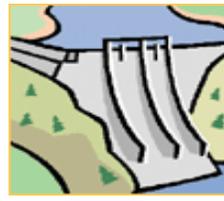


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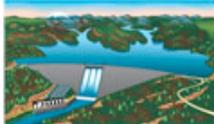
# Some Dam – Hydro News™ And Other Stuff



**Quote of Note:** *“Be sure you put your feet in the right place, then stand firm.” - Abraham Lincoln*

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**“Good wine is a necessity of life.” - Thomas Jefferson**  
**Ron’s wine pick of the week: 2015 Shannon Ridge Vineyards Petite Sirah "High Elevation"**  
**“No nation was ever drunk when wine was cheap.” - Thomas Jefferson**



## Dams:

(Doesn't think DWR can do the job!)

### No more patch and pray — privatize Oroville Dam

By Lawrence J. McQuillan and Hayeon Carol Park, January 30, 2018, sfchronicle.com

Just about one year ago, the collapse of two spillways at Oroville Dam forced the frantic evacuation of 188,000 people, caused millions of dollars in property damage and triggered hundreds of lawsuits. Earlier this month, an independent forensic team found that decades of reckless mismanagement by the California Department of Water Resources caused the crisis. Instead of making needed changes, Sacramento has responded by increasing the department's control.



What's needed instead is to transfer Oroville Dam and California's 43 other state-owned dams to private ownership and operation. This is not a radical idea; 64 percent of the 90,580 dams in the

Army Corps of Engineers' national inventory are privately owned. Even here in California, the figure is 43 percent. Dam safety experts faulted the Department of Water Resources for "ineffective and possibly detrimental" repairs, inadequate procedures to "identify risks and manage safety," and for being "overconfident and complacent," conducting "very little actual research." The problems persist. Cracks were detected in sections of the newly reconstructed main flood-control spillway. Predictably, department spokeswoman Erin Mellon downplayed the cracks as "something you expect to see." Not according to UC Berkeley civil engineering Professor Emeritus Robert Bea, an expert on dams, who said, "Cracking in high-strength reinforced concrete structures is never 'to be expected'" and can be deadly, allowing water to corrode steel embedded in the concrete. Indeed, "Such corrosion was responsible for the ... ultimate failure of the steel reinforcing in parts of the original gated (Oroville Dam main) spillway," Bea said. The department also estimates the reconstruction costs at \$500 million, nearly double the initial estimate of \$275 million, after workers discovered they must dig deeper than expected to reach bedrock.

Department of Water Resources mismanagement is not new. During Oroville Dam's relicensing more than 12 years ago, environmental groups filed a motion with federal regulators to require the department to armor with concrete the emergency spillway's earthen hillside. Despite the warnings and precautionary recommendations, regulators and the department failed to act. Safety experts also found that the department allowed the dam's main spillway to be built on faulty bedrock, used thin layers of concrete around vital spillway joints, and tolerated a flawed drainage system and cracks, allowing water to seep into the chute's interior. Shoddy maintenance was commonplace during 50 years of preventable decay. In response to the debacle, Gov. Jerry Brown issued a weak four-point plan, and the department created three deputy directors. But more layers of bureaucracy won't solve the problems that bureaucracy helped create. Institutional reform is needed. Currently, more than half (53 percent) of the 1,585 California dams monitored by the U.S. Army Corps of Engineers are categorized as having a "high hazard potential," where "loss of human life is likely if the dam fails." Nationally, the figure is 17 percent. Having the Department of Water Resources at the helm, with its opaque patch-and-pray approach to maintenance and public safety, is not reassuring.

Government ownership of infrastructure such as the Oroville Dam comes with little accountability and the automatic assumption of taxpayer bailouts when problems arise, which increases the likelihood that they will. The Clinton administration, in its "reinventing government" initiative, provided a blueprint for how this transfer process can work. The administration sold 19 federal water projects to nonfederal owners by 2006. Do private dams of similar size and age as government-owned dams have a better safety record? There appear to be no studies. Private ownership of dam assets, however, concentrates accountability and the costs of failure, which properly incentivizes more effective maintenance, timely repairs, increased innovation and efficiency. In the case of Oroville Dam, private ownership would mean putting responsibility for reservoir and outlet maintenance, and flood control, in the hands of individuals whose interests revolve around ensuring public safety and the function of the dam. Total dam failure in California is not speculation. In 1928, the government-owned St. Francis Dam north of Los Angeles collapsed from a defective foundation, destroying towns and killing 450 people. Californians deserve safe and professional management of state dams through responsible private ownership. Lawrence J. McQuillan is director of the Center on Entrepreneurial Innovation at the Independent Institute. Hayeon Carol Park is a policy researcher.

(It's a law suit field day!)

## State now facing cascade of litigation over Oroville Dam

BY DALE KASLER, sacbee.com, February 1, 2018

More than 40 farmers and business owners in the Oroville area sued the state Wednesday over the effects of the Oroville Dam crisis, seeking hundreds of millions of dollars in damages. The giant lawsuit against the California Department of Water Resources was filed by the same law

firms representing the city of Oroville in a suit it filed in early January against DWR. It accuses DWR of harboring a “culture of corruption and harassment” that compromised dam safety and led to last February’s near-catastrophe.



The suit says the failure of Oroville’s two flood-control spillways, which prompted the evacuation of 188,000 downstream residents, hurt a variety of businesses, landowners and others. For instance, grocery-bag manufacturer Roplast Industries lost \$1.5 million because of lost production time during the evacuation. JEM Farms, a walnut orchard downstream of the dam, suffered \$15 million in flooding damage because of dramatic surges of water pouring out of the dam during the crisis. Some of the plaintiffs are farmers as far south as Yolo County. “Local businesses were hammered by the state’s recklessness. Their losses continue to grow. It is time to correct this injustice,” said Niall McCarthy of Bay Area law firm Cotchett Pitre & McCarthy. A Woodland law firm, Gardner Janes Nakken Hugo and Nolan, is working with the Cotchett firm on the case.

(Lookout CA taxpayer. You gotta get money somewhere.)

## Federal government unsure whether it will pay for Oroville Dam spillway repairs

By Staff Reports, 02/06/18, chicoer.com

Washington, DC >> While it has been assumed the federal government will pay 75 percent of the now-\$870 million cost for repairing the Oroville Dam spillways, the agency that actually would allocate the money has been hedging on whether that is the case, according to two north state congressmen. A joint press release from Doug LaMalfa, R-Richvale, and John Garamendi, D-Fairfield, said the Federal Emergency Management Agency has been telling Congress it’s uncertain whether FEMA has the authority to pay for the types of repairs being made.



FEMA has stated it can’t fund a project where the agency determines there was a “lack of maintenance,” and can only provide reimbursements for work to bring facilities back to their “pre-disaster design,” according to the release. “The Independent Forensic Team determined that Oroville Dam spillway’s original design and inadequate maintenance contributed to the spillway failure nearly a year ago,” said LaMalfa in the release. “Knowing that, what good would it do for FEMA to reimburse the state only to return the spillways to the same condition that played a role in causing the disaster in the first place?” “FEMA’s guidelines for reimbursement raise more questions than answers given the complexity of the incident at the Oroville Dam,” said Garamendi. “I want to know how FEMA defines ‘lack of maintenance,’ especially in the context of the Independent Forensic Team’s report on the dam.”

Garamendi and LaMalfa sent a letter to FEMA seeking clarification on the agency’s authority to fund the repairs. “Congressman Garamendi and I are asking for some clarity,” LaMalfa wrote. In the most recent press conference call, Erin Mellon, DWR’s assistant director of public affairs, reiterated that the department was anticipating FEMA would cover 75 percent of the repairs and that the State Water Contractors would be on the hook for the rest.

### DESIGN CHANGES

A number of changes were made in the original design of the spillways due to the forensic team report. It found the main spillway was built on weathered rock, but that wasn’t reported to the people who designed it. When construction teams found the design didn’t match the site conditions, no changes were made. Then when recurring cracks began appearing in the spillway

concrete over the drain lines beneath, and higher than expected flows were found coming from the drains, that was written off as normal. The forensic team determined water was able to get under the spillway and lift one of the slabs up into the flow of water, which broke it off. The weathered rock underneath eroded rapidly causing more and more concrete to break off. The reconstruction, which isn't expected to be complete for another year, has included clearing out all the bad rock from beneath the new spillway construction, a redesigned drain system under the slabs and far thicker concrete.

As for the emergency spillway — just a concrete weir with a bare hillside beneath — geologists had warned before construction that the hillside would erode rapidly if water flowed down it. Somehow, that became a belief within the Department of Water Resources that the hillside was solid rock with a thin layer of soil on top. Water was allowed to flow over the weir and the predicted — but forgotten — rapid erosion did occur, prompting evacuation orders covering an estimated 188,000 people. The emergency spillway is being rebuilt with a new design that includes a wall drilled down to bedrock to prevent erosion back toward the weir. The weir is also being reinforced and the area between the wall and weir is being covered with a layer of concrete.

(Oroville fallout.)

## Memo Shows Seven State-Operated Dams Need a Closer Look in Wake of Oroville Dam Incident

By Stephen Stock, Rachel Witte and Michael Horn, Feb 5, 2018, nbcbayarea.com

NBC Bay Area obtained a memo written by engineers at California's Department of Water Resources (DWR) in June 2017 that raises safety questions involving seven dams owned and operated by the agency. The memo was sent by DWR to the state's Division of Safety of Dams and copied to the Federal Energy Regulatory Commission, which oversees dam safety and regulation around the country. It states the seven dams are in need of immediate evaluation.



The memo questions whether the seven dams, which are similar in age, design and construction to Oroville Dam, may have, "potential geologic, structural or performance issues that could jeopardize their ability to safely pass a flood event." All seven dams listed, along with Oroville Dam, are owned and operated by California DWR. The memo was sent just a few months after the February 2017 failure of the spillway system at Oroville Dam, when heavy rains caused the system's collapse and forced the evacuation of nearly 200,000 people living downstream of the dam. Following the event, Gov. Jerry Brown also ordered a separate safety review of 93 dams across the state. After NBC Bay Area's Investigative Unit began asking questions about the memo, state DWR officials conceded there are issues at those dams and that maintenance and repair would commence on them. The memo requested a work plan for each of the dams be submitted for review by September of last year. NBC Bay Area requested a copy of those work plans through a California Public Records Act request, but DWR responded that the plans would not be publicly available until later in 2018.

Each of the dams listed in the memo—Del Valle Dam, Castaic Dam, Pyramid Dam, Antelope Dam, Frenchman Dam, Grizzly Valley Dam and Cedar Springs Dam—is 45 years old or older. They're all earthen dams, or earth and rock dams, similar in construction to Oroville Dam. Like Oroville Dam, each of the seven dams is considered "high" or "extremely high" hazard, meaning there is likely loss of life downstream should they fail. One of the dams, Del Valle Dam in Alameda County, was built in 1968, the same year Oroville Dam was built. "The Department of Water Resources has indicated there are some concerns with the dam," Alameda County Sheriff Gregory Ahern told NBC Bay Area. Ahern oversees an emergency evacuation plan that—for a

disaster at Del Valle Dam—would stretch nearly 100 square miles, larger than the evacuation zones for each of the 22 other dams in Alameda County combined. “We’ve looked at what issues might arise if the dam does have uncontrolled release, or if there is a failure of that dam,” Ahern said. Inspection records show issues at Del Valle Dam that have gone unaddressed for years, such as broken sump pumps and plans to install new monitoring tools called piezometers. The reports also show the earth dam has settled in places as much as 13 inches, “not a concern,” according to the inspection reports that makes note of it. In each report, inspectors declare the dam in “satisfactory condition.” Those same “satisfactory condition” notes can be found in inspection records of Oroville Dam before its spillway system failed.

Inspection records also reveal safety issues in the six other dams listed in the memo. The safety issues also echo notations made in Oroville Dam’s inspection reports before its spillway failed. For instance, records show cracks and voids in the spillway at Cedar Springs Dam in San Bernardino County, cracks in the spillway at Frenchman Dam, and deterioration and settling of the dam itself at Grizzly Valley Dam. There was also cracking, spalling and erosion on the spillway at Pyramid Dam in Los Angeles County. The memo and the issues it raises about the safety of the seven other dams after the Oroville Dam incident did not surprise several recently retired DWR officials who spoke with NBC Bay Area. The department insiders expressed concern over what they called a “culture of complacency” regarding dam safety at DWR. They say inattention and a lack of follow-up has resulted in the state agency’s failure to maintain its critical structures. “They don’t have the adequate knowledge to maintain those facilities,” one former DWR engineer said. The insiders spoke to NBC Bay Area on condition of anonymity for fear they’d lose their state pensions for speaking out. “It’s my feeling that they don’t have adequate technical staff to fully do the full scope of what’s required,” that same engineer added. Another former top administrator told NBC Bay Area, “These folks (at DWR) don’t have the broad experience to really fully understand the missions of the department and what drives those missions and what the critical infrastructure is. “The infrastructure has not been maintained, and I think that’s across the board. Because budgets are strained,” the retired DWR administrator said. Last month, an independent forensic team issued a report that blamed in part the culture at DWR for playing a role in the spillway incident at Oroville Dam, citing what it called “long-term systemic failure” within the department. “I hope that from this report and from what happened at Oroville that DWR is going to learn from that and look at its other facilities in the way that we recommended here,” said John France, the forensic team’s lead engineer. Though the team didn’t specifically look at the seven other dams listed in the DWR memo, France’s team did raise concerns that the culture at DWR, namely its “overconfidence and complacency” about dam safety, pertained to the integrity of all its dams and their parts. “We need to not just focus on spillways,” France said. “It applies to everything with a dam and its related structures.” DWR Deputy Director Joel Ledesma said the department does face “resourcing issues” in getting all of the necessary maintenance and repairs done on the many dams it owns and operates. But in the case of these seven dams listed in the June memo, Ledesma said money will not be a problem.

“I think these dams right now that we’re talking about specifically, we have the funding to do all the maintenance work,” he said. As head of the State Water Project, Ledesma oversees the safety of all the state’s owned and operated dams. “None of [the seven dams] have showed any areas of concern where there’s any public safety issue,” Ledesma said. “But yes, there will be maintenance work done on all those, whether there’d be spalling on concrete ... unplugging of drains or just maintenance activities.” Meantime, Sheriff Ahern is working to make sure his county is prepared just in case something happens at Del Valle Dam. Despite being in charge of protecting hundreds of thousands of residents downstream of the dam, Ahern says he was never copied or notified about the DWR memo listing Del Valle Dam as needing special attention. That is until NBC Bay Area’s Investigative Unit gave him a copy of the June DWR memo. That lack of communication remains a point of concern for him. “We have stressed to people to please join our alert system so they can be made aware of any type of issues immediately because if something happens at Del Valle you’re not going to have a lot of time,” Ahern said. “It’s a matter of minutes.”

(Dams everywhere need more attention.)

## Texas dam regulation is in desperate need of repair

BY LIAM VERSES, January 30, 2018, dailytexanonline.com

California residents scrambled to pack their belongings into their cars before sitting trapped on roads for hours after warnings of an impending dam failure barreled through their community. Last year both spillways at the Oroville Dam, one of the largest in the country, failed, prompting an evacuation order for nearly 200,000 people downstream. Last week, costs reached \$870 million in the near-failure of the Oroville Dam, with an additional \$1 billion in various legal claims filed by property owners.



Sixty-eight percent of regulated California dams have emergency action plans. Texas boasts 81 percent, but both still lag behind a state such as New York, which touts a near-perfect 97 percent of dams with emergency action plans. Texas has had a mixed, at times unacceptable, history with dam safety and oversight. The American Society of Civil Engineers' 2017 Infrastructure Report Card gives Texas a D for dams. In 2013, the Texas Legislature passed House Bill 677, which exempted lower-risk, smaller dams in mostly rural counties from safety regulation. If they meet the criteria — which includes population, amount of water, location, private ownership and low- or mid-level hazard classification — they qualify for exemption until any one of those five criteria change. As a result, roughly 45 percent of Texas dams are now exempt from state safety regulation.

Lawmakers opted to exempt some dams at the significant hazard classification level from any oversight, those dams making up about 10 percent of the overall number exempted. Texas has three hazard classification levels: low, significant and high. Low means that loss of life is unlikely and minimal damage is expected. Significant means one to six deaths possible and appreciable economic losses expected. High means seven or more deaths and excessive economic loss anticipated. Federal standards set by FEMA state that “one or more” deaths rank as a high hazard classification. The federal significant hazard classification is assigned to dams whose breach would probably not cause loss of life but may cause economic losses. Texas' standards fall outside of FEMA standards, setting a seemingly arbitrary choice of six people as an acceptable cutoff. In effect, we're saying six deaths isn't that bad; seven, however, is extremely bad.

The potential loss of any human life should garner serious oversight, and those 10 percent — 231 dams — put up to 1,300 people in danger and should not be exempt from inspections and regulation. Texas should adopt FEMA classifications. Furthermore, as with much of Texas' infrastructure, dams are deteriorating quite quickly. The estimated cost to rehabilitate dams is more than \$800 million, with an additional amount in the billions needed to update aging dams. While these figures are growing larger and more unfeasible by the minute, in a state that already struggles to fund existing obligations. Slow and steady progress in the form of a state grant program could work to mitigate the risk associated with the 500-plus inadequately built, dangerous dams, at the very least. Considering 111 dam incidents have resulted from heavy rains in the past three years alone, Texans need to take dams more seriously. Our continued neglect of dams and public safety unnecessarily jeopardizes our state's residents. Texas dams are a ticking time bomb; it's only a matter of time before state action comes too little, too late.

(Dam failure history.)

## With a Flooding Disaster in Its Past, Utah Takes Dam Safety Seriously

A dam failure in 1989 prompted the state of Utah to revamp its dam safety program. Engineer David Marble explains how the state keeps up with the task a generation later.

WRITTEN BY Matt Weiser, Jan. 19, 2018, newsdeeply.com

THE DISASTER AT Oroville Dam in California last winter put questions about dam safety in the headlines for the first time in many years. It also inspired dam safety officials in many states to think about the inspection and maintenance programs they use to protect their own dams. The state of Utah went through its own disaster in 1989 that prompted big changes in the state's dam safety program. On New Year's Day, a portion of the Quail Creek Dam near St. George collapsed, causing a flood in the Virgin River channel below that damaged more than 50 homes and forced 1,500 people to evacuate. The earthen dam was relatively small, but it was only three



Millsite Dam, near the town of Ferron, Utah, is in the midst of multimillion-dollar upgrades to make it better able to withstand earthquakes. The project was ordered by the state's dam safety program. Photo Courtesy USDA Natural Resources Conservation Service

years old and it had experienced seepage problems almost from the moment it was completed. The following year, the state passed the Dam Safety Act, a new law adopting more rigorous dam inspection procedures and empowering the government to require safety upgrades to dams that no longer meet modern requirements. Those rules are overseen by a unit within the Utah Division of Water Rights. Water Deeply spoke with David Marble, assistant state engineer for dam safety, to learn more about Utah's program.

**Water Deeply: The Oroville disaster in California was a wake-up call on dam safety for a lot of Americans. What did it make you think about?**

**David Marble:** Anytime you see an event like that, it has to be a wake-up call. That's the kind of thing we're working very hard to prevent. Is there something we should be doing that we haven't done? What was missed? How did this develop? You self-evaluate and try to determine if there's something we could be doing better to try to determine how to prevent something like that from happening. We're very interested as to what happened, and if there are some lessons [as to what] we can learn to do better and try to prevent something like that in the future.

**Water Deeply: How many dams does Utah have and how do you rate them?**

**Marble:** There's probably 5,000 or so if you count all the very small ones. Anything about 20 acre-feet in size or less that is considered moderate or low in hazard rating, then we don't really actively regulate those. We have authority to inspect them if somebody makes us aware of a concern, but they're not inspected on a regular basis. Out of those, we regulate around 200 high-hazard dams, around 200 moderate-hazard dams and around 500 low-hazard dams that we regulate from a safety perspective. A hazard rating describes the consequence of failure: If a dam is there and if it were to fail, if people would likely be killed, then the dam is considered high hazard. A moderate-hazard dam is where loss of life is unlikely in a failure, but there would be appreciable property damage. In low-hazard dams, there's very limited opportunity even for property damage. The way we treat dams is going to vary based on what that hazard rating is.



Quail Creek Reservoir near the town of St. George, Utah, was the scene of a dam failure in 1989 that led to reforms in the state's dam safety program. (Photo Courtesy Utah Division of Wildlife Resources)

**Water Deeply: How often are these dams inspected?**

**Marble:** High-hazard dams get annual inspections. Moderate-hazard dams every two years and low-hazard dams every five years. It's a big task that keeps us going. There's a lot of fieldwork to be done. We always have somewhere we've seen some concerns and have them on a watch list. We have a few with storage restrictions as a result. We probably conduct 300 inspections a year on dams and we always will find anywhere from half a dozen to a dozen repairs that need to happen. There's routine maintenance, vegetation problems, rodent problems. There's hardly ever an inspection we do that doesn't have some maintenance that needs to

be done.

**Water Deeply: Utah decided to make its maps of dam inundation areas available to the public, in contrast to the federal government and many other states. Why?**

Marble: All of our high-hazard and moderate-hazard dams need to have emergency action plans. The inundation maps are pretty specifically geared toward high-hazard dams. A lot of agencies look at things like inundation maps and consider that to be confidential information. They're concerned someone may see that information and, in some way, maybe use that in a bad way – terrorism, perhaps.

I think the state of Utah has tended to look a little bit more at it from the perspective that we consider that the information we have is open-record information. And it may be better, especially in the event of an emergency, if the information about where there might be inundation is readily available even way before that emergency develops. Or somebody may say, I want to build a house in that location. We've taken the attitude that information ought to be readily available. So anybody can go onto our website and see where the inundation areas are as best we can predict it.

**Water Deeply: And besides hazard rating, does the state have some dams in poor condition?**

Marble: There are some we have concerns with. One of the proactive things we've been doing in our program – and this really started back in 1990 when the new law was written – was to recognize that many of our dams have been in place for a long time. We've got dams that are well over 100 years old, and the standards to which those dams were built is appreciably different from what we would approve of now. So we do have an active program now to focus on high-hazard dams.

What we were directed to do in the 1990 legislation was to review the design of all high-hazard dams to determine if they were designed consistent with current safety standards. In many cases, we didn't know how well some of them were designed. The design information was limited. So after we do our investigation, if we determine a dam does not meet current safety standards, or we could not determine if it does, we send out information to the owner saying you have to conduct an investigation to see what needs to be done to meet current standards.

**Water Deeply: That sounds expensive. Does the state have any way to help dam owners cover those costs?**

Marble: Since 1997, the state has provided us with some money to go to dam owners and provide grants. They actually cover 80–90 percent of the cost of bringing a dam up to current safety standards. So there is money provided through the state to upgrade that dam to meet current safety standards. The amount of money we have is not as much as we'd like to see. We upgrade two or three dams a year to meet current safety standards: increasing spillway capacity, increasing stability for earthquake loading – whatever we think is necessary. We've done about 50 dams in the past 20 years. There are probably around 10 dams that still need to be done.

**Water Deeply: Are your design flood standards changing because of climate change?**

Marble: At this point I would say not really. Certainly the issues related to climate change are an important topic. It has a real potential to impact some state standards because of the frequency of big storms. The Utah standard for high- and moderate-hazard dams is really based on what would be considered the probable maximum precipitation and flooding event. That is science-based information we get from the National Weather Service, and it's really based on what is the maximum amount of precipitation that can be held in the atmosphere and then released. Since it's the maximum amount, we're not really looking at frequency, for example. This is really the most that could happen.

**Water Deeply: In some cases, the hazard exists because development has crept in below a dam, right?**

Marble: That's an important concern. We call that hazard creep. You can have a dam, at one time, built with very little below it. Consequently, the hazard potential was not a big concern. Now we've got several dams I can point to with aerial photography, and 30 years ago there was very

little of concern. And now there's substantial development below those dams. We've had several dams where the hazard rating has had to be increased as a result.

(Are you going to wait for the next hurricane?)

### **Long-sought Addicks, Barker revamp hinge on congressional politics**

By Mihir Zaveri, January 24, 2018, [houstonchronicle.com](http://houstonchronicle.com)

Hopes for major improvements to the centerpiece of Houston's flood control system - the U.S. Army Corps of Engineers' Addicks and Barker dams - are hanging on an obscure provision of the 180-page disaster relief bill that has been languishing in Congress since December. Contentious issues such as immigration policy, children's health care and President Donald Trump's proposed border wall stole the national spotlight during congressional negotiations that broke down last week, causing a three-day shutdown of the federal government. But officials responsible for protecting Houston against deadly floods like those brought on by Hurricane Harvey have been paying close attention to something much less high-profile: the fate of lines 9 and 10 of Page 22 of the \$81 billion disaster relief bill passed by the U.S. House of Representatives in December. The provision would allocate funds for the Army Corps to "imitate and complete ... up to six authorized feasibility studies." The selection criteria in the bill make it likely that one of the studies would focus on Addicks and Barker.



For years, the region's flood control officials have sought such a study to assess how nearly eight decades of growth have affected the two dams and what fixes may be needed. Since Harvey, elected officials have called for significant improvements to the dams, including deepening their reservoirs, building canals to carry water out of the reservoirs when they become too full and constructing additional dams and reservoirs. No such project could get off the ground until the Army Corps has conducted a feasibility study. That's why those two lines of bureaucratise in the disaster bill loom so large. Houston officials who have been monitoring the bill had their hopes raised when the House approved the bill in December, only to be discouraged when the Senate went home for the holidays without voting on it. Optimism returned this week when Congress passed a stop-gap funding measure to end the government shutdown, and Senate Majority Leader Mitch McConnell, R-Ky., pledged that the Senate would take up various issues, including disaster relief, this month or next. "We're absolutely paying close attention," said Russ Poppe, executive director of the Harris County Flood Control District. "As vague as (the bill's language) is, it still sets the stage for what studies would be eligible for funding consideration."

Both dams were stressed to their limits by Harvey's record deluge, when some areas of Harris County saw more than 51 inches of rain over the storm's duration. At their peak, water levels in the reservoirs were the highest ever recorded. The situation had been building toward a crisis for decades, as development upstream of the dams caused increasing amounts of storm runoff to flow into the reservoirs and development downstream limited how much water could be released into Buffalo Bayou. With more water coming in and less going out, reservoir levels grew higher after heavy storms, straining the earthen dams, which were built in the 1940s.

During Harvey, the pool of water behind the dams grew so large that it inundated thousands of homes that had been built along the reservoirs' western fringes, upstream of Addicks and Barker. The situation was equally dire downstream. To prevent a dam failure during the storm, the Army Corps released massive amounts of water into Buffalo Bayou, inundating thousands of homes. In December, a Houston Chronicle report described how the Army Corps, Congress and local officials had failed for decades to take action to relieve the pressure on the dams, despite a string of studies documenting the dangers and proposing remedial measures. Those steps include buying out properties upstream and downstream of Addicks and Barker, constructing relief canals to keep reservoir water levels from getting too high, and building a third dam and reservoir.

The Army Corps feasibility study would assess the condition of the existing dams, the flow of storm runoff across the region and how the rapid development of recent decades have affected both. Corps money is distributed in a competitive process that pits such projects as harbor deepening or wetland restoration across the country against one another. That's why funding for a study of Addicks and Barker has proved so elusive. Harvey appeared to change that. The Texas congressional delegation secured language in the House disaster relief bill that put the Houston region at the head of the queue for a feasibility study. The text gives priority to areas that have had "multiple disaster declarations in recent years," a description that applies to Harris County. "It gives Addicks and Barker a leg up in terms of moving to the top of the line," said Michael Strachn, a senior adviser at Dawson and Associates, a government relations firm that focuses on water and other infrastructure projects.

It is unclear whether the Senate will seek to pass the House version of the bill as is, or wrap it into a bigger piece of legislation on government spending. If the latter, there is a danger the House bill's language giving priority to Harris County could get lost or revised in the political wrangling. Senator John Cornyn, the Republican majority whip, said Tuesday that political divisions over immigration policy and military spending still are complicating prospects for Senate passage of a disaster relief bill. Nonetheless, Ciara Matthews, a spokeswoman for Gov. Greg Abbott, said Abbott is confident Congress will fund the bayou projects, as well as the feasibility study that could lay the groundwork for a third reservoir. Abbott has "received repeated assurances" from members of Congress that it will fund a third dam and reservoir and that the funding will come in the next few weeks, Matthews said.

"If Congress refuses to provide Texas the funding that is needed, Gov. Abbott will strongly advocate for the use of state funds for the third dam and reservoir," she said. Harris County Judge Ed Emmett said he and other officials are "laser-focused" on getting disaster relief. He said he has been talking mainly with Culberson because he sits on the appropriations committee and "because he's the right person in the right place to be doing it." Emmett also is looking to the state's \$10 billion Rainy Day Fund. An investment of roughly \$500 million to plan and build a third reservoir, he noted, would require only 5 percent of the Rainy Day Fund. The investment likely would be spread over several years. "That way we're not even subject to what goes on in Washington," Emmett said. State legislators would have to vote on tapping the fund. Matthews said Abbott believes the cost would be higher than \$500 million. Emmett said that until Congress acts, the state and the county won't know how much money they'll have to provide to strengthen flood defenses. Some might come from a county bond issue. "We can't wait a lot longer. We have to decide if we are going to put a bond in May or November," he said. "In the next two weeks, we're going to have to make hard decisions and I really hope Congress and the federal government go ahead and vote."

(75 years young. What other energy source lasts that long?)

## **Dale Hollow Dam, Tennessee – 75 Years Strong**

By Sondra Carmen, U.S. Army Corps of Engineers, 2/2/18, recreation.gov

### **Visiting Dale Hollow Dam and Lake**

Dale Hollow is a vacation destination that borders the Tennessee-Kentucky state line. Natural forested hillsides and clear waters welcome those desiring water sports or a scenic getaway. Premium lakefront camping for RVs and tents is available at Dale Hollow Damsite, Lillydale, Obey River and Willow Grove Campgrounds. For those wanting a more secluded boat-in camping experience, Dale Hollow Lake primitive camping is a great option. Dale Hollow also offers 15 full-service commercial marinas, an 18-mile (28.9 km) horse and hiking trail at Red Oak Ridge and the 7.5 mile (12 km) Accordian Bluff Trail connecting two beautiful waterfront campgrounds.



### **2018 Powerhouse Tours to Celebrate the 75th Anniversary**

Find out firsthand about sustainable hydroelectric power production as a part of Dale Hollow Dam's 75th Anniversary celebration activities. Limited tours of the Dale Hollow Powerhouse, located 3 miles (4.8 km) north of Celina will be offered May 3rd and 17th for eighth grade and above students. Public tours will be held June 16th, June 30th, September 15th, September 29th and October 20th. An anniversary commemoration will be held on October 19th. "In 2018 Dale Hollow Dam and Lake will be celebrating 75 years of operation. We are excited to share our story and the distinctiveness of the dam and lake", Stephen Beason, Dale Hollow Lake Resource Manager

### Things to Do at Dale Hollow

This area is renowned for fishing and well known as a trophy smallmouth bass lake. The Obey River below the dam is an excellent place to catch rainbow and brown trout. Visitors also enjoy powerboat sports such as water skiing, wakeboarding and wake surfing. There are plenty of secluded tie-ups along the 620 miles (997.7 km) of shoreline. The Dale Hollow National Fish Hatchery, adjacent to the Dale Hollow Damsite Campground, is the largest federal trout hatchery east of the Mississippi and is open to visitors daily.

### Did You Know?

The U.S. Army Corps of Engineers designed Dale Hollow Dam and it was built by Morrison-Knudsen, private contractors under the supervision of the Corps. Construction began on March 2, 1942 and the lake was impounded by May 7, 1944. War efforts jeopardized the construction and completion of the dam since people, materials and construction equipment were critical to the defense effort. However, Dale Hollow was far enough along in construction that the dam rushed to completion on October 20, 1943. Three Francis turbines were installed from 1948–1953. Each unit can generate 18,000 kilowatts each for a total of 54,000 kilowatts; enough power to electrify a community of 45,000 and provide support to the national grid. The structure contains 573,760 cubic yards of concrete and cost about \$28 million to build. About 1,200 people were employed at the site during the peak of construction in July 1942.

### Interesting Facts about Hydroelectric Power

Electricity is like the air you breathe, you don't think about it until it is missing. Electrical voltage and current leaves Dale Hollow through a power grid. Imagine the power grid as a "spiderweb" of electrical lines over your head. The grid provides alternate routes for the electricity to follow should something happen to a section of grid. Once the switch is flipped, an electrical current flows through the grid and is distributed to communities ready to consume. This all happens in less than a second, every day and 365 days a year.

(More on removing Lower Snake River dams.)

### State bills tackle threats to endangered Puget Sound orcas

By PHUONG LE Associated Press, Feb 2, 2018, yakimaherald.com

SEATTLE, WA (AP) — With the number of endangered Puget Sound orcas at a 30-year low, state lawmakers want to protect the fish-eating killer whales that spend time in the inland waters of the Salish Sea. The measures range from boosting hatchery salmon production to increasing marine patrols so that boats keep their distance from the whales. Many have been sounding the alarm about the orcas' plight since the September death of a juvenile brought the population to 76. Orcas face threats from lack of food, pollution and noise from vessels.



A baby orca has not been born in the last few years. Half of the calves born during a celebrated baby boom have since died. Female orcas are also having pregnancy problems linked to nutritional stress brought on by a low supply of chinook salmon, the whales' preferred food, a recent study

found. "We haven't seen any viable calves born here in the last few years and that is disconcerting," said Brad Hanson, wildlife biologist with the NOAA's Northwest Fisheries Science Center.

Last year, the orcas spent the fewest number of days in the central Salish Sea in four decades, mostly because there wasn't enough salmon for them to eat, said Ken Balcomb, senior scientist with the Center for Whale Research. One House bill sets aside \$1.5 million to produce 10 million more hatchery chinook salmon — a roughly 20 percent boost — so orcas will have more to eat. "Using smart hatchery production we can still support rebuilding wild fish runs and have hatchery production," said Rep. Brian Blake, D-Aberdeen, prime sponsor of House Bill 2417 which unanimously cleared a policy committee and awaits action in a fiscal committee. Blake and other says there's growing awareness that the fates of two Northwest iconic species — salmon and orcas — are intertwined, and that efforts to save one endangered species could help another. "The idea is that, overall, you have more fish out there that are available to killer whales," said Penny Becker, wildlife diversity division manager with the state Department of Fish and Wildlife. She said the agency is committed to ramping up state hatchery production — which has been declining over the past decade — though it would still need to determine where and how best to do that.

Putting more fish in the waters won't necessarily mean whales will get them all. A recent study found that other marine mammals such as sea lions, seals and other killer whales were also feasting on the salmon that Puget Sound orcas prize. Recreational and commercial fishermen groups told lawmakers that increasing supply would benefit fishermen and orcas. But some skeptics think it should only be a short-term strategy and that efforts should focus on restoring salmon habitat or removing fish barriers including dams. "We can't stop there. We've got to have a more comprehensive approach that restores ecosystem health," said Joseph Bogaard, executive director with Save Our Wild Salmon, a coalition that is pushing to remove four Snake River dams.

(Who says they aren't building new dams? Gotta have drinking water.)

## North Texas cities to get water supply boost: Final permit received for construction on Lower Bois d'Arc Creek Reservoir

By Cassidy Ritter | Feb. 2, 2018, communityimpact.com

A permit has been granted to allow construction to begin on the Lower Bois d'Arc Creek Reservoir in Fannin County, according to a news release from the North Texas Municipal Water District.

The \$1.2 billion reservoir will be a key source of water to meet the growing needs in North Texas, Robert Thurmond, president of the NTMWD's Board of Directors, said in the release. This is the first reservoir to be built in Texas in 30 years.

Construction on the lake is expected to begin this spring with a completion date in 2022. "This is a major milestone for a critical project that will provide water to 1.7 million people living in about 80 communities in North Texas," Thurmond said. According to the release, a permit for construction was required under the federal Clean Water Act and involved a process that required avoiding and minimizing environmental impacts and identifies ways to offset impacts that do occur.





## **Hydro:**

(Relicensing, a tortuous path.)

### **Wallace Dam Project**

georgiapower.com, 1/24/18

The current Wallace Dam Project license expires on June 1, 2020. In 2015, Georgia Power began the process to relicense the hydropower plant using the Federal Energy Regulatory Commission's Integrated Licensing Process (ILP).



### **Wallace Dam Relicensing**

The Wallace Dam Project occupies approximately 39 miles of the Oconee River. The dam and the powerhouse are located in Hancock and Putnam counties. The project reservoir, Lake Oconee, lies in Putnam, Hancock, Morgan, and Greene counties. Lake Oconee covers 19,000 acres and has 374 miles of shoreline.

#### **Historic Timeline**

1963-1970

Georgia Power files a preliminary permit for the Laurens Shoals Project, a pumped storage hydroelectric project on the Oconee River. A preliminary permit order is issued in 1965 with FERC issuing an amending order for the Laurens Shoals Project in 1970. A month later, Georgia Power accepts the amended license. The project's name is changed to the Wallace Dam Project.

1971  
Construction on the Wallace Dam begins.

1977-1978

The clearing of the reservoir begins in April of 1977 and is completed in December 1978.

1979

The reservoir known as Lake Oconee starts filling in January 1979 and reaches an elevation of 434 feet.

1979-1980

Unit 6, the first pump turbine unit of the project, is declared to be in commercial operation in December 1979. By July 1980, all six units, including four pump turbine units are up and running. 1981 Georgia Power and the Georgia Department of Natural Resources enter into an agreement to develop geese and waterfowl habitats, which remain today.

2015

Georgia Power will begin the relicensing of the Wallace Dam Project by filing a Notice of Intent to FERC in early 2015.

2018

Georgia Power will file the Licensing Application.

2020

The current license for the Wallace Dam Project expires on June 1, 2020.

#### **Wallace Dam History Timeline**

During the relicensing process, numerous studies will be conducted to support licensing requirements. These include reviews of geology and soils, water resources, fish, wildlife and botanical resources, and cultural resources. The formal license application will be filed in 2018.

#### **Relicensing Meetings**

The current license for Wallace Dam expires on June 1, 2020. In 2015, Georgia Power will begin the process of relicensing this hydropower plant by using the Federal Energy Regulatory Commission's Integrated Licensing Process (ILP). The license application will be filed in May of 2018. The meetings schedule provides an opportunity for Georgia Power to engage stakeholders and the general public.

(It's relicensing season.)

## Ct. River hydroelectric relicensing starting

By RICHIE DAVIS, Recorder Staff, January 31, 2018, recorder.com

After more than five years of preliminary work, federal relicensing of the hydroelectric project along the Connecticut River is about to begin in earnest.

And the Franklin Regional Council of Governments, which has spent 20 years trying to control erosion upstream from the Turners Falls Dam, is ready to become an active participant in the Federal Energy Regulatory Commission. That means helping towns along the river that want to play a formal role, as preparing to file as a formal intervenor itself. FERC, is conducting a comprehensive relicensing process not only for FirstLight's Northfield Mountain and Turners Falls hydroelectric plants, but also 3 of Great River Hydro's Connecticut River projects in New Hampshire and Vermont — Vernon, Bellows Falls and Wilder.



Brookfield Renewable Energy's Bear Swamp and Fife Brook projects on the Deerfield River are undergoing a separate license review, with a formal application expected on March 31. Once the federal agency formally accepts their applications for relicensing, that will trigger a 60-day period for prospective intervenors in the process. Up until now, the COG has played a role in the relicensing, along with the non-profit Connecticut River Conservancy, the Franklin Regional Planning Board was told last week by member Tom Miner, who has been its liaison on hydro relicensing and streambank erosion issues. "It's a very complex process," said Miner, who was a former executive director of the conservancy when it was known as the Connecticut River Watershed Council. In the same way that the COG intervened in FERC's application for Tennessee Gas Pipeline Co.'s Access Northeast project and its assisting towns like Northfield, Montague, Warwick, Shelburne, Conway and Ashfield file for intervenor status, the regional planning staff has prepared a template for towns to prepare in advance for hydro relicensing. "We wanted to give something to towns that they could adapt from, a kind of template, to submit once the clock starts," Miner said. The COG's own intervention was approved in December by its executive committee in December, so that it can file during the short period. The templates are available to any towns that want to have a direct say representing their interests, so their applications have time to clear their selectboards, Miner said.

FirstLight's license is due to expire to the end of April, and Miner predicted there will be a request to FERC for an extension. "Whether it's one year or two years, I have no crystal ball," said Miner, who has backed away from his role after several years of actively monitoring the relicensing process. Filing of FirstLight's FERC application signals the company's completion of about 40 studies on fisheries, erosion and other issues, some of which CRC and the COG have disputed. Miner noted that the company has also been conducting confidential negotiations over a possible settlement agreement with CRC, the COG and other groups. "Those are still ongoing," said Miner. "It's going to be a significant. All of those final (negotiated) proposals are going to be on the table within the next month, and there could be a negotiated agreement or proposals from any of the players that are incorporated in the FERC process. "Presumably that will be clarified in the spring." Also ongoing are "stakeholder" meetings, being organized by the river conservancy, like one last fall with commercial whitewater outfits that are interested in being allowed to start up operations just below the Turners Falls Dam.

(Oh, oh maybe a low flow violation. It's the end of the world.)

## FERC investigating low-flow allegations at Reusens dam

By Margaret Carmel, 2/2/18, newsadvance.com

The Federal Energy Regulatory Commission has opened an investigation into the operation of the



Reusens hydroelectric plant on the James River, less than a year after New Jersey-based Eagle Creek Renewable Energy bought the plant According to a Jan. 25 letter from FERC's Division of Hydropower Administration and Compliance to Eagle Creek's Executive Vice President of Operations Robert Gates, the federal government received an allegation of unusually "low flows" in the James River downstream of Reusens that have been occurring since late summer 2017. This letter is available on FERC's website.

Hydroelectric dams must be licensed to operate by FERC, which sets a requirement for the average hourly flow of water that must pass through the dam depending on the level of the river. The license for Reusens, which has a power generation capacity of 12.5 megawatts, was issued in 1994 and is set to expire in 2024. In order to stay in compliance, when there is less than 3,300 cubic feet per second flowing into the dam, the operators of Reusens must release a minimum of 333 cubic feet per second of water. If flows are less than 333 cubic feet per second, Reusens must release the same amount of water through the dam that is flowing in.

In order for FERC to determine if Eagle Creek is out of compliance, the agency has requested the company submit a record of flows into the reservoir upstream of the dam measured from the U.S. Geological Survey gauge located at Holcomb Rock seven and a half miles upstream, the amount of water flowing out of the dam and project generation output between June 1, 2017, and Jan. 25. According to FERC spokesperson Celeste Miller, Eagle Creek has until Feb. 26 to submit all of this information, and the agency will not know if Eagle Creek is operating outside of its license requirements until then. Miller said there is no timeline on when the investigation will conclude after documents are filed. Gates did not respond to multiple requests for comment.

Between 1924 and April 2017, Reusens was owned and operated by Appalachian Power Company. When the sale of the dam first was announced in August 2016, APCo spokesperson John Shepelwich said the utility decided to sell the property because of high upkeep costs at the site. "It's a good facility, but it's an old facility," Shepelwich said in August 2016. "Over a few years, there had been equipment failures that would require a rebuild or perhaps a replacement, like the generators. We looked at whether we should replace the equipment or replace the power supply with another source." According to FERC documents, APCo stopped generating power at Reusens dam in 2011 due to turbine malfunctions that would be too expensive to fix. Now that Eagle Creek has purchased the dam, the company has restarted power generation. As of August 2017, the company was using three of the five generators installed at the site. When asked about the allegations of low flows coming out of Reusens dam, Virginia Department of Game and Inland Fisheries Regional Fisheries Manager Scott Smith said he was aware of the complaints, but based on looking at the U.S. Geological Survey gauges that measure the flow of the James River at certain points both upstream of Reusens and downstream of downtown Lynchburg, he thinks Eagle Creek most likely is in compliance.

However, it is difficult to use these gauges to study releases from Reusens specifically because Scotts Mill Dam is located between Reusens and the nearest gauge. "Looking at the actual flows, it appears that they are operating within the parameters of their license as near as I can tell," Smith said. "... I've heard folks say they aren't releasing any water at all, which I don't think would fit within their license parameters, but looking at the gauge data, and again it's not perfect, it appears that they're not operating outside their license requirement." According to Smith, FERC aims to regulate the dams in such a way the flows disrupt wildlife as little as possible. When dams release too little water or release water in a way that makes the river's depth and current fluctuate rapidly in a short period of time, it can cause issues for the ecosystem. "With low flows in particular, under natural conditions this is a really gradual process," Smith said. "In the summer, when the water is low because of drought, [river flow] goes down gradually so the river can adjust. If it goes down over the course of a few hours, that's a lot more stressful to everything." While Smith believes Eagle Creek may not be in violation of their license, he is concerned the license is not strict enough and allows the company to operate the dam legally in a way that is not healthy for the environment.

“At the time the license was done, it was reasonably protective, but knowing what we know now, you look back and it’s not as protective as we would like it to be,” Smith said. “They are taking advantage of the conditions in their license to maximize their production, but it’s all perfectly legal with the conditions we put in with begin with. We just didn’t do a good enough job on that relicensing 30 years ago to fully protect the river.” As Eagle Creek begins the long process of relicensing Reusens with FERC, Smith hopes comments supplied by both the Virginia Department of Game and Inland Fisheries and the U.S. Fish and Wildlife Service will help tighten up the license requirements to increase protections for the James River. “We’ll be involved with the whole process,” Smith said. Typically the city of Lynchburg draws its water supply from the Pedlar Reservoir in Amherst County, but when water levels are low the city pumps water in from the James River using one of two pump stations. According to Lynchburg’s Director of Water Resources Tim Mitchell, the city most frequently uses the Abert Pump Station, which is located upstream of Reusens and is unaffected by the flows through the dam. When asked about the compliance investigation into the operation of Reusens, Lynchburg Water Resources spokesman Jes Gearing said the city was not aware of it and will not be involved in the process.

Reusens dam originally was called Judith Dam when it was built in 1851 by the James River and Kanawha Company, according to The News & Advance archives. About 50 years later, the Lynchburg Traction and Light Company installed two 750-kilowatt generators, which were among the world’s largest when they were installed in 1904. APCo purchased the gravity dam in 1924, rebuilt and modernized it and renamed it after the nearby riverside community. Although the deal for Eagle Creek to purchase Reusens became public in August 2016, it did not become finalized until April 2017. Eagle Creek currently owns and operates 63 hydroelectric facilities representing 210 megawatts of electricity production capacity across the United States. Eagle Creek also owns the Schoolfield hydroelectric plant on the Dan River in Danville.

(Dam removal ain’t cheap.)

### Michigan to begin \$4M project to remove 90-year-old dam

By The Associated Press, February 4, 2018, newstalk990.com

KALAMAZOO, Mich. (AP) — Officials are preparing to remove a 90-year-old dam in southwest Michigan to help restore habitat for native fish. The Kalamazoo Gazette reports that the Michigan Department of Environmental Quality and other organizations will soon begin the \$4 million project to remove the Alcott Street dam in Kalamazoo. The dam, which was built in 1927, no longer has a function. Instead, it prevents fish migration and holds contaminated sediment in place. Linda Williams is a contaminant specialist for the U.S. Fish and Wildlife Service. She says the dam removal project is the highest priority project identified. She says removing the dam will improve habitat on both sides of the dam and give fish more space. The Natural Resource Damage Trustee Council will cover half of the project's cost.



### Environment:

(The majestic birds are our symbol.)

### Bald eagles gather at The Dalles Dam

The sight is attracting people who can’t get enough of the birds.

Author: Pat Dooris, January 18, 2018, kgw.com

THE DALLES, Ore. -- Dozens of Bald eagles have gathered at The Dalles Dam in the Columbia River Gorge. Many roost in trees across the water from the visitor’s center, which is just off Interstate 84. The sight is attracting people who can’t get enough of the birds. “When I’m



driving and I see one, I get excited. But this is crazy,” said Kim Folts as she stood near the dam’s visitor center. **This is the annual gathering of Bald eagles at The Dalles Dam. They show up in mid-December and leave in mid-February.** They started arriving nine years ago, a few years after the dam closed a park next to the huge cement wall on the south side of the structure. The massive birds are rarely disturbed as they sit in the park’s trees and have perfect hunting grounds, said park ranger Amber Tilton. “This is a popular spot. It’s their winter vacation home. And they congregate here because they’re right next to the grocery store,” she said. **“The Columbia River is their grocery store. And they’re fishing for shad. Their main diet is fish.”** The first year, about 10 bald eagles hung out at the park. The next year their numbers grew. This year there are as many as 60. “And they’re just so majestic! We like to see their size and their fishing,” said Henrietta Mattson.

The ranger said the eagles are likely from Canada and Alaska. They do not have nests at the dam, they just roost in the trees and fish until they leave. **“They never fail. I mean they always get one. And when they get one they may get six or seven bald eagles trying to get it away from them,”** said Cal Mattson, watching with his wife. There was a time the bald eagle seemed to teeter on the edge of extinction. Banning the chemical DDT and hunting of the birds helped the population rebound. Now they are not nearly as rare as they used to be. Still, it feels like a treat to see so many, so close. “Oh gosh! Do you see it over there? I’m seeing a happy, happy sight here—so many bald eagles and there, their children,” said Kim Folts. **The Army Corps of Engineers is having a special Eagle Watching Party, Saturday, January 20, at The Dalles Dam visitor center. It will run from 9 a.m. until dusk. It’s free and open to the public.**



### **Other Stuff:**

(Renewables on the move.)

#### **2016 Renewable Energy Data Book**

<https://dailyenergyinsider.com/news/10480-nrel-2016-renewable-energy-data-book-shows-continued-renewable-electricity-growth/>

- Overall U.S. energy consumption decreased slightly to 97.4 quadrillion British thermal units (Btu) in 2016—a 0.3% decline from 2015. Compared to 2015, energy consumption increased in 2016 for renewables (+7.3%), natural gas (+3.8%), nuclear (+1.0%), and petroleum (+1.2%). Consumption from coal continued to decline, dropping by 8.5%.
- U.S. electric power sector energy consumption decreased to 37.8 quadrillion Btu in 2016, a 0.8% decline from 2015.1
- In 2016, U.S. renewable electricity<sup>2</sup> grew to 18.3% of total installed capacity and 15.6% of total electricity generation. Installed renewable electricity capacity exceeded 214 gigawatts (GW) in 2016, generating 640 terawatt-hours (TWh).
- The combined share of wind and solar generation (294 TWh) continued to grow in the United States in 2016, exceeding generation from hydropower (266 TWh) for the first time. **U.S. hydropower produced nearly 42% of total renewable electricity generation,** wind produced more than 35%, solar (photovoltaic [PV] and concentrating solar power [CSP])<sup>3</sup> produced nearly 11%, biomass produced 10%, and geothermal produced nearly 3%.
- **In 2016, renewable electricity accounted for 67% of U.S. electricity capacity additions, compared to 64% in 2015.** Coal-fired generation comprised nearly 80% (7.6 GW) of retirements in 2016.

(Woe is me, the infrastructure is in bad shape.)

#### **Reps. on Infrastructure: “You Can’t Build Half a Hoover Dam”**

Feb 2, 2018, wcvb.com

Over 54,000 of bridges in the U.S. are considered “structurally deficient” according to data from the Department of Transportation. That’s not the only area where America’s infrastructure is lacking; according to the 2017 American Society of Civil Engineers report card, overall infrastructure gets a D+. Infrastructure holds the country together, including not just roads, railways, planes and local transit, but also your water system, waste management, electricity and broadband. Reps. Elizabeth Esty (D-CT) and Lloyd Smucker (R-PA) are members of the infrastructure working group on the bipartisan Problem Solvers Caucus. They sit down with Soledad O’Brien to discuss the need for more federal dollars, ways to streamline projects and why they believe Americans are willing to pay more for better infrastructure.



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