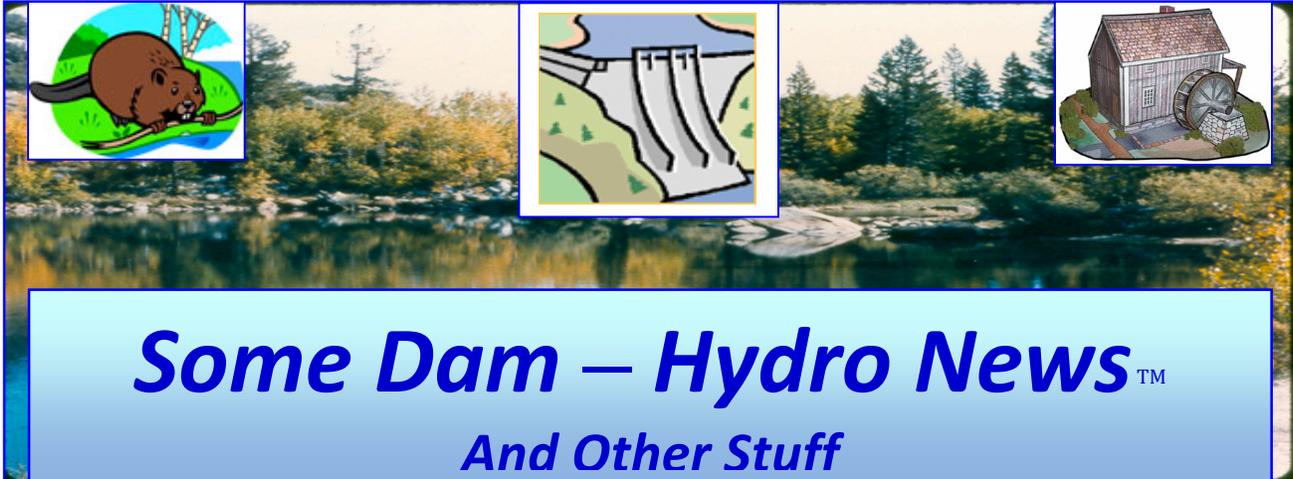


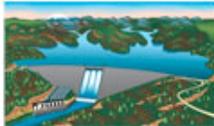
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Quote of Note: *“You can put things off until tomorrow but tomorrow may never come.” - Gloria Estefan*

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: 2017 Sanssouci French - Other (Red Blend) “Le Rouge”
“No nation was ever drunk when wine was cheap.” - - Thomas Jefferson



Dams:

(Computers for everything.)

State-of-the-Art Analytics Helps New York Power Authority Ensure Dam Safety at Hinckley Reservoir in Oneida County

September 16, 2019, globalrenewablenews.com

The New York Power Authority (NYPA) recently launched the application of **new state-of-the-art 3D modeling software** at its **Gregory B. Jarvis small hydroelectric plant on the Hinckley**



Reservoir in Oneida County to help the power dam withstand extreme weather events. **The new software - FLOW 3D - will allow NYPA engineers to harness powerful advances in 3D computer modeling on behalf of the Hinckley dam and continue to ensure maximum safety and peak performance.** "At NYPA, our engineers are leading the way by using advanced, cutting-edge

software to ensure the safe and reliable operation of our facilities, even under the most extreme environmental conditions," said Gil C. Quinones, NYPA president and CEO.

Flow Science's FLOW-3D software, the latest in computational fluid dynamics software, helps predict where water will flow and allows NYPA engineers to model the worst possible rainfall and flooding conditions for the region and predict how Hinckley Dam will perform. Use of the software is expected to be rolled out to other NYPA sites in the coming months. FLOW-3D draws a far more accurate picture of fluid interaction with the dam's structure than was possible using older software. It accounts for a vast range of factors, including upstream and downstream water levels, surface roughness and various water pressure profiles. It took NYPA engineers several months of calculations and verification using a multidisciplinary approach to produce an accurate model of the flows and forces during maximum flood conditions. The analysis will allow NYPA to make targeted modifications to the facility if necessary. This approach saves time and cost, and avoids disruptions to service in surrounding communities and with recreational use of the reservoir, which is a popular local boating and fishing spot. By developing expertise in the use of advanced software, NYPA engineering is supporting Governor Andrew M. Cuomo's Reforming the Energy Vision strategy to improve the state's energy infrastructure by ensuring the safe, efficient and cost-effective operation and maintenance of NYPA's assets and is consistent with NYPA's goal of becoming the first end-to-end digital utility in the country.

About NYPA

NYPA is the largest state public power organization in the nation, operating 16 generating facilities and more than 1,400 circuit-miles of transmission lines. More than 70 percent of the electricity NYPA produces is clean renewable hydropower. NYPA uses no tax money or state credit. It finances its operations through the sale of bonds and revenues earned in large part through sales of electricity. For more information, visit www.nypa.gov and follow us on [Twitter@NYPAenergy](#), [Facebook](#), [Instagram](#), [Tumblr](#) and [LinkedIn](#).

[\(What a disaster. I want my lake back.\)](#)

Boiling Spring Lakes lost part of its identity in Hurricane Florence; it will cost millions to bring the water back

By Ashlea Kosikowski | September 20, 2019, wect.com

BOILING SPRING LAKES, N.C. (WECT) - Boiling Spring Lakes lost its lakes in Hurricane Florence. Now, the community is losing its patience.]

Homeowners who enjoyed a lakefront view with all the perks that go with it - boating, fishing and swimming - are now looking out at a vast field. Vegetation grows on the sandy lake bottom, which was filled with feet of sparkling, blue water before the storm sucked the water from the lakes. The community named for its 50 lakes fed by one spring is working to rebuild the dams that years.



Hurricane Florence dumped 30 inches of rain in Southeastern North Carolina. The city drained water from the lakes ahead of the storm but it wasn't enough to counter the four days of rainfall that came with Florence. First, it filled the lakes. Then, the Sanford Dam, which was built in the 1960s and was considered a high hazard dam by the North Carolina Dam Safety Program, failed. It caused the city's other dams to burst, including the Upper Dam, Pine Lake Dam and North Lake Dam, draining much of the water out and leaving some unforgettable images of the storm. The storm also washed away several roads in the community. The estimated cost to fix all the damage is just under \$20 million and it will take years to fill up the lakes.

"Can we live without it? Yeah, but do we want to? No. We would like to have our lake back," said Rob Warner, who owns the Office Coffee and Wine Bar, which also used to have a lake view.



His shop became a hub for help and support during the storm. He handed out free coffee. The shop also became a hub for the distribution of supplies brought in by various relief organizations to help the community, as it went without power and water for days following the storm. A year later, it still is a place for support. Now, folks come here to talk about the big question: when will the lakes return? "It's a little frustrating," Warner said. "The time period keeps getting pushed back. I understand the money and all the studies that have to be done but it just gets a little frustrating. The lakes are a huge part of our community and it doesn't look the same right now."

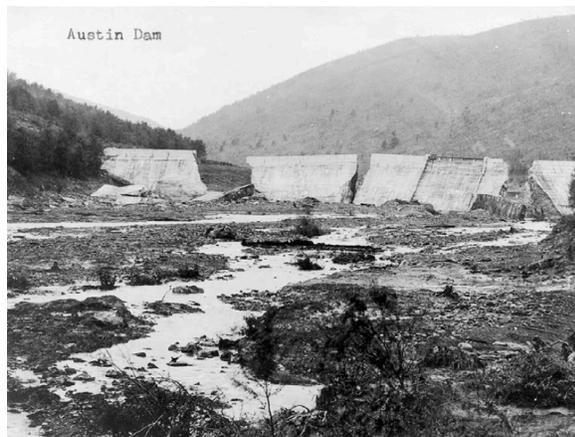
Boiling Spring Lakes Commissioner Steve Barger often checks on the progress at the Sanford dam along Alton Lennon Road. On a day in August, he watched as crews took soil samples along what's left of the road. "I understand everybody's frustration with what's going on now," Barger said. "This is not a fast process." He explained the city must pay for the projects up front. Then, FEMA and the state will send reimbursement money. In order for the city to get reimbursed, Boiling Spring Lakes must wade through mountains of paperwork and make sure everything is done by the book. Barger said the city has an annual budget of \$4.5 million and now, it is trying to come up with \$21 million to pay for the work. "The biggest thing for me is people are starting to lose their patience; I'm starting to lose my patience," he said. "When this sort of thing happens, you know it's going to be a lengthy project to put it all back. But once you start living it every day and the things you use for recreation, I used to bring my own children out here to the swimming area, when a city of our size loses a major recreation, it really hits hard." Aside from the spring that still flows in Boiling Spring Lakes, optimism is also flowing. "Our city's not gonna be known for the disaster," Barger said. "It's going to be known for what we were afterward." According to the latest projections from the city, the dams should be rebuilt by summer of 2021.

(The other dam failure in Pennsylvania. If you think you have problems, wait until you see this.)

The Austin Dam failure

By Marilyn Secco, thecourierexpress.com, 9/22/19

Johnstown wasn't the only Pennsylvania city to have been devastated because of the failure of a poorly constructed dam. Even though 2,209 lives were lost in Johnstown, the tragedy did not result in any laws concerning dam failures being passed. In 1911, twenty-two years after the Johnstown flood, a dam failed in the small, remote Potter County town of Austin. More than 78 people died in that disaster, and two years later, Pennsylvania became the first state to enact dam safety legislation. Finally the exploits of big business would come under scrutiny and the lives of common people would be protected.



The legislature had thus far been unwilling to interfere with powerful business trusts and industrialists, but dam failures in Pennsylvania changed that. I was surprised to learn how many devastating events had happened in a few short years to the people of Austin. Their citizens had endured an unimaginable string of disasters beginning on May 31, 1889, when they experienced flooding of most of the town. A year later, in 1890, a fire destroyed the town. They rebuilt only to lose everything again in another fire in the fall of 1891. In May, 1994, another flood took place. Unbelievably, that wasn't the end of it. In 1897, the town of 2,000 people was hit with another devastating fire. They managed to bring their town back after each disaster and try to carry on. I

think that explains why, when George Bayless decided to build his paper mill in Austin, most of the townspeople were excited about the prospects of more jobs. Some people, though, didn't really trust a big corporation seeking cheap business.

Pulpwood was plentiful, but Bayless needed a large, dependable water supply for his paper mill. A small earthen dam was first constructed, but it didn't provide enough water to the mill. Then Bayless set out to build the largest concrete gravity dam in Pennsylvania. He hired an engineer to design the dam, but in an effort to save time and money, many corners were cut and shortcuts taken, over the objections of the engineer. Most people in the town were relying on the mill for their jobs and didn't want to raise too much of a fuss, but there were others who were convinced that the dam wouldn't be safe. The dam was finished in December, 1909. One of the big problems was that the concrete was poured in below freezing temperatures, resulting in vertical cracks even before the dam was filled with water. Also eliminated in an attempt to save money, was a way to let water out of the dam gradually if the water level got too high. Again the advice of the engineer was ignored. Only two months after the dam was completed, the first signs of trouble appeared. Heavy rains and snow melt caused a rapid rise in the water level, and water began to bubble up from the ground in front of the dam. Part of the embankment slid down, letting some of the water out. The rains continued and the water level continued to rise, so dynamite was used to blow a hole in the top to let out more water. This resulted in some minor flooding, but disaster was avoided, although the dam had slid 18 inches at the base.

After that scare, engineers recommended many changes to the dam to reinforce it, but those recommendations were not followed. Water continued to leak under the dam, but business was booming at the mill, with no plans to shut it down long enough to drain the dam and make substantial repairs, as should have been done. September 30, 1911, was a beautiful sunny Saturday. There had been a local election and people went about their business. At 2:15 that afternoon, less than two years after it was completed, the dam split open. A lady of the night who ran a brothel on a hill near the dam saw the water rushing out and did her best to warn as many people as she could. The alarms were sounded, but because those alarms were tested regularly, people didn't pay much attention to them this time when they were real. It only took 15 minutes for the water to reach the town, and by then it had picked up tons of pulpwood from the paper mill and other debris. Buildings were pounded and ripped apart and the town was completely destroyed. Then some of the gas lines broke resulting in widespread fires adding to the destruction. The words of some of the survivors have been preserved and really give a sense of the horrors they saw. Survivor Agnes Murphy said, "I'm a very tender person, and it bothered me, seeing all those horses floating down. And they didn't know what in the world to do with all those horses – how to dispose of them. They had to keep making bonfires to burn the flesh up. And, oh, what an odor it was!" Alberta Broslet, another survivor, said, "I'll tell you what bothers me. I found a baby skeleton in one of the ditches down below the Catholic Church in a side stream. "It's a shame that it took so long for the legislature to stand up to big business and enact dam safety laws and back them up with required periodic inspections. But by no means was that the end of the dam failures. In 1977, the Laurel Run Dam and five other dams near Johnstown failed in the middle of the night following torrential storms that dumped almost a foot of rain in 24 hours. Eighty-six people lost their lives, and again when the responsible parties were sued, very little compensation was ever paid to the survivors. Again and again, big business found a way to avoid taking responsibility for neglecting to follow the law.

Flood Control legislation followed, and, coupled with dam safety laws, did much to reduce the loss of life and property as a result of flooding. These horrific floods in Pennsylvania finally got a lot of the attention of the legislature and the nation, but only after thousands of people and millions of dollars of property and possessions had been lost. Today, Austin has a population of 532. The ruins of the dam can be seen from the Austin Dam Park, which is the site of a "dam cool" music festival every August. I'd say they have reason to celebrate after all their town has survived! Marilyn Secco is a retired teacher and author of the book "Front Porch Tales." She has 2 children and 5 grandchildren and lives in Kersey with a temperamental cat named Tidder. Contact her at mbsecco@windstream.net

(Can't let a day go by without a dam removal story or two.)

Dam Nuisance

wpta21.com, September 24, 2019

FORT WAYNE, IND. (WPTA21)-It meanders through most of 21 Country, from Cedar Lake in northern Dekalb County to the St. Joseph River in Allen County. Cedar Creek is one of just three rivers in Indiana designated a natural scenic and recreational river system, home to countless species of wildlife and old growth sycamore, beach and oak trees. 273 miles of nearly unobstructed water flow...nearly unobstructed.



Casey: It really poses a threat to human safety," says Casey Jones of ACRES Land Trust. "There are several deaths occurred as part of kayakers and canoers actually trying to jump these dams." Just about midstream in Cedar Creek, in the shadow of the Highway 327 overpass, stands a relic of human interference in this gentle rivers journey. A man-made dam dividing the river to the detriment of creatures living in it. Who built the dam is a mystery. Some say it powered one of several grist mills that once harnessed Cedar Creeks power. Some say it was built by whoever constructed this nearby home in the mid 1800's alongside the original Highway 327, that dirt road you see is the old road. Whoever built it the dam is a menace not only to human safety but to the 43 species of fish that live in the creek, a fact demonstrated by numerous biological studies. "It's an obstruction to fish passage in the Cedar Creek," says Jones. "Well for example downstream of the dam we found northern pike actually and grass pickerel and none of these at least in the first couple of studies that we've done have been upstream of the dam. But the clock is ticking down for this rock and gravel impediment. Next fall thanks to state and federal funding the ACRES Land Trust will demolish the derelict dam, dismantle it rock by rock until Cedar Creek once again flows unimpeded from its headwaters to the St. Joe River, returning the river to its natural flow, restoring the natural migration of fish and mussels and other river life, restoring the balance of nature in this nearly wild, nearly untamed corner of 21 Country.

(Gotta maintain them.)

Aqua's dam gates replacement project proceeds

BY JENNIFER BAILEY, commercial-news.com, Sep 26, 2019

DANVILLE, ILL – Four gates have been replaced so far on the Lake Vermilion dam and by winter five or six of the 11 could be completed and prep work could even start on the seventh gate.

The approximately \$20 million Aqua Illinois project continues to move ahead. Preparation work started in March by Ballard Traylor joint venture, with equipment moved there in June, said Jon Hardt, senior project manager. Ballard Marine Construction is based out of Washougal, Wash.

Traylor Bros. Inc. is based out of Evansville, Ind. The project has been utilizing local vendors, such as Glesco Electric, Lowe's and Fastenal, and about a dozen local union workers also have been working on the project. Aqua Illinois this year is focusing on replacing the 94-year-old gates at the Lake Vermilion Dam at the end of Wilken Avenue. Some preliminary work started last year, such as a full structure analysis, tests and surveys. Schnabel Engineering of Glen Allen, Va. did design work on the project. Substantial completion with the replacement of the 10 steel spillway gates and one trash gate is expected by the end of May 2020. Hardt said when they wrap up for winter, they hope to start back again by March 15, "if not sooner."



The dam was built in 1925 to create a reservoir and recreational lake. In 1991, the 11 gates on the dam were extended when Lake Vermilion was raised by an additional 5 feet. The gated dam's 11 Tainter gates, a type of radial arm floodgate, control water flow. The dam also has a high-level sluice gate, through which water, sediment and other debris flow through. Hardt said weather hasn't affected them too much during the past few months, but there have been some issues pop up with the almost 95-year-old structure. Hardt and Aqua Illinois Director of Operations Bob Ervin said there's corrosion, and for example there's been different threads they've had to deal with. They also are replacing the 252 feet of bridge deck and have had to work around a city sewer line.

Construction equipment placed on barges in the lake for the work includes a 220-ton crane that weighs about 325,000 pounds. There are safety buoys and barriers placed near the dam during construction. Ballast blocks for the project weigh 40,000 pounds at each pier section. Over the years, seals have been replaced, cracks addressed and patch work completed. Ervin has said the dam is really in pretty good shape. "(But) given all the changes and age of those gates, we felt it was time to replace and renovate those gates," he said. The new gate project will preserve the lake and for the public to enjoy its benefits for many generations to come. Aqua also continues to deal with water main breaks, such as occurred at Main Street and Logan Avenue. It has also been completing fire hydrant flushing and valve exercises. Aqua Illinois provides water and sewer service to about 73,000 homes and businesses in 13 Illinois counties, including Vermilion County.

(Long, but a good summary of where we are.)

Courts can't keep Columbia and Snake River salmon from the edge of extinction

After decades of court cases have rebuffed federal management, it may take a political fix to restore salmon in the Columbia Basin.

By Carl Segerstrom, ANALYSIS, Sept. 26, 2019, hcn.org

On Sept. 20, the Idaho Fish and Game Commission voted to close all fall steelhead fishing on the Clearwater River and part of the Snake, tributaries of the Columbia, because so few fish had returned from the ocean. These steelhead are one of 13 threatened or endangered salmon and steelhead runs in the Columbia and Snake rivers. Since the Columbia Basin's rivers were impounded by dams — including four on the Lower Snake, and more than a dozen on the Columbia itself — a handful of salmon populations have died out. Now, about two-thirds of the remaining runs are at high risk of extinction. Compared to pre-dam returns in the 1950s, only 3% of wild sockeye and spring- and summer-run chinook, and 15% of wild steelhead, returned to the upper Snake last year, according to an analysis by the advocacy group Save our Wild Salmon. This year, returns look even worse.



Years of low salmon numbers, concern over endangered orcas that feed on salmon, and cracks in political support for the Lower Snake dams are breathing new life into the fight to breach those dams. For decades, lawsuits by tribal nations, state agencies and fishing and conservation organizations have forced changes in dam management aimed at improving fish survival. But those court-ordered tweaks haven't pulled salmon back from the brink. Now, salmon advocates are looking to the court of public opinion in their quest to see the Lower Snake River dams removed.



In the 1930s, hydroelectric dam construction in the Columbia Basin began, electrifying and irrigating the inland Northwest and sending commodities like wheat downriver on barges. But dams exact a heavy toll on salmon: Reservoirs not only create hotter water than the fish are adapted to, they slow their downstream journey to the ocean and force them to navigate artificial passage systems. To offset those impacts, the Bonneville Power Administration, the federal agency that sells power generated by the dams, has poured about \$17 billion into hatchery programs, fish passage projects and habitat restoration.

But since the early 1990s, state agencies, tribes and salmon advocates have sued the federal government, arguing that it's not doing enough for endangered fish. At issue are "biological opinions" from the National Marine Fisheries Service, reviews of management plans developed by the federal agencies that manage the Columbia basin dams: the Army Corps of Engineers, Bonneville Power Administration and Bureau of Reclamation. The biological opinions assess whether dam operations are likely to cause salmon extinctions and recommend ways to offset harm. But since 1993, federal judges have repeatedly overruled them. In the process, courts have become the system's de facto managers: Judges have ruled that more water be spilled over dams, and forced agencies to develop specific habitat improvement programs. While advocates have long sought the removal of the Snake River dams, federal environmental laws don't give judges the authority to force dam removal. Judges have, however, ruled that the federal government must assess the impacts of breaching dams as part of a National Environmental Policy Act review, a draft of which is expected in February 2020.

Salmon advocates have long argued that dam removal is the best way to restore salmon runs. That view is bolstered by a 2017 analysis by the Fish Passage Center, an organization funded by the federal government, which found that breaching the lower Snake River dams and increasing spills over the Columbia's dams would quadruple the number of salmon returning to spawn, compared to the status quo. But dam removal is not a silver bullet, biologists warn. "Even if we took out the dams, there could be other limiting factors for salmon recovery," said Christopher Caudill, a fish ecologist at the University of Idaho. Warming headwaters and changing oceanic



conditions can harm salmon whether or not the dams are removed, Caudill said. Any overhaul of the Columbia and Snake River dams likely requires an act of Congress as well as a lot of promises to local stakeholders who stand to lose regional infrastructure. Dam removal has long been anathema to politicians who tout the system's economic benefits. But the economics are changing as maintenance costs rise and natural gas and renewables undercut hydroelectric prices.

Now, the politics may be changing, too. Earlier this year, Rep. Mike Simpson, R-Idaho, broke with area politicians by calling for a serious look at removing the four dams on the lower Snake River. Simpson said he wants to work on a new federal plan to ensure salmon recovery in Idaho, one that would replace the Northwest Power Act, the 1980 legislation that guides dam management in the Columbia Basin. That political action can't come soon enough for salmon advocates tracking the threats fish face, including reservoir water temperatures that hit unhealthy levels for weeks at a time. "The climate is changing faster than the laws can keep up," said Angela Moran, an organizer for Save Our Wild Salmon. "We need political and community support, because we know that will be the biggest step to taking down the dams." Carl Segerstrom is an assistant editor at High Country News, covering Alaska, the Pacific Northwest and the Northern Rockies from Spokane, Washington. Email him at carls@hcn.org or submit a letter to the editor.

(Always like Hoover dam stories since construction finished the year I was born. Oops, I'm telling my age.)

This Day In History, September 30th, 2019 – I Dedicate Thee, The Hoover Dam

By Staff | Ronald G. Mayer Jr., September 30, 2019, signalsaz.com

It was just 84 years ago today, September 30, 1935, when the Hoover Dam, known then as the Boulder Dam, was officially dedicated. Started in 1931 under President Herbert Hoover, the Dam was meant to control the Colorado River and to provide not only electricity to the area, but also irrigation. Called Boulder by then President Franklin Roosevelt after the town of Boulder, Colorado, but also so as to not mention former President Hoover, the Dam was like nothing other. For several years' men toiled over it, and it claimed the lives of 112 souls. It was on this day that President Roosevelt travelled to the area to dedicate the Dam along with Interior Secretary Harold Ickes. With the temperature at 102 degrees, Roosevelt, with thousands of onlookers and the assistance of radio, proclaimed the great feat to all. A three-cent stamp was also printed for the dedication. 84 years ago today, the Hoover Dam began its long run of serving the people of the desert.

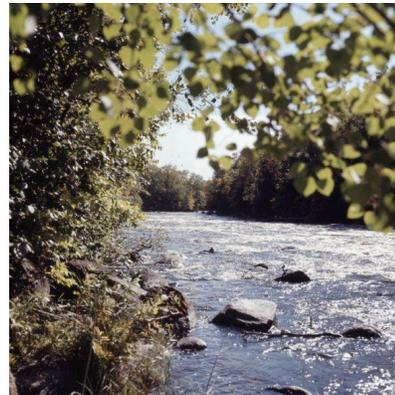


(Story on the dam that wasn't built.)

How The Wolf River Dam That Wasn't Helped Retain Scenic Beauty

By GARY ENTZ • 10/2/19, wxpr.org

Dams are an integral part of American history. One of the first things that British settlers did when they began colonizing North America was to build dams. Dams were built on streams in order to put them to work. They provided power by turning wheels and gears that ground corn and cut lumber. Before electricity became commonplace dammed streams created placid lakes that froze in the winter, which in turn provided chunks of ice that were sawed out and saved for summer. However, while dams had a practical use during the first three-hundred years of European settlement in America, it wasn't until the twentieth century that dam construction accelerated. It could easily be said that the United States went on a dam building craze.



Ten-thousand new dams were completed between 1920 and 1950, and between 1950 and 1980 another forty thousand were built. Thousands more were planned but never built. The justification for most dam building in the twentieth century was to create hydroelectric power to maintain the nation's electrical grid. With some dams that is indeed why they were built, but the truth is that of the tens of thousands of dams in the United States, only three percent of them are hydroelectric facilities. Most were built for other purposes. Some provide water for irrigating thirsty fields in drier parts of the country, while others were built to tame rivers and make them accessible to maritime shipping. Despite these uses, the number one reason why dams were built in the twentieth century was for recreation and land speculation.

In 1958 the Langlade County Board, under pressure from local land speculators, proposed to build a dam on the Wolf River near Pearson. Landowners saw an opportunity here to make a profit by selling lakeshore lots, if only the dam could be built. If constructed, the dam would have created an impoundment stretching back eleven miles to the Post Lake Flowage. Hunters, fishermen, Indigenous groups, and environmentalists actively opposed the idea, but the Langlade County Board largely shut them out of the discussion and during public hearings allowed only two opponents to speak. Feeling cut out of the process, the opposition groups appealed State Assemblyman Dave Martin. Martin had served in the Army Corps of Engineers and understood the damage a dam could do to the local ecosystem. Martin used his influence in Madison to convince the State Legislature to intervene and buy out Langlade County's investment in the dam. Because of the Wolf River Dam controversy, Martin sponsored legislation that created

Wisconsin's Wild Rivers Law. The bill went to then Governor Gaylord Nelson, who signed it into law in 1965. It was the Wisconsin law that inspired the federal government in 1968 to pass the Wild and Scenic Rivers Act. It was from this act of defiance in the Northwoods that unnecessary dam building across the entire United States was slowed and eventually stopped. The Wolf River and others like it retain their scenic beauty because of it.

(Yeah, that's what I say.)

LETTER: Enough about the dam

observer-reporter.com, 10/2/19



Enough about the dam Marianna Borough needs to stop worrying about the dam. It's been there for 100 years. Leave it alone and it will be there for 100 more. Fix the problems that need fixing, like the road going up the hill and the sewer lines. I bought a house there (by mistake), thinking it was an investment. What a mistake that was. No person wants to live in a dying town. Fix

something!

Jesse McCullough, Marianna. PA

(Squeezing every bit you get out of the water.)

Energy Trust can help with irrigation upgrades, hydropower

By BRENNIA WIEGAND For the Capital Press, 10/3/19, capitalpress.com

Three Sisters Irrigation District, one of Energy Trust of Oregon's largest projects, has recently achieved several milestones in its irrigation modernization project.

The district has installed two hydroelectric projects, with construction underway on a third. "When these three are fully operational, combined they'll generate more than 4.8 million kWh of electricity," Susan Jowaiszas of Energy Trust of Oregon said. "The revenue from selling this power helps the district offset the cost of their modernization projects."



Three Sisters Irrigation District started modernizing 20 years ago. Today they have modernized 92% of its irrigation systems, having piped 54 of the district's 59 canals. In addition to the hydroelectric systems, the district delivers pressurized water to 75 farms, which eliminates the need for on-farm irrigation pumps and saves these farmers and the district about 5 million kwh of electricity annually. Three Sisters is one of 20-plus districts around Oregon considering or in progress with modernization projects. Because of the size of its project, it has been able to leverage incentives from Energy Trust of \$1.04 million cash incentive and \$300,000 in project development assistance, state and federal dollars to offset its cost.



"On the other hand, Vern Spaur is a great example of a small project with Energy Trust," Jowaiszas said. "A rancher in Wallowa County, Spaur installed two micro-hydropower turbines on his ranch that generate 157,000 kwh each year — enough renewable power to run the truck and automotive repair business that is part of Spaur Ranch. "He also pressurized his irrigation pipes, saving him costs on pumping," Jowaiszas said. "Spaur's irrigation improvements are saving him between \$10,000-\$12,000 a year in energy costs." Spaur secured

\$137,000 cash incentive from Energy Trust, plus grants from the USDA Rural Energy for America Program to offset the cost of pressurizing irrigation pipes and installing the two micro-hydro turbines.

Energy Trust encourages farmers and ranchers to check into ways they can partner with Energy Trust on energy efficiency upgrades. These especially apply to greenhouses, where energy-efficient lighting, heating systems and insulation can significantly lower the costs of indoor growing; and on farm equipment. “We offer incentives for energy-efficient equipment like compressed air, heating and cooling, lighting, motors and drives and insulation,” Jowaiszas said. “We find that there are always new ways we can help a farmer or rancher save on their energy consumption or generate renewable energy on their property.” “Although every farm, its topography and its needs are different, Vern Spaur is a great example of what a farmer or rancher could achieve through on-farm renewable energy generation,” Jowaiszas said. “By pressurizing the irrigation pipes on the ranch and taking advantage of micro-hydropower, Vern is generating all the power he needs — and then some. **Saving money on their energy bills means farmers like Vern can reinvest in their operations — whether that’s new equipment or other farm improvements,**” Jowaiszas said



Hydro:

(Draw them down for maintenance.)

Utility Plans Annual Water Drawdowns At Lake Zoar, Lake Lillinonah

By Andrew Gorosko, Sep 14, 2019, newtownbee.com

Housatonic River, Conn. forming the impoundments known as Lake Zoar and Lake Lillinonah, has announced its schedule for drawing down the water levels at the two lakes. **The drawdowns allow FirstLight to do annual maintenance on Stevenson Dam, which forms Lake Zoar, and on Shepaug Dam, which forms Lake Lillinonah.** First Light urges



Lake Lillinonah

property owners with holdings alongside the lakes to remove structures, boat-lifts, and docks from the lakes’ shorelines to prevent ice damage or flood damage from occurring during the winter months. Any and all improvement work planned to occur along the lakes’ shorelines requires prior permits issued by FirstLight, according to FirstLight spokesman Len Greene.

Beginning on Wednesday, October 23, FirstLight will draw down the water level of Lake Zoar by discharging water at Stevenson Dam. That drawdown will allow the utility to do inspection and maintenance on its facilities. **The normal summer water level at Lake Zoar ranges from 100 feet to 103 feet above sea level. The lake’s drawdown target will be a water elevation of 98.5 feet above sea level.** Lake Zoar will return to its normal level by Friday, November 1. Beginning on Saturday, November 2, FirstLight will draw down the water level of Lake Lillinonah at Shepaug Dam to conduct inspection and maintenance. **The normal summer water elevation at Lake Lillinonah ranges from 200 feet to 195.5 feet above sea level. The lake’s drawdown target will be a water elevation of 191 feet above sea level.** Lake Lillinonah’s water level is slated to return to normal by Monday, November 11. *The Massachusetts-based FirstLight does business in Connecticut and Massachusetts.*

(A little, a little here, first thing you’ll know is that we have a lot of hydro.)

Approval sought to study feasibility of modifying Little Pine State Park dam to generate electricity

By John Beauge | Special to PennLive, Sep 23, 2019, pennlive.com



WATERVILLE, PA — An Alabama company wants to study the feasibility of modifying the dam in Little Pine State Park in northwestern Lycoming County into a hydroelectric facility. Lock + TM Hydro Friends Fund XXII, part of Hydro Green Energy, has filed an application with the Federal Energy Regulatory Commission for a permit which, if granted, would allow it to proceed with such a study. Wayne Krouse, chief executive office of Lock + TM, said he expects a decision from FERC later this year. The public has 60 days from Aug. 29 to file comments with the agency.

Little Pine State Park

The study would not only look at the feasibility of modifying the dam but determine if can be done economically, he said. Preliminary plans show two turbine generating units with a capacity of 1.3 megawatts, a pad-mounted transformer along with 200-foot-long, 13-kilovolt transmission line between it and an existing distribution line. The dam is one of about a dozen in Pennsylvania for which permits are being sought to do feasibility studies, Krouse said. None are in the Harrisburg area, he said. "It might work, let's go file a permit application," he explained how the decision was made to proceed with certain dams after reviewing a list of reservoirs in the state. "We like the state of Pennsylvania very much," he said, pointing out the company has a 50-year license for a 5.25-megawatt project at the Braddock Locks and Dam on the Monongahela River near Pittsburgh. That project is in final design, with construction expected to begin next year, he said.

At this stage of the process with the Little Pine dam, the Department of Conservation and Natural Resources has not been contacted and no one from Lock + TM has visited the site, Krouse said. Once a permit is issued the state will be asked to provide drawings of the dam and there will be visits, he said. It would be premature to comment on the Pine Creek project "until we know what is being proposed," DCNR spokesman Terry Brady said. The permit sought by Lock + TM does not authorize it to perform any land-disturbing activities or approach the dam without the state's approval. This is not the first time the Little Pine dam has been looked at as a potential hydroelectric facility. American Hydro Power Co. in the late 1980s determined such a conversion would impact upstream recreation and flood control capacity, DCNR says. Lock + TM in 2016 obtained a permit to study the feasibility to turning the Hepburn Street dam on the West Branch of the Susquehanna River at Williamsport into a hydroelectric facility but did not pursue the project.

(Pumped storage marriage with renewables will happen.)

Pumped-storage will be necessary and inevitable

Letters to the Editor, SEP 21, 2019, .leaderherald.com



In two recent letters to the editor (Leader-Herald, Aug 27, and Sept 14, page 6A) I discussed why building utility-scale solar electric plants is not a bright idea for the ratepayers. But let's assume that the state government, the green lobby and the too-large number of ignorant voters get their way and push through their socialist and very costly (where does all of this money come from?) so-called green power agenda. Pumped-storage will be necessary and inevitable. "So here are four Blenheim-Gilboa-sized potential sites, three of which have never been publicly disclosed until now, that could be used for pumped storage plants. Except for the Storm King project (see <https://en.wikipedia.org/wiki/Scenic-Hudson-Preservation-Conference-v.-Federal-Power-Commission>). Here are the GPS coordinates for the other three:

1. West Mountain: <https://www.google.com/maps/@43.281279,-73.7408301,15.32z/data=!5m1!1e4>.
2. South Bay, Lake Champlain: <https://www.google.com/maps/@43.5356223,-73.4942604,15.58z/data=!5m1!1e4>.
3. Cold Spring Park, between Port Henry and Crown Point – <https://www.google.com/maps/@43.986622,-73.4911227,14.68z/data=!5m1!1e4>.

Using 2000 MWe for the shelved Storm King project and assuming 1000 MWe for each additional site gives 5000 MWe of nameplate capacity — not a bad start.

China is going full-bore with pumped-storage development. About 25,000 MWe have already been built and about 43,000 MWe are under construction (see <https://en.wikipedia.org/wiki/List->

[of-pumped-storage-hydroelectric-power-stations](#)). So let's get on with it. CHARLES F. HEIMERDINGER, Edinburg, WA

(More history.)

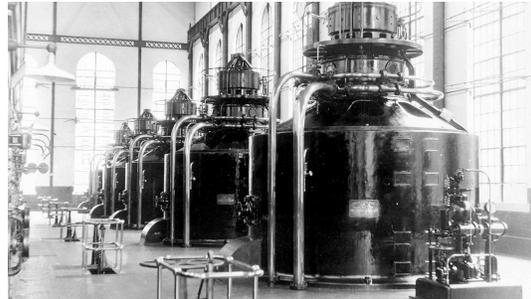
The Power Play: 100 Years: Lake Burton and Georgia's Hydroelectric Revolution

September 26, 2019, southerncompany.com

At Southern Company, we are honoring the past while we build for the future. "The Power Play: 100 Years: Lake Burton and Georgia's Hydroelectric Revolution" is a documentary that will "follow the journey through the decades and trace the little-known historical facts of Georgia's development of electricity and the people who made it happen."

Southern Company provided support for this new film that treats viewers to more than 150 years of history,

from the formation of Georgia Power to Atlanta's triumph of hosting the 1996 Olympic games. Follow along: <http://www.gpb.org/television/shows/gpb-originals/episode/593cf1fd-804c-486c-ae2e-d88038554cfd> as Henry Atkinson, Georgia Power founder, and Preston Arkwright, his attorney, embrace a vision of the New South that allowed Atlanta to rise from the ashes and become a city of the future. In the late 1860's as Georgia is beginning to recover from the devastation of the Civil War. In this look back, we trace the little-known historical facts of Georgia's development of electricity and the people who made it happen. In the early 1900's, new innovation would harness the power of water in North Georgia's Tallulah valley wilderness and flood the town of Burton to create a new lake.



(The odds say this will never be built.)

Two new dams near the Grand Canyon? Conservation groups call the plan 'unconscionable'

By Debra Utacia Krol, Arizona Republic, Sept. 27, 2019, azcentral.com

A Phoenix company wants to build two hydroelectric dams less than five miles from the eastern border of Grand Canyon National Park, submerging several miles of the Little Colorado River and the endangered fish habitat it protects. If they're built, the dams could produce more than just electricity.

Environmentalists say the project could further imperil the fish, the native humpback chub, interfere with the Canyon's already-degraded hydrology and irreparably damage sites held sacred by at least one Arizona tribe.



Pumped Hydro Storage LLC recently applied for a preliminary permit from the Federal Energy Regulatory Commission to begin the process of developing a hydroelectric dam project on the Little Colorado River. The dams would rise on Navajo Nation land, close to the eastern border of the Grand Canyon. The Navajo Nation Salt Trail Canyon Pumped Storage Project would generate electricity by pumping water between two dams located within the river gorge about 16 miles northwest of Cameron and four river miles upriver from the confluence of the Little Colorado and the Colorado. A 240-foot-tall upper dam would be sited about 3,000 feet higher in elevation than the 140-foot-tall lower dam. Both dams would enclose reservoirs, one of which would stretch 2 miles up the Little Colorado River Gorge. Turbines would pump water through underground tunnels between the two bodies of water. A paved road would be constructed between State Route 89A and the Salt Trail Canyon where it emerges into the Little Colorado, and a new 20-

mile-long transmission line would be built to the existing Moenkopi substation. The application was published Sept. 23 in the Federal Register and attracted the notice of environmental groups, who swiftly reacted to the idea. **“(The dam) will industrialize what is now a very remote area,”** said Taylor McKinnon, senior public lands campaigner with the Center for Biological Diversity. The project would further impede the recovery of the endangered humpback chub, the last remaining chub species within the Grand Canyon, he said.

Since the gates of Glen Canyon Dam were closed in 1963, the ecology of the Colorado River in the Grand Canyon has been altered, some fear forever. David Wallace and Michael Chow/The Republic, Arizona Republic “It would flood miles of humpback chub habitat and imperil one of its most important spawning sites by altering the flow downstream at the confluence with the Colorado River,” McKinnon said. “It would also flood and eliminate river habitat.” The project would also remove about 13,000 acre-feet of water from other uses, since it would be contained within the two reservoirs. **And the dam would affect one of the Hopi Tribe’s most sacred places, Sipapu, located near the Salt Trail Canyon.**

“The proposed pumped storage project is an unconscionable assault on the Grand Canyon and its Native peoples,” said Roger Clark, program director for the Grand Canyon Trust, in a statement. “Not only would it industrialize the Hopi Salt Trail and areas culturally significant to Navajo and many others, it would violate the rights of those who have called this place home since time immemorial.” Hopi Tribal Chairman Timothy L. Nuvangyaoma was unavailable for comment.

Phoenix-based Pumped Hydro Storage filed for incorporation March 24, about six weeks before filing the initial application with the federal agency. Steve Irwin, Pumped Hydro Storage’s manager, said the project would provide power storage and on-demand power generation. He also said it would bring new jobs to the Navajo Nation, which will suffer deep economic losses from the closure this year of the Navajo Generating Station and the coal mine that supplied it. “This is one of the best sites in the country for a pumped hydro project,” Irwin said. Irwin said he has spoken with Navajo officials, but was not aware of any Hopi cultural concerns. **He said he will consult with the tribe.** Navajo Nation officials did not return calls by The Republic seeking comment. Irwin said he’s aware of the humpback chub. “We have to go through five assessments, like hydrology, environmental, engineering and archaeological assessments to get the permit,” he said. “The project will have to pass muster.” He would not say if the company had secured the funding to conduct the study, which the application said could cost from \$4 million to \$8 million, or obtained the rights to the water for the reservoirs. It’s not the first time that development has been proposed on or close to the confluence of the Colorado and Little Colorado rivers.

In 2017, after an eight-year campaign by local Navajo and Hopi tribal members and environmentalists, the Navajo Nation voted down the Grand Canyon Escalade project. Opponents said the mega resort and tramway would have caused environmental and cultural damage without any significant revenue benefit to the tribe. In the 1950s and 60s, a series of dams were proposed along the Grand Canyon and its tributaries for water storage. Those were also scrapped, a decision that ultimately led to the construction of Navajo Generating Station. **“Every dam that was proposed for that same stretch of the river was deemed unfeasible because the reservoir would fill with sediment,”** Clark said. Moreover, he said, the sediment trapped by the new dams would not flow to the Colorado, where it’s needed to keep beaches built up, provide camouflage for indigenous fish like the chub and provides other environmental benefits to the riverine system. The public comment period for the project runs through Nov. 22.

(Good hydro photos, but some of the captions don’t make sense so just enjoy the photos.)

The photos are in this article (see URL below):

<https://unsplash.com/s/photos/hydroelectric-dam>

(Gotta have that water for hydro.)

US Northwest river runoff remained unchanged at 94 pct – NWRFC

September 29, 2019, boereport.com

Projected water runoff at The Dalles Dam on the Columbia River in Oregon held at 94 percent of normal for April-September, the U.S. Northwest River Forecast Center (NWRFC) said on Sunday. That is unchanged from the prior forecast of 94 percent of normal. In the 2018 water year, actual runoff at The Dalles from April to September was 114 percent of the 30-year (1981-2010) average.



The Dalles is the next-to-last dam on the Columbia River and a key point to measure the volume of water available for power generation in the Northwest, which receives about 65 percent of its power from hydroelectric dams. Portland, Oregon-based NWRFC is an arm of the National Weather Service (NWS), which is part of the U.S. Department of Commerce's National Oceanic & Atmospheric Administration (NOAA). The water year starts on Oct. 1.

(Excerpts. I like places like this.)

Travel Wisconsin: Hidden Gems

By: Nick Van Wagenen, Oct 02, 2019, wtmj.com

Excerpts

Building at Bookworm Gardens

Wisconsin is home to many well-known and widely admired places to explore. But there are definitely less-traveled places offering unique hidden gem experiences as well. Here are a few of our favorites: -----.

Hearthstone Historic House Museum – Appleton

The first home in the world to be lit by a hydroelectric central power station was in Wisconsin—and today it's a museum.

- The bluff-top mansion overlooks the Fox River and is an excellent example of Queen Anne style architecture with stained glass, nine fireplaces and elaborate 12-foot-high painted ceilings. The home maintains its original light fixtures and switches.
- Tours are available Thursday-Sunday.

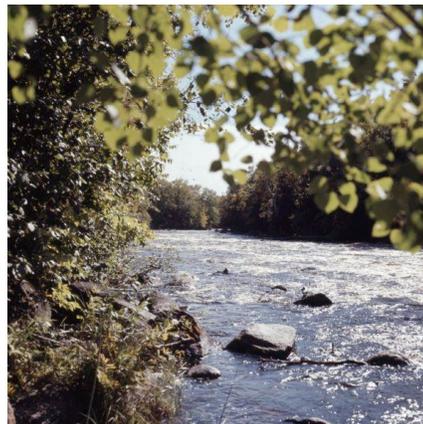


(Sometimes nothing is better than something.)

How The Wolf River Dam That Wasn't Helped Retain Scenic Beauty

By GARY ENTZ • OCT 2, 2019, wxpr.org

Sometimes things that didn't happen in the past can have a profound impact on the future. Such was the case with the dam that never was on the Wolf River. Gary Entz explains for this week's A Northwoods Moment in History.



Dams are an integral part of American history. One of the first things that British settlers did when they began

colonizing North America was to build dams. Dams were built on streams in order to put them to work. They provided power by turning wheels and gears that ground corn and cut lumber. Before electricity became commonplace dammed streams created placid lakes that froze in the winter, which in turn provided chunks of ice that were sawed out and saved for summer. However, while dams had a practical use during the first three-hundred years of European settlement in America, it wasn't until the twentieth century that dam construction accelerated. It could easily be said that the United States went on a dam building craze. Ten-thousand new dams were completed between 1920 and 1950, and between 1950 and 1980 another forty thousand were built. Thousands more were planned but never built. The justification for most dam building in the twentieth century was to create hydroelectric power to maintain the nation's electrical grid. With some dams that is indeed why they were built, but the truth is that of the tens of thousands of dams in the United States, only three percent of them are hydroelectric facilities. Most were built for other purposes. Some provide water for irrigating thirsty fields in drier parts of the country, while others were built to tame rivers and make them accessible to maritime shipping. Despite these uses, the number one reason why dams were built in the twentieth century was for recreation and land speculation. In 1958 the Langlade County Board, under pressure from local land speculators, proposed to build a dam on the Wolf River near Pearson. Landowners saw an opportunity here to make a profit by selling lakeshore lots, if only the dam could be built. If constructed, the dam would have created an impoundment stretching back eleven miles to the Post Lake Flowage. Hunters, fishermen, Indigenous groups, and environmentalists actively opposed the idea, but the Langlade County Board largely shut them out of the discussion and during public hearings allowed only two opponents to speak.

Feeling cut out of the process, the opposition groups appealed State Assemblyman Dave Martin. Martin had served in the Army Corps of Engineers and understood the damage a dam could do to the local ecosystem. Martin used his influence in Madison to convince the State Legislature to intervene and buy out Langlade County's investment in the dam. Because of the Wolf River Dam controversy, Martin sponsored legislation that created Wisconsin's Wild Rivers Law. The bill went to then Governor Gaylord Nelson, who signed it into law in 1965. It was the Wisconsin law that inspired the federal government in 1968 to pass the Wild and Scenic Rivers Act. It was from this act of defiance in the Northwoods that unnecessary dam building across the entire United States was slowed and eventually stopped. The Wolf River and others like it retain their scenic beauty because of it.



Other Stuff:

(How come these kids have to do this? Look at those in the photo. Always said if you're under 21, you think you do, but don't know much, if you're under 30, you're finally beginning to know what the world is about, and if your under 40 that's where the separation begins for "those who do" and "those who don't")

Why 2020 Democrats' plans on climate change are pure fantasy

By Jonathan A. Lesser, September 6, 2019 | nypost.com

At CNN's Climate Town Hall on Wednesday, the 2020 candidates unveiled their plans for addressing global warming. They ranged from unrealistic (to be generous) to outright delusional. Bernie Sanders, for instance, wants all of our electricity to come from renewable resources in just 10 years. Huh? In 2018, the single largest source of renewable energy was large hydroelectric dams, which many environmentalists want to ditch. Wind and solar power provided about 370 terawatt-hours (TWh) of



electricity, roughly 9% of all generation, which was around 4,200 TWh. How does he expect to generate 10 times more wind and solar in 10 years? The candidates also want to electrify the entire US economy — cars, trucks, industry, you name it. Realistic? Not a chance. In 2018, that 4,200 TWh of electricity consumption — for heating, air conditioning, industrial processes and so forth — accounted for only about a sixth of total US end-use energy consumption. So, electrifying the entire economy would require generating at least six times more electricity than we do today.

All of the candidates' plans would gut the US economy and lead to soaring energy prices, which would impoverish all of us. In return, their plans would have no measurable effect on the world's climate. Zero. Nada. Zip. They all want to rejoin the Paris Agreement. That won't have any measurable effect on climate, either. The reality is that developing countries, especially India and China — the two countries whose greenhouse-gas emissions are the largest and increasing rapidly — are not going to impoverish their growing populations to reduce greenhouse-gas emissions. As my Manhattan Institute colleague Mark Mills has written, a belief that we can transform the US economy to run solely on wind and solar power is "magical thinking." It's simply not possible given today's technology and basic physics.

Moreover, none of the candidates addressed the adverse environmental effects of wind, solar and batteries. All three require vast amounts of land and rare-earth metals, which are mined primarily in China, whose environmental protection record is dismal. Discarded solar panels, which are often sent overseas, leach cadmium, a toxic heavy metal. Just disposing of huge wind-turbine blades has become problematic: The 120-foot-long (and longer) fiberglass blades, which have to be replaced every 10 to 20 years, cannot be recycled. Landfills are becoming reluctant to take them because they require such huge amounts of space. As for all of the concrete wind turbines require — wind developers are usually silent about what happens when the turbines are dismantled. Andrew Yang proposes 'green' amendment to the Constitution

The missing link in the Democrats' green fantasies is the one realistic source of emission-free energy: nuclear power. To his credit, Cory Booker was willing to embrace nuclear power as the only realistic way to reduce carbon emissions. Joe Biden was non-committal, as was Kamala Harris. Bernie Sanders and Elizabeth Warren want to eliminate nuclear power plants altogether because of nuclear-waste storage issues and the adverse environmental impacts of uranium "tailings" that occurred decades ago. As my recent Manhattan Institute report discussed, solving the nuclear-waste storage issue isn't a technical problem, it's a political one. We can now store nuclear waste safely — and Sanders and Warren should know that. Finland, for example, is building an underground waste depository. The town where it will be located is enthusiastic. Of course, the Finns have trust in their government, something in vanishingly short supply in this country, thanks to decades of scare tactics by nuclear power opponents and endless quantities of political demagoguery.

New modular designs will enable nuclear plants to be built in factories and shipped where needed. The first such plant, comprising of 12 60-megawatt modules, is scheduled to be installed and operating at the US Idaho National Engineering Laboratory in 2026. The modular-design formula will also allow capacity to be bumped up as needed, lowering the "bet-the-company" financial risks that have plagued nuclear-power development. This doesn't mean we should throw money willy-nilly at existing nuclear plants, many of which have been granted subsidies to remain in business, including New York's three upstate nuclear plants. But nuclear power is the only generation resource that is reliable, economical and emissions-free. That is, it's realistic. Alas, if this week's town hall is any indication, reality and the Democrats' energy proposals have little in common. Jonathan Lesser, an adjunct fellow with the Manhattan Institute, is the author of "Is there a Future for Nuclear Power in the United States?", a report published in July

(Where's the money going to come from? Watch out taxpayers!)

Financial Trouble at an Iconic American Hydropower Giant

By STEPHEN LACEY SEPTEMBER 27, 2019, greentechmedia.com

The Bonneville Power Administration, the government-owned “power marketing agency” that serves the Pacific Northwest, is facing a strong current of problems. As cheap renewables make hydro less competitive in the region, BPA is bleeding money. There’s now concern that its utility customers will stop buying hydro after contracts expire. Meanwhile, the cost of rehabilitating salmon populations is mounting. As the power provider grapples with \$15 billion in debt, some are calling for a reformation of BPA. Can the government prepare the hulking agency for the competitive clean energy future? On this week’s episode of The Energy Gang, We’ll talk to a Jeremy P. Jacobs, a reporter for E&E’s Greenwire, who’s been digging into the story. You can read [part one](https://www.eenews.net/stories/1061110823): [https://www.eenews.net/stories/1061110823](https://www.eenews.net/stories/1061125873) [part two](https://www.eenews.net/stories/1061125873): <https://www.eenews.net/stories/1061125873> and [part three](https://www.eenews.net/stories/1061166033): <https://www.eenews.net/stories/1061166033> of his ongoing series.

Then, climate strikes swept the globe last Friday, raising unprecedented media coverage. How is this different from previous mobilizations around climate? We’ll put this moment in the context of recent history. [Finally, offshore wind is becoming dirt-cheap in Europe.](#) According to Carbon Brief, [recent offshore wind prices are set to compete with existing gas seven years ahead of schedule.](#) We’ll venture out to the leading edge of offshore wind development.



(The topic everyone is talking about.)

Lecture paints an alarming picture

By Dick Mason The Observer, Sep 30, 2019, lagrandeobserver.com

[Climate change is doing more than raise ocean levels and global temperatures — it is also playing cruel tricks on Mother Nature.](#) David Mildrexler, a systems ecologist for Eastern Oregon Legacy Lands, made this and many other often alarming points Thursday during his presentation, “Future Trends in Climates and Ecosystems in the Pacific Northwest” at La Grande’s Cook Memorial Library. A portion of Mildrexler’s presentation addressed the impact of global warming and included recent photos of snowshoe hares whose coats change from white to rusty brown during the year to help them blend in with their surroundings. The pictures are disturbing for they show snowshoe hares with white fur against a background of dark vegetation and soil and barren of snow. “It does not blend in with the surroundings anymore (in late winter and early spring),” Mildrexler said of the snowshoe hare. “It is more vulnerable now.” This is an indication of how snow is disappearing in many locations earlier each year because of global warming. [“Snow is declining everywhere. It is very concerning,” Mildrexler said.](#)

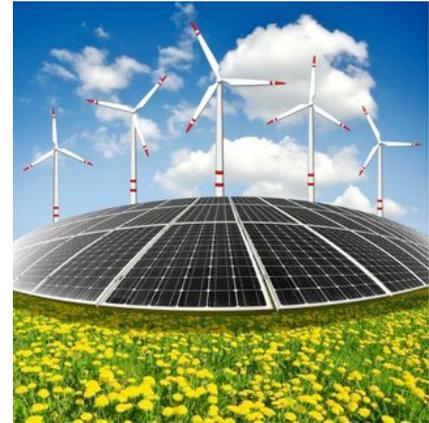
Those who are being impacted in a big way by climate change include people living in coastal areas. [Mildrexler said rising sea levels caused by glaciers melting due to warmer weather are putting towns near oceans at risk.](#) “Coastal areas are very vulnerable,” Mildrexler said. This means natural events like full moons that raise ocean levels may make communities in areas near oceans more likely to experience flooding in the future. [Mildrexler said if climate change continues and its impact reaches a disastrous level, rural areas like Northeast Oregon will be greatly affected.](#) He explained that this is because rural areas rely so much upon natural resources that would be hurt by drought and other climate change impacts. “They rely on ecosystems,” he said, adding that this is a reason for rural America to lead the effort to tackle climate change. [Mildrexler said the key to taking on climate change is to do everything possible to reduce carbon dioxide emissions, which trap heat.](#) Most man-made carbon dioxide emissions are created by the use of gasoline and coal as energy sources. [“We have got to keep coal in the ground and limit consumption of oil,” he said.](#)

(Renewables are the news.)

EIA: Renewables will provide half of world electricity by 2050

OCTOBER 2, 2019, .bicmagazine.com

In 2018, 28% of global electricity was generated from renewable energy sources, most (96%) of which was produced from hydropower, wind, and solar technologies. In its International Energy Outlook 2019 (IEO2019), the U.S. Energy Information Administration (EIA) projects that renewables will collectively increase to 49% of global electricity generation by 2050. Of the top three renewable sources, EIA expects solar's share of generation to grow the fastest and hydroelectric's share to grow the slowest. EIA's international outlook includes analysis of eight countries and eight multicountry regions. Different regional- and technology-specific factors influence the growth rates of renewable technologies throughout the world.



Resource availability, renewable policies, regional load growth, and declining technology costs drive EIA's projected increase in global electricity generation from solar technologies. As more solar power systems have been installed, installation costs have experienced the steepest cost declines of all renewable technologies in recent years, and EIA expects that they will continue to decline as a result of learning-by-doing effects. In many regions, solar resources are also generally more abundant than wind resources and typically follow very predictable daily and seasonal generation patterns. Resource availability and predictability and relatively simple plant construction technology also support favorable economics for solar photovoltaics, the most common solar generation technology in the IEO2019 Reference case.

EIA projects that China is the country that will see the most growth in solar generation because of its growing demand for electricity, favorable government policies, and competitive technology costs. Growth in solar generation is also strong in India, European countries in the Organization for Economic Cooperation and Development (OECD), and the United States—each of which have near-term renewable policies in place. IEO2019 Reference case projections for the United States are consistent with those in the Annual Energy Outlook 2019 Reference case. Wind power is still a relatively new technology, and the declining capital costs it experiences as a result of learning-by-doing effects are not as steep as solar technologies. Wind technology adoption has significant growth potential, however, because many wind resource areas around the world are not yet developed. Similar to solar power, EIA forecasts that near-term renewable policies in India and OECD Europe will lead to wind generation growth in those areas. In China, wind is among the many sources meeting the country's increasing demand for electricity. Hydroelectricity was the predominant global renewable electricity generation source in 2018, but EIA expects relatively little growth in hydroelectric generation through 2050. Hydroelectricity is a mature technology, established in the nineteenth century, so many of the best sites for hydropower plants have already been developed. New hydro plants are not being built as rapidly as other renewable technologies because construction of new hydroelectric plants is relatively disruptive and capital intensive. The regions that EIA forecasts will have the greatest growth in hydroelectric generation in 2050 are areas such as China, Brazil, and OECD Europe, which tend to have extensive and accessible hydropower resources. *Principal contributor: Michelle Bowman*



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