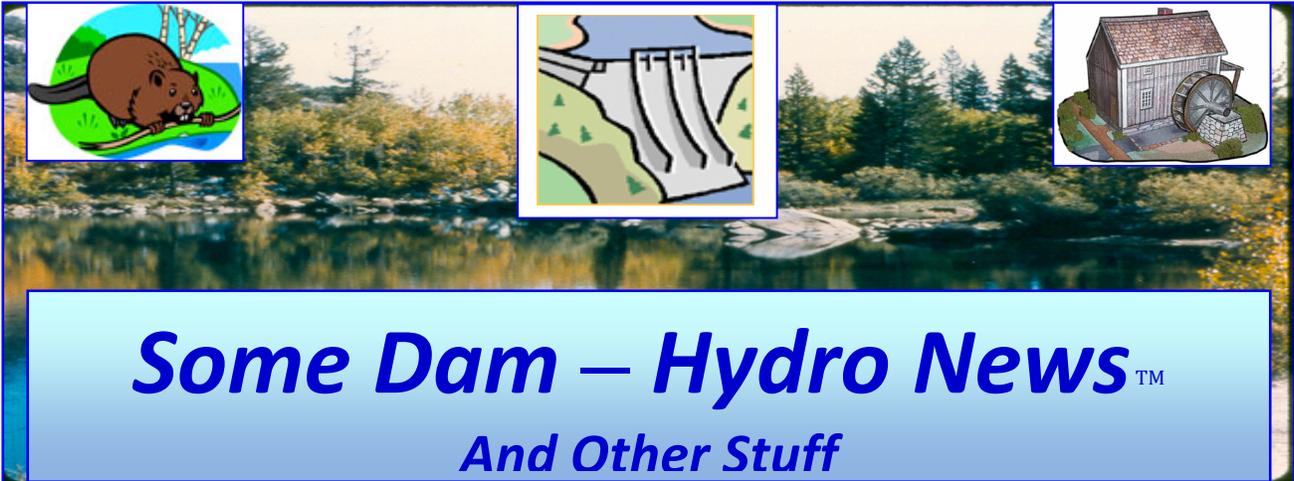


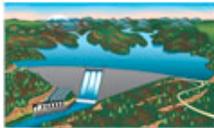
6/7/2019



Quote of Note: *“I don't think anybody should write his autobiography until after he's dead.” - Sam Goldwyn, film producer*

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: 2015 Vinum Cellars Cabernet Franc "The Scrapper"
“No nation was ever drunk when wine was cheap.” - - Thomas Jefferson



Dams:

(Wanna see barges hit a dam. Pretty spectacular!)

Barges hit two dams in Arkansas

https://www.wjhl.com/news/barges-hit-two-dams-in-arkansas_20190523182551/2021733279

(You can see the video on this site too.)

Runaway barges cause ‘minimal’ damage to dam

May 24, 2019, wpsdlocal6.com

WATCH: Barges hit dam in Oklahoma along river strained by floodwaters **(It's a better view.)**

<https://www.wpsdlocal6.com/2019/05/24/runaway-barges-cause-minimal-damage-to-dam/>

JEFFERSON CITY, Mo. (AP) — Army engineers say two runaway barges did “minimal” damage when they struck an Arkansas River dam. The barges, filled with 1,500 tons of fertilizer, swept down the flood-swollen river and **hit the Webbers Falls Lock and Dam about noon Thursday and**

sank. Town officials in the riverfront town of Webbers Falls had warned residents to flee for fear such a collision would catastrophically breach the dam and flood the town. In a statement posted on its Facebook page, the Army Corps of Engineers said **their initial inspection “found no integrity issues”** that make the engineers concerned the dam’s locks and flood gates wouldn’t perform as designed. **However, the engineers said the wreckage of the barges obstruct three of the dam’s 12 flood gates, preventing them from closing.** The corps says it “will continue to monitor and assess the dam as water conditions change.”

(There's not enough dams to control all the water. The environmental folks won't let you build a major dam.)

Greenwood County: Those below Fall River Dam should 'evacuate immediately'

kwch.com, May 25, 2019

GREENWOOD COUNTY, Kan. Update (1:00 a.m.)- The Greenwood County Emergency Manager says the **water release in the reservoir is currently underway. Evacuations for those living below Fall River Dam are voluntary, but strongly encouraged.** A shelter is set up in Eureka at Jefferson Street Baptist Church, 300 S. Jefferson Street. The Greenwood County Sheriff's Office late Friday night relayed a message from the county's emergency management that all residents below the Fall River Dam should evacuate immediately. The sheriff's office says a shelter is set up in Eureka at Jefferson Street Baptist Church, 300 S. Jefferson Street. **"Record levels of water are being released out of Fall River Reservoir that will cause widespread flooding," the sheriff's office says.**

(The battle goes on re the Lower Snake River dams. You could say the same about the dams. Once they're gone, they're gone forever. What a dilemma!)

What the dams provide can be replaced. Idaho's wild fish would be gone forever.

By David A. Cannamela, May 24, 2019, idahostatesman.com

Marci Green's editorial representing the wheat growers inspired this writing. She's right, the debate on the Snake River dams has run its course, and here's the bottom line: If we want healthy, sustainable levels of Snake River salmon, steelhead and lamprey, we must plan for removal of the four lower Snake River dams. **The sooner we accept this reality, the sooner we can dig in and work together to find solutions.** But this much is clear and



inescapable: If you are unwilling to accept removal of the dams, **then you are in favor salmon extinction,** and all of the ramifications and costs that come with it: extinction of Southern Resident killer whales; continued wasted taxpayer and ratepayer money; and the loss of cultural, **economic and ecological benefits that the fish and the free-flowing river provide.** Notably, what Marci described as a “tenuous” link between orca survival and the dams (and salmon) is anything but. **Orcas are utterly dependent on Snake River salmon for survival. “Tenuous” describes the future of our salmon, steelhead and lamprey.**

I respect Marci's right and commitment to support her constituents. **And fairness dictates that she do the same relative to the other stakeholders affected by the dammed lower Snake,** including the Native Americans; sport and commercial anglers; outfitters and guides; hotel and motel owners; restaurateurs; tackle shop owners; boat retailers and repair people; whitewater recreationists; and others. In fact, one of the most important messages we heard at the recent Andrus Center conference was this: **We will not solve this problem unless all stakeholder needs are met.**

(More get rid of the dams stuff. Best argument yet!)

Letter: Save BPA, remove dams

By Luan Pinson, Vancouver, WA, May 24, 2019, columbian.com



Can we save Snake River salmon runs? That question is linked to the following two: **Can we save Bonneville Power Administration?** And does it make sense to breach the Lower Snake River dams to save both? **Under what Bonneville Power Administration considers “critical water conditions” — that is, the past 100 years’ lowest water levels — surplus Pacific Northwest energy sits at 17 percent.** In part due to having to sell that surplus power at ever lower prices, even at a loss, BPA administrator Elliot Mainzer has recently acknowledged that BPA is in trouble. **The Corps of Engineers says the lower Snake dam turbines have a life expectancy of 35 to 45 years.** By 2030, nine of the LSR turbines will be over 60 years old, and twelve others 56 years old. The cost of rehabilitating all the turbines: over \$1 billion. **Since the LSR dams only produce 3 to 4 percent of total Pacific Northwest energy, midst a surplus of at least 17 to 24 percent, the LSR dams’ output is already unneeded — it’s surplus energy. Shedding itself of these four dams could very well save, not only fish, but BPA from “extinction.”**

(Still trying to beat that dead horse.)

Fundraiser focuses on stopping dam removal

May 16, 2019, mtshastanews.com

Halting plans to remove four dams on the Klamath River was the theme of a well-attended fundraising event hosted May 4 by the Siskiyou County Water Users Association. Halting plans to remove four dams on the Klamath River was the theme of a well-attended fundraising event hosted May 4 by the Siskiyou County Water Users Association. Guest speakers, including Congressman Doug LaMalfa, Siskiyou County Supervisor Brandon Criss, former Klamath County Commissioner Tom Mallams and Attorney James Buchal, author of “The Great Salmon Hoax” discussed problems they foresee with dam removal which they believe is far from a done deal.



James Buchal

“Those in attendance were reminded that the many articles placed by the Klamath River Renewal Corporation are meant to intimidate the public to instill in them that it is useless to struggle over the issue of dam removal,” said Richard Marshall, who helped coordinate the event. Marshall said KRRC’s press releases and contracts with independent contractors for dam removal **are being paid for with \$25 million granted them by the State of California from taxpayers.**

“KRRC had no money of its own, yet is proceeding as though it could carry out the largest dam removal project ever attempted,” Marshall said. “The organization formed in New York City in 2016 for sole purpose of taking the license to the dams from PacifiCorp and with the blessings of the States of Oregon and California per the Amended KHSA agreement destroy the Hydro Electric facilities on the Klamath River, raining destruction down river and terminating the existence of both Salmon and other endangered species habitats by the reservoirs and along the Klamath.” **“The KRRC’s mission is to remove the dams and provide liability cover for PacifiCorp, California, Oregon and the numerous ... signers on the KHSA,”** Marshall added.

Buchal, who is representing the Siskiyou County Water Users Association before the Federal Energy Regulatory Commission, has filed a Motion to Dismiss with FERC regarding dam removal and what opponents call the “thwarting of the Federal Statute derived from the compact clause of the US Constitution.” **Buchal also commented on the potential damage that opponents believe dam removal would mean for the environment and fish.** LaMalfa reaffirmed his support to keep the hydroelectric facilities in place. He also discussed the many issues facing the national

government and especially the tenor in Washington “which remains at an all-time confrontational level,” said Marshall. “He indicated that he felt confident that the current administration, once they understand the situation here, will be able to be of assistance,” Marshall said. “He will continue his efforts to speak on behalf of the District 1 region ... on the many issues confronting the area.” Criss outlined the efforts of Siskiyou County to prevent dam removal. In particular, he pointed out the reactions of PacifiCorp to the EIR by the California Water Quality Control Board on behalf of the KRRC, Marshall said.

Through its contracted attorneys, the county is an intervenor in the FERC process and has filed a challenge to the EIR done by the state, Marshall explained. The county has also brought an environmental consulting firm on board to assist in challenging assertions made by KRRC and its team. Mallams gave insight into the destruction he believes will ensue after dam removal. He raised the issue of “corrupted science,” which he believes is being used to support taking out the dams. The audience heard a review of the dam process and related issues that opponents insist remain unanswered. “They showed great support for the event by taking part in the silent and live auctions in true Siskiyou County fashion,” said Marshall. “The take away was that the FERC has not made a decision yet and the deadlines continue to get moved back as the KRRC, contrary to its public position, shows considerable weakness in its position. Any statement that the dams are coming out is premature as it is not a done deal.”

(Plugging up old holes.)

PSE planning multi-year safety project at Lower Baker Dam

By KIMBERLY CAUVEL, May 18, 2019,
gorskagit.com

The U.S. Army Corps of Engineers and state Department of Ecology are reviewing an application from Puget Sound Energy to perform maintenance at its hydroelectric dam on the lower Baker River, WA at the south end of Lake Shannon in Concrete. The agencies are tasked with reviewing permits for construction in waterways to ensure the construction is in compliance with the federal Clean Water Act and state laws. Puget Sound Energy proposes repairs to ensure the continued integrity and safety of the dam, according to the application.



Tom Danielson, PSE senior project manager for dam safety, said the work is needed to slow the leak of water from under and around the sides of the dam. The project will place sand and gravel in a portion of Lake Shannon and use grout — a concrete-and-water substance similar to that used in bathroom tiling — to stop or slow the leaks. Lower Baker Dam is a 285-foot tall arch dam that holds back Lake Shannon and generates electricity for PSE’s customers throughout the region. The concrete dam was built in 1925. “Essentially ever since it was constructed there has been an issue with leakage, not through the dam, but through the foundation and the sides,” Danielson said. It’s not uncommon, he said, for old, large dams to require occasional grouting repairs. The last time that type of work was done on Lower Baker Dam was in 1982, and before that it was done in the 1950s and 1930s.

The work in 1982 reduced the flow of leaking water from 140 cubic feet per second to 30 cubic feet per second, Danielson said. With leaks reopening and worsening over the past nearly 40 years, the flow from leaks has reached about 200 cubic feet per second. “We’re higher than we’ve ever been,” Danielson said of the leaks. “We don’t like to see water just wasted, for electricity generation, or like this year where we have a low snowpack, and if we’re losing that water we’re not getting (the lake) as high for boaters.” If PSE obtains the necessary permits,

repair work could begin in 2020 and last two years or longer. The corps will weigh the benefits of the project — which Danielson said is critical for long-term dam safety — against the possible impacts, including to the lake, river, wetlands and scenery, according to the project documents. “That water that’s leaking, we’ve recently discovered it is pulling some of the foundation rock away with it over time,” Danielson said. “There isn’t an imminent threat to anybody in the valley, but over the years ... there is a stability issue with the dam.”



PSE proposes to first put 24,000 cubic yards of fill into the lake directly upstream of the dam. The fill will include gravel and sand layers covered by a clay or manufactured membrane. In steep areas near the sides of the dam, other synthetic membranes or concrete may be used. Danielson said that will slow the leaks, making grouting easier. “It’s hard to put grout into something that has 200 cubic feet of water flowing through it per second,” he said.

After the fill is in place, PSE will drill about 300 holes into the bedrock surrounding the dam and inject grout. That will involve installing drill casing and pipe through about 200 feet of water, drilling through about 70 feet of debris on the reservoir bottom, and drilling and grouting up to 250 feet deep in bedrock below the base of the dam, according to project documents. To complete the work, PSE will need to build work platforms, docks and ramps to access both sides of the dam. Cranes, barges and helicopters may also be used. Sediment barriers will be used downstream of the work to catch fill, silt or other material that gets into the river at the project site, according to project documents. PSE plans to dispose of wastewater, material removed during drilling and excess grout at an abandoned quarry about a quarter-mile northeast of the dam. The project is expected to permanently impact 0.2 acres of wetlands, for which PSE proposes buying mitigation credits from the Skagit Environmental Mitigation Bank in Mount Vernon, according to project documents.

(More dam removal.)

Bellingham To Remove Dam For Salmon Restoration Project

By Jim Ferretti, May 20, 2019, kxl.com

BELLINGHAM, Wash. (AP) — A dam that diverts river water to Washington state’s Lake Whatcom will be removed next year as part of a project that aims to restore salmon habitat.



The Bellingham Herald reported Monday that Bellingham’s dam on the Middle Fork Nooksack River has been diverting water since 1962 to supplement the city’s main source of drinking water.

Bellingham project engineer Stephen Day says the system that pulls water from the river will be redesigned and moved upstream after the dam is demolished. The Middle Fork Nooksack River Fish Passage project aims to restore access to spawning and rearing habitat for endangered chinook salmon and steelhead and bull trout. Day says the state has set aside \$10.5 million for the more than \$16 million project

(Flood control doing its job.)

Complex system of dams turns 50, saves Oregon \$1 billion annually

By Lauren Bennett and Tom Conning, U.S. Army Corps of Engineers, Portland District, 05.16.2019, davidshub.net

Portland, Ore. - Blue River Dam is a heavy collection of rock, 270 feet high and more than 1,200 feet long. It, along with Cougar Dam, another massive rock-fill structure, work in coordination to provide flood risk management along the McKenzie River, a tributary of the Willamette River. This year, Blue River Dam turns 50-years-old, and marks the 50th commemoration of the completion of the entire system of U.S. Army Corps of Engineers’ 13 dams in Oregon’s Willamette Valley,

which has been systematically protecting people, infrastructure and a way-of-life since 1969. Flood control was the main driver behind the multiple purpose development of the Willamette River Basin after World War II. The Flood Control Act of 1938 outlined the basic development, and prompted the construction of the Willamette Valley Project's first two dams: Fern Ridge and Cottage Grove.

Additional Flood Control acts resulted in the construction of a total of 13 dams and reservoirs that make up the Willamette Valley Project. The great flood in December 1964 put these projects to the test. The end result was flood prevention benefits amounting to \$514 million (about \$4.2 billion today), over twice the cost of the projects completed at the time.



"It's interesting to think about how settlement patterns have changed in the Valley," said Cameron Bishop, Willamette Valley Project environmental specialist. "We're occupying areas where we normally wouldn't because of the lessened risk from floods. It's a strange tension," he said. Portland District owns and operates and the 12 others within the Willamette system. The District estimates that the system reduces the impacts of flooding enough to save the state of Oregon, its taxpayers and the roughly 70% of the state's residents who live in the valley more than one billion dollars on an annual basis.

Even with the annual savings and an estimated savings of \$26 billion dollars since 1994 from the reduction of floods and flood severity, the system has presented challenges. For one, many of the high-head dams block fish passage to Endangered Species Act-threatened species. Additionally, when the Corps built the structures, some lands were inundated with water, resulting in the government relocating homes and towns. These reservoirs also change water temperatures, which can have multiple impacts, some to fish and wildlife, others to water supply and quality. "Our system has allowed Willamette Valley residents to live with less disruption from flooding because we can take the peaks off of flooding events," said Dustin Bengtson, Willamette Valley Project deputy operations project manager. "But people have to realize that there are trade-offs and our agency has to balance those competing needs." As one can conclude by the amount of money saved throughout the system's history, even with the challenges it represents, the Willamette Valley Project has had an immense impact on communities downstream of the dams for the past 50 years.

(If it fails go uphill.)

OKC officials warning residents of potential dam failure

FROM STAFF REPORTS, May 22, 2019, oklahoman.com

Oklahoma City officials on Wednesday are warning residents in northeast parts of the city to take precautions for possible flooding, citing the potential for a dam to fail. "People near a private lake along Air Depot Road between Hefner Road and NE 115th Street should take flooding precautions because of a possible dam failure," officials said in a news release Wednesday. "The dam at the lake is in danger of failing, and there's more rain in the forecast. If the dam fails, flash flooding is possible along and west of Air Depot, and across NE 115th Street." Officials said residents along Autumn Road and Air Depot Road, between NE 115 and NE 122, are most at risk if the dam fails. Residents along Old County Road should also prepare for flood conditions. Air Depot Road between Hefner Road and NE 115 has been closed as a precaution. Officials say residents should consider finding a safe place to go before flooding can occur and to bring critical supplies, such as prescriptions and important papers, with them. Those who might be trapped by flood waters should call 911.

(Too much dirt. A truck driver's dream job.)

Trucks Begin Epic Dirt Removal Effort at Devil's Gate Dam

By DAVID CROSS, May 22, 2019 | pasadenanow.com

The wrangling is over and the dirt moving begun. The County of Los Angeles Public Works Department launched the first of hundreds of daily dump truck round trips out of Devil's Gate Dam early Monday.

"The first truck arrived at the site at approximately 7:15 a.m.," said Los Angeles County Public Works Department spokesman, Kerjon Lee. "Work has been going very smoothly." Lee released the routes and timing of the haul runs, which he said are varied to avoid negative traffic impacts and balance truck traffic between affected communities. Routes between 7 a.m. to 10 a.m., will run from Oak Grove Drive just south of

Berkshire Place in one direction, and the 210 Freeway La Canada ramp in the other. From 10 a.m. to 3 p.m., Oak Grove Drive near the Devil's Gate entrance will be cleared and the hauls will split in two; one taking Berkshire Place, and the other La Cañada Flintridge ramp. When school is out, hauling from 7 a.m. to 3 p.m. will be done along Oak Grove Drive, in both directions, between



Devil's Gate and Berkshire Place. The project is gargantuan in scope. It is anticipated that about 400 daily runs will take place for 10 months in each of the next four years. Some 1.7 million cubic yards of sediment are to be dispatched with, which is the volume equivalent of three Rose Bowls filled with sediment, is how LA County Public Works spokesman Edel Vizcarra described it last week.



The county tweeted Monday morning: "Moving the material enables #LACounty to increase downstream flood protection and create permanent areas for habitat restoration, recreation and reservoir maintenance." The project was and is still controversial, with local activists qualifying the measure as an environmental catastrophe. Not only is the site itself being damaged, they say, surrounding neighborhoods will bear the brunt of dust from the hauled loads and particulate matter emitted by diesel trucks that will be doing them. But that has all been hashed over. The debate may still be roiling, but the truck has left the garage. Pasadena City Councilmember Victor Gordo said, "I'm surprised to learn that the county has accounting for traffic and other related issues in La Cañada, but has failed to do so for Pasadena and Altadena. Working with some of the neighbors, I'm going to be asking the City to rectify that. The neighborhoods on the west side of Pasadena and Altadena deserve the same level of service being afforded to La Cañada and the La Cañada school district." He continued, "I'm working with together with a group of neighbors from Pasadena and Altadena.

We're developing recommendations that we will bring to the City's attention and if need be asked that the matter be agendized for discussion. My hope is that a plan can be achieved administratively. We're looking for better mitigation than we've seen." Altadena Town Councilwoman and Corresponding Secretary Dorothy Wong, who is also Chairperson for the Safe Streets Committee in Altadena observed that, although the traffic study for the project is still being done, the traffic has already been unleashed. The Councilwoman expressed concern, "as vulnerable road users must move in dangerous bicycle lanes, and no sidewalks, being sandwiched between 50-foot long trucks, cones, and cars." Wong urged the County to redouble its efforts on project safety so as, "not to lose one life in this project."

(Dams you never heard of doing flood control.)

Flood control dams protecting Oklahoma communities

By William Maetzold, May 23rd 2019, okcfox.com

STILLWATER, Okla. (KOKH) — Retired USDA engineer Larry Caldwell said flooding is hard to predict on the Cimmaron and Arkansas rivers. But he said the potential has always been there.

"It seems like we go through periods of extreme drought and then it seems like every drought is broken with a flood," Caldwell said. He said many communities should have natural flood control dams and Oklahoma has more than any other state.



"These dams were originally constructed in the '50s and '60s and they were originally constructed to protect agricultural areas downstream," Caldwell said. "Since that time, many people began to construct homes downstream because it doesn't flood anymore."

If there isn't enough of a dam network around you, you need to be ready for a possible flood. He said you need to take precautions. "When it's not flooding, to be aware of what can be done upstream in terms of maintenance, be aware of where the dams are and be prepared for if the dams do function that you know what to do," Caldwell said. Caldwell said these are needed to make sure more lives aren't devastated by flooding. "If those dams were constructed, they would see a marked reduction in the amount of flooding that occurs in those areas," Caldwell said. In total, there are just over 2,100 of these dams across the state of Oklahoma. Caldwell said there are another 330 dams that are planned but haven't been built because there's no money to pay for them.



Hydro:

(Now, they're trying to stop hydro with a world-wide campaign.)

Report Warns Of Dangers Of Swelling Number Of Hydropower Dams

By CHIKA IZUORA, May 16, 2019 5, 2019, leadership.ng

A new report by the World Wide Fund (WWF) and The Nature Conservancy has warned on the implications of thousands of hydropower dams planned across the globe. The report demonstrates how the renewable energy revolution can solve the world's climate and energy challenge without sacrificing its remaining free-flowing rivers and the diverse benefits they provide to people and nature. Launched on the eve of the World Hydropower Congress in Paris, Connected and Flowing: A Renewable Future for Rivers, Climate and People, 'details the transformations that are already



underway and how the world can capitalise on these opportunities to achieve sustainable power systems. Thanks to the plunging costs of solar power, wind generation and storage technologies as well as significant advances in energy efficiency and grid management it is now possible for the world to expand electricity generation to provide power to the billion people who currently lack access, while drastically reducing greenhouse gas emissions, and preserving tens to hundreds of thousands of kilometres of free-flowing rivers.

Jeff Opperman, WWF Freshwater Scientist and lead author on the report said, "We can not only envision a future where electricity systems are accessible, affordable and powering economies with a mix of renewable energy, we can now build that future. By accelerating the renewable

energy revolution, we can secure a brighter future for people and nature with power systems that are low carbon, low cost and low impact.” With contributions from multiple academics, the report found that accelerating the renewable revolution could prevent nearly 165,000 km of river channels from being fragmented, while still helping to limit global temperatures to below a rise of 1.5° C. Along with tackling climate change, this would help slow the catastrophic decline in freshwater species populations, which have fallen by 83 per cent since 1970.

The Nature Conservancy’s director of energy and infrastructure, Mark Lambrides, said, “A key recommendation of last week’s landmark global assessment by the Intergovernmental Panel for Biodiversity and Ecosystems Services was for governments to protect and restore river connectivity.” Here we show how, for the first time, the renewable energy revolution offers an opportunity to plan for the right mix of renewable sources in power systems, while avoiding fragmenting rivers, potentially displacing communities and contributing to the loss of freshwater fisheries that feed millions.” The report comes days after a global study published in Nature revealed that just 37 per cent of the world’s longest rivers remain free-flowing, with dams and reservoirs the leading cause of this connectivity loss.

(Another strike against hydro.)

Hydropower dams can harm coastal areas far downstream

By Paula Ezcurra and Octavio Aburto, The Conversation, MAY 17, 2019, phys.org

Thousands of hydroelectric dams are under construction around the world, mainly in developing countries. These enormous structures are one of the world’s largest sources of renewable energy, but they also cause environmental problems.

Hydropower dams degrade water quality along rivers. Water that flows downstream from the dams is depleted of oxygen, which harms many aquatic animals. The reservoirs above dams are susceptible to harmful algal blooms, and can leach toxic metals such as mercury from submerged soil.



San Pedro Mezquital River

We wanted to know whether dams also impact river systems farther away, at the coastlines where rivers flow into the sea. So we performed a natural experiment comparing four rivers along Mexico’s Pacific coast – two that are dammed and two that remain free-flowing. We found that damming rivers has measurable negative ecologic and economic effects on coastal regions more than 60 miles (100 kilometers) downstream.



Shrimp fishing along coast of Nayarit, Mexico

Feeding or starving coastlines

We studied four river outflows along the Pacific Coast of Mexico in the states of Sinaloa and Nayarit. Two of these were from the San Pedro and Acajoneta rivers, which are relatively unrestricted, with over 75% of their flow unobstructed. The other two outflows came from the nearby Santiago and Fuerte rivers, which have over 95% of their flow retained in reservoirs. In addition to restricting water flow, these reservoirs trap sediments – over 1

million tons per year along the two rivers combined.

In unobstructed rivers, sediment flows downstream and is eventually deposited along the coast, helping to stabilize the shoreline and sometimes even to build it up. We found that this was happening along the free-flowing Acajoneta and San Pedro rivers. However, because the sediment from the dammed Santiago and Fuerte rivers is no longer carried downstream, wave

action takes over at the coast. At the mouths of these two rivers, we found that waves were eroding up to 33 hectares of combined land – equivalent to about 62 football fields – each year, with widespread ecologic and economic effects on the surrounding regions.

The ecology of healthy coasts



Our field research clearly showed that coastal instability resulting from sediment loss at the mouths of the dammed rivers was harming ecosystems along the shore. For example, we found that coastal regions downstream of free-flowing rivers had significantly more plant diversity. Many of these plants were found only in coastal areas, and therefore had high conservation value. Coastal erosion due to lack of sediment input from the rivers also reduces critical nursery habitat, such as mangrove forest, where many commercially important fish species spend their juvenile stage. We found that fishing activity at the mouth of the free-flowing San Pedro River was much higher than around the mouth of the dammed Fuerte River. **This loss of fishing potential comes at a cost of around US\$1.3 million every year.** Reduced sediment flow also deprives coastal estuaries of nutrients. Lucrative shrimp and oyster fisheries in the region we studied rely heavily on nutrient inputs from rivers. **In the San Pedro River region, these fisheries generate around \$5.8 million yearly;** near the dammed rivers, they have been all but **abandoned.**

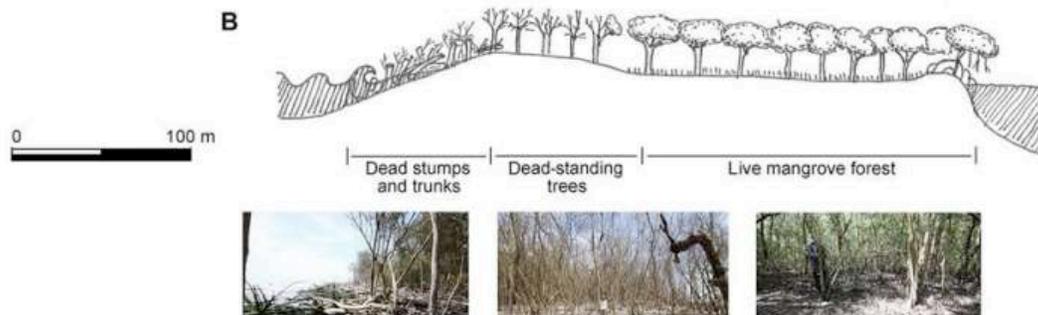
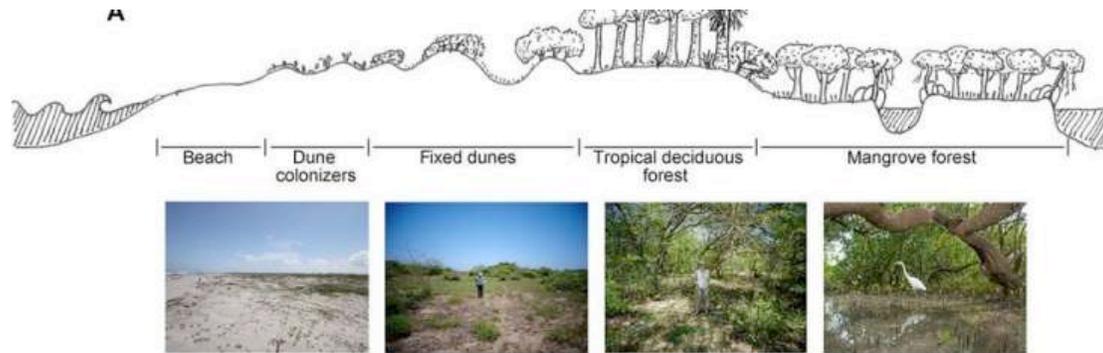
Coastal mangrove wetlands also protect shorelines from hurricanes and tropical storms, and serve as recreational areas and conservation habitat for wildlife. Knowing this, we calculated that the loss of these ecosystem services around the dammed rivers totals \$3.9 million annually. Still another valuable function that mangrove wetlands perform is storing "blue carbon" in plant tissue and soils, reducing the effects of climate change. But when coastlines recede and mangroves are destroyed, this carbon is released. We calculated that mangrove loss in our study region represented a loss of around \$130,000 in annual carbon trading potential for this region. Adding up all of the ecological services that coastal ecosystems provide, we estimate that the economic consequences of shoreline loss around the Santiago and Fuerte rivers related to hydroelectric damming totaled well over \$10 million yearly.

Letting more sediment flow

Because sediments are so essential to areas around river mouths, reducing sediment trapping behind dams could mitigate some harmful impacts on coastal areas. There are several ways to do this – notably, sediment bypassing, or diverting a portion of the sediments flowing from upriver

around dams and allowing it to rejoin the river downstream. **This strategy can be included in new construction or incorporated into existing dams.** In addition to reducing dams' environmental impacts, it also increases dams' service lives by reducing the rate at which their reservoirs fill up with silt. Critics are challenging a proposed dam on the San Pedro River at Las Cruces. **To date, environmental impact assessments of large inland dams have often failed to properly analyze the impacts that these dams will have downriver on coastlines,** estuaries, deltas and lagoons. Our study shows how important it is to fully account for dams' environmental and economic impacts along coasts and basins.

Mexico may be at a juncture in its approach to hydropower. The Mexican government recently contracted with Hydro-Quebec, the world's largest hydroelectric power producer, to revamp existing dams across the country. And a recent study by a Mexican nongovernment organization, SuMar-Voces por la Naturaleza, reported that a long-disputed proposal to build a new



Vegetation profile of sandbars of the free-flowing San Pedro River (A) and dammed Santiago River (B), where receding black mangrove forest is being eroded away into the advancing coastline.

hydroelectric dam at Las Cruces is neither financially feasible nor needed to meet energy demand for the region, prompting national groups to call for the final cancellation of the project. **We believe that Mexico and all nations working to develop efficient, low-impact energy sources should take a holistic approach to future dam-related projects,** so they can weigh their potentially harmful consequences. The coastal effects that we documented should be part of those reviews.

(Duh, we already have many pumped storage projects that give the answers they're looking for. It's like these people came from another planet. In fact, there's already pumped storage in NY.)

GE looking at reservoir pumps for renewable energy storage

By Larry Rulison, May 23, 2019, timesunion.com

Niskayuna, NY - Scientists from General Electric's Global Research Center in Niskayuna recently won a \$1.25 million grant from the U.S. Department of Energy **to study the viability of so-called pumped storage hydropower technology** that essentially stores up power generated from solar and wind farms for use on the electric grid. The grant, which was awarded by the DOE's Water Power Technologies Office, will be shared by GE Research, GE Energy Consulting and GE

Renewable Energy's hydro team. The idea of pumped storage hydropower is to pump water into a reservoir with a hydroelectric dam using excess electricity generated by a solar or wind farm when it is not needed on the power grid. When the grid needs additional capacity, the water in the reservoir is then released through the dam and through hydroturbines, generating electricity that can be immediately put on the power grid. The idea helps solve a problem with wind and solar farms, which often generate electricity during times of the day when it is not needed. Large industrial batteries often can solve that problem by storing the power for use when the grid needs it most. The idea of pumped storage hydropower is a new idea that could also be used to help store power for when it is needed more on the electric grid.

"Can (pumped storage hydropower) prime the pump to enable more renewables?" said Yazhou Jiang, a power systems engineer leading the project for GE Research. "This is a central question we're asking as part of our DOE-supported study. It's part of a mix of promising storage solutions that are emerging to meet the needs of a fast-changing energy landscape." Jiang said that the GE study will look at how viable pumped storage hydropower is as an energy storage technology. "One of the factors we will examine very closely is how quickly it can be activated to respond to rapidly changing power loads and highly variable renewables," Jiang said. GE has its own large-scale, 1.2 megawatt battery called the Reservoir that it sells to customers who need to store excess power. GE will also study if customers that are close to hydro power stations or locate near them could use pumped storage hydropower. "We're testing the hypothesis that at high levels of wind and solar, you will need a storage portfolio," said Debra Lew, senior technical director with GE Energy Consulting. "This project will help to value the benefits of pumped storage hydro to the grid that are currently not well understood." GE will also look at how the viability of pumped storage hydropower could result in more investment in the expansion of hydropower dams, which would end up putting more renewable hydropower on the grid. The study will take place over the next 17 months, GE said.

(Well, get busy!)

Report examines non-powered dams, hydroelectric conversion

May 24, 2019, by Douglas Clark, [dailyenergyinsider](http://dailyenergyinsider.com)

Thirty-two dams that currently do not generate electricity are expected to be converted to hydroelectric dams, according to the Energy Information Administration's (EIA) most recent electric generator inventory. The effort would add more than 330 megawatts (MW) of electric generating capacity to the grid over the next several years. The United States has more than 90,000 dams, but only 3 percent of those currently support hydroelectric generators. The generators have a total hydroelectric capacity of nearly 80,000 MW as of February 2019, per officials, adding other dams are used solely for water management or navigational purposes and are referred to as non-powered dams (NPDs).



The analysis revealed recent NPD presents growth is notable because conventional hydroelectric generation capacity growth has been relatively modest across the United States. Incremental capacity changes are comparatively small on a national level but can be more meaningful on a state and watershed level. If the conversion concepts come to fruition, officials said the Ohio River would gain 66 MW and reach a total operational capacity of 750 MW – which represents an increase of nearly 10 percent. Other rivers such as the Red River in Louisiana and the Allegheny River in Pennsylvania would also increase hydroelectric capacity by 49 MW and 9 MW, respectively.

(People don't do things anymore until the obvious hits them in the face. The question should be – when will the wind and solar folks see the need for PS?)

Will Pumped Hydro Energy Storage Really Get The US To More Wind & Solar? See the need for PS?

By Tina Casey, May 25th, 2019, cleantechnica.com

For all the whiz-bang cutting edge developments in new battery technology, good old fashioned pumped storage hydropower is still the number one bulk energy storage system currently available in the US. The big question is how to deploy pumped hydro in ways that funnel more wind and solar power into the US grid — and guess what, the US Department of Energy is on it. No, really!

US Energy Department Hearts Water Batteries

For those of you new to the topic, pumped hydro energy storage is exactly what it says: you pump water uphill to one reservoir. Ideally that happens when you have excess energy available to run your pumps, like at night. Basically what you've done is create a gigantic "water battery." When you need more electricity to meet peak daytime demand, you let the water flow downhill to a hydropower station. Pumped storage hydro is already a thing in the US. According to the National Hydropower Association, pumped hydro accounts for about 97% of utility-scale energy storage in the US. That probably explains why the US Department of Energy is all over pumped hydro like white on rice. In the latest development, last month the agency announced a new round of \$7.5 million in funding for innovative approaches to hydropower development that include pumped hydro.



GE Tapped For New Pumped Hydro Energy Storage Research

One of the pumped hydro awardees was GE, through a partnership between its Research and Energy Consulting arms. The team won \$1.25 million in funding to conduct an 18-month study aimed at assessing how pumped hydro can "enable higher penetrations of renewable energy" into the nation's grid. Do tell! If you're thinking that's a rather odd assignment considering how much energy the White House is pumping into preserving US coal jobs, join the club. Nevertheless, the Energy Department has been pitching wind and solar energy hand over fist along with all sorts of hydropower. In addition, GE has some new pumped hydro technology up its sleeve.

Energy Storage Under The Microscope



Until the recent drop-off in wind and solar costs, the Energy Department's vision of grid optimization through pumped hydro was so much pie in the sky. Pumped hydro does account for almost all of the utility-scale storage in the US, but the Federal Energy Regulatory Commission only lists 24 projects currently in operation, and a lot of those first started pumping decades ago. The low cost of renewable energy has changed the game, and more pumped hydro projects are now in the works. Renewable energy critics may complain that the intermittent nature of wind and solar are handicaps, but pumped hydro energy storage turns a liability into a benefit.

Here's the explainer from GE:

When paired with a wind and/or solar farm, the idea is that you could utilize excess power generated from these renewable installations to drive a pump that pushes water up into the PSH reservoir. Once in the reservoir, this energy can be released whenever it is needed most to supplement a grid's overall power needs. Thank you Captain Obvious, but the devil is in the details. GE still has to come up with a science-based accounting of the potential for reducing costs. Power Systems Engineer Yazhou Jiang, the project leader from GE, describes the

challenge: For this study, we will examine just how viable PSH [pumped storage hydro] could be as a long-term solution. One of the factors we will examine very closely is how quickly it can be activated to respond to rapidly changing power loads and highly variable renewables. Got all that? The basic idea is to see if and how modern pumped hydro technology can respond quickly and efficiently to the more nimble, renewables-integrated grid of today.

What About Renewable Hydrogen?

Yes, what about it? "Splitting" water is another interesting pathway for storing renewable energy. If you take apart H₂O molecules with an electrical current supplied by wind or solar power, suddenly you have renewable hydrogen gas. That's a big development. Hydrogen is commonly used in industrial processes, including food processing, but the primary source for hydrogen today is fossil natural gas. Yikes! So, what are the opportunities for merging pumped hydro energy storage with, wind, solar, and renewable hydrogen production? Good question! If you have an answer, drop us a note in the comment thread. Meanwhile, CleanTechnica has reached out to GE to see if renewable hydrogen is one of the angles they're considering for the new pumped hydro study, so stay tuned.

(There's always something in the way.)

Idaho, Oregon OK water certifications for hydroelectric dams

BY KEITH RIDLER, ASSOCIATED PRESS, May 28, 2019, newsobserver.com

BOISE, IDAHO - Idaho and Oregon have completed key elements in a process that will allow the license renewal for a major hydroelectric project on the Snake River on the Idaho-Oregon border, an Idaho utility said Tuesday. Idaho Power said the two states approved the company's water quality certification for the Hells Canyon Complex on Friday. The Federal Energy Regulatory Commission will now review the certification. Idaho Power has been trying to obtain a new 50-year license for the three-dam complex after the old one expired in 2005, and it's been operating on annual licenses. The utility had been caught in the middle of a fight between the two states over returning federally protected salmon and steelhead above the dams.



The deal that ultimately emerged involves Idaho Power spending more than \$400 million on water quality and habitat improvements, including narrowing and deepening key stretches of the Snake River between Walters Ferry and Homedale. Idaho Power supplies electricity to nearly 534,000 customers in southern Idaho and eastern Oregon. The Hells Canyon Complex in a normal water year produces about 30% of the company's total annual power generation. The complex, comprised of the Brownlee, Oxbow and Hells Canyon dams, together also provides about 70% of the company's hydroelectric generation, the company said. The states approving the water certification "allows us to move forward with relicensing our most valuable asset," said Brett Dumas, director of Environmental Affairs for Idaho Power. "And, it clears the way for a tremendous number of projects to improve the environment of the Snake River while Idaho Power continues to provide safe, reliable, clean energy into the future." In a related relicensing matter, Idaho Power sued the U.S. Environmental Protection Agency last year seeking to force that agency to act on a request by the state of Idaho to modify water temperature standards below the hydroelectric project where federally protected fall chinook salmon reproduce. The agency has responded and now NOAA Fisheries is considering a possible analysis of how the dams harm salmon and orcas, which feed on salmon produced in the Columbia River Basin



Water:

(Photos of flooding along Arkansas River. A lot of photos to see the devastation. **Highly recommended.**)

https://www.tulsaworld.com/news/state-and-regional/gallery-aerial-views-of-flooding-thursday-along-the-arkansas-river/collection_df4db5e6-55c5-50e2-bbb8-117cf1939b2f.html#6

(It just keeps getting worse before it will get better.)

Arkansas braces for possible "life-threatening" flooding

cbsnews.com, May 27, 2019

The National Weather Service is warning of a "dangerous and life-threatening situation" along the Arkansas River, which is expected to rise another three feet in the next few days. The river has already overtaken roads and devastated communities like Fort Smith, where homes and businesses are surrounded by water. The river is expected to crest Wednesday around 20 feet above flood stage, breaking a record set in 1945 and causing potentially catastrophic flooding.



Near Barling, Arkansas, Sunday, two Army Corps engineers assessing a dam had to be rescued by helicopter after they were trapped by the rising waters. Floodwaters are putting stress on dams and levees.

Barling police officer James Breeden told CBS News' Manny Bojorquez that he's never seen the water so high and worries about the levees holding up. "There is a concern about the integrity of the levees. They have never been tested to this limit before," Breeden said. "The potential impact is literally tens of thousands of people would be without a place to live. It would wipe out that many homes." Even after the river crests, Breeden says it might not start to recede until Friday. It could be weeks before the water returns to its normal level.

(Just think of how much worse it would be without the dams.)

One Part of the Country Faces 'Worst Flooding Ever'

Hundreds of homes are at risk or will be, authorities say

By Newser Editors and Wire Services, May 26, 2019, Newser.com

(NEWSER) – Residents in parts of Arkansas were preparing for what meteorologists on Sunday predicted will be the worst flooding in recorded history along parts of the Arkansas River over the coming week, the AP reports. The National Weather Service said in the statement that levee "over topping" is likely with "significant impacts to life and property across a very large area." The Arkansas River reached 38.2 feet on Sunday near Fort Smith, Arkansas, surpassing the historic crest of 38.1 feet in April 1945. Spokeswoman Karen Santos said the city of 80,000 residents that's on the border with Oklahoma was in "preparedness and warning mode." She said one home was completely submerged and about 500 homes either have water very close or in them.



Authorities predict hundreds more homes and businesses will flood by the time the river crests there Tuesday at 42.5 feet. Across the river from Fort Smith, the tiny town of Moffett, Oklahoma,

population about 120, was submerged by Saturday afternoon, an official said. In downtown Van Buren, Arkansas, just northeast of Fort Smith, Rickey Jones, co-owner of BrokenJoe's Screen Printing, was among several business owners who put sandbags in front of their entrances. "We're going to be stacking things as high as we can in here, taking out electronics and helping out our neighbors," Jones said. On Sunday afternoon, a National Guard helicopter was sent to rescue two Army Corps of Engineers workers trapped in a building as the Arkansas River rose, and several roads have been closed due to high water.

(Too much water.)

Swift Dam is full, water being released through spillway

MTN News, May 27, 2019, ktvh.com

Several areas in north-central Montana are grappling with excess water, including two dams along the Rocky Mountain Front. Swift Dam, which is west of Dupuyer, is full and water is running over the spillway while Gibson Dam, which is 70 miles west of Great Falls, is almost full. According to Vern Stokes, manager of the Pondera County Canal and Reservoir Company, 2,300 cfs (cubic feet per second) of water is being released through Swift's gates while 250 cfs is going over the spillway. "We should start seeing a drop later this afternoon or tomorrow," Stokes added. "I'm monitoring the situation up there all the time."



Swift Reservoir holds around 30,000 acre feet of water. According to the National Park Service, an acre foot is enough to cover one acre a foot deep or 325,851 gallons. A gallon of water weighs 8.33 pounds and an acre foot of water weighs 1,357 tons. Lake Frances in Valier, which receives water from Swift, is full so the water is being directed down Birch Creek and into Tiber Reservoir in southern Liberty County. The Cascade County Sheriff's Office reported Monday Gibson Dam is almost full due to the heavy rain and melting snow. Officials are preparing to open Gibson Dam to release the overburden of water. When the dam is opened, the Sun River will experience flooding in low-lying areas, according to the CCSO. Gibson Dam is able to store 99,000 acre feet of water in its reservoir. As of May 26, Gibson Reservoir was 93.9 percent full and pool elevation was recorded at 4719.4 feet. The reservoir flood control pool was zero percent filled. Gibson Dam is on the Sun River and Sun River is a tributary of the Missouri River. For more information or a history of Gibson Dam and Reservoir, please visit the National Park Service's website.



Other Stuff:

(Climate change solutions. You can't do it with just wind and solar, you need a holistic approach. Sounds like AOC.)

Energy Innovation and Carbon Dividend Act will lead to climate change solutions

By Joyce Tuten, Middletown, 5/26/19, fredericknewspost.com



A shoutout to our Rep. Jamie Raskin (D-8th) for co-sponsoring the Energy Innovation and Carbon Dividend Act (HR763). We need more leaders with the courage to lead. Thank you, Mr. Raskin! Climate change is threatening extinction of 1 million species on this planet, along with our own health and well-being. Most of us are alarmed and concerned for the future (for ourselves and all the world's grandchildren). Spewing

excess carbon into the atmosphere continues at record-breaking levels. To avert ever more extreme natural disasters, the U.N. estimates we have about a decade to cut carbon emissions in half, and we must be carbon-neutral by 2050. Dumping and polluting should not be free — and this bill puts a price on carbon emissions, and when things are more expensive, people buy less of them — it's simple economics! Companies will dash to renewable energy sources to reduce their costs. Consumers will easily see which products are "green." Nobody will be forced to change anything they're doing today, but those who choose to will save money — and we will all see a dividend check at the end of every year. This planet is hit by enough solar energy in one hour to power our needs for an entire year. Solar, wind, geothermal, biofuels, hydroelectric, hydrogen fuel cells, wave and tidal power — all these renewable energy sources are ready to transform our world. The days of freely burning fossil fuels must end. We understand the crisis climate change is causing and we have the tools to get to zero emissions. But we must elect politicians who will lead us there. It won't be easy, but we can demand that it get done! Joyce Tuten



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