



Some Dam – Hydro News™ And Other Stuff



Quote of Note: Engineering - Engineering is the art of organizing and directing men and controlling the forces and materials of nature for the benefit of the human race. - Henry G. Stott

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"Good wine is a necessity of life." - Thomas Jefferson

Ron's wine pick of the week: 2015 Dry Creek Vineyard Zinfandel "Heritage Vines"

"No nation was ever drunk when wine was cheap." - Thomas Jefferson



Dams:

(Now ya know.)

Oroville Dam Incident Explained: What Happened, Why and What's Next
Problems at two spillways at California's Oroville Dam in February have resulted in months of analysis and reports about what went wrong and how much repairs will cost.

Written by Ian Evans, Jun. 14, 2017, newsdeply.com

In February, damage to the spillway of the dam on Lake Oroville in Butte County, California, and erosion under the dam's emergency spillway threatened to send billions of gallons of water cascading through dozens of California communities. The dam did not collapse, but the damage to the spillway and the emergency spillway was enormous. The incident, and the political aftermath, have sparked tensions and concerns that the problems that led to the Oroville incident may be part of larger institutional issues. To catch up on what happened at Oroville, and what has happened since, here's a brief overview.

Construction

The flood in late 1955 and early 1956 was historic. It caused widespread damage in Northern and Central California, resulted in 64 deaths and more than \$200 million in property damage. To prevent further flooding, the state passed a \$25 million appropriations act, including money for a dam. The dam was to be located on California's Feather River, just above the town of Oroville, about 70 miles north of Sacramento.



Between 1961 and 1968, the California Department of Water Resources (DWR) built Oroville Dam, still the tallest dam in the United States. Since its construction, the Oroville Dam has had several incidents, including a crack in the main 3,000ft spillway in 2013 that was repaired, with a senior engineer for the DWR telling CBS Sacramento that “everything checked out.”

The 2017 Spillway Emergency

In the winter of 2016–17, after heavy rain in Northern California, Oroville's water levels rose quickly. While the water may have been a welcome sight after five years of drought, unprecedented rainfall filled the reservoir to dangerous levels. To relieve some of the pressure, the state released water down the main spillway at rates of up to 54,500 cubic feet per second (cfs). Then, on Tuesday, February 7, a crack in the spillway appeared and soon grew into a 250-ft crater. To prevent further damage, officials shut off water to the main spillway, but behind Oroville the reservoir continued to fill. Officials were hesitant to rely on the dam's emergency spillway, because it had never been used and would wash earth and trees into the Feather River below. To test how much it could safely rely on the now-damaged main spillway, the state released relatively small amounts of water – around 20,000 cfs. This eroded the spillway's hole by another 50ft. Because officials were unable to safely release enough of it, on Saturday, February 11, the reservoir's water rose to 901ft – enough to flow over the emergency spillway, as it was designed to do.

Unlike the main concrete spillway, the emergency spillway spills water over the lip of the dam wall. The water passes down an earthen hill and into the Feather River. On February 12, as water flowed down, it began to erode the hillside. Officials soon noticed that the erosion threatened to undercut the entire dam, which could cause a collapse and send a 30ft wall of water into the valley and communities below. That same day, California officials ordered 188,000 people to evacuate the Feather River basin, which the reservoir now threatened to inundate.

To ease the dangerous erosion, officials also released 100,000 cfs of water down the main spillway, damaging it further. But the dam held, and the reservoir eventually dropped below 850ft. Two days after the evacuation order, the state downgraded the order to an evacuation warning and cautiously allowed residents to return to their homes.

Emergency Aftermath

After the spillway collapse and evacuation, the Federal Emergency Regulatory Commission (FERC) ordered the DWR to put together a team of independent analysts to assess the damage to the dam, how the emergency happened and what steps should be taken next. Meanwhile, the DWR also put together a separate team of independent consultants. Experts have already identified many factors that may have led to the collapse of the spillway. For example, the spillway was built on top of weak, porous soil, according to reporting by Water Deeply, which likely eroded during the wettest water year in recorded history for Northern California. In the first independent report by DWR's consultants, they pointed to both damage and design failures in the main spillway that would prevent the state from completing repairs before the beginning of the rainy season in November. The study directly contradicted the official DWR report, which stated that repairs could be completed by then. State and federal officials subsequently kept another two independent reports secret, citing security risks and terrorism risks. However, public outcry prompted officials to eventually release another five redacted versions. Many documents related to the incident remain

secret, including documents about asbestos that may have been released by the dam, and the risk to the public. Like the initial report, the redacted reports detailed the extensive structural damage and failures from the crisis. Similarly, on May 5, the FERC investigators released a preliminary memo that detailed 24 factors that potentially led to the spillway collapse.

According to Martin McCann, Jr., the director of the National Performance of Dams Project at Stanford University, Oroville may have been an institutional failure as well as a structural one. Problems with the dam-building industry not paying attention to data on dam safety and structure, bad communication between groups – like engineers and geologists – and a failure to catch the signs of impending failures during routine inspections, all contributed to the Oroville Dam incident. They may point to a much larger problem. The Sacramento Bee reported that California is borrowing \$500 million from the federal government to pay for the Oroville Dam repairs, including \$274 million that was previously approved by President Donald Trump to respond to the crisis. Currently, work is underway to repair the damaged spillway – just dredging the spillway debris has cost the state more than \$22 million, and Kiewit Corporation won the contract to repair the spillway for \$275 million, according to the Bee. The state has deployed helicopters and drones to assess the extent of the damage, and engineers in Utah even built a working, scale model of the spillway to better assess how water flows over the damaged concrete, and how best to repair it.

(Too much info in an EAP.)

California Legislature votes to keep dam-safety plans secret

By Ryan Sabalow, Jim Miller and Dale Kasler, sacbee.com, June 15, 2017

Fresh off the Oroville Dam crisis, California lawmakers on Thursday voted to make dam-safety plans secret through language that was quietly inserted into a budget-related bill. The legislation, which requires Gov. Jerry Brown's signature before becoming law, says emergency action plans at dams would be kept confidential to "protect public safety." Assemblyman James Gallagher, R-Yuba City, said slipping the language into a budget-related bill, Senate Bill 92, without debate was "kind of insulting, really" to the 188,000 evacuees such as him who were forced to flee their homes for two days after the near-failure of Oroville's emergency spillway.



Kiewit Infrastructure continues concrete demolition work on the lower chute of the Lake Oroville flood control spillway in Butte County, California. Photo taken May 26, 2017. Florence Low California Department of Water Resources

A Brown administration official took issue with the notion that the language wasn't open for discussion and review. Brown spokesman Gareth Lacy said the language has been in Brown's budget proposal since March. That some did not read it doesn't make it secret," he said in an email. The language is included in one of several so-called budget trailer bills that carry out policy embodied in the main spending bill for the fiscal year beginning July 1. Trailer bills often involve significant policy changes. And unlike non-budget, majority-vote bills that go through a months-long hearing process, trailer bills typically involve much less review and take effect immediately. Identical trailer bills with the public records exemption became public Saturday in the Assembly and Monday in the Senate. David Snyder, executive director of the First Amendment Coalition, said the legislation achieved "anti-transparency language in an anti-transparency way." "None of this language went through any sort of committee process. No one had the opportunity to discuss the pros and cons" of the proposal, he said, describing it as a "blanket confidentiality provision." "The health of the dams in this state ... is an issue of intense public concern." The additional layer of secrecy comes as the state Department of Water Resources already files its emergency plans for Oroville Dam with federal regulators under seal, through a provision that makes secret "critical energy infrastructure information." The 109-page legislation touches on dozens of state programs.

Midway through, it strikes the state's existing dam-flood "inundation map" requirements and replaces it with new rules requiring emergency action plans. Dam owners, for example, would have to conduct annual emergency exercises. The legislation also adds provisions meant to strengthen the state's evaluation of dam safety. Dams, for example, would be classified based on their risk. On the legislation's second-to-last page, it says the required emergency action plans would be kept confidential to "protect public safety."

"An emergency action plan contains a blueprint for emergency response following an incident involving a dam and details various failure scenarios of a dam and its related critical infrastructure," the bill reads. "An emergency action plan also includes specific notification procedures and information about local emergency management officials, such as their personal identifying information. To keep this information from individuals with improper motivations who could use the information maliciously to expose a dam's vulnerabilities and to disrupt a critical emergency response, it is in the state's interest to limit public access to this information."

The Brown administration called for the records exclusion on the last page of draft trailer bill language posted in March shortly after Brown unveiled its dam-safety and flood-protection plan. Legislative budget hearing agendas do not include a mention of the administration's proposal to make the plans confidential.

The latest secrecy language is the latest in a tug of war between the state and members of the public over Oroville Dam records. The state has denied The Sacramento Bee's requests for certain technical documents and dam safety records. The agency also hasn't yet fulfilled a request the paper made in February seeking emails from top water officials during the spillway crisis. Brown's office also denied certain internal communications and emails from the governor's staff. Those records could show how Brown and his top staff members were coordinating the ongoing crisis with each other, with outside agencies and with members of the public.

State officials say the state is reassessing some of The Bee's requests. Last week, a Northern California activist group sued state officials, alleging they were illegally withholding information about potentially toxic asbestos around the dam.

Oroville Dam's main flood control spillway cracked in two Feb. 7, leaving an enormous chasm that hindered water releases and eventually triggered the evacuations. Gallagher, the Republican assemblyman who represents the Oroville area, said the crisis showed why safety plans need to be open to the public. He said state dam managers seemed unsure of what to do, and it ended up being the Butte County sheriff who made the "critical decision" to order an evacuation. "So there's clearly problems with the emergency action plan at the dam that we need to improve and change," Gallagher said, "But they're going shield it from public review and criticism."

(DWR has some fence mending to do.)

Oroville Dam repair is huge, but so is residents' mistrust

By Kurtis Alexander, June 18, 2017, sfchronicle.com

OROVILLE, Butte County, CA — The rush of workers and heavy machinery to the shore of Lake Oroville is so vast and unfamiliar it's fanning rumors across this rural region that the ruckus couldn't just be for a historic dam repair. Some say the around-the-clock clamor high above town must be a secret effort to mine undiscovered metal from the once-booming Gold Country outpost. Others suspect a missile silo is taking shape, not a new spillway to send water down the Feather River. At the least, many residents are skeptical that the unprecedented, deadline-driven project will restore their shaken faith in the nation's tallest dam.



Memories are still fresh from February when 180,000 people were forced to evacuate their homes after both of the lake's spillways — the main chute and an emergency one — were severely damaged. Authorities worried the whole dam might collapse.

"I'm moving as soon as I get the chance," said Charles Hunter, 47, a handyman who lives and works below the lake, as he painted the interior of a new downtown Oroville cafe on a recent morning. "I worry that it's just a patch job going on up there." But as state officials gave *The Chronicle* a tour last week of the construction site, they said the effort was both extensive and relatively straightforward. The two damaged spillways, they said, are being rebuilt to maximize safety and strength — and, once again, reliably discharge water.

It's difficult to fathom the size of the job, which is critical for flood protection and the state's water supply. As many as 800,000 cubic yards of cement — about twice what was used for the new Bay Bridge skyway — will be poured. Two concrete plants are being fired up at the lake to supply the material. The workforce will soon grow from about 200 to 500. The challenge, officials say, will be finishing the work before the rainy season returns. Officials want both spillways to be operational by Nov. 1 in case the lake fills up by then and water needs to be released. Final touches, they say, can wait until the following summer. Complicating matters, the state had little choice but to move forward before it figured out exactly what caused the spillways to erode. A team of independent dam experts investigating the debacle has offered a preliminary list of about two dozen structural deficiencies that may have been to blame — and wants the repairs to account for all of these. State consultant and former Department of Water Resources manager Dave Gutierrez, who is advising on the project, said many of the shortcomings are the result of the dam's age. "Just by doing a modern design," he said, "you're going to take care of most issues."

During last week's tour, behind several road checkpoints that keep residents far from the construction site, Gutierrez pointed out the many problems with the old spillways. The 3,000-foot-long main chute — where the crisis began Feb. 7 when a crater opened up amid heavy releases from the lake — didn't have water stops to seal joints and prevent leaks from weakening it. Also, there is too little steel reinforcement in the structure, and the pipes that drain water beneath it are made of clay instead of superior PVC. "You can't even find clay pipes anymore," Gutierrez said, as he looked down from the top of the 770-foot earthen dam that was completed in 1968. After weeks of blasting with explosives, the state's main contractor, Kiewit Corp. of Omaha, Neb., finished demolishing 2,000 feet of the compromised main spillway, including the part that initially gave way. Over the next 4½ months, the company will rebuild the section as well as fill in the 300-foot-long hole that opened up.

The upper 1,000 feet of the chute will be patched and waterproofed, as needed, then rebuilt next summer. There simply isn't time to do it this year. As many as 800,000 cubic yards of concrete will be poured to repair the main spillway of the Oroville Dam. The emergency spillway was essentially a barren hillside below a concrete apron at the lake's edge, and it was supposed to handle overflow if the lake got too high. But when it was thrust into action this year for the first time, the hill quickly eroded. That's what prompted authorities to evacuate downstream communities, in case the land gave way. State officials say they don't plan to use the emergency spillway ever again. However, they're building a 1,700-foot cutoff wall, similar to a retaining wall, within the hillside to prevent future erosion, should the spillway be needed. Next year, they plan to pave the spillway's upper stretch. Kiewit, which has set up a sprawling operations yard at the lake's main boat launch, with more than a dozen trailers and countless construction vehicles, is being paid \$275 million for two years of work.

The expense follows an estimated \$200 million price tag for the emergency response to the crisis and is expected to be paid largely with federal emergency funds. Critics of the Department of Water Resources say deficiencies in the spillways should have been addressed — if not when the dam was built in the 1960s, then in ensuing decades as dam safety science evolved. While state officials insist they've done all they can to keep the dam safe, the team investigating the spillways said it's looking into the possibility of poor management.

"I'm not sure that we're going to be pointing blame on any particular person or organization," said John France, an independent engineering consultant who is leading the investigation. "We're more trying to focus on what lessons we can learn on how the process may have let us down in terms of not having the proper training or not responding to things the way they should have." France said he expects the team's findings to have implications for other dams in California and beyond. "There will be some changes in the way the dam safety industry does its work," he said. This month, at the direction of Gov. Jerry Brown, the state Division of Safety of Dams sent letters to at least 100 dam operators directing them to re-evaluate their spillways for potential problems.

Downstream in Oroville, construction at the lake has manifest as a small economic boom.

"The workers are all over the place," said an employee at the Sunset Inn on Feather River Boulevard. "It's helpful." For Tayler Rash, an employee at a downtown boutique called Pardon My French, the gains are yet to come, but she's hopeful the spotlight on Lake Oroville — even though it came via crisis — will translate to more business.

"I was out of town last weekend, and I told someone I was from Oroville," she said. "They said, 'Oh, yeah, the dam place,' and I said, 'Oh yeah, the dam place.'" If there are benefits, many say they pale in comparison to everything else the city has had to put up with, from closed roads and truck traffic to lingering concerns about the dam's integrity. Some still carry a grudge from the dam's original construction, when the state put forth plans that never materialized, including a proposed amphitheater and restaurant and a tourist train to the lake, which submerged thousands of valuable acres. "We gave up a lot to have this facility here, and we don't gain from it," said Butte County Supervisor Bill Connelly, a longtime critic of the Department of Water Resources. Connelly sees renewed attention on the dam as an opportunity to revisit past inequities. But he knows that's an uphill battle. "Hopefully," he said, "we can just be reassured that we'll be safe."

(No, they shouldn't.)

Dam safety records should be public

San Francisco Chronicle, June 18, 2017, sfchronicle.com

Since the tallest dam in the United States threatened California with catastrophe last winter, state officials have responded with policies to stanch the flow not just of water but of information.

The latest example is the Legislature's vote to exempt a whole class of crucial information about dams from the state's public-records law. A provision in the recesses of a lengthy budget-related bill requested by the governor and passed by both houses last week could prevent public and press access to plans for responding to dam emergencies. That is hardly an academic issue in the wake of February's brush with disaster at the



Oroville Dam, where record rains and brittle spillways forced nearly 200,000 to evacuate downstream areas. Gov. Jerry Brown's administration has since awarded a \$275 million contract to repair the structure and, last week, ordered new inspections of some 70 aging dams. At the same time, citing security concerns, the state has limited access to contract, inspection and other records despite the objections of journalists, legislators and local governments.

The bill passed Thursday, now awaiting Brown's signature, is one of several trailer bills dealing with an array of policy issues. Among them, it expands the emergency action plans required of federally regulated dams to other dams and makes them consistent with other state emergency plans, such as those for earthquakes and tsunamis, said Kelly Huston, a deputy director of the state Office of Emergency Services. It also exempts those emergency plans, as the Sacramento Bee reported, from disclosure under the California Public Records Act. Noting that evacuation routes and most of

the other information in the plans are meant for public consumption, Huston said the administration's intent is to make them largely public but to withhold select sensitive information, such as specific dam vulnerabilities or law enforcement officers' phone numbers. Oroville project communications manager Erin Mellon said officials' intent is to improve safety with more emergency planning and make most of the plans transparent. The governor's office also noted that the draft language of the legislation was published three months ago. But the provision nevertheless underwent little public discussion and has the effect of creating a new exception to a public-records law that already has plenty, said David Snyder of the First Amendment Coalition. The legislation's blanket language forces the public to rely on the best intentions of state officials rather than the legal presumption that the emergency plans, like most other government records, are public. **The dam legislation certainly has important public-safety goals. And it's possible that in an attempt to keep a narrow swath of sensitive information confidential, lawmakers and the administration have inadvertently come to the brink of creating an excessively broad and unnecessary exemption to the Public Records Act.** In any case, the governor can easily reassure the public of his commitment to transparency by refraining from signing that provision into law.

([More complaining about secrecy.](#))

Editorial: Legislators see no problem with dam secrecy

06/21/17, orovillemr.com

The state agency in charge of Lake Oroville prefers secrecy, and it has an enabler in Gov. Jerry Brown.

Now Democrats in the Legislature are on board, voting to keep the public in the dark.

We hoped elected officials would have endangered citizens in mind. Sadly, we were wrong.

There's no good rationale for what the Assembly approved last week on a straight party-line vote.

Senate Bill 92 requires that emergency response plans be developed but kept secret. The vote was 55-23, with only Democrats in favor.

The bill is an insult. Emergency safety plans are made for the public, but the public can't see them?

The state says the plans are being kept secret because terrorists could use the plans to do harm. It defies common sense.

Assemblyman James Gallagher, R-Yuba City, the only person in the 120-member Legislature who had to be evacuated from his home during the Oroville spillway crisis, chastised the deaf ears in the Assembly before Thursday's vote.

Gallagher reminded legislators about the evacuation of 188,000 people downstream of the dam four months ago. He called it a "debacle in terms of how emergency action plans were carried out."

Gallagher noted that while state officials were dithering, Butte County Sheriff Kory Honea stepped in and made the decision to evacuate.

The incident proved emergency action plans need to be updated. SB 92 would help in that regard.



"The problem is, in this bill, the public will be restricted from being able to view what these emergency action plans are," Gallagher said. **"So we're going to improve them but we're just not going to let you see them. And again they're going to say, 'Maybe somebody might be able to use this to commit a terrorist act.'**"

"I can tell you my constituents are more scared of the people operating and maintaining that dam than they are of terrorists right now."

Gallagher cited several other reasons why he couldn't support SB 92. He said the legislation didn't go far enough to address dam safety and flood control issues. He pointed out the state Department of Water Resources is asking dam operators across the state to inspect their structures.

"We still don't know what these inspections are going to entail," Gallagher said. **"So I guess we can expect more of the same inspections, the same ones that were done on Oroville Dam — and we saw what happened there."**

Gallagher also criticized fellow legislators for not funding repairs to levees through the general fund. The state seems willing to wait for a disaster to happen, then pay the bill, he said. Gallagher went on for more than four minutes until the Assembly leader intoned,

"Thirty seconds, Mr. Gallagher." Gallagher wrapped it up concisely: "This is a cultural problem (culture in the DWR) that we need to address in this state and it's the Legislature that's going to have to demand it because the administration is doing nothing. They want to just say, 'Don't worry about it. We're taking care of it.' We're doing the repairs up there but we're not really changing how we're doing business. It's not acceptable to my constituents. I urge a 'no' vote on this budget bill." The vote was a quick "yes." Shut off the spigot of water from Lake Oroville and maybe Democratic legislators to the south might care about what's going on up here.

(Oroville fallout.)

California ordering inspections at aging dams after crisis

By Ellen Knickmeyer and Scott Smith, Associated Press, June 14, 2017, sfgate.com

SAN FRANCISCO (AP) — California is ordering immediate spillway inspections at about 70 aging dams that it believes might not be sound enough to protect downstream communities in a flood, a state dam regulator said Wednesday. The engineering and on-site reviews are part of stepped-up inspections following February's surprise failures of both spillways at California's 770-foot-high (230-meter-high) Oroville Dam, the nation's tallest. Authorities ordered nearly 200,000 people to evacuate in that crisis. Since then, regulators at California's dam-safety division began reviewing their records on the 1,250 dams they monitor, focusing on 100 big, aging dams that have people downstream, supervising engineer Daniel Meyersohn said.



The state has since written to owners of about 70 of the dams, ordering them to carry out a thorough review of the spillways' engineering and, if necessary, on-site inspections of the soundness of the spillways and the rock supporting it.

Meyersohn declined to identify the dams that had received the orders for extra inspections, saying some of the owners may not yet have received their notices. Operators at Whale Rock dam near San Luis Obispo on the Central Coast received one of the letters this week. In it, the state informs dam operators that the state believes the spillway "may have potential geologic, structural, or performance issues that may jeopardize its ability to safely pass a flood event."

The state order mandates that dam operators fix any spillway problems they find before the next rainy season, which in California usually begins around November. Many of California's reservoirs and rivers are at their fullest in years after heavy winter rain and snow. At Oroville, construction crews already are rushing to rebuild and anchor half-century-old spillways before November, as part of about \$500 million in emergency response and repairs. Oroville's main and then back-up spillways collapsed in February, despite years of inspection and maintenance reports that failed to warn of any catastrophic failure of the concrete main spillway in particular. Many of the spillways the state is singling out for closer evaluations by dam owners are even older than Oroville's, including some dating back to California's 19th-century Gold Rush, Meyersohn said.

At Whale Rock dam, the orders come despite dam operators' weekly sight checks of the structure, said Noah Evans, supervisor for the city of San Luis Obispo's Whale Rock Reservoir. Up to 2,000 people living in the coastal community of Cayucos are downstream from the reservoir, Evans said. The dam's operators have used the spillway a dozen times since the dam was built in the 1960s, the last time in 2005 with no problems, Evans said. The Lopez dam is upstream from about 5,000 people in the community of Arroyo Grande, said Mark Hutchinson, deputy director of San Luis Obispo County Public Works, which also received a letter from the state calling for an inspection. Water first tumbled over the spillway a year after the completion of the dam in 1968. A

detailed inspection in 1991 led officials there to perform significant repairs a decade later, Hutchinson said. "If we were to build it today what would be different? If there is something that would be different, what are the implications of that?" he said. "There's some good stuff to sink your teeth into."

(Here's good place to eat with a good name.)

The Dam Site Inn is Northern Michigan at its finest

June 15, 2017, by Amy Sherman | mlive.com

Heading to the Northern Lower Peninsula this summer and want a unique, delicious experience that can't be duplicated anywhere else? Of course you do. And you'll find it at the one of a kind Dam Site Inn located in Pellston, at the tip of the mitten. This place has a throwback interior, with a downright amazing bar straight from the 1960's. White tablecloths, but no dress code. The best use of a lazy susan since 1976. And some of Michigan's Best fried chicken.



Originally on this site stood a building that functioned as the dining hall for the many local lumberjacks that worked in the area. In the early 1900's, the Efting sisters bought the building. They also owned the building across the street, and ran it as the Maple River Inn. The plan was that they were going to move the Inn to the current spot of the Dam Site Inn, but that never happened. The ladies were known not only for their chicken and noodles (surprise!) but also for, possibly, offering a few other things during Prohibition. There is a legend that one of the sisters still haunts the Inn today, with appearances most frequently in the "N" dining room. All of the dining rooms have names to differentiate them for the staff, the "N" stands for new, as that room was new in 1960. The restaurant offers beautiful views of the Northern Michigan countryside from huge windows all the way around the building. Grab a table, and soak in the best the mitten has to offer this summer.



In 1953, Ken and Kathy McLaughlin purchased the inn with the intention of running it as a bed and breakfast. Their chicken dinners, inspired by both the Maple River Inn, and the equally impressive (and another of Michigan's Best) Iva's Chicken Dinners in Sterling, proved so popular that they just stuck with dinner. They still only serve dinner at the Dam Site Inn, opening at 5 pm during the week and 3pm on Sundays. The bar chairs, and the walls, feature naugahyde from Buick. Both Ken and his brother worked there. Both the bar chairs and the cocktail tables in the bar are original, and designed by Eero Saarinen who also designed the St. Louis Arch and the JFK airport. He also

worked with Charles Eames at the Knoll furniture company in Grand Rapids. A bit of furniture history with your fried chicken.

In 1977, Joe and Betty Church purchased the Dam Site, and the family still owns it today. Ray and Pam East are current owners, and their daughters, and the Church's granddaughters, Erica and Olivia are on site almost every day, making sure that the history and traditions are still honored. The Inn has many long time employees, who come back year after year, that have really become part of the family now.

(Another dam is going to bite the dust.)

Lexington City Council votes to demolish landmark dam at Jordan's Point

The council said the dam is beyond any repair the city can afford

By Alison Wickline - Reporter, June 16, 2017, wsls.com



LEXINGTON, Va. - The Jordan's Point dam is a landmark for the Lexington community. Now because of safety concerns and structural issues, the dam may be a thing of the past. The low-head dam is built on history, hundreds of years of history. Now it is a point of deep discussion. Demolish with the help of the Virginia Department of Game and Inland Fisheries, or spend millions to maintain. "We don't know if the dam will stay another day, a week, six months, six years or 60 years but the 2007 report recommended the dam be removed and conversations with the state said it was going to be expensive to repair that," said Noah Simon, Lexington city manager.

On Thursday night, the Lexington City Council voted to move forward with demolition, citing the 2007 inspection report that found numerous structural and safety issues with the dam.

The cost of demolition will fall to the Department of Game and Inland Fisheries. "Certainly a very attractive offer when you have someone who's willing to go seek funding for the removal, to manage the project and to really carry that ball forward," said Simon. On the other side of the divide, some residents are worried the removal of the dam will remove one more piece of Lexington's history. But city staff say an act of nature destroying the dam would be the real loss. "I think this is real opportunity to document a lot of Lexington's history down there and to preserve that because if no investment is made in the dam, at some point that dam will fail and all of that history would be lost," said Simon. For one longtime Lexington resident, the decision to demolish the dam could sweep away years of tradition. "I mean there's simply not a finer way to spend a lazy afternoon in the summer than floating down to the dam. Everybody here knows you put in at Bean's Bottom, take a couple hours, get down to the dam and get out," said Tom Lomax. The timeline for demolition is fluid. The Department of Game and Inland Fisheries has to first work on an agreement with the city and then find the grant funding to be used for the project.

(200 years and then it'll be gone. Replaced with rocks.)

Nature Conservancy To Remove 200-Year-Old Dam To Restore Ecosystem, Prevent Major Flooding

By AVORY BROOKINS • 6/19/17, ripr.org

Rhode Island's chapter of The Nature Conservancy is preparing to remove a 200-year-old dam from the Pawcatuck River to restore the ecosystem and protect local communities from flooding due to dam failure. The six-foot-high, 200-foot-wide Bradford Dam will be replaced with a series of stone walls that have openings for fish to swim through. Suzanne Paton, biologist for the U.S. Fish & Wildlife Service, said the new structure will open the river for fish that live there year-round. "They may have been trapped on one side or the other of the dam and now they can navigate further upstream or further downstream to explore to maybe find better areas for them to lay their eggs and spawn, or sometimes they're looking for a certain water temperature," Paton said.



Paton said other benefits of the new structure include opening the river for migratory fish; adding more small fish to the food chain as more fish eggs are released throughout the river; eliminating the possibility of the dam failing during a major storm event; and improving paddling. The project is expected to cost \$1.8 million and is being supported by \$821,000 in federal funding for Hurricane Sandy recovery and resilience projects. The new structure is expected to be completed in December.



Hydro:

(Using the existing hole in the ground.)

Hydro power legislation filed

6/16/17, thecoalfieldprogress.com

Ninth District U.S. Rep. Morgan Griffith (R-Va.) announced Thursday he has introduced legislation to promote closed-loop pumped storage hydropower. The Federal Energy Regulatory Commission defines closed-loop pumped storage as projects that are not continuously connected to a naturally flowing water feature; and open-loop pumped storage as projects that are continuously connected to a naturally flowing water feature.

"Our state legislators have worked hard to facilitate the deployment of this technology in the coalfields, and my bill provides the support necessary to complement their work from the federal level," Griffith said in his announcement. The bill would allow FERC "to impose licensing conditions only as necessary to protect public safety; or that are reasonable, economically feasible, and essential to protect fish and wildlife resources," the congressman said in his announcement. "At a couple of hearings earlier this year, I raised this issue as a possibility that some are exploring as a way to re-purpose abandoned mine lands that already have much of the infrastructure in place to accommodate these projects," he said. "Sites that could be considered in Southwest Virginia are especially attractive since they use clean, non-acidic water for use in the system." Griffith also said the idea "could be a real benefit to our coalfield regions, in the form of jobs, economic development, and energy security."



The congressman got praise from members of the state Southwest delegation, who had supported bills approved by the Virginia General Assembly this year that would promote development of pumped storage electric generating facilities in the coalfields. Officials are looking at former underground mines as possible locations for such facilities. Del. Terry Kilgore, R-Gate City, and Sen. Ben Chafin, R-Lebanon, sponsored the state legislation. Chafin said Griffith's bill "will help fast track the process for hydro pump storage. These facilities will create jobs and help our localities financially." Kilgore said hydro pumped storage power plants "could help Southwest Virginia remain the energy provider of Virginia." Next week, communications officials with Dominion Energy will be in the region discussing the state legislation and the company's potential interest, spokesman Greg Edwards said Thursday. "We are evaluating the possibility of pumped storage in Southwest Virginia in the wake of the new law," Edwards said, "but there's not a lot of detail at this point." He said they expect to talk more about it later this summer.

On its website, FERC said many of the recently proposed pumped storage projects can be classified as using a closed-loop system. The commission website also observed, "Differentiating between open- and closed-loop systems is helpful for illustrating trends in pumped storage project proposals, but project-specific impacts (rather than the open- vs. closed-loop classification) are the primary concern during the licensing process." According to the Energy Storage Association's website, "While a project utilizing sub-surface reservoirs has yet to be completed, these types of projects are attractive due to their perceived site availability and their potential for reduced environmental impacts." Abandoned mines, caverns, and man-made storage reservoirs have all been proposed as potential project reservoir options, and there are examples of several projects

under initial phases of development. The underground excavation or materials-handling costs, construction risk, and time required for underground excavation and construction could make the economics of such a project difficult, so most developers are looking to utilize existing subsurface structures or minimize/offset underground costs through the sale of excavated materials (ore, aggregate, etc.)."

(Getting new stuff.)

Elkhart dam gates being replaced

By Ed Ernstes, WSBT 22 Reporter, June 15th 2017, wsbt.com

ELKHART, IN — A project began Thursday at the I & M dam in Elkhart. The Saint Joe River is being lowered to allow crews to replace the main gates controlling the flow of water. While the power company says there aren't any problems with the huge gates, they are more than 100 years old. The hydroelectric dam played a big role in electrifying Elkhart. The hydroelectric dam alongside the Johnson Street bridge was between 1910 and 1913. Most of the gates that control the water flow at the I and M Dam, have now been closed. That's to remove the water out of the spillway so crews can work.



I & M says there are no problems with the gates or the dam itself, but the gates are more than 100-years-old and approaching the end of what they say is their useful life. Local historian Paul Thomas is interested in watching the project begin. "This is another big project in Elkhart this summer. It's going to be interesting to see how quick they can do it," Thomas said. Thomas says when the dam was originally built, crews didn't have modern day construction equipment. "It was very primitive. It was done by horses and manual labor. Manual labor was the main thing, built by hand. A lot of the horses did the dredging," Thomas said. Prior to the work nothing was in place to control the water flow. That was handled by mother nature, until the dam was built. But when the work was completed on the hydroelectric dam, it brought electricity to businesses and homes along the St. Joseph River. "Very interesting that electricity came in and it was very, very popular," Thomas said. I&M says the project is not expected to noticeably affect the water levels along the St. Joseph River.

(Let's get 'r done.)

Sen. Gardner reintroduces legislation to retrofit dams with electricity-generating technology

June 16, 2017, by Daily Energy Insider Reports, dailyenergyinsider.com

Sen. Cory Gardner (R-CO) reintroduced this week a bill that would reauthorize an existing Department of Energy (DOE) program that provides funding to retrofit existing dams and river conduits with electricity-generating technology. "The Reliable Investment in Vital Energy Reauthorization Act (RIVER Act) is commonsense legislation that is a key component to an all-of-the-above energy strategy," Gardner said.

According to DOE reports, there are as much as 12 gigawatts of unused hydropower development within the existing U.S. dam infrastructure. Only three percent of the nation's 80,000 dams are used to produce hydroelectric power. "Senator Gardner understands how important hydropower is to Colorado," Kurt Johnson, president of the Western Small Hydro Association, said. "Senator Gardner's RIVER Act will help ensure that Colorado continues as a national leader in new small hydropower development on existing dams, canals and pipelines. We're excited to support him as he works to get his legislation signed into law." Gardner sits on the Energy & Natural Resources Committee and Subcommittee on Energy. "Since only three percent of the nation's 80,000 dams are used to generate clean hydroelectric power, it's important we have the tools to retrofit these existing dams to produce electricity," Gardner said. "Colorado has been able to utilize this program in the past to bring hydropower to communities across the Western Slope, and I'm looking forward

to working with interested stakeholders to bring new hydropower opportunities to more of Colorado.”



Water:

(Look up, it might be raining.)

Letter: Rising rivers caused by man-made dams, not climate change

By – Bob Boggetti, nwherald.com

To the Editor:



“Climate change may be affecting inland bridges,” Scott McFetridge of The Associated Press said. This is the reason the Red Bridge in Des Moines, Iowa needs to be raised more than 4 feet.

Rivers have always flooded. Scott in his article would have you believe “man-made climate change” has made the river rise so drastically in the past decade or so. Personally, I believe “man-made dikes and dams” play a bigger role in the rivers rising than climate change does.

Restricted water will rise. *Bob Boggetti*



Other Stuff:

(Will we ever get there?)

Scientists are Fighting Over How to Make the Power Grid Green

It all comes down to how you feel about nuclear energy.

By Dyani Sabin, June 19, 2017, inverse.com

On Monday, a new paper broke open the academic fight over how the United States can get to a 100 percent renewable grid. It’s a re-analysis and rebuttal of a study, which is the academic equivalent of starting a brawl. Also on Monday, the author of original study came out swinging with an academic takedown of the rebuttal. There is no doubt that we can eventually hit a 100 percent renewable grid, the debate is whether we need more than solar, wind, and hydro power to get there. Christopher Clack, an environmental mathematician at University of Colorado-Boulder and lead author of the new paper in the Proceedings of the National Academy of Sciences attacks a Stanford University paper for its main hypothesis of a 100 percent renewable energy grid. The debate has been going since 2015, and this is just the latest chapter. In the midst of all the fighting, the scientists seem to agree that we can get to 80 percent renewable by 2050. It’s getting that last 20 percent and whether we keep nuclear energy that forms the real sticking point.

“It is important to understand the distinction between physical possibility and feasibility in the real world,” Clack writes. “There is a difference between presenting such visions as thought experiments and asserting, as the authors do, that rapid and complete conversion to an almost 100% wind, solar, and hydroelectric power system is feasible with little downside.” In 2015, a paper was published by Mark Jacobson, an environmental engineer at Stanford University, which stated that the U.S. could get to a totally green grid by 2050 to 2055 without having to use alternative fuels like biofuel, nuclear, or batteries. At the time, it was criticized for cutting out possibilities like nuclear energy or trade-offs between a renewable grid and helping to manage climate change. Jacobson wrote a rebuttal of this criticism, saying that the criticism shows how other studies failed to measure “true nuclear and carbon capture costs.” Other analyses have suggested that we will need all of our

current technology to hit eighty percent decarbonization, which is needed to keep global warming at the level set by the Paris climate agreement.

“It is one thing to explore the potential use of technologies in a clearly caveated hypothetical analysis; it is quite another to claim that a model using these technologies at an unprecedented scale conclusively shows the feasibility and reliability of the modeled energy system implemented by midcentury,” Clack and his team write in the academic version of throwing down.

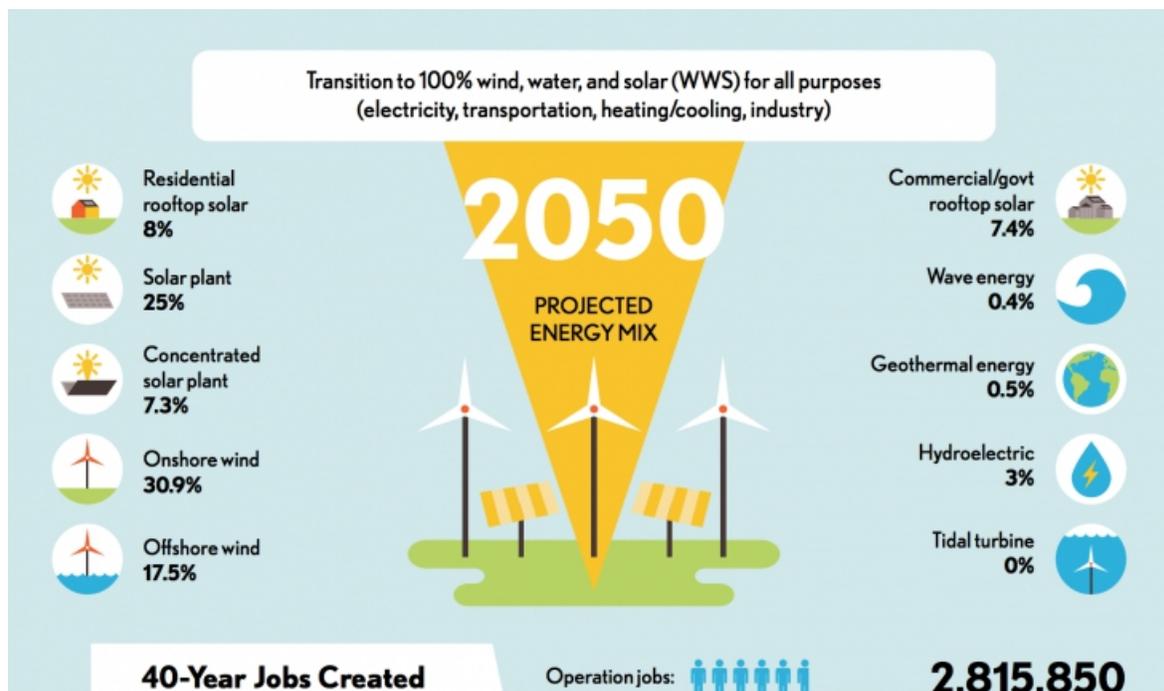
Essentially, Clack says that Jacobson’s paper doesn’t analyze the costs of the transition and rely too heavily on scaling up existing renewable technology too quickly. In particular, Jacobson recommends installing 156,000 wind turbines off the coasts of the U.S. by 2050, which is 52 times more offshore wind turbines than have been installed in Europe over the last 20 years. One of the main problems Clack has, is that Jacobson uses the estimated impact of a nuclear war every 30 years as part of the data to de-incentivize the use of nuclear power. And importantly, in 2016 the U.S. relied on nuclear power for 19.7 percent of our energy generation.

In Jacobson’s published response to Clack he calls the analysis of his study is full of “inaccurate claims.” He also writes that Clack is ignoring the social costs of biofuels and nuclear power in order to decrease carbon alone. Despite the criticism, Jacobson ends his rebuttal by stating that Clack’s paper has no impact on his work and that the United States can reach a 100 percent renewable grid using just solar, wind, and water energy. “In sum, Clack et al.’s analysis is riddled with errors and has no impact on [my] conclusions,” he writes. However, in Clack’s analysis and the analysis of the international Deep Decarbonization Pathways Project have found that without things like nuclear, carbon capture and storage, and bioenergy it will be impossible to get to a grid with zero emissions. It’s too early to know if Clack or Jacobson are correct, but the fight between major clean-energy experts itself suggests that there are perhaps multiple ways towards a renewable future. We are just going to have to decide how much we want to find a way to replace nuclear energy.

(Some people don’t believe it!)

Lies, errors and fabrications of the claimed low cost 100% US power from wind, water and solar power

Brian Wang | June 20, 2017 |



Researchers have detailed the implausible assumptions and many flaws in the Jacobson proposal to provide 100% of the USA's power with wind, water and solar. Jacobson et al. (2015) consider whether the future primary energy sources for the United States could be narrowed to almost exclusively wind, solar, and hydroelectric power and suggest that this can be done at "low-cost" in a way that supplies all power with a probability of loss of load "that exceeds electric-utility-industry standards for reliability". The analysis involves errors, inappropriate methods, and implausible assumptions. Their study does not provide credible evidence for rejecting the conclusions of previous analyses that point to the benefits of considering a broad portfolio of energy system options. A policy prescription that overpromises on the benefits of relying on a narrower portfolio of technologies options could be counterproductive, seriously impeding the move to a cost effective decarbonized energy system.

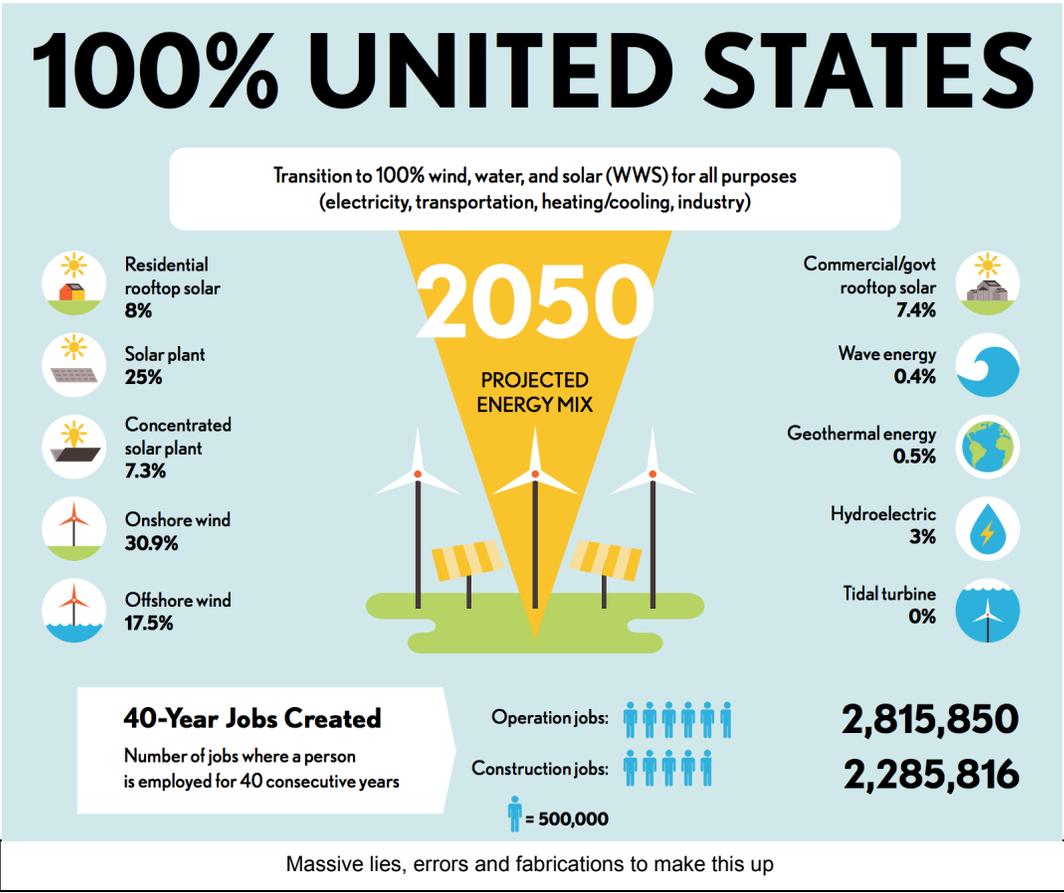
- * cost of capital assumed to be 33-50% of the historical costs, this is both unrealistic and biased for wind and solar power
- * emissions for nuclear power include fossil fuel used during construction and emissions from assumed nuclear wars
- * assumes small scale technology can be scaled up thousands of times without delay
- * assumed permitting problems and other issues with wind farms all vanish

A number of analyses, meta-analyses, and assessments, including those performed by the Intergovernmental Panel on Climate Change, the National Oceanic and Atmospheric Administration, the National Renewable Energy Laboratory, and the International Energy Agency, have concluded that deployment of a diverse portfolio of clean energy technologies makes a transition to a low-carbon-emission energy system both more feasible and less costly than other pathways. In contrast, Jacobson et al argue that it is feasible to provide "low-cost solutions to the grid reliability problem with 100% penetration of WWS [wind, water and solar power] across all energy sectors in the continental United States between 2050 and 2055", with only electricity and hydrogen as energy carriers. Researchers evaluate the Jacobson study and find significant shortcomings in the analysis. In particular, they point out that this work used invalid modeling tools, contained modeling errors, and made implausible and inadequately supported assumptions. Policy makers should treat with caution any visions of a rapid, reliable, and low-cost transition to entire energy systems that relies almost exclusively on wind, solar, and hydroelectric power.

A number of studies, including a study by one of us, have concluded that an 80% decarbonization of the US electric grid could be achieved at reasonable cost. The high level of decarbonization is facilitated by an optimally configured continental high-voltage transmission network. There seems to be some consensus that substantial amounts of greenhouse gas (GHG) emissions could be avoided with widespread deployment of solar and wind electric generation technologies along with supporting infrastructure. Furthermore, it is not in question that it would be theoretically possible to build a reliable energy system excluding all bioenergy, nuclear energy, and fossil fuel sources. Given unlimited resources to build variable energy production facilities, while expanding the transmission grid and accompanying energy storage capacity enormously, one would eventually be able to meet any conceivable load. However, in developing a strategy to effectively mitigate global energy-related CO₂ emissions, it is critical that the scope of the challenge to achieve this in the real world is accurately defined and clearly communicated. Wind and solar are variable energy sources, and some way must be found to address the issue of how to provide energy if their immediate output cannot continuously meet instantaneous demand. The main options are to

- (i) curtail load (i.e., modify or fail to satisfy demand) at times when energy is not available,
- (ii) deploy very large amounts of energy storage, or
- (iii) provide supplemental energy sources that can be dispatched when needed.

It is not yet clear how much it is possible to curtail loads, especially over long durations, without incurring large economic costs. There are no electric storage systems available today that can affordably and dependably store the vast amounts of energy needed over weeks to reliably satisfy demand using expanded wind and solar power generation alone. These facts have led many US



and global energy system analyses to recognize the importance of a broad portfolio of electricity generation technologies, including sources that can be dispatched when needed.

Relying on 100% wind, solar, and hydroelectric power could make climate mitigation more difficult and more expensive than it needs to be. For example, the analyses by Jacobson et al. exclude from consideration several commercially available technologies, such as nuclear and bioenergy, that could potentially contribute to decarbonization of the global energy system, while also helping assure high levels of reliability in the power grid.

Both hydroelectric power and flexible load have been modeled in erroneous ways and that these errors alone invalidate the study and its results. The study of 100% wind, solar, and hydroelectric power systems extrapolates from a few small-scale installations of relatively immature energy storage technologies to assume ubiquitous adoption of high-temperature PCMs for storage at concentrating solar power plants; UTES for heating, cooling, and refrigeration for almost every building in the United States; and widespread use of hydrogen to fuel airplanes, rail, shipping, and most energy-intensive industrial processes. Jacobson claim to have shown that their proposed system would be low cost and that there are no economic barriers to the implementation of their vision. However, the modeling errors described above, the speculative nature of the terawatt-scale storage technologies envisioned, the theoretical nature of the solutions proposed to handle critical stability aspects of the system, and a number of unsupported assumptions, including a cost of capital that is one-third to one-half lower than that used in practice in the real world, undermine that claim.

Jacobson boosted the lifecycle emission of nuclear energy by including the emissions of the background fossil-based power system during an assumed planning and construction period for up to 19 y per nuclear plant. Jacobson also added to these emissions, the effects of a nuclear war, which is assumed to periodically reoccur on a 30-y cycle, are included in the analysis of emissions and mortality of civilian nuclear power. In contrast, not only does wind power not get the same penalties they assume that permitting problems go away for wind. Historically there have been very few offshore wind facilities been permitted in US territorial waters. The 100% wind, solar, and hydroelectric power system envisions more than 150,000 5-MW turbines permitted and built offshore without delays.



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