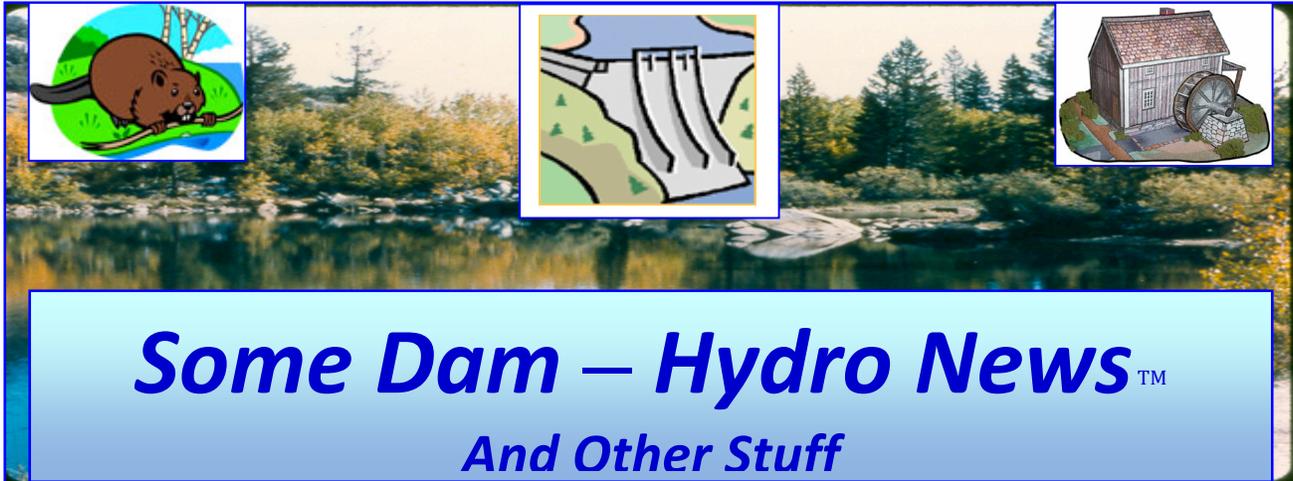


7/26/2019



# Some Dam – Hydro News™

## And Other Stuff



**Quote of Note:** *“Always borrow money from a pessimist. He won't expect it back.” - Unknown*

**Some Dam - Hydro News → Newsletter Archive for Current and Back Issues and Search:**  
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**“Good wine is a necessity of life.” - -Thomas Jefferson**  
*Ron’s wine pick of the week: 2017 Sanssouci Cabernet Sauvignon "Pays d'Oc"*  
**“No nation was ever drunk when wine was cheap.” - - Thomas Jefferson**



### Dams:

(Another dam removal story. Media loves them. It's harder to build them than to tear them down.)

### **With removal of Columbia Dam, shad are back in the Paulinskill**

By Bruce A. Scruton, New Jersey Herald, Jul. 11, 2019, njherald.com

KNOWLTON, NJ -- As the speakers and guests gathered under a tent, across the Paulinskill an eagle hatchling chirped mightily for its parents, one of which was nearby while the other soared over the river.

"The eagles know," said Barbara Brummer. "This has become a great fishing spot." Brummer is New Jersey director of The Nature Conservancy, and Wednesday's gathering was the "Welcome Back Shad" celebration of the removal of the century-old Columbia Dam, a project nearing its end.



Dam removals -- more than 1,000 of them across the country -- are meant to

open up the river and give migrating fish access to spawning grounds. Within two weeks after the large equipment that leveled the Columbia Dam was taken out of the river, American shad were seen swimming upstream. They made it some 10 miles until faced with another old dam.

The project was undertaken by The Nature Conservancy, which hired Beth Styler Barry as its river restoration manager, about three years ago. She was able to put together the long list of partners in the project, ranging from federal and state agencies -- the dam and surrounding land are part of the Columbia Wildlife Management Area, owned by New Jersey -- to the project engineers and the construction company that did the actual work. The project was more than just taking down a concrete dam. To be included were the remains of an older dam also on the property. An interstate highway had been built across the lake created by the dam, and the bridge supports needed to be reinforced because water would be moving. The former lake bed needed to be re-planted, and the power from the old power house needed to be replaced. Chad Sumner of SumCo Eco-contracting, which did the removal and reinforcement work, remarked on the skill of his crews.

"This was a fast project," he said, "Two, three years from the start to today." Geoff Goll of Princeton Hydro, the engineers on the project, said, "What we've done is literally untie this river. For 100 years it was tied up, and for the next 100 years it will be fixing itself." He said changes will be dramatic from year to year as the river becomes more natural. There were also the technical experts on the job, such as the U.S. Fish and Wildlife Service, which helps oversee dam removal projects across the country. David Bean, of the state's Office of Natural Resources, said, "What a difference a year makes. But we knew it would be a great project." Carrie Lindig, from the U.S. Department of Agriculture's Natural Resources Conservation Services, recalled how Styler Barry called her about getting grant money under a program run by her agency. "I told her that program no longer existed. I told her to come in anyway and we'd see if there was some other way. We settled on post dam removal work."

As a result, more than 5,000 saplings and uncounted willow sticks have been planted along what was covered by water for the past century. More plantings are still to be done. Dave Golden, acting director of the New Jersey Division of Fish and Wildlife, which manages the wildlife management area, said many parts of the state Department of Environmental Protection were involved in the project, mentioning people in the dam safety office and clean waters, as well as within his own division. Zach McCue, an aide to U.S. Sen. Cory Booker, read a letter from the New Jersey senator that praised the dam removal "for realizing its goal. The shad have returned." "Dam removals are complex and time-consuming," said Deputy DEP Commissioner Debbie Mans, who added that the work is not completed. Still to come is removal of the power house. Initial plans to turn the building into a visitors center or a restaurant did not work out. The demolition of the building is scheduled to begin in late summer. By then the young eagle will have learned to fly and to fish for itself. The shad will come back again for springs to come. Somewhere in the Sargasso Sea next spring, an eel egg will hatch and the elver will begin drifting on currents toward the North American coast. That journey will bring eels back into the Paulinskill.

(More on Columbia Lake Dam. Dam removal always in the news. Don't like shad, too bony.)

## **BEFORE AND AFTER: There was a dam on this N.J. stream for 100 years. Now that it's gone, the shad have returned.**

By Steve Novak | lehighvalleylive.com | July 11, 2019

A year ago, environmentalists gathered on the bank of the Paulins Kill to celebrate the eventual destruction of the huge, 100-year-old dam before them. On Wednesday, they returned to the same spot, this time to celebrate what one speaker called a "river



renaissance.” The dam is long gone, and the Delaware River tributary in northern Warren County is returning to its natural state. **The 330-foot-long, 18-foot-high Columbia Lake Dam was built in 1909 as a hydroelectric station, but has long been obsolete and out of use.** It stood a quarter-mile up the Paulins Kill from the confluence with the Delaware River, in the shadow of the Delaware Water Gap. Conservationists said it blocked fish such as shad from reaching spawning grounds farther up the 40-mile tributary.

**But after the dam’s removal last year, the shad quickly returned.** The first proof came in April, when one was caught by an engineer who had been involved in the demolition. Local, state and federal groups for years urged the removal of the dam in Knowlton Township. Together, they amassed \$8.5 million for this one project, and they plan to document the positive effects on the waterway to build support for more dam removals around New Jersey – including more farther upstream. “We did it!” said Barbara Brummer, New Jersey State Director of The Nature Conservancy, to applause during Wednesday’s news conference. “We’ve given this important part of the river back to nature.”

(Tear the dam down. Imagine, they’re putting in a fish ladder to get around a natural obstacle, the falls.)

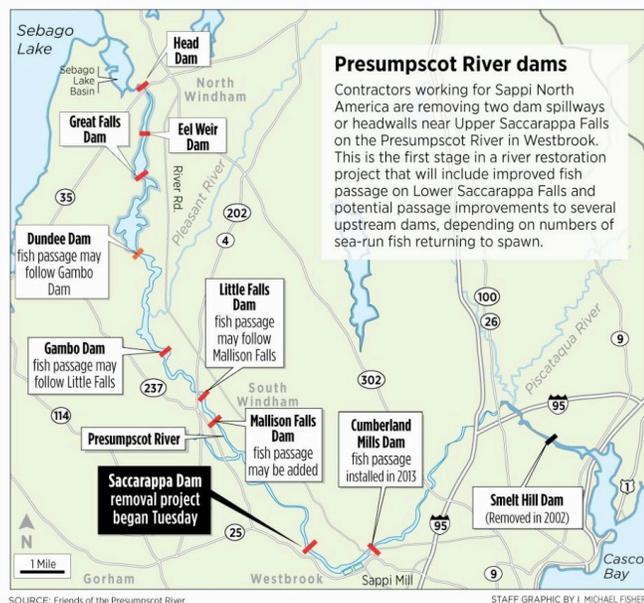
### **Long battle over, dam removal begins on Presumpscot River in Westbrook It’s the first stage of a river restoration project that will allow water to flow freely through Upper Saccarappa Falls for the first time in centuries.**

BY KEVIN MILLER, STAFF WRITER, 7/16/19, [pressherald.com](http://pressherald.com)

WESTBROOK, Maine — Crews began removing the first of two dam headwalls on the Presumpscot River in Westbrook on Tuesday, **allowing water to flow freely over Upper Saccarappa Falls** for the first time in centuries.

The work is part of a multistage project that aims to restore fish passage and wildlife habitat while making the section of the Presumpscot River near downtown Westbrook more attractive to residents, tourists and whitewater paddlers.

- **Agreement calls for dam removal, fish passage on Presumpscot River in Westbrook**



Although the project has been in the works for several years, the timing of the work to remove the eastern spillway or headwall at Upper Saccarappa Falls came as a surprise to several of the parties involved in the years-long negotiations with its owner, Sappi North America. “A happy surprise, but a surprise nonetheless,” said Michael Shaughnessy, president of the Friends of the Presumpscot River. “Looking up the river, you can see a view that you haven’t seen since the 1800s at least, if not before that. The river has been dammed since the 1700s. ... and it’s going to change.”

A center of industrial activity for centuries, **the Presumpscot flows for roughly 25 miles from Sebago Lake to Casco Bay** through one of Maine’s most populous areas. Organizations such as Friends of the Presumpscot River and the Conservation Law Foundation have been working for decades to remove or bypass 10 dams that block upstream passage for sea-run fish such as river herring, American shad and Atlantic salmon. In 2016, Sappi North America, which operates a paper mill in Westbrook, negotiated a deal **to remove the two dam spillways or headwalls** on

either side of an island at Upper Saccarappa Falls. In return, Sappi received a license extension from the Federal Energy Regulatory Commission for other dams farther upriver. The deal, which also involved the city of Westbrook as well as state and federal agencies, calls for Sappi to install a ladder-like fish passage system around Lower Saccarappa Falls and to restore a more natural flow to the heavily altered river bottom around the upper falls. The numbers of returning blueback herring and shad will, in turn, dictate when or if the company must improve fish passage on at least four more dams on the Presumpscot. On Tuesday, demolition crews used heavy equipment to remove the eastern spillway or headwall at Upper Saccarappa Falls, thereby reopening the eastern channel. The crew is expected to remove the western spillway in the near future.

Sappi representatives could not be reached for comment Tuesday evening. Sean Mahoney, vice president of the Conservation Law Foundation in Maine, said it was “great news” to hear about the work, which took place ahead of schedule. “Looking up Saccarappa Falls, with that spillway, that’s a view that we haven’t seen in more than two centuries. It’s amazing,” Mahoney said. “And it’s our hope that, come next spring, that view is also going to include fish going up and over the falls.” Sea-run fish have returned to other Maine rivers in huge numbers following river restoration projects.

One of the nation’s first major dam removal projects took place 20 years ago this month on the Kennebec River in Augusta. This spring, more than 3 million river herring were counted swimming upriver in the Kennebec to spawn. Likewise, biologists counted nearly 2 million herring plus 2,300 shad in the Penobscot River this spring and summer six years after several major dams were removed or bypassed. The Presumpscot may never see numbers like that. But herring, shad, shortnose sturgeon and other sea-run fish already have started showing up in larger numbers since the Smelt Hill Dam was removed near the outflow to Casco Bay. And six years ago, an upgraded fish passage system was installed at Cumberland Mills Dam below the Saccarappa dams.



Removal of the two Saccarappa Falls headwalls could affect upstream water levels, and it is expected to open up a stretch of whitewater likely to be popular with adventurous kayakers. Tuesday’s removal of the eastern spillway marked the culmination of more than two decades of battles over the Presumpscot. In 2002, the Smelt Hill dam – reportedly the river’s oldest impoundment – was removed near the mouth of the Presumpscot in Falmouth. But that still left nine dams farther upstream. In 2006, the U.S. Supreme Court upheld the Maine Department of Environmental Protection’s authority to require fish passage and minimum water flow standards around the Presumpscot River dams – then owned by S.D. Warren Co. – as part of water quality certifications required for federal re-licensing of the dams.

Another conservation group, Friends of Sebago Lake, tried to block the current agreement with state and federal regulatory agencies. Friends of Sebago Lake argued that the agreement does not go far enough to restore fish passage in the upper Presumpscot watershed because it could allow Sappi to avoid allowing fish passage at the upper dams. The Westbrook Planning Board approved the removal of the two Upper Saccarappa Falls spillways in March. The Federal Energy Regulatory Commission then gave final approval to the Saccarappa Dam projects in April. Shaughnessy, with Friends of the Presumpscot River, noted that the numerous dams dating to the 1700s not only allowed industrial development but also were attacks on Native American tribes. In fact, an Abenaki leader Chief Polin walked to Boston twice in the 1750s to lodge formal protests with colonial leaders against dams that were blocking upstream passage of the fish his people needed to survive. Polin was killed in 1756 during an armed conflict with white settlers over the fish passage issue. “So there is a wonderful historical note in these dams coming out,” said Shaughnessy, who last year helped dedicate a memorial to Polin in Westbrook. “We always felt like we were picking up the mantle of Chief Polin, so I think he is smiling now.”

(Klamath River dam removal. Makes a convincing argument. We shall see.)

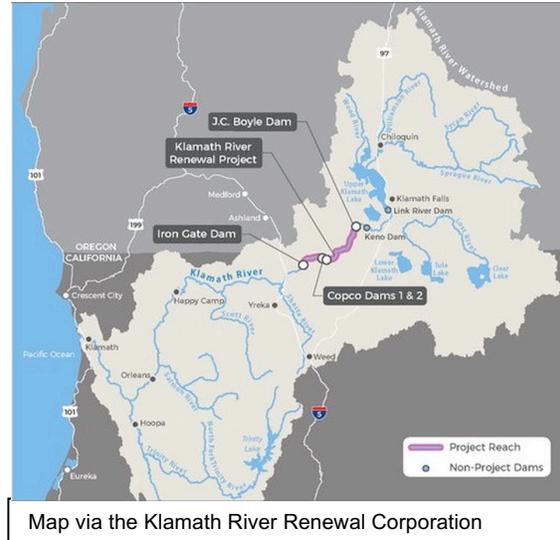
## OP-ED: Yes, Removing the Klamath Hydropower Dams Would Immensely Improve Water Quality on the River, Says Environmental Scientist

By CLAYTON CREAGER / JUL 11, 2019, [lostcoastoutpost.com](http://lostcoastoutpost.com)

Op  
Ed

As a Senior Environmental Scientist and Environmental Program Manager for the California Regional Water Quality Control Board's North

Coast Region, I've spent more than a decade of my career studying, developing and implementing pollutant control and ecological restoration programs for the Klamath River. If you've ever visited the reservoirs behind the lower Klamath dams between the months of June and November, you know what that brings. Warm, nutrient-rich water are captured in deep pools, creating ideal conditions for the growth of *Microcystis aeruginosa*, a type of freshwater cyanobacteria (blue-green algae) that produces harmful algae blooms. It produces a potent liver toxin (microcystin), and if you are in the water with *Microcystis aeruginosa*, it can cause skin rashes. If people, pets, or other animals ingest it, it can cause stomach cramps, nausea, diarrhea and liver and kidney damage. High levels of microcystin have even caused deaths in pets, cattle and wildlife. Trust me, you want to stay as far away from this stuff as possible.



In the reservoirs behind Copco 1, Copco 2, and Iron Gate dams, the concentrations of the toxic blue-green algae so often exceed levels considered safe that Public Health Advisories are posted, and it is recommended that all contact with the water be avoided. The toxin is so stable that even boiling water from the reservoirs does not destroy the microcystin or its toxic potential. But here's the interesting finding from our research. Many have long assumed that the toxic algae is imported into the reservoirs from Upper Klamath Lake. They believe that if we don't do something about Upper Klamath Lake, that the toxic algae will still persist down river with or without the lower Klamath dams. That is not true. A recent study (Otten and Dreher 2017) showed that the toxic algae in Copco and Iron Gate is often a distinct population that is "home" grown in the reservoirs and is often genetically different from that found in Upper Klamath Lake. In addition, *Microcystis* does not grow well in turbulent free-flowing rivers so that even if toxic algae are transported into the river from upstream, the harmful algal blooms will not occur without the calm and warm water created behind the dams. What these studies tell us is that removing the four lower Klamath dams and creating a free-flowing river would eliminate the ideal conditions that allow the *Microcystis* to grow to dangerous levels and the public would no longer have to avoid the toxic waters for six months out of the year. Sincerely, Clayton Creager, Watershed Stewardship Coordinator, California Regional Water Quality Control Board North Coast Region

(Hard to fathom never having a spillway)

## Tunnel boring completed at Schoharie Reservoir Nearly 100-year-old dam has never had regular release system

By Stephen Williams, [dailygazette.com](http://dailygazette.com) | July 12, 2019

SCHOHARIE COUNTY -- New York City reservoir officials this week retrieved a tunnel-boring machine from the bottom of the Schoharie Reservoir, another step in a \$400 million project to install the first regular water release system the nearly 100-year-old Gilboa Dam has ever had.

The installation of the release system will increase protections against flooding for downstream communities along the Schoharie Creek and reduce fluctuations in the creek downstream, benefiting fish and wildlife. The new system will replace a siphon system now used when excess water needs to be released. The city Department of Environmental Protection retrieved the submersible boring machine from the reservoir on Wednesday, after it earlier had completed 2,118 linear feet of tunnels that will be used to release water downstream. The work was entirely done by engineers remotely controlling the drilling machine. "The completed excavation and retrieval of this tunneling machine are major milestones in our work at the Schoharie Reservoir," DEP Commissioner Vincent Sapienza said in a released statement. "The net release works and upgrades to our intake structure at the reservoir will provide DEP with more operational flexibility to send the best-quality drinking water to New York City and support the ecological health of the Schoharie Creek."



The Schoharie Reservoir, on the Schoharie-Greene counties border, is the northern most of New York City's Catskill Mountains reservoirs. The condition of the massive dam across the Schoharie Creek has long been a concern of downstream residents, even before Tropical Storm Irene in 2011, when the Schoharie Valley suffered devastating flooding. The dam held, but a sensor failure at the top of the dam contributed to public alarm. Work on the new tunnel system began in 2017 with two segments built, both starting at a 185-foot-deep shaft along state Route 990V. A 1,188-foot segment goes downstream to the eastern bank of the Schoharie Creek, and a 930-foot segment to the reservoir bottom. Boring work was completed in January, but the drilling machine could not be removed until winter ice was gone.

Work still to be done in the multi-year project includes the lining of the new tunnels and installation of an intake structure. Crews are also currently working on a valve structure on the creek below the dam that will be used to control the flow of water into the creek. The city is working with the state Department of Environmental Conservation on how to make water releases most effective in aiding trout and other fish. The dam, which was built in the 1920s, is 2,024 feet wide and 182 feet high, and holds back up to 19.6 billion gallons of water. Work on the several phases of dam upgrades began in 2005 and is expected to last until 2022.

(Here's a guy that has a crazy idea. How can you do this especially with a growing population? It's the I got mine, you can't have yours theory. Let's go back to living in the woods.)

### It's time for 'de-growth'

By Max Wilbert, Jul 13, 2019, [registerguard.com](http://registerguard.com)

## Opinion:

As an environmentalist, I see the now-failed House Bill 2020 as a false solution. Yes, it would have established higher taxes on the most pollution-heavy industries in Oregon. But the revenue raised by this tax will be used to invest in ... restoring forests? Protecting wild lands? Helping wild salmon populations? No. The money would be invested in industrial energy production. Here in the Pacific Northwest, where most of our electricity comes from hydroelectric dams that are often called "green" despite choking off our rivers and putting salmon on the brink of extinction, we should know enough to question mainstream narratives about "green energy." From the perspective of birds and bats and desert tortoises, lower-carbon electrical energy from solar panels and wind turbines is not good for the planet. It's just another threat to species already facing many threats. In fact, research published right here at the University of Oregon by sociologist Richard York, shows that investing in wild and solar energy rarely "displaces" fossil fuel energy. Usually, it's simply added on top. Endless growth is not a plan with a future, no matter what the energy source.

We live in a world run by fossil fuels. This can't continue. But increasing taxes on fossil fuel companies isn't the right way forward. Just look at the Yellow Vests protest movement in France. People don't like when politicians unload the cost of climate change onto the wallets of the poor. The average person isn't responsible for global warming. We were born into this world — most of us don't have much power over it. Instead, climate action needs to focus on businesses and the wealthy — those who have power and disproportionate carbon footprints. Bills like HB 2020 encourage companies to lie about their emissions — like the Volkswagen emissions scandal — and outsource polluting industries to poorer states or countries. Ultimately, state-level emissions don't matter one bit. If all Oregon's heavy industry migrates to China or Nigeria, global emissions will stay the same, or even rise. And with global warming, it's global emissions that matter. If Oregon politicians truly want to address climate change, they need to recognize this requires fundamental structural change, not just a few edits to the tax code.

A realistic climate change policy would mandate a simple end-date for the use of fossil fuels. It would inspire the people with visionary thinking about an entirely new way of life. It would accept the end of our high-energy lifestyle and the need for a "de-growth" economy — not in the far future, but right now. And it would begin massive investments in local agro-forestry and other crash programs to transition away from a high energy society and towards a more sustainable way of life. Some people may think these ideas aren't realistic. And it's true — our politicians are unlikely to challenge the status quo. But that just means we need new politicians or a new system. What's truly not realistic is House Bill 2020 and the idea that solar power will allow us to maintain this wasteful modern lifestyle. Cap-and-trade schemes don't work. They're the political equivalent of rearranging the deck chairs on the Titanic. We are living in a dangerous new world, and the old way won't work anymore. Max Wilbert is a long time environmentalist and wilderness guide in Eugene.

(The levees need some work.)

## With Tulsa levees 'unacceptable' since 2008, how did they beat a historic 2019 flood?

By Kelly Bostian, Tulsa World, Jul 14, 2019, tulsaworld.com

From the outside, the bomb shelter-like appearance of Pump Station No. 1 on the Tulsa-West Tulsa Levee System gives an appearance of strength, like a battlement on ramparts protecting the homes and industries of the area.

The station and six others like it stand along the 20 miles of levees that held the Arkansas River at bay for a historic 22-day flood fight, May 10 to June 1. But



weaknesses under the surface illustrate issues local

officials have complained about for at least a decade and that now are the source behind an urgent push by local, state and federal political leaders for an expedited full upgrade.

Communications among Levee District 12 Commissioner Todd Kilpatrick, Tulsa County District 2 Commissioner Karen Keith and other state and local officials through those three key weeks tell a story that shows it wasn't the ramparts and battlements that won the fight to protect the 10,000 residents and up to 20,000 who live and work in the area. It was a patchwork of human-powered, round-the-clock work and coordination between local and federal agencies to hold the levees together.

### Antiques at work

Kilpatrick offered a little joke prior to a recent tour of the pump station structure, construction of which was completed in 1945. "Got your \$10 for the antique road show?" he asked. It does indeed feel bomb-shelter tough inside the pump station, but battleship-gray pump housings that look like missile heads from a 1950s sci-fi movie are the first hint you've stepped back in time. "Mercury switches and a whiskey bottle float, that's how they operate," Kilpatrick said. He had to explain "whiskey bottle float" isn't trade talk for the float that rises with the water in that lower

portion of the pump station to push a cable and tip a mercury switch (a glass tube with a ball of liquid mercury inside) to complete an electrical circuit and start the pumps. “No, it’s an actual jug, a whiskey jug, a ceramic jug,” Kilpatrick clarified. “You have to remember when these were built it, was war time, and materials were in high demand.” The float system is designed to use those jugs, so there they stay. “Finding a replacement is tough,” he said. “If something breaks on these pumps, we have to have it machined. ... You can’t find a mercury switch anymore.” To say the levees “worked as designed” is a gross overstatement of how well things went, Kilpatrick said. “It worked as expected, put it that way.” And what if the levee system had been simply monitored and left to operate as designed in 1945? “We would have lost it on about Day 4,” he said.

### **Flood fight**

Emails and texts obtained by the Tulsa World indicate Kilpatrick worked with few days off and slept in his office about half the days the flood event was in full swing. Kilpatrick and U.S. Army Corps of Engineers Tulsa District Chief of Emergency Management William Smiley developed an emergency action plan a few years ago that was successfully followed, according to email correspondence. The district office was command central for everything from mosquito control to Blackhawk helicopter sandbag deliveries. About a hundred National Guard soldiers and County Levee District and Corps personnel worked 12-hour shifts to monitor every inch of the levees 24 hours a day.

“The Guard kept asking what I needed, and they kept picking it up. We got through it, but it was arduous,” Kilpatrick said. Water seepage is a part of the design of the levees, which are mostly made of sand. That’s why the levee system has a series of 1,800 relief wells and miles of drainage pipe inside the drain toe on the city side. Water is supposed to collect in the drainage system, and the pumps push it through pipes back out into the river. It’s a sort of invisible underground circular flow where hydrostatic pressure keeps everything intact. The problem is none of it works. “Our relief wells and toe drains are junk,” he said. Even if they did, only two of the original pumps still worked. Some had mechanical issues, others simply couldn’t generate enough pressure to push water out against back-pressure from the river and they failed.

“The pressure on the river side was just too much for those 70-year-old pumps,” Kilpatrick said, explaining the need to bring in portable pumps. Water seepage is normal, but erosion, sinkholes and sand boils are the enemies, he said. There were no breaches of the levees, and no water entered homes or businesses behind the levees, but sand boils kept crews busy and flooded streets and yards. “It’s like someone opening a fire hydrant. One pops up, and then another and another. It can get out of control quickly, so you have just a little window to jump on it,” he said. “We had some that popped up a hundred yards from the levee.” Crews circled those eruptions with sandbags to create ponds. Eventually the amount of water in the pond would equalize against the water pressure coming through the sand boil. The bigger the sand boil, the bigger the pond. Some were 3 to 4 feet deep. “Every time the flow through the dam increased it changed pressure, so all those ponds had to be rebuilt, and you were going back through that drill again, getting it equalized,” he said. “It’s constant monitoring.”

The concrete sea walls, located at Charles Page Boulevard where Bigheart Creek crosses under the road and the railroad tracks, presented a different challenge. The joints of the concrete walls did not expand, crack or fail, but water moved under the foundation, Kilpatrick said. The structure is a pinch point with runoff coming down the creek and pressure from the river pushing back upstream. It was strained and leaked like a pipe joint under too much pressure and, essentially, became buoyant. Gravel trucks brought loads of rock to add more weight around the seawall, and Blackhawk helicopters brought in 2,500-pound sandbags — all in an effort to essentially hold the structure in place. Kilpatrick walked the structure at Charles Page recently and said he was unsure of its exact future but knows it’s on shaky ground. “It will probably have to be completely rebuilt,” he said.

### **Lingering threat**

About 20,000 sand bags on pallets form white rows around the District 12 Levee offices and warehouse in Sand Springs, and they're not going anywhere until Keystone Lake returns to its normal elevation level of 723 feet, Kilpatrick said. "It's not time to relax yet," he said. "I still don't have a warm, fuzzy feeling." **The flood pool of the reservoir immediately upstream from Sand Springs and Tulsa is still 60% full, 20 feet above normal.** It topped out at 34 feet above normal, when the maximum flow against the levees was 285,000 cubic feet per second at one point, according to Kilpatrick. Kilpatrick's concerns are not unwarranted, according to state climatologist Gary McManus. Eastern Oklahoma's soils still are moist, areas still are prone to flash flooding, lake levels still are high and hurricane season is upon us July through early October.

"Chances are decent that we could get remnants of a tropical storm system as we do many years," McManus said. "The tropical depression that became Barry is a prime example this week of how these things can come out of nowhere and develop into a tropical storm." **Emergency repairs are complete,** Kilpatrick said, and the levees are prepared should another event happen soon. Surveys with the Corps of Engineers are underway to determine needs for other repairs that will require larger efforts. Also, a feasibility study started 10 months ago continues to look for a long-term solution. "A lot of what we experienced in May will work into the feasibility study and help move things along," Kilpatrick said. **Local and state politicians and Oklahoma's federal delegation all recently sent letters to the Corps of Engineers asking the Corps to expedite what was initially a three-year feasibility study into about 18 months.** "It's been moved up as a high-priority project, but now it's tip-of-the-spear," Kilpatrick said. Engineering, designing and obtaining federal matching funds for such a big project takes time, but it's past due. The Corps labeled condition of the levee system as "unacceptable" in 2008. **"I'm hoping that five years from now we'll be cutting a ribbon,"** Kilpatrick said. "That's the end goal. To get it completely fixed from end to end and to give everyone sitting behind it a reasonable sense of safety."

[\(Drain them to maintain them.\)](#)

## **GBRA to consider emptying four more lakes over safety concerns**

### **McQueeney, Placid, Gonzales and Meadow, Texas could be emptied following dam failures**

By Garrett Brnger - Reporter, Adam B. Higgins – Photojournalist, July 16, 2019, ksat.com

**Two months after a dam failure led to the draining of Lake Dunlap,** the Guadalupe-Blanco River Authority will consider purposely **draining four more lakes due to safety concerns.** GBRA management will brief the board of directors at its monthly meeting Wednesday on the option of dewatering Lake McQueeney, Lake Placid, Meadow Lake and Lake Gonzales, confirmed Jonathan Stinson, deputy general manager of GBRA.



## **Hydro:**

[\(Pumped storage is the answer.\)](#)

## **Energy storage is key to reaching renewable energy goals**

### **Lower storage costs and battery innovations needed to reduce carbon emissions**

By James Marshall, Herald Staff Writer, July 5, 2019, the-journal.com

**Large-scale energy storage will be a key to meeting 100% renewable goals,** but the cost remains high and technology insufficient to meet needs. U.S. senators, including Cory Gardner, R-Colo., introduced the Better Energy Storage Technology Act, which would dedicate \$300 million to energy storage research.

WASHINGTON – As Colorado pushes toward its goal of 100% reliance on renewable energy by 2040, deploying grid-scale energy storage should play a crucial role, experts say. Energy storage experts and utility company executives urged the U.S. Senate Energy and Natural Resources Committee last month to invest in making energy storage more affordable and in developing innovative storage technology. “Energy storage really is the way we’re going to harness the full potential of alternative energy,” said Sen. Cory Gardner, R-Colo., who is a member of the Senate energy committee and sponsor of two energy storage bills this year.



Xcel Energy, Colorado’s largest utility, has committed to an 80% reduction of carbon emissions by 2030 and going carbon-free by 2050. Xcel is relying more and more on wind and solar energy. But its lack of capacity to store renewable energy for times when the wind isn’t blowing and the sun isn’t shining hinders further reliance on clean energy, said Xcel CEO Ben Fowke. “Wind and solar provide low-price clean energy to our customers, but they are intermittent and seasonal,” Fowke told the Senate energy committee at last month’s hearing on energy storage. “Grid-scale storage can help with renewable integration.” For decades, Xcel and other utilities have used pumped-hydro storage systems, which involve two reservoirs at different elevations. When there is excess electricity, water is pumped from the lower reservoir to the upper one through a pipe. When energy is needed, water flows to the lower reservoir through a turbine, generating energy.

### Think globally, power locally: Hydro plants serve neighbors

By MICHAEL HILL Associated Press, Jul 8, 2019, ivpressonline.com

WALKILL, N.Y. (AP) — Eat locally. Shop locally. Generate locally?

Some electricity customers in New York’s Hudson Valley support hydropower harnessed from running water close to home. The idea is similar to farm-to-table, except for electricity instead of food. Green-minded customers supporting an area renewable resource. And smaller hydro plants like those run by Harry Terbush and Sarah-Bower Terbush have a different way to keep their turbines turning. “It’s community energy, and it allows us to sell directly to customers, and allows them to get a little more benefit of what’s in their backyard,” said Sarah Bower-Terbush. The husband-and-wife engineers running Natural Power Group have been maintaining hydro sites north of New York City for three decades. The trio of sites they operate now are “run of the river” that rely on flowing water. The steel-encased turbines are modern, but sites have a long history of producing power.



Natural Power Group co-owner Sarah Bower-Terbush stands near power turbine at company’s hydroelectric site in Wappingers Falls, N.Y. The owners sell renewable power locally from three hydro sites they operate in the Hudson Valley. Customers say they like investing their money locally in clean power. By Michael Hill

The Walkkill River site once provided mechanical energy for a hat factory. It now can generate 0.5 megawatts — enough power for around 400 homes — by diverting into a short canal that feeds a pair of turbines inside the rebuilt plant. A larger 2.5-megawatt site across the Hudson River in Wappingers Falls is in a long brick building beneath a fast-falling stretch of Wappinger Creek. Water flows through a 9-foot diameter pipe that snakes across Wappinger Creek to a site that first produced electricity more than a century ago. “Why not utilize what we have?” Bower-Terbush asked. But it can be difficult for smaller hydro sites to compete in the electricity market. In New York, plants that generate less than 1 megawatt are currently unable to participate in wholesale markets because of their size. Older hydro sites can miss out on incentives promoting new construction in solar and wind. And as Matthew Swindle of the hydro company NLine Energy put it: “The challenge is that you can site wind and solar just about everywhere. I can’t put hydro on a rooftop.”

Swindle, who is involved with the National Hydropower Association, said hydro operations are starting to sell to customers in their area by taking advantage of states' differing energy policies. In states like California, New Hampshire and New York, it can involve a form of "net metering." In New York, Gravity Renewables sells its power from its Chittenden Falls Hydro Project on Kinderhook Creek plant to Skidmore College 60 miles away under the state's remote net metering program. Skidmore owns the meter at the site, and it counts toward around 10 percent or more of the campus's electricity use. "You can produce kilowatt hours more cheaply from a coal plant or from, generally, a gas plant than you can from a small hydro plant," said Ted Rose, CEO of the Colorado-based company. "But the real question is: Is a small hydro asset that's been around for 100 years inside a community, does that have value to that community above and beyond those kilowatt hours? And I think that answer is yes."

For decades, the Terbushes sold their hydro power to the local utility under a 1978 federal law promoting renewable energy. Those contracts lapsed, and they began selling power last year from Walkkill under the state's "community-distributed generation" program. Bower-Terbush said the transition to marketing directly to customers has been challenging, but they are working toward selling power the same way at their other two sites. The policy allows electricity customers to collectively invest in renewable projects, mostly solar, in their utility service territory. It allows Manna Jo Greene to support the Walkkill site, 20 miles from her home.

"My thought was to support a local source of generation: clean hydroelectric power," said Greene. They can't run a power cord from Greene's home. Walkkill's hydroelectricity still flows into the grid. Instead, customers essentially reserve a percentage of the power generated by a hydro project. The local utility still sends a monthly bill, but with credits based on hydropower the customer signed up to buy. Natural Power Group sends a separate bill, with a 10 percent discount on the credits. New York ratepayers help fund renewable programs like this through a monthly charge on their bills, though regulators say costs are mitigated by investments in local generation. Greene and other customers say cheaper electricity bills are nice, but the choice is philosophical. Greene is a veteran environmental activist who already relied on rooftop solar panels for most of her electricity. Officials in nearby Woodstock purchased hydro to help keep the famously left-of-center town meet its carbon-neutral goals. "They decided that they really wanted to have something local, where you could actually understand that the renewable power was being generated," said Kenneth Panza, a resident who helped choose hydro, "rather than buying renewable energy credits from windmills in Texas or Oklahoma."

(Hydro saving them money!)

## Colonie Announces Agreement With Gravity Renewables

By JESSE KING • 7/12/19, wamc.org

The town of Colonie, New York has entered a 20-year deal with Gravity Renewables to offset its energy costs with locally-produced hydroelectric power. The hydroplant largely hidden from the road in Schuylerville, New York, produces electricity by using water from Fish Creek en route to Saratoga Lake. At the facility on Tuesday, Democratic Colonie Town Supervisor Paula Mahan said the new deal, facilitated by the Municipal Electric and Gas Alliance, will offset the town's power costs by over 50 percent, or roughly \$400,000 a year.

"It's great for the town. It's great for the environment, it's gonna offset about 50 percent of our carbon footprint. And it's also great for the regional economy," Mahan assures. "As part of this agreement we're a major part of this whole process here today." John Elmer is the director of operations at Brookfield Renewable, which runs the Schuylerville site, about 45 minutes north of Colonie. He says the water moves a turbine – which, in turn, spins a self-excited generator to produce voltage for the National Grid field outside. Elmer adds Brookfield staff actually brought the plant back to



life last year, after a broken shaft temporarily knocked it out of commission. "Our challenge on this was we had to work on the turbine, which is inside this tank – we had a small gantry crane here that we had to use, we had to use some outside craneage to get the equipment in and out. So just a lot of work and skills needed to do that," Elmer explains. "We take good care of [the equipment], they last for a long time."

Indeed, Elmer expects the new work to last 15 to 20 years – and the plant itself is almost 100 years old. Gravity Renewables Director of Project Development Omay Elphick says that reliability makes hydropower an "economic and energy legacy" in New York. He says there are hundreds of plants like Schuylerville's across the state. "These plants are already here... They just need reinvestment today," says Elphick. "So these types of partnerships, and this project here, is really about taking care of the resources that we already have." Schuylerville hydroelectric is a 1.7 megawatt facility, which according to Elphick was important in its selection – the plant is just the right size for Colonie. Of course, at 37 miles away, the town won't directly see any of it. Rather, Colonie will generate energy credits with a meter on site – a process Elphick calls "remote net metering." "That meter belongs to Colonie, in [its] name. And when we generate electricity here, that meter is spinning backwards, generating a credit," he explains. "In the accounting department at the utility, that credit is then applied on a monthly basis to Colonie's various electric bills located around the town of Colonie." Supervisor Mahan says the town has already generated credits over the past few weeks. While she says this is the town's deal – it won't affect individual households – Colonie residents will reap the benefits in other ways. "Our goal is always to maintain the services that we have, which we feel are excellent," says Mahan. "We're doing a lot of different things in town, a lot of big capital projects, so anytime we have a savings it affects our overall budget – which, in the end, is a positive for the residents." The town of Colonie has about 82,000 residents.

(Maybe Montana will get some pumped storage.)

### **Enormous Montana pumped hydro project gets Danish investment** **The investment from Copenhagen Infrastructure Partners suggests that new pumped hydro storage projects can compete with battery storage. Construction of the 400 MW, 3400 MWh facility could begin as early as next year.**

By WILLIAM DRISCOLL, JULY 10, 2019 , pv-magazine-usa.com

A 400 MW pumped hydro project in Montana has received an equity investment from Copenhagen Infrastructure Partners (CIP). While the technical potential of closed-loop pumped hydro storage is an estimated 500,000 sites worldwide, the cost of pumped hydro, especially as it compares to the cost of battery storage, remains an issue. One study found that pumped hydro storage with more favorable financing could compete with batteries, while a study from the National Renewable Energy Laboratory is forthcoming. CIP's investment indicates that the renewables-focused investment firm has determined that this particular project will pay off. CIP Senior Partner Christian Skakkebaek described pumped hydro storage in a press release as a unique and valuable asset class that will be a key resource as the global transition to renewable energy continues to accelerate in states such as Montana."



With CIP's long investment horizon, Mr. Skakkebaek added that the fund is able to "participate in large projects overseeing financing, construction and operation." In a possible nod to the capability of pumped hydro storage to balance renewable generation, the project partners state in their press release that the facility "will be a carbon neutral alternative to the types of natural gas facilities that many of the region's energy providers are contemplating—and at a lower cost." The project, which has a license for construction and operation, is designed to generate 3400 MWh of electricity in 8½ hours, and then take 10 hours to pump the water back uphill from the

lower reservoir to the upper one, said Carl Borgquist, president of project owner Absaroka Energy. The project location, near Martinsdale, Montana in the center of the state, has good solar resources, with direct normal solar irradiation averaging 4.5 to 5.0 kWh per square meter per day, plus diffuse radiation refracted by clouds. Following CIP's investment, CIP will "finalize the project development and step into the role of the project's long-term sponsor equity provider," says the press release, with the remainder of the capital structure to be determined prior to start of construction. The amount of CIP's initial investment was not specified. The Gordon Butte pumped hydro project site is within six miles of its interconnection to the Colstrip twin 500 kV transmission lines—described in the press release as "the backbone of the Pacific Northwest's electric system." Pump and turbine equipment will be provided by GE Renewable Energy. The Gordon Butte project timeline goes back at least six years, as FERC issued a preliminary permit in 2013. The project will be "ready for construction" in 2020, states the press release. Further details are provided on a project website.

(They found out a long time ago that pumped storage is good.)

### **A closer look: GRDA's Salina Pumped Storage Project**

7/15/19, claremoreprogress.com

Located in the hills southeast of Salina, Oklahoma, on the Saline Creek arm of Lake Hudson, the Salina Pumped Storage Project (SPSP) is a unique facility that plays a vital role in the Grand River Dam Authority's overall electricity production. Built in the late 1960s, the facility – commonly referred to as "the Pumpback" – has the capability to produce 260 megawatts of electricity with its six pump-turbine units. However it is those "pump turbines" that serve to make the facility unique.



The SPSP operates like a traditional hydroelectric facility in the sense that it does harness the power of falling water to spin turbine-generators. Water flows down through large pipes, called penstocks, and passes across turbine blades, which rotate a shaft, attached to a generator rotor. The rotor spins inside a magnetic field, creating electricity. That's common among practically all hydroelectric facilities. However, pumped storage facilities like GRDA's have another function. Those same turbines that create electricity can also be reversed to act as pumps to move water back through the units, back up the penstocks and back into storage for later use. The SPSP's storage reservoir (W.R. Holway Reservoir) actually sits approximately 200 feet above the powerhouse, in the hills above Lake Hudson. Six penstocks, one for each unit, are used to move water both directions along the bluff. During times of generation, water flows downhill, from Holway Reservoir, through the powerhouse and into Lake Hudson. During times of pumping, water is pulled from Hudson, through the powerhouse and pumped uphill into Holway Reservoir.

While such pumped storage projects were already popular in Europe, there were only a few in existence in the United States when GRDA built its facility in 1968. With no other sites along the Grand River available to construct a traditional hydroelectric facility, it was the only viable option at the time. Even though some believed it to be a bit "experimental" when it was constructed, the SPSP continues to be a vital part of GRDA's overall generation portfolio today. Headquartered in Vinita, GRDA is Oklahoma's state-owned electric utility; fully funded by revenues from electric and water sales instead of taxes. Each day, GRDA strives to be an "Oklahoma agency of excellence" by focusing on the 5 E's: electricity, economic development, environmental stewardship, employees and efficiency.

(Will they ever get it done?)

### **Work resumes on Red Rock hydroelectric project**

Work on the Red Rock Hydroelectric Project, Iowa has resumed on the upstream side of Red Rock Dam as water levels have receded. Those levels were more than 774 feet above sea level as of June 1, but have since dropped to 747 feet, which is below the level of the upstream work platform. Work continues on the downstream side of the dam. Final equipment installation, verification, and equipment checks are in full swing and the switchyard located between the dam and the powerhouse is nearly complete. The underground transmission cable from the powerhouse to the overhead transmission line has been installed and final testing started July 8. The transmission line is expected to be energized the first week of August.



The U.S. Army Corps of Engineers (USACE) monitors, maintains, and determines water flow exiting the Red Rock Dam into the Des Moines River in accordance with its water control manual. Even with the addition of the hydroelectric project, the primary purpose of Lake Red Rock will remain flood control. When RRHP becomes operational, currently scheduled for 2020 barring additional flood events, the USACE Hydrology Department will continue to be responsible for scheduling water releases from the Dam into the river as it has been for the past 50 years. These releases could be directed through the existing gates on the Dam, through the new hydroelectric facility, or through a combination of these depending on the reservoir elevation and desired flow release. Regardless of where the releases are directed, no additional water will flow into the river below the dam than what has occurred in the past.

The Federal Energy Regulatory Commission license for RRHP allows for the generation of 36.4 megawatts of electricity. The current design model indicates that, to achieve this level of generation, it would take up to 10,000 cubic feet per second (cfs) of water flow. The minimum flow for the hydroelectric facility would be 1,200 cfs. When flows drop below this minimum level, the turbines will not operate efficiently so the hydroelectric facility will be taken out of operation. Once fully operational, RRHP will be able to generate enough power to satisfy the electrical needs for all the homes in Marion County.



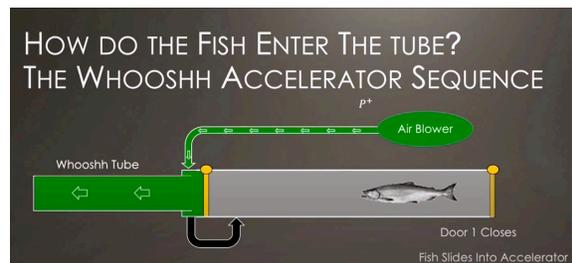
## **Environment:**

(Must be a hell of a ride.)

### **New technology could help salmon swim over hydroelectric dams**

By Abby Acone, Meteorologist | July 15th 2019, komonews.com

SEATTLE — A Seattle company called Whooshh Innovations has developed a creative way for fish to swim over hydroelectric dams. This product creates a pressure difference around the salmon, sucking the fish up a long tube and releasing it at the top of the dam. "We do introduce a little bit of water to keep them moist and keep their gills moist and all those kinds of things for the few seconds it takes them to get through the system," said Mike Dearan, Whooshh's chief engineer. The Whooshh system also takes pictures of salmon and sorts the fish as they travel, dividing up wild and hatchery fish. If there was a constant stream of fish, 86,000 salmon could move through just one of these Whooshh systems every day.





around my cranium, I wondered what had happened to us. I also wondered why the people of Montana had so much trouble spelling comma. Did they confuse it for coma? And why does Arizona struggle with patient, while New Mexico cannot spell patience? Oklahoma worries me, too. It cannot deal with February. Then there's Alabama and Mississippi. The former can't cope with niece. The latter gets stuck on fifteen. I can better understand Idaho having problems with embarrassed, as well as Oregon struggling with phenomenal. But why would Arkansas not be able to spell family? And why, for that matter, would Louisiana have trouble with indict? You will, no doubt, reach your own conclusions as to this data. Does it really say anything about education, personal proclivities, or desperate fears? We may never know. I find myself, though, dwelling on Minnesota and Iowa. The former cannot cope with especially. The latter can't spell loose. Ah, perhaps that's because so many loose-lipped politicians travel to Iowa and end up losing.

(At least, they're not like CA and are counting large hydro. The lady with sign has a big mouth.)

### **Climate change bill goes to Gov. Cuomo's desk Act calls for sharp reductions in greenhouse gas emissions**

By Rick Karlin, July 17, 2019, timesunion.com

The landmark Climate Leadership and Community Protection Act, which passed during the past legislative session following years of failed attempts, expands upon and puts legal teeth in what have been several large steps in recent years to limit and eventually eliminate emissions of carbon dioxide, which scientists say is a major contributor toward global warming.

The measure mandates that New York by 2050 reduce greenhouse gas emissions by 85 percent from 1990 levels.

It also calls for 100 percent carbon-free electricity generation by 2040. The state currently gets approximately 60 percent of its electricity from carbon-free sources, most of which are nuclear plants and hydroelectric dams.

There is also a small but growing number of wind and solar sources. To help reach the 100 percent goal, members of a yet-to-be-appointed Climate Change Action Council, to be created by 2020, would have to calculate the costs of such changes and then by 2023 submit a plan for getting there. Environmentalists cheered passage of the bill and Cuomo's earlier indications that he would sign it.

"Establishing a mandatory, comprehensive reduction plan that touches all sectors and sources of climate pollutants controllable by human endeavor, New York will lead nationally in the effort to avert the most catastrophic, predictable results of a rapidly heating planet," wrote Liz Moran, environmental policy director at NYPIRG, one of the bill's backers. Others, including business and power production groups, however, worry about the still-unquantified costs of the plan.

"This has very, very wide-reaching ramifications. It would fundamentally change our electric system and our entire economy," said Joe Shahan, communications manager at the Independent Power Producers of NY, a trade group of electricity generating firms. The CLCP Act was sponsored by Sen. Todd Kaminsky and Assemblyman Steve Englebright, both Democrats from Long Island. That region has long been a hotbed of environmental activism with concern over beaches and wetlands, industrial pollution and problems stemming from the historic use of cesspools in numerous residential areas. The governor is said to be planning a bill signing on Thursday along with an announcement regarding plans to produce power from offshore wind generators.



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