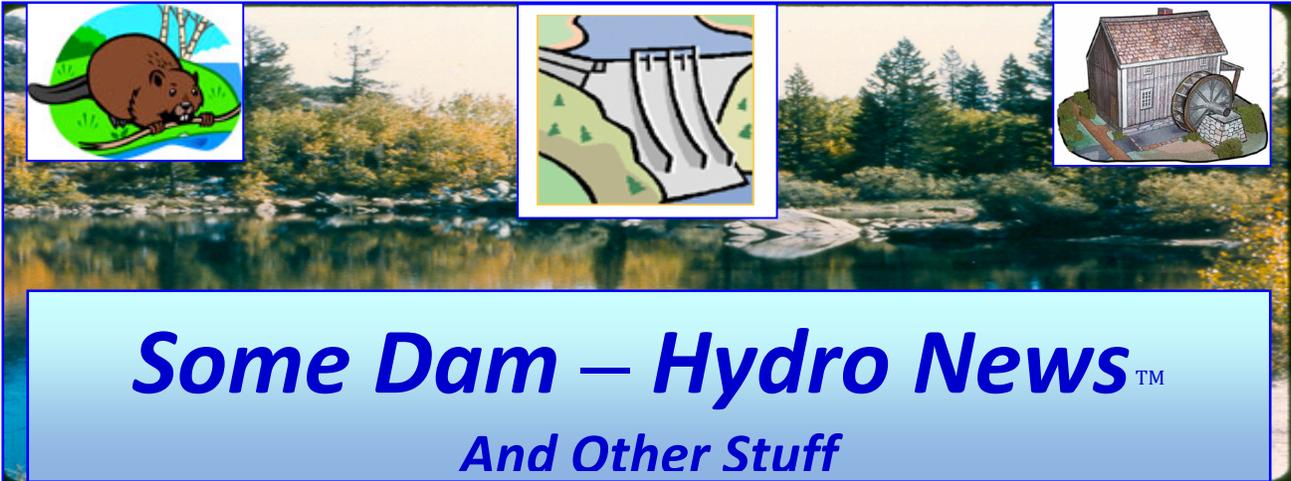


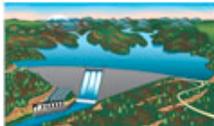
9/28/2018



**Quote of Note:** *“A pessimist sees the difficulty in every opportunity; an optimist sees the opportunity in every difficulty.” - Winston Churchill*

**Some Dam - Hydro News → Newsletter Archive for Current and Back Issues and Search:**  
*(Hold down Ctrl key when clicking on this link) <http://npdp.stanford.edu/>. After clicking on link, scroll down under Partners/Newsletters on left, click one of the links (Current issue or View Back Issues).*

**“Good wine is a necessity of life.” - -Thomas Jefferson**  
*Ron’s wine pick of the week: 2014 Arrowood Cabernet Sauvignon "Knights Valley"*  
**“No nation was ever drunk when wine was cheap.” - - Thomas Jefferson**



**Dams:**

(They dug a hole they can’t get out of.)

**Letter: DWR must work harder to win Oroville’s trust**

By LETTERS TO THE EDITOR | September 15, 2018, chicoer.com



Risa Johnson’s careful reporting on the Oroville Dam (Sept. 6) gives further evidence of the state Department of Water Resources’ continued arrogance and naïve belief in the gullibility of the community. Despite consensus that the spillway incident was the result of DWR’s errors, DWR expects the Federal Emergency Management Agency to pay for the reconstruction. Maintenance is the responsibility of the State Water Contractors, which get free water. If FEMA does contribute, this would weaken efforts to hold DWR accountable and create a moral hazard, in that those responsible for the failure would benefit from it. With more effrontery, the DWR spokesperson implies that she speaks for the Department of Dam Safety. She tells us that both the DWR and the DODS believe that once the spillway is rebuilt the dam will be safe,

ignoring such things as the crumbling gates, river tunnel and powerhouse, the unexplained green spots, the questionable management, maintenance and design and the anachronistic operating methods.

A comprehensive independent forensic report of the dam is needed so that the risks can be assessed. The DWR continues to resist this. The DWR denied that the spillways would fail. They are still in denial. The risk of inundation remains unknown. ORAC has withdrawn from the settlement agreement. Other organizations that signed it 15 years ago should review their participation. The Feather River Recovery Alliance ([www.notjustaspillway.com](http://www.notjustaspillway.com)) is dedicated to providing the truth about the dam and encouraging the DWR to change so that it can be trusted.  
— Robert Bateman, Oroville, CA

(Somebody's dream in the toilet!)

## Film: 'A Dam That Never Was' highlights Auburn controversy

By: Hannah Kanik, Aug 28 2018, [auburnjournal.com](http://auburnjournal.com)

A dam larger than Hoover was supposed to be built in Auburn, but it never was. Steve Hubbard, a local documentary and film maker, investigates the dam in his documentary, "A Dam That Never Was." He will be hosting a presentation to discuss the content of the documentary at 10 a.m. on Aug. 27 at The Domes located at 175 Fulweiler Ave., Auburn. "The Dam That Never Was," centers around the massive dam that was supposed to be constructed at the North Fork of the American River in 1965 and the controversy that led to it never being built. Hubbard said he wanted to figure out what exactly happened



and look at every reason the dam was not built. "Everything I heard raised a question. You would ask a dozen people and you would get a dozen answers," Hubbard said. "Everyone had a different idea, so I decided to see what really happened here." The dam would have held a massive amount of water that could have been used for water storage and recreation. Hubbard said as the project progressed, three main reasons surfaced that thwarted the project from completing: cost, environmental concerns and safety. The initial cost of the dam was \$300 million, but as time progressed, the total reached as high as \$10 billion. After the dam was authorized, the government had not selected how it would be funded and it took time for them to try to come up with a solution. The dam was proposed right at the time of a change in the national sentiment regarding the environment. Several laws that protected the environment were passed and rose concerns with the dam's impact.

Safety was another big concern. Considering that the location of the dam was at the convergence of major fault lines, if an earthquake were to occur the damage would be devastating. The government still approved the dam despite the potential threat it posed to residents of the area, Hubbard said. The supporters of the dam also "oversold" the recreational value of the dam, Hubbard said. Promises of water skiing and waterfront living were not plausible in the reservoir of the dam because of the steep canyons and lack of a beach. After spending three years collecting archived documents, letters, interviews and video, Hubbard is nearly done with the documentary and said he hopes it will be ready for next year's film festival season. Hubbard is an Auburn-based photo journalist and film instructor at Sierra College and has entered his films, "Power to the People," and "Saving Auburn Ravine," in the Wild and Scenic Film Festival. Hubbard said he hopes that after seeing the film, viewers will be skeptical of what the government tells you about building a dam. "There was a lot of misinformation about this project given out," Hubbard said. "Look at all issues and don't rely on one source."

(Some things cost more than you think.)

## LETTER: Cost of Elwha dams' removal keeps ratcheting up

September 2, 2018, peninsuladailynews.com

### Costs of dams



It would seem that the Peninsula Daily News might do a follow up series on the Elwha dams removal project that would be of local interest to their readers, especially with its latest news concerning the recent transfer of the costly Elwha water facilities treatment plant. I have denounced the wisdom of the dams' removal in past letters, and openly declaring the overall projection costs will be greatly understated due to the reclamation figures, and future problems that will occur within our national park roadways, campgrounds, etc., the bridges; and eventually the treatment

facilities; and even the Lower Elwha Klallam Tribe area, and having accumulated many various costs related to the dams' removal – such as the nursery rehabilitation costs, damages within the Olympic National Park, the bridge on U.S. Highway 101; the faulty treatment facility for the residents of Port Angeles, etc. I found the original cost for that infamous Elwha River restoration was \$325 million. But digging back through many PDN dam articles I calculated \$344 million of various connected costs involved with the Elwha River's restoration project, and now a recent local article tells of adding another \$6.65M for additional miss-adventures by the people who promoted it to save and increase the salmon population. Yeah, right. And, where are all the salmon now to feed the sick and dying orcas in our local waters? Maybe that's why our city utility water costs have gone thru the roof these past few years — even if we don't flush on every trip to the bathroom. *Paul Lamoureux, Port Angeles, WA*

(A little shakin' goin' on.)

## Earthquake hits South Bay reservoir with seismically challenged dam

By MATTHIAS GAFNI | Bay Area News Group, mercurynews.com, September 3, 2018

MILPITAS, CA — A magnitude 3.4 earthquake rattled the South Bay on Sunday night with an epicenter at the Calaveras Reservoir, where crews are finishing a replacement dam for one that had engineers concerned, according to the United States Geological Survey.

The temblor struck at 7:10 p.m., about nine kilometers east of Milpitas, smack dab at the Calaveras Reservoir. It had a depth of about 7.2 kilometers, according to the USGS. The USGS indicated the magnitude 3.4 quake on Sunday had an epicenter directly on the Calaveras Reservoir. On the northern tip of the reservoir lies the old 1920s-era

Calaveras Dam, which state regulators ordered lowered in the past when they determined a 7.25-magnitude quake on the Calaveras Fault, which runs north and south through the reservoir, could cause the sides of the old dam to slump. That weakening, they determined, could cause a 30-foot-high wall of water to cascade down on Fremont.



Calaveras Dam, building a new zoned earth and rock fill dam immediately downstream of the existing dam. The replacement dam will have a structural height of 220-feet high and is designed to accommodate a maximum credible earthquake on the Calaveras Fault. Once the \$823 million project is completed, the current dam will be submerged. (Courtesy San Francisco PUC)

However, Sunday's 3.4 temblor was much weaker and officials do not believe it could have damaged any of the facilities, San Francisco Public Utilities Commission spokeswoman Betsy Rhodes said. "Based upon its magnitude and its location, they review the impact radius to determine whether or not any SFPUC appurtenances are within the potentially affected area and might be affected by earth movement," she wrote in an email Sunday. "The upper limits of the

impact radius are close enough to the dams for our operators to do a visual inspection (Sunday evening to confirm that all is fine out of an abundance of caution.” Rhodes said crews perform visual inspections on a daily basis and staff also would check Monday during daylight. She added that reservoir levels are already low due to the ongoing construction on the new dam which will be able to withstand a magnitude 7 quake on that fault.

In 2001, the state Division of Safety of Dams ordered the San Francisco Public Utilities Commission to reduce the water level by 60 percent because of the earthquake concerns. The new dam project is expected to be completed next year. The replacement dam will have a height of 220 feet and is designed to handle a maximum level quake on the Calaveras Fault. The reservoir will then be able to hold 31 billion gallons of water, providing for the PUC’s 2.6 million customers in the Bay Area.

(One is too many. Sounds like they never heard of a PMF.)

### How Many Dam Bursts Are Too Many?

BY FIONA MCALPINE – AUGUST 30, 2018, earthisland.org

Many nations are counting on hydropower to meet growing energy needs even as climate change is likely to increase risks. This story originally appeared on The Borneo Project website. This week, a breach of the Swar Chaung dam in central Myanmar forced an estimated 50,000 people from their homes and flooded the country’s main highway. The dam, located in Bago region, overflowed as the result of this year’s particularly generous monsoon, which has already flooded crops in south and central Myanmar and displaced 150,000 people.



Catastrophic weather events caused by monsoonal overpour are becoming everyday news in south and Southeast Asia, with 2017 bringing devastating floods to India, Pakistan, Nepal, and Bangladesh, causing more than 1,000 deaths. Just last month, the collapse of the Xe-Pian Nam Noy hydroelectric dam in Laos killed 35 people and displaced thousands more, including communities in neighbouring Cambodia who were not told about the disaster. At the time of writing, the death toll of monsoonal flooding in Kerala stands at 445. Emergency workers and the 225,000 displaced people sheltered in displacement camps are breathing a sigh of relief that the Mullaperiyar and Idukki dams didn’t burst, which they would have had the rains continued. Thirty-five of Kerala’s fifty-four dams were opened for the first time in history and the low lying coastal state remains on red alert.

Climate scientists are predicting that increased rainfall will be one of the most unpredictable and potentially catastrophic effects of a warming climate. The distribution of rainfall throughout the year is likely to alter, meaning longer dry spells and more intense monsoons. It follows that we will likely see more flooding and more dam breaches (and collapses) in the coming years. Yet hydroelectric dam policies are proceeding largely unabated in the developing world while their potential risks in a changing climate are poorly understood.

These policies are particularly disturbing considering mega-dams are a huge contributor to global carbon emissions through the methane produced by decomposing organic material at the bottom of reservoirs (which produces about a billion tons of methane per year) and through dam reservoirs flooding thousands of kilometres of tropical rainforests in some of the world’s most vital carbon sinks, like in Sarawak where The Borneo Project works. Not to mention the huge carbon footprint from their construction. Big Hydro is burning the climate candle at both ends. Sarawak is no stranger to downpour, with the capital Kuching experiencing rain 279 days of the year and serious flooding occurring most years in recent history. Sarawak is also no stranger to giant

hydroelectric dams, with the Baleh dam next in line for construction. While there is very little local opposition to the dam — as very few (if any) communities will be displaced —downstream villages are ill-prepared for the risks of living downstream from a large dam in an uncertain climate future.

Many nations are banking on hydropower for their growing energy consumption needs, despite the fact that flood records (and dams) are breaking year-after-year. It will be dam-adjacent and downstream communities who will continue to lose their land and lives as the result of short-sighted mega-hydro policies and record breaking rain. We need to support those on the ground who are fighting mega-hydro and safeguarding their rivers and waterways for generations to come. Development without destruction is not only the right thing to do, it has become part of our survival. The Borneo Project fights against mega-hydro projects in Sarawak, Malaysian Borneo, calling out mega-dam policies as corrupt, environmentally destructive and socially devastating. You can support our work here and watch our mega-dam film series here.

(Being fretful is good.)

### Honolulu warns residents after storm swells dam water levels

BY CALEB JONES AND AUDREY MCAVOY, Associated Press. September 13, 2018, sacbee.com

HONOLULU - Honolulu officials said a dam holding 21 million gallons (80 million liters) of water was not in danger of collapsing Thursday, but still warned nearly 10,000 residents downstream that they might need to evacuate after a tropical storm caused water levels to rise in the reservoir. Water levels in the dam rose 4-to-5 feet (nearly 1.5 meters) overnight as heavy rains from Tropical Storm Olivia dumped 7.3 inches (18 centimeters) of rain in the area. Meteorologists downgraded the storm to a tropical depression as it moved away from the islands, but warned lingering moisture could bring more rain. The Board of Water Supply, the agency that manages the dam, said plans call for a mandatory evacuation if the water reaches 1 foot (30 centimeters) under the top of the dam.



The water was 5 feet below the top of the dam at midday Thursday. It's also 18 inches (45 centimeters) below a spillway. Areas downstream would flood if water goes over the spillway, said Ernie Lau, the agency's chief engineer. "We want people to know, if you live near a dam and were the dam to fail, these would be areas we would want to evacuate before the failure of the dam," Lau said. "But we're nowhere close to that." The dam is called Nuuanu Dam #1, an earthen reservoir built in 1905 in a residential neighborhood near downtown Honolulu called Nuuanu. Lau said workers began siphoning water away from the dam before Olivia reached the islands. But these efforts were unable to keep pace with the rain that fell during the storm. On Thursday morning, Lau decided to begin pumping water out of the dam with the help of Honolulu firefighters. Lau said workers made some headway and water levels came down by 2 to 3 inches. He said they'll make more progress if the rains decrease. Pumping will continue over the next week, he said. The agency, which is the water utility for nearly 1 million people in Honolulu and surrounding towns on Oahu, said it would coordinate with the city on any evacuation notice. Andrew Pereira, a spokesman for the city, urged residents to be aware of the situation. "While it appears the rain is subsiding, we are taking a cautious approach and asking residents to remain on alert," he said in an email.

Sherwod Chock, an artist who has lived in the neighborhood for nearly 50 years, said officials have never warned about high water levels in the dam before. "It looks it like it can hold it, but you never know," he said. As for whether he had plans if the dam breached, he said: "I think God's going to take care of us." The dam is one of multiple dams in Nuuanu that are used for flood

control. Water levels at a bigger dam, Nuuanu Dam #4, are much lower. This dam also has an additional method for releasing water in a controlled fashion that Nuuanu Dam #1 lacks. Meteorologists say moisture will linger through Friday, with additional rainfall of 3 to 5 inches (8 to 13 centimeters) and isolated amounts of 6 to 8 inches (15 to 20 centimeters) on higher terrain. That could cause life-threatening flash floods because the ground is already saturated, the Central Pacific Hurricane Center said in a statement. The storm, which was a hurricane earlier in the week, slowly weakened as it neared the state. President Donald Trump has signed a disaster declaration, which will help FEMA respond, Gov. David Ige said.

(Hawaii dams need a close watch.)

## Most dams in Hawaii have 'high hazard potential,' says report

By Associated Press, September 14, 2018, staradvertiser.com

The vast majority of Hawaii's state-regulated dams are considered to have "high hazard potential," according to a 2017 infrastructure report by the American Society of Civil Engineers.

One of the 124 dams given that classification is one in Honolulu that prompted an evacuation warning Thursday amid heavy rains. Later in the day, officials said the century-old reservoir wasn't in immediate danger of collapsing. Hawaii has 132 state-regulated dams.



The hazard potential isn't an indication of the condition of a dam, but the consequences if it failed would be deaths or significant property damage, said Mark Ogden, a member of the report committee and a technical specialist with the Association of State Dam Safety Officials. "Our dams are aging and deteriorating, while downstream populations are increasing," the association said in a Hawaii dam safety performance report. "Thousands of U.S. dams have the potential to fail with tragic consequences." The last time there was a fatal dam failure in Hawaii was in 2006, when seven people were killed after the Ka Loko dam on the island of Kauai collapsed and hundreds of gallons of water rushed downhill. Ogden said as far as he knows that's the last fatal dam failure in the United States.

Hawaii's Legislature expanded the state's dam safety program after the Ka Loko breach, said Edwin Matusda, who heads Hawaii's flood control and dam safety program. The infrastructure report noted that 98 percent of Hawaii's state-regulated dams have an emergency action plan. Workers plan to keep pumping water throughout the weekend and into next week as needed from the dam in Nuuanu, a residential neighborhood near downtown Honolulu, said Kathleen Elliot-Pahinui, a spokeswoman for the Honolulu Board of Water Supply. The dam was built in 1905. Water levels in the dam rose 4 to 5 feet (nearly 1.5 meters) overnight as heavy rains from a storm dumped 7.3 inches (18 centimeters) of rain in the area Wednesday into Thursday. The Board of Water Supply, the agency that manages the dam, said plans call for a mandatory evacuation if the water reaches 1 foot (30 centimeters) under the top of the dam. The water was 5 feet below the top of the dam at midday Thursday. It was also 18 inches (45 centimeters) below a spillway. Areas downstream would flood if water goes over the spillway, said Ernie Lau, the agency's chief engineer. The water was 6.5 feet below the top today, Elliot-Pahinui said. "We always siphon to keep the water levels low ... well before any storm hits," she said in an email.

There was intermittent rain in the area this morning. Meteorologists said there will be passing showers in the coming days, but heavy rains aren't likely. There's not much that can be done to reduce the number of high-hazard dams— other than removing them, Matsuda said. The rise of development downstream of dams is especially true in Honolulu, where people live on a small island. Climate change is also a concern. "We are noticing that the hydrology in the islands is starting to change due to climate change, and so it's becoming more frequent that you have these

... rainfall events,” Matusda said. Some dams are being retrofitted to increase the spillway, he said. Matsuda noted that while dams may have high hazards, they are also valuable resources for the islands including for hydropower and recharging aquifers. The Nuuanu dam was built for hydroelectricity, but it isn't currently being used for anything, Elliot-Pahinui said. Officials hope to repurpose it as a part of a hydroelectric project, she said

(Dam Failure. Wonder how many.)

### Sanford Dam breaches in Boiling Spring Lakes, water draining at fast rate

abc11.com, September 16, 2018

BOILING SPRING LAKES, N.C. (WTVD) -- Water is draining at a fast rate after the Sanford dam breached around 7:10 p.m. Saturday due to rains from Florence.

The city, located in Brunswick County, took to Facebook and said the failure of the dam was due to the water volume over the last several days.



The Big Lake began draining at a fast rate along with Pine and North Lakes. The Emergency Action plan was enacted and the city said no member of the public was at risk. Several roads are closed for the immediate future, including Alton Lennon, E. Boiling Spring Road and Hwy 87

(Another possible dam failure.)

### Warning dam could breach, Hope Mills encourages some residents to evacuate

BY PAUL A. SPECHT, newsobserver.com, September 16, 2018

Fayetteville's largest suburb is encouraging some residents to evacuate ahead of potentially "catastrophic" rain. The town of Hope Mills, home to about 15,000 people in Cumberland County, emailed a statement to the press late Saturday night encouraging people to seek safe shelter. The warning was for people who live near Hope Mills Lake and downstream of the dam. "If we receive the catastrophic rain that is predicted and that is not



controllable by a dam and spillway structure; and since we cannot predict with any certainty what will happen with the flooding of the Cape Fear River Basin, we strongly feel that action by you now is warranted," Melissa Adams, the town manager, said in a statement.

"We expect flood waters are going to overtake the dam possibly sometime Sunday and wanted to notify people tonight," Adams said. The warning applies to residents who live on Main Street to Parkton and River roads, as well as people who live along the lake, The Fayetteville Observer reported. Florence had been downgraded from a Hurricane to a Tropical Storm by the time Hope Mills issued its warning to residents. But it had already toppled countless trees and flooded low areas across the state. Gov. Roy Cooper and weather experts warned North Carolinians on Saturday that Florence will likely drench the state with bring inches upon inches of rain over the weekend. Hope Mills and its dam have had a tumultuous history. The dam, then 79-years-old, breached in 2003. It took five years and \$14 million to be rebuilt, according to News & Observer archives. And in 2010, only two years after being rebuilt, the dam failed again. In a phone interview Sunday morning, Adams noted that cresting over the dam doesn't mean it's failing. She urged Hope Mills's residents to take shelter while they still can.

(Let's hope they weather the storm.)

### Carolina dams hold up — for now

By Jeremy P. Jacobs, E&E News reporter, Greenwire, September 18, 2018, eenews.net

In the aftermath of Hurricane Florence, the Carolinas' aging dams have emerged as an unsung success story — at least so far. Only one North Carolina dam — in Brunswick County — has breached. The state is home to more than 3,400 dams. In South Carolina, two small, low-hazard dams have failed, a tiny percentage of the state's more than 2,400 dams. "I have been a little surprised that we haven't heard of more issues with dams," said



John France, an engineer and dam safety consultant based in Denver. France and other experts cautioned that the worst may be to come. Rivers are still rising, putting additional strain on dams in both states. The risk appears particularly high in North Carolina, where there are 1,448 dams classified as "high hazard," according to the Army Corps of Engineers' National Inventory of Dams. "High hazard" means a failure would result in the loss of life.

Most of those dams are more than 50 years old, and 185 were rated in "poor" or "unsatisfactory" condition in recent inspections. Concern about the dams has put state officials and local residents on high alert. Multiple false alarms of dam breaches have been reported, and a mandatory evacuation was ordered at a lake in Hoke County, near Fayetteville. The dam there was overtopped but did not fail. Officials also are closely watching two high hazard dams at Duke Energy Corp.'s Weatherspoon Plant in neighboring Robeson County. The demolished plant has one dam impounding a coal ash pond and another holding back a cooling pond (Energywire, Sept. 18). The dam at the coal ash pond was found to be in poor condition during an inspection last year. Mark Ogden of the Association of State Dam Safety Officials noted that both states have suffered through severe storms in recent years that caused dozens of dam failures.

In October 2015, torrential rains in Columbia, S.C., caused 51 dams to fail. A year later, Hurricane Matthew made landfall on the South Carolina coast and another 25 dams popped. In North Carolina, Matthew caused at least 17 dams to breach. "These areas have been hit by a lot of really significant storms in recent years," Ogden said, "so maybe a lot of the dams that were vulnerable to this type of rainfall and flooding conditions have already failed, or they are the ones that have been rebuilt."

North Carolina has long had a robust dam safety regulatory agency, and the recent storms in South Carolina led that state's Legislature to bolster its program. Both programs have million-dollar budgets and about 20 full-time employees. In the lead-up to Hurricane Florence's landfall, both began reaching out to dam owners to make sure they were prepared to consider safely lowering lake levels to make room for stormwaters (Greenwire, Sept. 12). France, the dam safety consultant, noted that many of the dams that were rebuilt following the previous storms with enlarged spillways, which allows them to safely release more water in emergency situations. He cautioned, however, that neither state is in the clear yet. "It might be a little premature until we see the storm pass and we see what happened," he said

(Havoc from Florence.)

## Florence flooding puts dams, many high hazard, to the test

By SARAH RANKIN | Associated Press, Sept. 17, 2018, foxnews.com

Devastating flooding in North Carolina in the aftermath of Florence has raised concerns whether dams across the state, some of them in poor condition, will be able to hold up under the strain.



State officials have been monitoring dam safety in cooperation with local authorities and say there has been at least one dam breach so far, with no homes affected. But there have been several other locations of concern. According to data obtained by The Associated Press from the National Inventory of Dams, the state has 1,445 dams rated high hazard out of about 5,700 dams, ranging from large federally owned ones to small private ones. That hazard classification doesn't indicate the likelihood of failure — just that any failure would likely cause the loss of one or more lives.

(Watch out for this one.)

## Hartsville dam expected to overflow Tuesday, Darlington Co. officials warn homes may flood

By WPDE, September 17th 2018, wpde.com

DARLINGTON COUNTY, S.C. (WPDE) — The Darlington County Emergency Management Department and Sonoco say flood waters are expected to rise above a Hartsville dam on Prestwood Lake after 2 a.m. on Tuesday, and will likely cause flooding in areas around the lake and Black Creek. Public safety officials say they are notifying all homes in businesses in areas that could flood to evacuate to high ground if they see rising water. They say buses are staged and ready to evacuate any residents in need to a storm shelter.



Sonoco has been releasing excess water from the dam for the past 36 hours, in an attempt to control flooding. The complex where the dam is located has been closed because additional flooding is expected, and Sonoco says it will remain closed for at least 24 hour. Sonoco says it is working with Duke Energy, state officials, Darlington County officials, and Hartsville officials to keep to public updated, and will release additional advisories as necessary. For more information, you can call the Darlington County Emergency Management Department at (843) 398-4469. If in an emergency situation, call 911.



## Hydro:

(It's always nice to be first.)

## Montana's first hydroelectric dam

By TOM KUGLIN, helenair.com, Sep 13, 2018

Black Eagle Dam was built in 1890 with the original dam constructed of timber and rock. It was the first hydroelectric dam in the state, sitting on the Missouri River at Great Falls.



(At least you get something out of a hurricane.)

## Florence's Rains Are Kicking Hydroelectric Dams Into Overdrive

By Jim Efstathiou Jr, September 17, 2018, bloomberg.com

Florence's driving rains are forcing hydroelectric dam operators to run generators at full tilt and open flood gates that haven't been used in more than 20 years. The Tennessee Valley Authority - which operates dams in Tennessee, Georgia and other states -- began increasing output last

week to make room in reservoirs. Duke Energy Corp. has been doing the same in North and South Carolina.

TVA, a corporate agency of the federal government, went beyond cranking up generators and opened spill gates at the Cherokee Dam on the Holston River near Knoxville, Tennessee, that haven't been used for flood control since 1994, spokesman Travis Brickey said. "We went to full turbine capacity at most facilities early last week," Brickey said in an interview. "As the week progressed, we started more aggressive releases."



Rain in North Carolina and southwest Virginia feeds the Tennessee River watershed where reservoirs were already at seasonal high levels before the storm. While forecasts called for around 15 inches (38 centimeters) from Florence in some parts of North Carolina, only about 6 inches have actually fallen, Brickey said.

Florence, which made landfall Friday as a Category 1 hurricane, continues to drench the mid-Atlantic. Flood warnings are in place from North Carolina to Virginia, according to the U.S. Weather Prediction Center in College Park, Maryland. Rivers in North Carolina are still rising. The Cape Fear River in Fayetteville was almost 17 feet above flood stage Monday and forecast to rise another 10 feet by Tuesday. Flash flood watches have been posted from West Virginia to New England. TVA plans to stop spilling water at hydro dams Monday. Duke said it will assess flood damage at hydro dams after the storm passes. "We are still operating all our available hydro generating units to move water through our river systems," Kim Crawford, a Duke spokeswoman, said in an email. "This includes gate operations on some dams as well as running the generating units to increase storage capacity in our largest reservoirs."

(Everybody is dumping water.)

### Appalachian Power lowers water levels in Virginia hydroelectric plants

September 17, 2018, by Dave Kovaleski, [dailyenergyinsider.com](http://dailyenergyinsider.com)

Water levels in hydroelectric facilities operated by Appalachian Power in Virginia were lowered in preparation for the heavy rain expected this week from the remnants of Hurricane Florence.

Water levels at the Claytor Hydro facility on New River and the Smith Mountain facility on Roanoke River were reduced to mitigate against possible flooding on the reservoirs. The Claytor Project operates at a level of about 1846-foot elevation. It reached its lower target elevation of 1841 feet last Wednesday in advance of the storm.



The Smith Mountain Project is a two-reservoir hydroelectric generation project operated by Appalachian Power located near Roanoke, Virginia. It is comprised of the Smith Mountain and Leesville reservoirs. Water levels were lowered from 795 feet to 792 feet. The adjusted level will also be maintained pending the rainfall outcome from Hurricane Florence. Appalachian Power personnel has been monitoring the movements of the hurricane and have, or will, adjust as necessary. "We are always monitoring weather for events that could damage our electrical facilities and cause power outages," Phil Wright, Appalachian Power's vice president of distribution, said. Customers can access Appalachian Power hydro levels and flows at <https://www.aep.com/environment/conservation/hydro/>. Appalachian Power, a subsidiary of American Electric Power, serves approximately 1 million customers in Virginia, West Virginia, and Tennessee.



## **Environment:**

(The fish are back.)

### **Dams powered Tacoma but killed off salmon runs. 92 years later the fish are back**

By: Craig Sailor, TNT, Sep 15, 2018, kiro7.com

Tacoma Power is now in the fish business. After a 92-year absence, spring chinook salmon are once again moving up and down the North Fork of the Skokomish River, thanks to a lot of human intervention and \$62 million worth of state-of-the-art facilities. Two new hatcheries, collection facilities and extensive monitoring of fish habitat have been put in place. In August, some of those first efforts returned to the North Fork in the form of spawning spring chinook.



“This is a very exciting summer for us,” said fishery manager Andrew Ollenburg. “To actually get returning adults and get eggs from them is super exciting.” The reversal of fortune for the fish came after years of negotiations with the Skokomish Indian Tribe and decades of increasing alarm over declining salmon populations. In the 1920s and 1930s, Tacoma Power built the Cushman Hydroelectric Project, which dammed at two places the river that flows from the Olympic Mountains overlooking Hood Canal. While the project created two lakes and provided clean energy to the growing city of Tacoma, it abruptly ended the upstream and downstream migration of salmon on the river. Fish that for eons had swum into the upper reaches of the mountains to spawn now hit a concrete wall. The project ended the river as well. A tunnel and penstocks, large exposed pipes, carry water from dam No. 2 to Tacoma Power’s powerhouse built along Highway 101 near Hoodport. The diversion essentially drained the river dry.

The tribe knew what the dams meant for them before the first concrete was poured. “You’re building a hydroelectric dam across the most productive salmon river here in the Hood Canal watershed, you’re building it without any fish passage and you’re diverting the entire flow of the north fork of the Skokomish River out of the watershed,” said Joseph Pavel, the Skokomish Tribe’s Natural Resources Director. “We protested all the way along. It dates back to when the project was first thought about. The tribe resisted,” Pavel said. “My great-grandfather filed (suit) in probably (19)29.” Today, the era of dam building is long gone in America. In some places, like along the Elwha River farther north, dams have been demolished. That wasn’t the plan for Cushman which produces 134 megawatts of electricity — enough to serve about 30,000 homes.

#### **Relicensing prompts action**

On March 23, 1926, President Calvin Coolidge pushed a button inside the White House that started electricity flowing from the Cushman Hydroelectric Project to Tacoma. The button was only ceremonial, but the event wasn’t — the dam that holds back Lake Cushman was at the leading edge of a decades-long period of hydroelectric projects in the West. From the rim of that first dam today, a visitor can see the waters of Lake Cushman pointing like a curved dagger at the Olympic Mountains to the north. The river bed below is dry — as it has been for over 90 years. The water goes through a tunnel bored into a rock cliff and into a powerhouse below where it’s used to spin electricity-producing turbines. When storms fill the reservoir beyond capacity, excess water flows over a nearby spillway. Further downstream is Lake Kokanee, held back by Cushman Dam No. 2, built in 1930. The waters below its face froth and churn as they leave the dam and continue down to the Hood Canal. That hasn’t always been the case. For decades that river bed also was dry.

In 1974, Tacoma Power's original license for the hydroelectric project expired. The utility applied for renewal. The relicensing process stretched on for years, and in 1999 the tribe sued again over the loss of fish and water. In 2008, the Cushman settlement agreement was signed by the tribe, Tacoma Public Utilities and the state Fish and Wildlife Department. Tacoma Power received a 50-year-long federal license, retroactive to 1998. As part of the agreement the Skokomish Tribe was given:

- o A \$12.6 million payment.
- o Skokomish Park at Lake Cushman (formerly Camp Cushman), Saltwater Park on Hood Canal and 500-acre Nalley Ranch.
- o 7.25 percent of the value of electric production from the Cushman No. 2 powerhouse.

As part of the agreement, Tacoma Power agreed to return fish to the river it had blocked decades earlier. The \$62 million fish recovery project, funded by bonds, is the result. Today, the tribe actively assists in Tacoma Power's hatchery operations by providing both fish and manpower, Pavel said. Pavel characterizes the relationship between the tribe and Tacoma Power as productive. "We've finally reached a consensus on what are the appropriate actions. Both for ecological and resource management but also for operation of the hydro and power facilities," he said. "We might not be happy with each and every element of that, but it's something we agreed upon and signed and we're committed to making it work."

### **Two tall dams**

Bringing salmon back to the North Fork was no easy feat. The Cushman dams rise 275 and 235 feet high — too tall for a fish ladder like the kind used by dams on the Columbia River. Salmon-bearing rivers are two-way streets. Fish need to move downriver and into the sea to mature into adults, and adults must go upriver to spawn. Dams as tall as these thwart them both ways. For the new fish recovery plan, Tacoma Power has built a series of transportation systems designed to get the fish where they need to go. Now, fish are trapped, trammed and trucked up, over and down the faces of the dams. Coming up river to spawn, fish are met by the face of Cushman No. 2, holding back Lake Kokanee. That marks the end of the free-flowing North Fork. That's when hatchery personnel go into action.

First, adult fish are collected from a trap at the base of the dam. Then, a tram on rails hauls the salmon in a hopper up the face of the edifice. From there, a crane latches onto the hopper and swings it over to a sorting facility. Fish are sorted according to species and origin. That pickup point at the base of the No. 2 dam is also a drop-off point. When they are ready, fish from the nearby hatchery are loaded into the tram and safely delivered to the base where they begin their journey to the sea. "We release juvenile fish there with the thought that they're going to return to that spot as adults," Ollenburg said. As part of the relicensing agreement, Tacoma Power is required to keep water flowing from the dam and into the river year round. They installed a new powerhouse at the base of the dam to use the water for hydroelectric generation. "We're attracting salmon with the water we've already generated electricity with," Ollenburg said.

### **State-of-the-art hatcheries**

Forget about the long concrete trough-like ponds of old hatcheries. Tacoma Power's North Fork Skokomish Salmon and the nearby Saltwater Park Sockeye hatcheries are the latest in technology. Operating room-like facilities keep eggs and fish disease-free. Alarms let operators know when something is going wrong on the road from egg to full-finned fish. From fry (three-fourths inches long) to the time they are released (2-1/2 to 7 inches long) the fish grow in circular tanks. Water is continually added and removed, providing both a current for the fish to swim in and a waste disposal system. "The fish are always swimming so they are getting exercise to maintain their health," Ollenburg said. The constantly moving water also improves its quality. The upper hatchery, within sight of Lake Kokanee, grows chinook, steelhead and coho. The lower hatchery on Highway 101 across the road from the iconic powerhouse, raises only sockeye. Sockeye are vulnerable to an infectious disease and must be kept separate from other fish.

On Wednesday, a crew gathered at the North Fork hatchery to begin the process of raising a new generation of chinook. A holding tank held females and another held males. "We separate the boys from the girls so there's no flirting going on," Ollenburg said. Chinook will return to their spawning grounds at 3 to 7 years old, he said. The average age is about 4 years. The brood stock being used Wednesday were caught at the base of the dam and held in tanks for a month while they matured sexually. These particular fish had been released at the dam's base in 2016 but had been raised by a nearby hatchery.

One by one, three females were caught and their eggs removed. Each group of eggs is kept separate from one another and numbered. A technician took samples of each female fish's kidney to run tests for a bacterial infection endemic to the chinook. If a high enough level of infection is found in results, that batch of eggs will be destroyed. Then, males were squeezed in just the right place to produce a stream of sperm, carefully shot into each bucket of eggs. Water, it turns out, is the magic ingredient that makes fertilization possible, Ollenburg said. The three components are mixed together in a spawning room by two technicians. Inside a building at the hatchery, Ollenburg took the cover off an incubator to reveal trays constantly bathed in running water. Each tray holds 3,200 eggs — the product of one female fish and a few males. The eggs will take two months to hatch but already, at five weeks, black eyes were forming. In addition to the chinook (king) and sockeye (red), winter-run steelhead and coho (silver) are part of the fisheries project. Tacoma Power also owns hatcheries on the Cowlitz River but those are run by the state Department of Fish and Wildlife.

#### **Floating fish palace**

The highest — in terms of elevation — of Tacoma Power's fishery facilities is a group of floats and buildings attached to the Cushman Dam No. 1. Built in 2014, the pumps, pens and nets are all designed to do one thing: catch fish. From March through July, 24 hours a day, the machinery operates at what's called the Floating Surface Collector. It's there that the fishes' migration to the sea begins. Unless they're sent back to the lake. Using a design not unlike traditional native fish-funnel traps, the machinery tricks young fish into thinking there is an outflow at the dam's face. Fish are lured into a wide funnel shaped chute that gets progressively narrower and shallower. Pumps pull water through the chute and as it becomes more narrow, the water current increases in speed. Soon, the fish pass a point of no return — where they are unable to turn around. "Once the fish are past that point, we have them captured," Ollenburg said. The water is drained away and the fish are deposited in holding tanks.

From there, the fish are sorted by species and size. Where they go changes year to year, based on fisheries' requirements. Some fish, like sockeye and kokanee, are placed downstream below the second dam. Others, like young chinook, are put back in the lake. Some fish, like largemouth bass — an invasive species — are killed under the direction of Fish and Wildlife. Lake Cushman is stocked with only one fish from Tacoma Power's hatcheries: sockeye. Chinook and coho might be placed in the lake in the future, Ollenburg said. "Right now we are focusing on building the sockeye returns," he said. "They are not strong enough to be released directly into the river when they leave the hatchery, so we grow them in the lake for a year." Some sockeye are tagged with various tracking devices. "From that we can get three dimensional models of how the fish move through the lake," Ollenburg said. Habitat monitoring is accomplished the old-fashioned way.

Once a week, year-round, two biologists are sent down the North Fork in dry suits and snorkel gear. The divers float from the base of the dam to Little Falls, a waterfall four miles downriver where a series of natural looking pools were carved into the rock in 2015 to assist the fish in their upstream migration. Soon, fish carcasses from the hatcheries will be placed back in the river. It's another crucial link in the salmon's gifts to the ecosystem. "The overarching goal is salmon recovery which affects so many other things," Ollenburg said. "To see these adult fish return is a very good sign of that." Pavel agreed. "Just to see them is always a beautiful thing," he said.

[\(Get the money elsewhere.\)](#)

#### **Bill would change how invasive species prevention is funded**

MISSOULA, Mont. (AP) — The Montana Environmental Quality Council is proposing legislation that would drop hydroelectric power fees as a funding source for aquatic invasive species prevention program. Instead, the proposed bill would shift the cost of the \$6.5 million state program to boaters, anglers and Montana's general fund. The Missoulian reports the Environmental Quality Council voted Thursday to send the bill to the state Legislature to consider in the 2019 session. The original 2017 law funded the public information campaign and boat inspection stations through a combination of fees on hydroelectric facilities and utilities and on fishing licenses. Under the proposed changes, all boaters would have to buy "prevention passes" and anglers would still have to pay their fees. Payments from the general fund would make up the difference between that revenue and the \$6.5 million cost.



### Other Stuff:

(Let's all be Happy!)

### This Is the Happiest State in the Union Congratulations, Hawaii

By Newser Editors, Newser Staff, Sep 10, 2018, newser.com

(NEWSER) – It may be tough to measure happiness, but WalletHub took a crack at it by crunching data on 31 factors from depression to income in each state of the union. Your happiness winner is perhaps not a shocker: Hawaii. On the flip side, West Virginia fared worst. One big factor was "emotional and physical well-being," with Hawaii first and Arkansas last in that category; others were "work environment" (Utah first, Louisiana last), and "community and environment" (Idaho first, Alaska last). Read on for the top and bottom 10 overall states:



#### Happiest states overall:

1. Hawaii, 68.27 overall score
2. Utah, 67.84
3. Minnesota, 67.26
4. North Dakota, 65.62
5. California, 63.14
6. Idaho, 63.09
7. Maryland, 61.78
8. Iowa, 61.07
9. South Dakota, 60.80
10. Nebraska 59.11

#### The least happiest states:

41. New Mexico, 43.35
42. Missouri, 42.76
43. Mississippi, 41.63
44. Kentucky, 39.42
45. Alabama, 39.35
46. Oklahoma, 38.89
47. Alaska, 38.21
48. Louisiana, 37.15
49. Arkansas, 36.61
50. West Virginia, 33.42

Click for the full rankings here: <https://wallethub.com/edu/happiest-states/6959/> and more breakdowns.



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