



12/30/2016



Some Dam – Hydro News™ And Other Stuff



Quote of Note: "May all your troubles last as long as your New Year's resolutions." -
Joey Adams

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"Good wine is a necessity of life." - -Thomas Jefferson
Ron's wine pick of the week: 2013 Louis Martini Cabernet Sauvignon "Napa Valley"
"No nation was ever drunk when wine was cheap." - - Thomas Jefferson

Happy New Year!



Dams:

(Another dangerous low dam.)

Dangerous Bitterroot River dam being fixed

By PERRY BAUCUS, missoulian.com, 12/16/16

Boating on the Bitterroot River, Missouri is going to be whole lot safer come spring. Construction is set to begin right after the New Year to rework the dangerous, century-old Supply Ditch Diversion Dam downstream from Corvallis. The current low-head irrigation dam creates a recirculating hydraulic current that can swamp boats and trap floaters. There have been numerous boating accidents at the site, including one that killed a 6-year-old girl in 2013.



The dangerous undertow develops because of a large hole immediately downstream of the dam. The plans call for filling that hole in with large rocks and creating ramps that boaters will be able to navigate much more safely, said Mollie Davidson, the lead Morrison-Maierle engineer for the project. "Rather than have a steep drop off that creates that roller hydraulic, there will be gradual ramp," Davidson said. While boaters will be able to cross the dam at any point, the most desirable spot will be on the left side of the river where the ramp will be less steep, she said. The project is being paid for through several different agencies and the irrigators. The Army Corps of Engineers provided a \$300,000 grant, which Davidson said made the project possible. "That grant was extremely huge," she said. Other funding sources included a \$125,000 Renewable Resource Grant from the Montana Department of Natural Resources and Conservation and \$40,000 from Montana Fish, Wildlife and Parks. The Bitter Root Conservation District also chipped in \$10,000 and irrigators paid \$50,000.

(When there's too much water, this is what happens.)

Why are Sacramento dams releasing so much water right now?

By Harry Stockman, KXTV, December 15, 2016, abc10.com

Heavy rain spread across Northern California today. At times, the rain came down so hard, you could not see a quarter of a mile ahead of you while driving down Highway 99. The rain is heavy enough to also force water releases from both Folsom and Nimbus dams. Rainfall amounts ranged from 1 to 2 inches in the Sacramento Valley and nearby foothills with more rain expected tonight and tomorrow. In anticipation, the National Weather Service issued flood warnings and watches for many northern California locations. The main concern is local flooding of streets and along creeks and streams. All this rain is really great news when you consider we're still working our way out of 5 years of drought. In fact, the seasonal



rainfall total for Sacramento is almost 9 inches or about half the rain we receive in an average year. That's what you call a "good start."

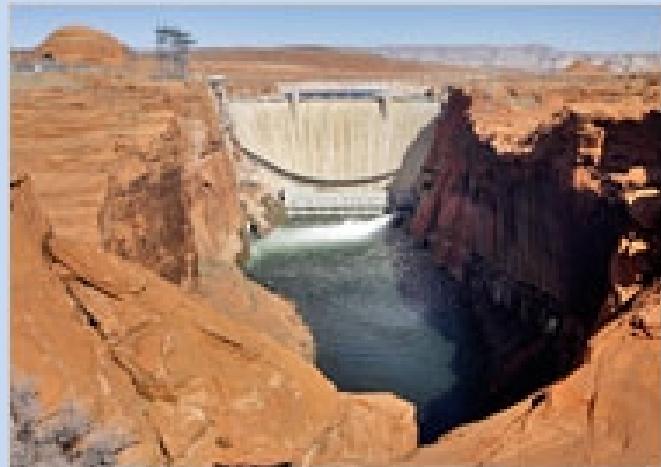
So, with all this great news, why is the Bureau of Reclamation releasing water from Folsom and Nimbus dams? Well, it's complicated. Even in a drought, there is the possibility of flood, not just light, local flooding along creeks and streams, but dangerous flooding, the kind of flooding a series of big storms will bring. Gully washers! Frog stranglers! A real soaker! At this time of the year, no one knows how much rain will fall for the balance of the season. Consequently, the Bureau has to prepare for the worst. The Bureau of Reclamation has an agreement with the Sacramento Flood Control Agency, not to mention a bunch of other government agencies, which requires them to release water whenever water storage in Folsom Lake exceeds 575,000 acre feet. Today the Folsom Lake rose 20 feet, bringing total storage to 620,000 acre feet. Thus the water is flowing out of the lake to keep us safe in case we get more rain than the dam can handle later in the season. Around March or April, the Bureau of Reclamation, the operating agency for Folsom Dam, is allowed to let Folsom fill up as the Sierra snowpack melts. When full, the lake contains 977,000 acre feet of water. That's a lot of water!

(Getting it done before Trump takes over.)

Feds Give 20 More Years to Glen Canyon Dam on Colorado River

By Ken Ritter, Associated Press — Dec 15, 2016, abcnews.go.com

LAS VEGAS - The federal government is committing to at least another 20 years of use of a huge Colorado River dam that officials call crucial to states in the West, but that critics say is unstable and should be removed. "Politics belong out of this, because water is life," said U.S. Interior Secretary Sally Jewell at a conference of key water managers in Las Vegas. She signed an agreement that allows the federal Bureau of Reclamation to manage Glen Canyon Dam and the Lake Powell reservoir in Arizona through 2036.



The agreement "provides certainty and predictability to those that use water and power from the dam," Jewell said, while also providing environmental protection for fish and wildlife in the Grand Canyon, through which the dam sends water to Lake Mead and Hoover Dam near Las Vegas.

Critics call Glen Canyon Dam obsolete and Lake Powell too porous and wasteful to keep operating in a basin. Glen Canyon Dam, completed in 1964 near Page, Arizona, is the second-tallest concrete-arch dam in the United States, behind Hoover Dam near Las Vegas. But while Hoover Dam is anchored in solid volcano-baked basalt, Glen Canyon Dam spans a gorge lined with Navajo sandstone that critics compare with hardened sand dunes. "Lake Powell is evaporating and seeping hundreds of thousands of acre-feet per year that are completely lost to the (Colorado River) system," said Gary Wockner, executive director of the Denver-based group Save the Colorado. He called Jewell's decision "an extraordinary waste." "In order to keep the lake level high enough to keep electric turbines spinning, they're going to have to buy massive amounts of water from farmers in Colorado and Utah," Wockner said. Glen Canyon has eight hydroelectric turbine generators that the Bureau of Reclamation says produce about 5 billion kilowatt-hours of hydroelectric power per year for distribution by the Western Area Power Administration to Nebraska and six of seven Colorado River basin states. U.S. Rep. Rob Bishop, R-Utah, chairman of the House Committee on Natural Resources, accused Jewell of "making long-term decisions before the clock runs out" on President Barack Obama's administration.

Bishop said the plan shortchanges hydropower in favor of fish, and he predicted communities and states that rely on cheap hydropower will suffer.

Jewell told reporters the agreement received five years of study about economic, technical, social and environmental factors, and was supported by states, the National Parks Conservation Association, Western Area Power Administration, the Navajo Nation and six other tribes, Grand Canyon river rafting groups and the public. She said the so-called Long-term Experimental and Management Plan won't change water allocations for the basin states — Arizona, California, Colorado, Nevada, New Mexico, Utah and Wyoming — or Mexico. But drought might. Jewell spoke several times of a 50-50 chance that a drought declaration will be made next August, forcing cuts in water deliveries beginning in January 2018 to Arizona and Nevada. Under various treaties, regulations, statutes and agreements including the Colorado River Compact of 1922, seven states are promised a share of about 15 million acre-feet of water the river was projected to take in annually from rainfall and snowmelt. Drought has cut that figure, and officials acknowledge the available supply today falls short of promised amounts. Anne Castle, a former assistant Interior Department Interior secretary who spent years working on Colorado River issues and now heads a research program at the University of Colorado, called the decision that Jewell signed important for the West. She said revenue from power produced at the dam pay for endangered species, environmental management and reclamation programs.

(Here's your answer.)

DOI's Dam Plan Undermines Hydropower

By Natural Resources - December 19, 2016, realestaterama.com

WASHINGTON, D.C. – (RealEstateRama) — U.S. Secretary of the Interior Sally Jewell and U.S. Deputy Secretary Mike Connor announced the final Record of Decision for Glen Canyon Dam's Long-term Experimental and Management Plan (LTEMP). The Glen Canyon Dam's reservoir is located in both Arizona and Utah. Chairman Rob Bishop (R-UT) issued the following statement:



"The Obama administration is once again making long-term decisions before the clock runs out. Today's announcement is not about balance. The plan creates undue imbalance that undermines hydropower generation at Glen Canyon Dam. "Communities in seven states, including Utah, depend on this once low-cost and renewable resource but have been shortchanged by ignorant federal officials. This will have long-term negative impacts on an entire region that depends on federal hydropower for years to come."

(Darn earthquakes.)

Why the state wants to lower Lake Gregory's water level

The state Division of Safety of Dams, a unit of the California Department of Water Resources, has ordered the county to lower the dam level by 2 to 3 feet by Jan. 1.

By JIM STEINBERG / STAFF WRITER, Dec. 16, 2016, pe.com

After years of study, San Bernardino County officials have been ordered to lower Lake Gregory in Crestline to relieve pressure on its seismically unfit, nearly 80-year-old earthen dam. The state Division of Safety of Dams, a unit of the California Department of Water Resources, has ordered the county to lower the dam level by 2 to 3 feet by Jan. 1. The lowering is part of a larger plan to retrofit the dam, potentially protecting campers, hikers and county property,



including roads, from a potential breach following a major earthquake in that area, state and county officials said.

The buttressing of the dam will cost \$8 million, said David Wert, a county spokesman. Valves that wouldn't turn were replaced so that the lowering could be accomplished, said Rick Dinon, chairman of San Bernardino County Supervisor Janice Rutherford's Lake Gregory Improvement Committee. The seismic rehabilitation of the Lake Gregory dam is scheduled to begin at the end of summer 2017 and take an estimated 18 months to complete. Once the work is done, the county can seek state approval to restore the lake to its normal level, Wert said. The water draining from Lake Gregory will go down the north side of the San Bernardino Mountains into Lake Silverwood, Dinon said. The drought has already been shrinking the levels of both Lake Gregory and Lake Silverwood, as well as Lake Arrowhead and Big Bear Lake. Despite the 1992 Big Bear magnitude-6.5 earthquake, the Lake Gregory Dam "has not experienced a significant seismic event," said Chris Dorsey, a senior engineer with the state Division of Safety of Dams. And based on the expanse of Lake Gregory and the dam's size, the structure is rated as a "high hazard dam", Dorsey said. A higher level of risk is called "extreme hazard dam," he said.

(Oh, oh, they're trying to pin something on the Army, or could there have been too much rain.)
2013 inspection found holes in Fort Jackson dam that failed two years later

On a visit to Columbia in June 2016, , U.S. Army Secretary Eric Fanning declined to say whether the military would release inspection records of Fort Jackson dams that broke last October.

By SAMMY FRETWELL, thestate.com, DECEMBER 17, 2016

COLUMBIA, SC - Federal inspectors found holes, broken equipment and "out-of-control" vegetation on a Fort Jackson dam two years before the earthen structure burst during a massive 2015 flood, according to a government report that provides new details about the dam's condition. The 2013 U.S. Army Corps of Engineers inspection report, obtained by The State newspaper, urged swift action to fix the Semmes Lake dam after federal officials said people could die if the dam failed.



Millions of dollars worth of property flooded and two people were killed downstream after the dam broke the morning of Oct. 4, 2015. It remains unknown if Fort Jackson fixed the Semmes Lake dam after the 2013 report because Army officials won't talk about the matter. Fort Jackson officials plan to rebuild the dam, but they declined to say during a public hearing Wednesday why the dam broke in 2015. Base officials cited pending lawsuits as a reason for their silence. Records show the Army made some improvements to the dam before 2009. But Pete Strom, an attorney who is suing the government on behalf of downstream property owners, said details in the 2013 inspection report reinforce evidence the Army generally did a poor job overseeing the 76-year-old Semmes Lake dam. "We are finding out what we hoped was not true," Strom said. "All the evidence tends to lead to the conclusion that they did not maintain and repair the dam."

2013 inspection cited 'serious' issues

The Army Corps of Engineers' inspection report gave the Semmes Lake dam a "serious" rating, one of the worst grades that can be assigned to a dam during an inspection. It is one of at least six dams on the Army training base that scored poorly in recent inspections, records show. Emails obtained by The State last year showed Army inspectors had concerns about Semmes Lake and

suspected deficiencies in the dam that contributed to it breaking. But the inspection report obtained by the newspaper provides the first details of the condition of the dam in 2013. "Deficiencies were identified during the inspection that require immediate remedial action," the Sept 10, 2013, inspection report says, noting improvements would upgrade "the condition of the dam and its capacity to operate safely for its current purpose." The 2013 inspection report, which has 84 pages, gave bad grades to virtually every part of the dam that was examined. Among other things, the report found problems with the top of the dam, its side slopes and its spillway. Asphalt on top of the dam had cracked and water appeared to be seeping out of the structure near an outlet, the report said. Inspectors also found medium to large voids — or holes — on the downstream slope of the Semmes Lake dam, evidence that animals had burrowed into the upstream slope of the dam, and signs of erosion on the upstream slope and at an outlet structure. In the latter case, the erosion was considered severe and may have contributed to seepage from the dam, the report said.

Holes and erosion on dams are a concern because they can weaken earthen structures and cause them to collapse, dam inspectors have said. In addition to animal burrows, trees and bushes also can cause weaknesses in dams because the roots create openings in the earthen structures. The Corps of Engineers report noted numerous examples of trees and bushes growing out of the dam. In one spot on the downstream slope, the size and density of vegetation had increased since a 2009 inspection of the structure. The 2013 report said vegetation "can be considered out of control."

Problems not cited in 2009 inspection

Trees on a dam are a particular concern if they fall over, creating openings in the dam, said Mark Ogden, project manager at the Association of State Dam Safety Officials. Dam safety officials often recommend dams remain free of substantial vegetation other than grass. "Typically, if a tree gets uprooted, that's a serious concern," Ogden said. In addition to problems with erosion and weaknesses in the dam, inspectors also said a wheel used to control water levels in the lake was missing. The dam's spillway, which sends excess water downstream to relieve pressure on the dam, also showed signs of weathering, the inspection report said. Many of the problems noted by Corps of Engineers inspectors in 2013 were not identified in 2009 by inspectors from another division of the Corps, record show. In 2009, for instance, inspectors said the dam's outlet works appeared to be in good condition. But the 2013 report found a "clear seep coming from the right side of the outlet area." The 2013 inspection was done by officials with the Corps' Engineer Research and Development Center in Mississippi. The 2009 report was put together by the Corps' Wilmington District office.

Dam 1 of 2 at fort that failed

The Semmes Lake dam was a 970-foot long structure built in 1940 to create a 29-acre reservoir on Fort Jackson. The lake has been used primarily for recreation and is one of many ponds on the military base. The dam was one of two structures known to have failed on Fort Jackson during the morning of Oct. 4, 2015. When they breached during the storm, Semmes Lake and another pond, Lower Legion Lake, sent millions of gallons of water rushing down Wildcat Creek. Property owners in the high-end King's Grant neighborhood, next door to the base, have sued the government for damages. They claim flooding in their neighborhood resulted from the dam failures and caused up to \$20 million in property losses. After the dams failed, flooding also occurred in the Devine Street area downstream, where two people died when they drove cars into the rushing water. But dam failures in other parts of Columbia, as well as torrential rain the morning of Oct 4, contributed to that flooding, experts have said. All told, more than 40 private dams failed in the Columbia area, including many in the Gills Creek watershed above Devine Street.

Parts of report blacked out

While the 2013 Corps of Engineers inspection report provides more details about the Semmes Lake dam's condition, numerous pages of the document were blacked out by military officials.

Some sections of the report did not include any pages other than a cover page. The government is allowed to redact information from some types of reports, but it needs a reason. The Corps refused to release the 2013 inspection report last year when it was sought by The State, saying information about Fort Jackson's dams could be used by terrorists. For Jackson officials have referred questions about the Semmes Lake dam failure to the U.S. Department of Justice, which is representing the Army in legal cases by downstream residents. However, the Justice Department contact listed by Fort Jackson, legislative affairs advisor Karen Wilson, said she could not comment and referred questions to the department's public information office. Attempts to reach a Justice Department spokesman were unsuccessful Friday.

Fort Jackson is proposing to reconstruct the Semmes Lake dam, with work starting in the fall of 2017. At a meeting to lay out the plans Wednesday, Fort Jackson and Corps officials said they want to build a stronger dam than the structure that failed in October 2015. The Army has considered not rebuilding Semmes Lake but prefers a new dam to restore water to the lake for recreation. A new lake also could store stormwater after heavy rains and help prevent an explosion of mosquitoes, which could occur if the lake bed returns to being a natural flood plain, according to the base.

(Oops!)

Incident at Hamilton County dam has emergency responders on watch

Staff report, poststar.com, 12/20/16

An accidental release of water that may have damaged a temporary dam causeway on Lake Abanakee has prompted emergency officials to monitor for the potential of minor flooding on the Hudson River. The dam in the town of Indian Lake is the site of a repair project, but a water release that sent more water than desired over a temporary causeway that was built as part of the repairs has prompted concerns about possible damage to the dam, Warren County Public Safety Director Brian LaFlure said.



A failure did not appear imminent, and officials in Hamilton and Warren counties were monitoring the situation. Lake Abanakee feeds the Indian River, which then flows into the Hudson River, according to LaFlure. LaFlure said the state considers the dam a "low hazard" dam that would not result in major flooding if it was breached. There would likely be minor flooding in the Hudson in northern Warren County LaFlure said there had been significant misinformation being spread about the situation Tuesday, and emergency services officials in Hamilton and Warren counties wanted the public to know what had transpired and that the situation was being monitored. Fire departments along the rivers have been notified of the potential hazards, LaFlure said.

(Another old bites the dust.)

Old Mill Dam in Bellingham to be removed

By Jennifer Fenn Lefferts Globe Correspondent, December 22, 2016, bostonglobe.com

Town officials in Bellingham, MA have started work to remove the Old Mill Dam along the Charles River. Demolishing the dam will increase public safety while improving river habitat and water quality, officials said. When the dam is removed, fish and other aquatic wildlife, as well as nutrients and organic materials, will be able to move freely between the Charles River and three of its tributaries, including Mine Brook.



The dam, which is owned by the town and is located off Pearl Street, is a hazard and would cost more than \$1 million to repair. "The dam is a liability for the town," said Bellingham Department of Public Works Director Donald DiMartino. "It is not only a cause of constant concern as we fear an untimely breach, but requires costly periodic inspections."



Hydro:

(Wonder if hydro will get any credit for the recreation opportunity it creates.)

Government Is Finally Taking Outdoor Recreation Seriously

And it will soon have the same lobbying tools as mining and timber

By Michael Harthorne, Newser Staff, Dec 9, 2016, newser.com

(NEWSER) – It's no surprise to anyone who's set foot in an REI that outdoor recreation is big business, but thanks to a rare show of congressional unity, we're about to find out exactly how big. The Denver Post reports the Rec Act was passed unanimously by both the House and Senate last month. And it was signed into law by President Obama this week, outside reports. Through the Rec Act, the Bureau of Economic Analysis will come up with official numbers for the outdoor recreation industry's economic impact. That includes its contribution to the GDP, how many jobs it creates, and the consumer spending it generates. In its own study a few years ago, the industry estimated its own value at \$646 billion, including 6.1 million jobs and \$80 billion in taxes.



But with official government numbers, the outdoor recreation industry will be able to "even the playing field," in the words of one outdoor advocate, with other industries competing for the use of public lands, including mining and timber. While those industries have "concrete federal statistics" to back up their arguments, outdoor recreation advocates had been stuck with anecdotes. Outdoor recreation can be immensely important to local economies, the Chattanooga Times Free Press reports. One expert found rock climbing alone brought \$7 million into a single Tennessee county last year. Protecting natural resources is vital to that. One sponsor of the Rec Act says he'll be able to tell other legislators: "Look at the incredible contribution to your Wyoming/Montana economy from outdoor recreation. Let's not jeopardize that by ramping up how much fossil fuel extraction is going on here."

(Everybody wants their own hydro project.)

Notre Dame to build hydroelectric station

By Associated Press, December 15, 2016, journalgazette.net

SOUTH BEND, IN – The University of Notre Dame has reached a deal with South Bend allowing the school to build and operate a hydroelectric power station on the St. Joseph River. A 50-year lease approved Monday by South Bend's parks board authorizes Notre Dame to build the station on and beneath the St. Joseph River near downtown South Bend. Construction is expected to begin in the fall, with the project coming



online in early 2019, the South Bend Tribune reported. Notre Dame will run transmission lines from the dam to its campus to generate about 7 to 10 percent of its electricity needs.

South Bend obtained an exemption in 1984 from the Federal Energy Regulatory Commission to operate a hydroelectric power station on the river, but the city did not act upon the exemption due to financial constraints. The lease agreement transfers that exemption from the city to Notre Dame. "It wasn't financially viable for the city to pursue using the exemption," said Aaron Perri, the city's executive director of parks and recreation. "Financially, there wouldn't be a return on investment for the city to do that." The project will help reduce campus carbon emissions as part of sustainability plans that aim to eliminate the use of coal in the university's power plant by 2020 and cut overall carbon footprint by more than half by 2030. However, the project will not provide a return on investment for the university, according to documents filed with the commission. University spokesman Dennis Brown said the school is also looking to harness solar energy and heat recovery projects as part of its ongoing sustainability plans.

(There's another way to use hydro.)

World's first commercial geothermal-hydro hybrid power plant located at Cove Fort

Dec 15, 2016, heraldextra.com

ROME, Utah-- Recently Enel S.p.A. ("Enel"), through its subsidiary Enel Green Power North America, Inc. ("EGPNA"), has started operations at the world's first integrated, commercial-scale geothermal-hydro power plant at its Cove Fort site in Utah. At Cove Fort, EGPNA added a fully submersible downhole generator technology to a geothermal injection well, combining geothermal and hydroelectric power at one site. "The operation of this technology, a world's first, is a major milestone for the geothermal industry and a reinforcement of our commitment to innovation and energy efficiency," said Francesco Venturini, Head of Enel's Global Renewable Energies. "We are creating innovative solutions that are making renewable energy better, stronger and smarter. As a result we have once again discovered a more resourceful way to maximize plant operations and power generation with the aim of using this technology at our facilities around the world."



Cove Fort geothermal plant, which powers 13,000 homes, has just implemented a brand new renewable energy production technique which leverages oil and gas technology to successfully add a hydroelectric generator to a geothermal plant, officially making this plant the first in the world to harness both hydroelectric and geothermal power at one site.

Findings from the initial testing phase held between July and Sept. 2016 reveal that the addition of the hydro generator to the geothermal injection well resulted in an overall increase in output of 1,008 MWh over this time, offsetting the energy consumption of the Cove Fort plant by 8.8 percent, therefore improving the plant's operational efficiency. The innovative generator technology captures the energy of the water flowing back into the earth to produce additional electricity while also better controlling the flow of brine back into the ground. The presence of the generator creates pressure against the brine flow, which reduces the flow's turbulence into the well, hence minimizing the likelihood of any potential damage to the well. The result is a first-of-its-kind innovation that can reduce operational and maintenance expenses, while also having the potential to generate additional revenues. Cove Fort is EGPNA's second hybrid power plant to begin operations in the United States. The company also operates the award-winning Stillwater facility in Fallon, Nevada, the world's first power plant to combine medium enthalpy, binary cycle geothermal, solar thermal and solar PV technologies at the same site. With an installed capacity of 25 MW, Cove Fort began operations in 2013 and generates up to 160 GWh of electricity each

year, powering more than 13,000 US households while avoiding the annual emission of about 115,000 tons of CO₂ into the atmosphere. EGPA is present in 23 US states and two Canadian provinces with more than 2.5 GW of installed capacity spread across four different renewable energy technologies: wind, solar, geothermal and hydropower.

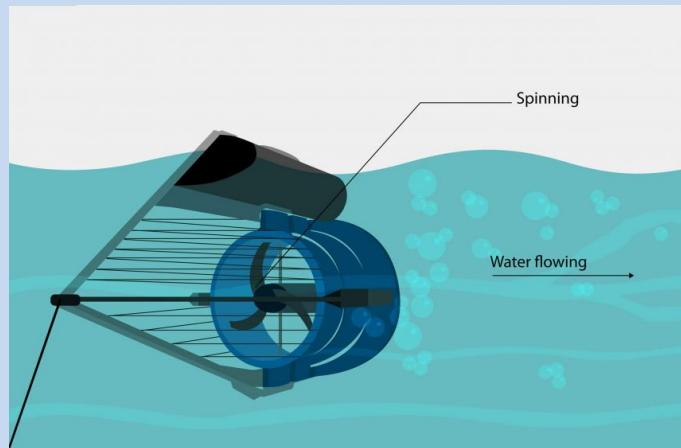
(Excerpts. Not much power, but it's better than nothing.)

Smart Hydro Power's floating turbines provide electricity to world's most remote locations

By Ben Hobson | 15 December 2016, dezeen.com

A hydrokinetic turbine works like a wind turbine underwater – the force of the current in a river or canal turns a rotor, which in turn spins a generator to create electricity.

Smart Hydro Power designs and manufactures these turbines to provide a renewable source of electricity to inaccessible rural locations. "Today, 1.2 billion people do not have any access to electricity," Kolmsee says in the movie, which Dezeen filmed at Smart Hydro Power's studio in Germany. "What we do is bring power to the most remote locations in the world." Smart Hydro Power's turbines feature a float on the top and are fixed in position using an anchor and tethers so that the rotor sits just below the surface of the river. The power output depends on the current of the river, but Kolmsee claims that a turbine can provide 8,500 kilowatt hours of electricity a year on average. This is "good enough for 30 households and a small workshop," he says. Rivers are a more reliable and constant source of energy than the sun or wind, according to Kolmsee. "A hydrokinetic turbine has one real advantage over all other renewable sources of energy," he explains. "It works 24 hours, seven days a week." This reduces the need for batteries to store the electricity generated, which are usually a costly component of systems based on solar or wind power.



Nonetheless, Smart Hydro Power usually packages its turbines together with solar panels and diesel generators – a backup in case the flow of the river slows. Kolmsee says he got the idea for the project after talking to a farmer on a trip to the Peruvian Amazon. "The farmer told me: 'What I really need is a product that allows me to use the strength of the Amazon to give me electricity,'" he recalls. He developed the product with a small team of engineers at his studio in Tutzing, Germany, using simulation software to refine the design without having to build excessive numbers of expensive prototypes. "This allowed us to bring down our cost for product development because we are able to simulate many things before going to real site testing," he explains. "It shortened the time to market for our products." Smart Hydro Power's main customers are currently NGOs (non-governmental organisations) working in Latin America, Africa and India. To date, it has set up and installed 50 turbines in these countries, which feed into "microgrids" that provide a steady supply of electricity year-round. "It enables a full utility service to even the poorest people in the world," Kolmsee says.

(Messing with historic places will be tough.)

Revolution-era New York mine could produce hydro power

Mine in Mineville, 100 miles from Albany, contributed iron for one of the first naval battles of the Revolutionary War

By Andrew Topf | 12/18/16, mining.com

Flooding a mine is a closure strategy that mining companies often use as part of a rehabilitation plan usually decided at the beginning of a mine's operating life. Once the tunnels are flooded, the

mine and its workings become submerged, not just in a physical sense but in the minds of the public, who then regard that mine as finished, and the lake that fills the former pit probably assigned a recreational use. An abandoned mine in New York state seemed to be destined to a similar, ignominious fate, but for a group of engineers who saw the historically-significant iron ore mine serving a more useful purpose.

The engineers are "pitching a plan to circulate some of the millions of gallons of groundwater that have flooded the mine shafts over the years to power an array of 100 hydroelectric turbines a half-mile underground," reads a story about the centuries-old mine, located in the Adirondacks mountains of upstate New York, carried by Associated Press.

The mine which closed in 1871 apparently notched its mark on history for contributing iron for one of the first naval battles of the Revolutionary War on nearby Lake Champlain. According to Wikipedia, the Battle of Valcour Island, also known as the Battle of Valcour Bay, took place on October 11, 1776, on Lake Champlain. Some more color is provided by the Lake Champlain Maritime Museum, which sets the stage for the battle on its website: The American fleet, commanded by Arnold, consisted of eight gondolas, three row galleys, two schooners, one sloop, one cutter and bateaux. The vessels in the British fleet were not only larger with better sailing characteristics, but they were also crewed by professional sailors under the command of skilled naval officers.



Designated a U.S. national historic landmark, Valcour Bay, Lake Champlain in New York State is one of the first naval battles of the American Revolutionary War, and one of the first fought by the United States Navy. Image by Daniel Case on Wikimedia Commons.

Electricity produced from the turbines would feed into current solar and wind producers, who lack a source of uninterrupted power, according to AP: Engineers would drain roughly half of the water from the shafts and pump the remainder into an upper chamber. The water would then be released into a lower chamber, powering turbines and creating electricity. The turbines would be reversed to pump the water back up to repeat the process. The project is basically an underground version of big outdoor projects that rely on the same principle. The New York Power Authority's Blenheim-Gilboa Pumped Storage Project in the Catskills and the proposed Eagle Mountain project in southern California, for example, use outdoor, hilltop lakes as the upper reservoirs. While pumped hydro power has been used for decades in the United States as the primary source of energy storage used to meet periods of peak electricity demand, mines are not typically used as reservoirs. If approved by federal authorities, the Mineville Pumped Storage Project would be one of the first of its kind in America. AP points out that a similar project has been proposed for an abandoned mine and quarry in Elmhurst, Illinois. North of the border, Northland Power is considering a pumped power project involving a decommissioned open-pit iron ore mine on the former Bethlehem Steel site between Ottawa and Toronto. The Marmora Pumped Storage facility would produce 400 megawatts of electricity for five hours, and create a waterfall nearly five times the height of Niagara Falls, Clean Technica reported in 2013.

(It's always the hydro project's fault because the owner has big bucks.)

FERC gets fight on FirstLight's river study

By RICHIE DAVIS, Recorder Staff, December 18, 2016, recorder.com

The Franklin Regional Planning Board and the Connecticut River Streambank Erosion Committee have responded formally to a study that largely clears Northfield Mountain pumped storage project of blame for river bank erosion. The response to the Federal Energy Regulatory Commission about FirstLight's operation of the hydroelectric project criticizes the methodology

used and arguments made in the study, which was submitted in September. The study is part of a relicensing application for hydroelectric plants along the river. That study concludes that the hydroelectric facility is responsible for only 4 percent of the erosion caused along the banks in the 20-mile river segment between the Turners Falls and Vernon, Vt. dams.

"Despite this extensive scientific literature, FirstLight claims that most of the erosion in the Turners Falls Impoundment (TFI) is due to the 'natural' erosion that happens during high flows in an undammed, unregulated river. FirstLight goes so far as to draw comparisons between the erosion in the TFI and erosion seen in 'natural alluvial' rivers in Yellowstone and Glacier National Parks."



Pine trees along the Connecticut River in Erving are dusted with fresh snow as seen from the French King Bridge, Monday, December 5, 2016.

The letter, signed by Franklin Regional Council of Governments Executive Director Linda Dunlavy, planning board Chair Jerry Lund and streambank erosion committee chair Tom Miner, faults "FirstLight's bias and lack of scientific rigor in their geomorphic analysis" and concludes, "We are very concerned that our opportunity to collect good data and apply sound scientific methods to analyze how the hydropower facilities are impacting the river — water quality, geomorphic function, bank erosion, etc. — is slipping away and may be lost for the next 30-to-50-year period of the new license." The underground pumped-storage power plant uses Connecticut River water pumped up the mountain overnight, when electricity prices are lowest, and releases it when there is peak demand and prices are highest, providing the region's electricity grid with 1,168 megawatts of power. "This huge, ongoing experiment, which began over 40 years ago, will essentially continue unmonitored for another 30 to 50 years if FERC doesn't require (FirstLight) to rigorously examine the impacts of the hydropower projects on the river and provide ... (government agencies and non-government organizations) with sufficient information to craft FERC license articles and a 401 water quality certificate that adequately protects the local, regional and national treasure that is the Connecticut River."

The response to the study was one of several that were submitted to FERC to meet the filing deadline for comments. Miner told The Recorder, "FirstLight and its consultants have treated the Connecticut River (in its analysis) like a normal river, without any dams, an alluvial. And it is anything but that. It's been manipulated for over a century, and that manipulation has been complicated further by the operation of the pumped storage, which daily cycles the surface of the river up and down. And as such, we really question the validity of their conclusions." A new license for the project is scheduled to be issued in April 2018.

(It's a big one at over 820 feet.)

Salini completes record-breaking dam

theconstructionindex.co.uk, 12/20/16

Gibe III is the first dam in Ethiopia to be built using roller-compacted concrete (RCC). It has a crest length of 630m and a height of 250m (820 ft. and 2,5 in.), which is said to be the tallest of its kind in the world. The volume of concrete used to build the dam totalled 6.2 million cubic metres and the reservoir holds 15 billion cubic metres, equal to half the volume of Ethiopia's largest lake. The Gibe III hydroelectric project has an installed capacity of 1,870MW - the same amount produced by two nuclear power plants - and will almost double the eastern African country's



electricity production. It will generate up to 6,500GWh of electricity a year, increasing the country's production capacity by at least 80%.

The dam – which stands on the Omo River 450km southwest of the capital Addis Ababa - is the latest in a series being built by the country to harness its vast water supply. Ethiopian Prime Minister Hailemariam Desalegn presided over the inaugural ceremony of the €1.5bn (over 1.85 billion dollars) (£1.25bn) project. "This is a very special day for Salini Impregilo and in particular for me," said chief executive Pietro Salini in a speech. "What was considered a dream – after years of hard work – has now become a reality. It is an extension of a complex that includes two other hydroelectric dams: Gibe I and Gibe II. These three dams, along with the Grand Ethiopian Renaissance Dam (GERD) being built by Salini Impregilo, are the product of an ambitious programme by the country to arrive at a generation capacity of 40,000MW by 2035. The project created jobs for a combined total of 20,000 Ethiopians during the various phases of its construction. Its complexity also called for international expertise, involving people from 32 countries. Salini Impregilo has recently started work on another record-breaking dam, a 335m-tall rockfill dam for the Rogun hydro project in Tajikistan.

(Hope it never happens.)

Rapidan Dam reinforced for 500-year flood

By Tim Krohn, mankatofreepress.com, Dec 20, 2016

RAPIDAN, MN — Aged and unworking parts of the Rapidan Dam are being removed and replaced with new parts or being filled in with concrete as the 105-year-old structure is reinforced to withstand a 500-year flood. "We had the contract in place this fall and had anticipated a little earlier start," said Blue Earth County Engineer Ryan Thilges. But the unusually wet fall and high river levels put off work by contractor Edward Kraemer North America until recently. Crews are working on removing, repairing and reconfiguring Tainter gates. They are a radial arm floodgate used on dams to control water flow. After that, timber "needle gates" on the east side of the dam will be removed and replaced with concrete. Needle gates are wooden timber that aren't intended to be water tight but allow water to flow through to maintain the level behind a dam. The contractor will then move to the inside cavity of the dam. Large iron gates were built into the bottom upstream side of the dam. Those gates used to be opened to let sediment sluice through the dam and downstream. But the gates long ago rusted tight and current environmental rules would prohibit letting sediment flow downstream even if they did work.



Thilges said there is concern the rusted gates will start leaking or give way and allow sediment to flow. So the gates will be covered with a thick layer of concrete inside the dam to seal them. "It will also add some additional stability to the bottom of the dam by providing more dead weight," Thilges said. All that work should be done this winter. Then late in the winter or next spring or summer, the contractor will work in the downstream riverbed, expose some of the dam's apron and do some concrete repair work on it. The state allocated \$2.4 million for repairs to the dam in the 2014 bonding bill. Early this year the county, working with the Federal Energy Regulatory Commission and the Department of Natural Resources, honed in on safety repairs that will allow the dam to withstand a 500-year flood.

The current contract work is for \$1.2 million. Thilges said the county is working with the state and federal agency as well as Eagle Creek Renewable Energy, which operates the power plant at the dam, to see what safety work should be done with the remaining state funds. "Right now we're looking at stabilizing the west wall by the powerhouse. That's our main focus." Eagle Creek leases

the dam from the county. Based on how much electricity is generated each year, the county gets a portion of the annual profits. Thilges said anyone visiting the dam area should be aware it is a construction zone and that the deck of the dam is closed. "So just stay back from that area." One thing that won't be included in the safety repair projects is rehabilitation of the generation room building at the dam. Some county commissioners had hoped part of the project funding could be used to uncover windows that have been cemented in and do other preservation work to the building. But the DNR, which administers the dam safety funds allocated by the state, said it would only allow funding to go toward safety, not aesthetic projects.



Environment:

(So fish can do what they do, swim upstream. It's amazing what free money can do.)

Fish ladder complete at Center Falls Dam

By Ryan LaRoche, homenewshere.com, December 16, 2016

WINCHESTER, MA - Good news . . . for fish, anyway Thanks to \$250k in funding from the EPA Superfund, fish will now be able to cross over the Center Falls Dam (behind Town Hall and the library) and swim upstream toward Woburn and points north. Two companies, Bayer CropScience Inc. and Pharmacia LLC, both the settling defendants under the terms of the consent decree entered in the case titled "United States of America v. Bayer Crop Science Inc, and Pharmacia Corporation, constructed a fish ladder adjacent to the Center Falls Dam. Both companies built and will maintain the ladder. After 5-10 years, the town will take over maintenance responsibilities. Town Manager Richard Howard said that the project won't interfere with the town's ability to regulate the dam gates to control flooding. In fact, the agreement clearly specifies that "neither the Companies, their Project Coordinator nor their respective employees, agents, consultants or contractors shall have any right, authority or responsibility with respect to the operation, monitoring, inspection, maintenance, repair or replacement of the Center Falls Dam ("Dam") or the condition of the Dam, nor shall they have any right, authority or responsibility to manage or control the flow of water over, through, under or around the Dam. All authority, control and responsibility for the Dam and said flow of water in connection with it shall rest solely and exclusively with the Town." The agreement also specified the date which the project had to finish, which was Dec. 31. Now, when spring arrives and fish return to the Aberjona River, they'll be able to continue their trek northward.



History

The project landed on the town's radar a year ago when Town Counsel Wade Welch said the town had been asked to comment on the coordination of this potential project with the construction of the remaining flood improvement projects and the operation and maintenance of the flood control projects when completed. To complete the project, the Board of Selectmen had to take several factors into consideration. Those included:

- Permitting: The additional federal and state permits needed to construct the fish ladder include modifications of the Ch. 91 license and of the USACE general permit 1;
- Timing: The construction of the ladder needs to take into consideration the time of year restriction imposed by the Mass. Department of Marine Fisheries (DMF) that says no work can be done during migration season, April - June;

- Operation and maintenance: Once completed, the town should enter into an agreement with the DMF to coordinate water removal prior to major flood events with minimum requirements of water levels required to promote fish migration and spawning.
- Thanks to the Superfund money, the town paid nothing to have the ladder constructed.

(Good question!)

Since You Asked: Fish use more dam water than humans

12/22/16, mailtribune.com

From the dams releasing water into the Rogue River through Jackson County, a lot of water is used to keep the water temperatures to protect fish and a lot is for human consumption (drinking, water, agriculture, industrial). Which uses more dam water, fish or people?

- Dennis D., OR

That's a little like asking how much air do humans need to live, Dennis. If you're just talking about the Applegate and Lost Creek dams, the answer is generally "fish" - with a caveat. In the 1960s, the U.S. Congress authorized creation of the dams in recognition of the economic engine that salmon and steelhead pump into the local economy, according to Russ Stauff, Rogue Watershed Manager for the Oregon Department of Fish and Wildlife. ODFW and Travel Oregon contracted with Dean Runyon and Associates in 2008 to estimate fishing-related expenditures in Jackson, Josephine and Curry counties, and the final number was \$28,373,624.

Of course, the dams' ultimate purpose is to control flooding in winter months, Stauff said. But to maintain temperatures in rivers that are beneficial to fish, water officials release cooler water from dams as needed during summer months. Local cities have the ability to tap into a portion of the water in the dams. Stauff said the cities currently don't take the maximum amount of water they're entitled to from the dams, however. So, Dennis, those dams provide a big boost to fish and to the local fishing industry. And there still seems to be plenty of water for humans.



Other Stuff:

(Interesting! What happened to WW II?)

5 Most Significant Historic Events of Americans' Lifetimes

9/11 overwhelmingly tops the list

By Evann Gastaldo, Newser Staff, Dec 16, 2016, newser.com

(NEWSER) – The Pew Research Center recently asked 2,025 US adults to name the 10 most significant historic events of their lifetimes and found that "nothing else has come close to being as important or as memorable" to Americans as the September 11 terrorist attacks, which ranked No. 1 on the survey, with 76% of respondents including it on their lists,



The rest of the top 5:

2. The election of President Barack Obama. This came in at No. 2 overall, with 40% of respondents including it on their lists. But for black Americans, this event shared the top spot with 9/11.

3. The tech revolution. This category is where Pew lumped any and all mentions of the internet, computers, cellphones, smartphones, and social media. It was included on the lists of 22% of respondents.

4. The assassination of John F. Kennedy. This was included on 21% of respondents' lists, and was particularly important to Baby Boomers.

5. The Vietnam War. This was included on 20% of respondents' lists, and was particularly important to Baby Boomers.

Click for the full top 10, plus how different generations ranked events differently:

<http://www.people-press.org/2016/12/15/americans-name-the-10-most-significant-historic-events-of-their-lifetimes>



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