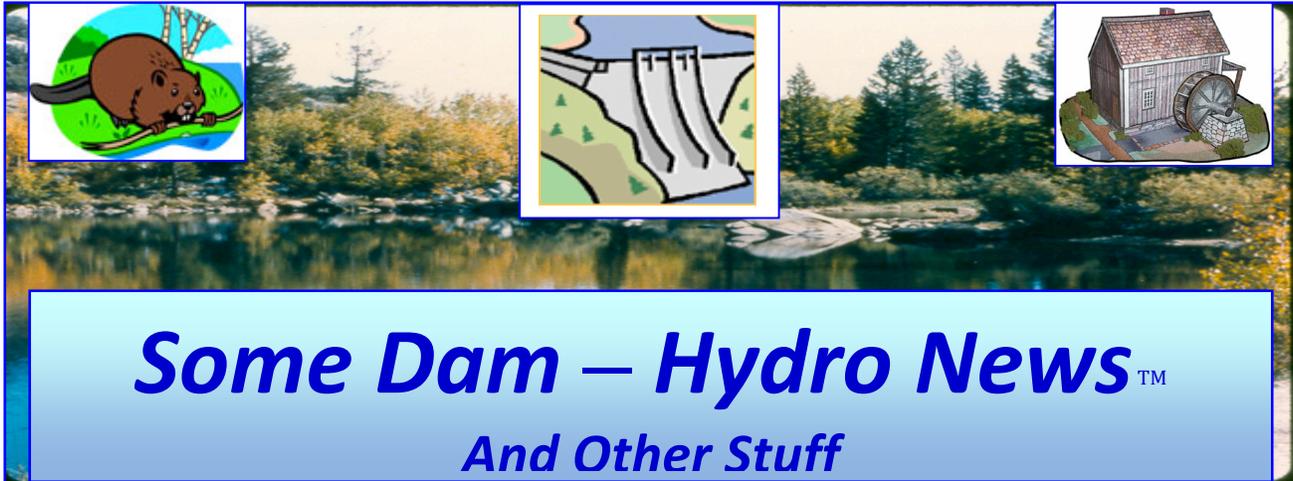


6/1/2018



Some Dam – Hydro News™

And Other Stuff



Quote of Note: *“The goal is not always meant to be reached, but to serve as a mark for our aim.” - Joseph Joubert*

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

“Good wine is a necessity of life.” - -Thomas Jefferson
Ron’s wine pick of the week: 2014 Tenuta di Arceno Italian (Tuscany) Red “Chianti Classico Riserva”
“No nation was ever drunk when wine was cheap.” - - Thomas Jefferson



Dams:

(Oroville in the news again.)

Oroville Dam: Bird’s eye look at second phase of reconstruction

By CHICO ENTERPRISE-RECORD STAFF REPORTS | Mercury News, May 22, 2018, mercurynews.com

This year, contractor Kiewit Infrastructure West Co. is rebuilding the top 730-foot portion of the main spillway and using structural concrete to rebuild the walls and resurface the chute in the middle. A flight over the location last week during a break in Butte County Sheriff’s Office helicopter training exercise, showed that much original concrete at the top of the chute has been removed, along with the walls. The exposed surface will next be prepared for installation of a drain system



and leveling concrete. The structural concrete surface will be applied over that foundation, and new structural concrete walls will be built there.

In the center, a top layer of the roller-compacted concrete that was placed last year has been removed, and the RCC walls are being removed. Next a drainage system will be added, along with a new structural concrete surface and walls. The dentates or energy dissipaters at the bottom of the spillway are also being resurfaced. At the emergency spillway, a roller-compacted concrete "splash pad" is under construction. It is designed to reduce erosion uphill erosion toward the weir like that which prompted evacuation orders in February 2017, should the emergency spillway be used again.

(Low head dams are dangerous.)

Dock Street Dam, built to improve lives, has been a 'drowning machine'

By Barbara Miller, 5/11/18, pennlive.com

Dock Street Dam, blamed for numerous drowning deaths over the years, was originally built to help improve Harrisburg, PA residents' lives. Before the city's water and sewer treatment plants were built, stormwater and sewage were discharged into the river, said Ken Frew, research librarian at the Dauphin County Historical Society. The dam was built by the city of Harrisburg between 1913 and 1916 to cover the mouth of the sewer outlets along the Susquehanna River and eliminate odors, Frew said. "They called it the sanitary dam at first," he said, adding that it also reduced mosquito breeding areas as the river levels dropped in summer. But this low-head dam has also claimed at least 17 lives through drownings, officials say.



Watch Harrisburg firefighters pull man from 'drowning machine'. The latest is Mary Bredbenner of Palmyra, who drowned Monday night after the boat she was in capsized near the dam. The body of her daughter, Madelyn Binkley, 3, was found Thursday night. Madelyn's father Cody Binkley, 26, survived and was treated for hypothermia. Grandmother of missing 3-year-old Madelyn Binkley makes an emotional plea. "If an engineer designed an efficient, unattended, self-operated drowning machine, it would be hard to come up with anything more effective than a low-head dam under certain flow conditions," writes Virgil Chambers, former chief of boating education for the Fish & Boat Commission, in an article on low-head dams.

(Gotta get rid of the water.)

Water sent through St. Lucie Dam amid flood concerns

By Andrew Lofholm, May 15, 2018, wptv.com

ST. LUCIE COUNTY, Fla. - **UPDATE:** On Wednesday, the gates remained open, but water flow was lower than what was released Tuesday. An Army Corps of Engineers spokesman said the gates will open and close based on weather in the area. No lake water is being released. Any decision to release lake water will be well publicized. Rain runoff in the swelling St. Lucie Canal was being sent eastward through the St. Lucie Lock and Dam at a rate of 1.2 billion gallons of water per day, which would fill 1,800 Olympic-sized swimming pools. Officials worried about flooding after recent rainfall.



The canal is about 20 miles from the eastern edge of Lake Okeechobee. Video shot by St. Lucie River Activist Kenny Hinkle Jr., shows four of the seven so-called "gates of hell" open, unleashing

problematic fresh water into the St. Lucie River. "It's like we're the punching bag of South Florida," Hinkle said. "It destroys everything. It destroys our economy, our property values and quality of life." "I want to emphasize that this is not water from Lake Okeechobee," said John Campbell, a spokesman for the U.S. Army Corps of Engineers. The Corps manages the dam, and the recent rain forced their hand. "Ensure that flood risk is reduced for nearby property owners," said Campbell. "We could have sent that water west to the lake and given it a little time to see what rainy season was going to do," Hinkle Jr. said. Filling Lake Okeechobee this early in rainy season could lead to dreaded discharges from the lake, which was a main contributor to the crippling algae crisis in 2016. The safer, but not perfect option is sending it east. "Certainly the runoff that collects in the canal has some challenges with quality and certainly our partners at the state and local level are aware of that. The flows through the lock and dam will be altered based on the rainfall.

(Need a new dam.)

As Dam Strains Above Leavenworth, Feds And Local Irrigation District Disagree

By Anna King, May 16, 2018, opb.org

The National Weather Service is predicting possible thunderstorms later this week around the Bavarian-themed town of Leavenworth, Washington. That could cause the Eightmile Lake Dam above the town to fail. And a simmering dispute between the local irrigation district and the U.S. Forest Service isn't helping. The Icicle and Peshastin Irrigation Districts have come under intense questioning and scrutiny as one of their four dams is under intense pressure this week and is in danger of failing.

Eightmile Lake Dam sits in a federal wilderness area. But a local irrigation district owns the dam, which helps water fruit trees, grapes, pastures and yards. "Yes, it's an old dam and it's deteriorating. But the problem is that the dam was never designed to handle the amount of outflow that the watershed can produce at this point," said Tony Jantzer, who manages the Icicle & Peshastin Irrigation District.



This week, the dam's condition has become a crisis. It's unseasonably warm. Snow is rapidly melting above the lake the dam holds back. And the area was largely burnt out by the Jack Creek Wildfire last year. That means the rocky soils now won't absorb as much rain. Fresh storms could turn even more snow on north-facing slopes into fast-running water. And now the dam has a plugged low-lying release pipe. So instead of letting out a bunch of water, the clogged pipe is only letting out a trickle. If the dam fails before it can be fixed, officials say it could take out popular hiking spots, campgrounds, roads, a fish hatchery, a community theater and possibly as many as

50 homes.

"Luckily my home's not worth much — but the land is, and lives are, and my animals are. 'Cause I have a farm. And there is no way I'd be able to get them out, so they'd all die," said Will Henson, one of about 60 downstream residents who packed into a sweaty fire hall in Leavenworth to hear the plans from officials. Jantzer has hired a consultant from Seattle and said the district is working with state experts. "So we're going to do the best job that we can right now to make it as safe as we possibly can," Jantzer said. But some in the fire hall blamed the irrigation district for failing to maintain the dam. "We've got crumbling dams high up in the Alpine Lakes Wilderness Area that have been in poor shape for decades," area resident Bruce Mack said. "And the maintenance and upkeep should have been addressed years, and years and years ago." Jantzer said there are short-term fixes: tearing down parts of the rock spillway and earthen dam to let more water out of

the lake. And installing a larger pipe to drain out even more water. On Saturday, the irrigation district spent nearly \$100,000 to fly an excavator up to the remote dam. But, the machine sat idle for about three days waiting for a federal permit.

Long-term, Jantzer wants a new dam. But U.S. Forest Service manager Jeff Rivera said that's a tall order in a designated wilderness area. He said some actions on this scale could require a new law by Congress or presidential approval. "We would need a detailed proposed action to figure out what level of authority it would take to authorize that." But Rivera said that is not something that happens fast. For now, Jantzer's hiking up to the dam with three-days' worth of food and hand tools. Once the water is low enough, he plans to crawl into the clogged 300-foot-long drain pipe himself. "Anything that's dumb and risky — I'm the manager of the district — I don't ever ask anybody to do something that I think is suspect. So I do it myself," Jantzer said. Jantzer said the irrigation district may end up suing the Forest Service. In the meantime, the district owns three more dams above Leavenworth — all of which are around 100 years old. And there aren't any reports on their current condition.

(Update.)

Eightmile Lake Dam Update

Repairs by the Icicle-Peshastin Irrigation District

BY: DAVE BERNSTEIN, MAY 18, 2018, kpq.com

Chelan County, WA Emergency Management issued the following update Friday on conditions at Eightmile Lake Dam. Chelan County Emergency Management reports that 95% of the Phase 1 repairs have been completed by the Icicle-Peshastin Irrigation District as of Thursday evening May 17th. The Phase 1 repairs at the dam involved creating a new 55 foot wide spillway at the site which is in addition to the previously existing 13 foot spillway. These repairs have greatly reduced the risk of a potential failure of Eightmile Lake Dam. The Washington State Department of Ecology successfully installed the lake level monitoring equipment on Thursday. The equipment has been calibrated and is currently transmitting data to the National Weather Service in Spokane. The Weather Service will monitor the lake level data 24 hours day – 7 days a week, and will alert Chelan County Emergency Management if there is any significant change in the lake water levels. Public alerting would take place if a dramatic change in lake level is reported. Additional monitoring equipment will be installed next week. Precipitation amounts in today's forecast are in the range of .25 to .50 inches over the Eightmile Lake drainage. These precipitation amounts do not currently raise concern, nor does it raise the alert status for the dam (Level 2). There are currently no evacuation orders in affect for Icicle River residents



(They never let up.)

Dam removal has become key for river restoration in the West

Dams, despite their gains, are hardly ever free from controversy. They throw the ecology of their surroundings off—migrating fish species can't reach breeding grounds and often die out, setting off a chain of consequences for the food-chain; damming impacts local flora dependent on an uninterrupted supply.

By: The Financial Express | May 17, 2018, financialexpress.com

Dams, despite their gains, are hardly ever free from controversy. They throw the ecology of their surroundings off—migrating fish species can't reach breeding grounds and often die out, setting off a chain of consequences for the food-chain; damming impacts local flora dependent on an uninterrupted



supply; and contrary to the purpose of improving access to water through storage, dams often bring down river capacity by as much as 25% because of silting.

Hence, dam removal has been gaining ground in developed nations—the US alone has retired and brought down over 1,200 man-made barriers to the flow of the river in the last couple of decades while in France, Sweden, Spain, Finland and the United Kingdom, over the past 20-25 years, at least 5,000 small dams, weirs and culverts have been removed, reports Nature. Recently, Spain has started dismantling its Yecla de Yeltes dam, the largest in the European Union to be decommissioned—this has been hailed as a milestone for river restoration. Studies show that the effects of dam removal have been beneficial for the ambient ecology. India, the third largest dam-building nation in the world after China and the US, has more than 5,000 large dams. To prevent ecological degradation, should it do what the West is doing? That's a hard question to answer. Some scientists call for more research into the adverse effects of dam removal, since it could dislodge toxic sediment and also help invasive species spread. Also, while ecological considerations must be factored in while evaluating dam proposals, it helps to keep in mind that there are more sustainable alternatives that can serve the same of the purposes that dams serve. Japan relies on sub-surface dams to store river water underground, rather than pooling it in reservoirs. This is far more sustainable since it cuts evaporation losses while not altering the river's flow.

Japan relies on sub-surface dams to store river water underground, rather than pooling it in reservoirs.

(Dam removal marches on.)

DNR crew begins removing Missaukee County dam

First step in dam removal is drawing down water

By Karen Hopper, Usher Cadillac News, 5/16/18, cadillacnews.com

MOORESTOWN, MI — As fish swam and turtles sunned themselves in a Missaukee County flooding, a small crew of workers took steps to drain the pond where the critters live. A gas-powered generator and air compressor rumbled, a metal cutting tool shrieked and birds sang overhead. The earthen dike at Cannon Creek No. 2 is no longer safe, according to a Department of Natural Resources assessment, said Vern Richardson, a wildlife biologist with the department who led the crew Monday morning. Trees grow along the edges of the dike, which isn't supposed to happen, he said.



Roots can give water a pathway to weaken and wash out the dike, and when trees die or fall over, they can yank out a section of the dike. On Monday morning, Richardson and two wildlife assistants, Abby Schafer and Greta Simpson, started the piecemeal dismantling of the dam in a remote part of state land in Norwich Township. They dug out underwater sediment that collected around the mouth of the dam, some of it the work of beavers. A steel tube or culvert cuts under and through the middle of a dike, which doubles as the dead end of a state forest road. A three-to-four foot wide circular steel dam controls the east-west flow of water through the culvert. Richardson, Schafer and Simpson lifted off a lid made out of chain link fencing, then used the power tools to start cutting apart the steel dam. They cut six inches below the water level, so more water could draw down. There aren't many dams like this one. Figuring out how to take it apart and cut steel underwater took some creative thinking. They practiced in a bucket beforehand, the crew said. Rebuilding dams like this one is expensive, and another dam nearby was re-done recently. So this one is going away for now. Chances are, once the area turns back into a stream, beavers will come along someplace around there and dam it back up again. They've already shoved a bunch of sediment around the mouth of the dam, trying to dam up what water there is flowing between the east and west part of the flooding.

Initial steps to remove the dam began a couple years back when the DNR lowered the water level of the flooding. Now, with a Department of Environmental Quality permit posted on a tree nearby, and in consultation with the Fisheries Division, the DNR plans to lower the flooding another six inches every few days. They can't just pull the dam out all in one go because too much sediment would wash downstream and fish might get stranded upstream. By lowering the water level slowly, the fish will acclimate, finding deeper water. Once the water level drops six inches, a result of Monday's work on the dam, Richardson and his crew will return and cut another six inches below the water level from the other half of the dam. After they've drawn down as much water as they can, heavy equipment will begin removing the dike. Richardson estimated that stage of the project will begin in June.

(Holding up under high flows.)

Enloe continues to hold fast, despite increased flow

The Chronicle, May 17, 2018, omakchronicle.com

OROVILLE, WA — Water continues to flow over Enloe Dam with no indications of issues with the structure because of high water. The Okanogan County Public Utility District on Wednesday, May 16, said the dam “continues to pass flows as it has done historically and there have been no visual indications of issues...



Spray shoots up from Enloe Dam (behind trees) on the Similkameen River. The old powerhouse is at far left.

(Excerpts. Lots of rain.)

Rains wipe out South Dakota dam, 26-year-old Indiana woman hospitalized

MAY 18, 2018, BY ASSOCIATED PRESS, cbs4indy.com

PIERRE, S.D. — A powerful storm system has dumped heavy rains from western to central South Dakota, washing away a dam in a state park near Selby. Walworth County sheriff's Deputy Justin Jungwirth says the downpour wiped out the dam in Lake Hiddenwood Recreation Area early Friday. No one was camping in the park. The earthen dam was 27 feet high and had a concrete spillway with a bridge over it. The dam was built in 1927 to create Lake Hiddenwood, one of the first artificial lakes in South Dakota. The park is closed indefinitely. The storm also brought hail and winds gusting up to 80 mph. The National Weather Service in Aberdeen reports more than 9 inches of rain fell near Long Lake. Golfball-sized hail pelted Eureka, which received nearly 4 inches of rain.-----.



(Fix for a shaker.)

Southern Oregon's Howard Prairie Dam To Get Seismic Retrofit

By Mark Freeman, Ashland Daily Tidings, May 20, 2018, opb.org | Ashland, Ore.

The dam that creates Howard Prairie Lake will get a seismic retrofit over the next year to boost its chances of surviving a large earthquake should one rock Oregon's southern Cascades. A Portland firm has won a \$5.9 million contract to beef up a large portion of the 1,040-foot-long earthen dam that is not actually resting on bedrock like the rest of it does, according to its owner, the U.S. Bureau of Reclamation.



Those portions of the 100-foot-tall dam base sit on 10 to 14 feet of stream bed "that could liquefy during an earthquake and all slide out," said Chris Regilski, the bureau's regional dam-safety coordinator. "The overall risks are higher than we'd accept," Regilski said.

(Some want them gone, and some don't.)

Dams to be removed, but some don't want them gone

By: Erick Payne, May 20, 2018 10: illinoishomepage.net

DANVILLE, Ill. (WCIA) -- Two defunct dams that are blamed for killing several people are finally coming down. But many who use the areas around the dams to fish say they're worried they won't be able to catch anything after they're removed. One of those spots is in Elsworth Park, the other is behind the public safety building. City leaders are moving toward removing them this summer. We spoke with fishermen at Elsworth Park today who are upset. Even though the city says the dams are a hazard, fishermen say it's one of their favorite spots. "I really like it here, this is what I do all the time. I don't do nothing but come fishing." Rosemary Jones says she comes to this spot of Elsworth Park every day to fish. "I don't like a lot of noise so I go fishing where it's quiet and peaceful." And the fish here are bitin'. It's part of the reason Jones, and many other fishermen don't want the dams to go.



"The people I've talked to don't want them to do it because they'll mess up the fishing." But city leaders say the process to remove them will start this summer. That was always the plan for the dam here, with the removal of the dam behind the public safety building next. Over the past 35 years the dams have been blamed for the deaths of at least seven people. The city decided to remove them in 2013. "At first they said they wouldn't because they didn't have the money." The state budget impasse put things on pause, but now the money is there. For fishermen like Damen Hagan, it could be the end of family tradition. "I loved the peace and quiet of fishing, and I loved coming out here with family going fishing." He's also worried the dam removal will mess with fishing here. "They're not going to like the fact they're getting rid of it." "I don't think these people should remove this dam because it's the only recreation around." The mayor says when the project is done, people will be able to travel the river from Danville all the way to the Wabash. We don't know how far off that reality is. We're still waiting on a date for construction to start. The state handled the bid to remove the dam behind the public safety building, so the mayor says he doesn't know exactly how much it will cost. He says he was told it will cost much less than they thought.

(Passing the flood. Get your facts straight!)

Your Views: Centerway Dam gates are fully open. Come see for yourself

gazettextra.com, 5/21/18

I thought I'd respond to the Sunday Sound Off comment regarding high Rock River, WI Levels. First, your claim that the gates are not fully open is inaccurate. All gates, including the four visible floodgates, the sluice gate (not visible from the street) and the two hydro-electric turbines in the building are and have been fully open since Jan. 23! Second, there are a number of factors contributing to the rise in the Rock River levels and being aware of them gives you a better understanding of why.

- The amount of rainfall over the last five years has been inordinate during the spring.
- The amount of new construction puts more and more land under concrete and asphalt, causing increased runoff.
- Global warming plays an integral part in the early melt and runoff of snow and ice.

- The level of Lake Koshkonong level had been lowered more than seven inches to stave off the rise in the level of the river. However, rains again have played a part in that river level.



- With each narrowing of the river, the water will back up to residents upstream, such as the narrows just north of Memorial Bridge.

Since I operate the Centerway Dam for Eagle Creek Renewable Energy, I invite the author of the Sound Off submission to visit the dam Monday through Saturday from 8 to 10 a.m. I would be happy to give you an opportunity to view all the gates' position first hand. Until that visit, please be sure your facts are straight when making claims. *DUANE SNOW, Centerway Dam operator*

(Looks like a piece of junk.)

Dangerous dam to be removed, easing paddling of Great Miami River

By Chris Stewart, Staff Writer, 5/23/18, daytondailynews.com

By fall, a second dangerous low dam along the Great Miami River will be gone, easing the way for paddlers downstream of downtown Dayton, Ohio. A \$1.75 million project to remove the Tait Station low dam between Dryden Road and Interstate 75 is set to begin July 1, according to the Miami Conservancy District (MCD). "Removing Tait Station Low Dam is a real positive for the paddling community," says Sarah Hippensteel Hall, Miami Conservancy District manager for watershed partnerships.



"Low dams are notoriously dangerous. Boaters can be trapped at low dams and drown. Now, people will be able to more safely enjoy this section of the river." Once done in October, water will riffle over stones, creating a safer experience while improving river access in the area of UD Arena and Carillon Historical Park, according to MCD.

Another low dam at Monument Avenue in downtown was partially removed beginning in Sept. 2016 and transformed into one of the features of the \$4 million RiverScape River Run, a kayak play area with boating passages that opened in May 2017. MCD worked with the Ohio Department of Transportation, which is fully funding the project that is also expected improve water quality and habitat for fish, insects and birds along the river. The 2015 US Army Corps of Engineers report about the Great Miami River Corridor recommended removing the low dam. Both the City of Dayton and Montgomery County passed resolutions supporting the project. The dam serves no flood protection service nor any other current purpose, but would require \$5 to \$8 million in repairs, according to MCD. MCD's work along the river corridor encompasses 99 miles of river along with paved trails connecting southwest Ohio communities.

(Watch: Runaway Boat Sucked thru spillway.)

<https://www.weather.com/news/trending/video/boat-in-wisconsin-sweeps-through-dam-pops-out-other-side?pl=pl-the-latest>



Hydro:

(No snow, less power.)

Reduced power possible during California summer evenings

May 9, 2018, lompocrecord.com

FOLSOM, CA — The manager of California's power grid said Wednesday that below-average hydroelectricity production could mean reduced supplies for consumers during high-demand periods this summer. The California Independent System Operator's annual summer assessment predicts supplies could dip during peak evening hours on hot days when solar power dissipates and people get home from work and turn on air conditioning. Cal-ISO said 2018 hydroelectric production will be down 1,300 megawatts by late summer compared to the above-normal production during a wet 2017. That's because snowpack water content was just 51 percent of average as of April 2, according to the state Department of Water Resources.



Peak summer demand is projected to be 46,625 megawatts under normal conditions. Last year's peak load was 50,116 megawatts on September 1, 2017. The analysis found a 50-percent probability that for at least one hour this summer officials will need to declare a Stage 2 Emergency, which has not been implemented since 2007. A Stage 2 Emergency requires Cal-ISO intervention in the market, such as ordering power plants online to meet surging demand. There's an extremely low probability officials will be forced to initiate rotating power outages, the report said

(Getting rid of the little stuff.)

Duke Energy (DUK) Reports Agreement to Sell 5 Hydroelectric Plants to Northbrook Energy

streetinsider.com, May 16, 2018

Duke Energy Carolinas NYSE: DUK) announced today that through a competitive bidding process, it will sell five small hydroelectric plants in the Western Carolinas region to Northbrook Energy. The transaction will save customers money over time, while ensuring a continued source of clean energy. The facilities, which have a combined 18.7-megawatt generation capacity, are Bryson, Franklin and Mission hydro stations in the Nantahala area, and Tuxedo and Gaston Shoals hydro stations in the Green/Broad River Basin.



Gaston Shoals

DEC will purchase all of the energy generated by these facilities for five years through power purchase agreements with Northbrook Energy. "This sale will deliver long-term benefits for our customers and shareholders," said Randy Herrin, Duke Energy Vice President, Carolinas Regulated Renewables. "Over the past few years, the cost to operate these facilities has risen significantly. Through this transaction, the plants will continue to serve our customers with clean renewable energy, but at a lower cost." "Northbrook is pleased with the opportunity to supplement its renewable hydroelectric portfolio in the Carolinas and leverage its local operating efficiencies," said Chuck Ahlrichs, President of Northbrook Energy. "Nearly 22 years after our first purchase of hydropower assets from Duke Energy, we are excited to build on our success in the region by expanding employment opportunities and proffering hydropower's baseload capabilities in support of the region's demonstrated desire to deploy intermittent renewables such as wind and solar."

Northbrook Energy is a privately-held, independent power producer that has been in the hydroelectric business for more than 30 years. The company operates hydro assets in 12 states, including the Carolinas. Northbrook partnered with New Energy Capital Partners, LLC to finance the acquisition of these hydroelectric plants. Based on the upkeep investments needed over time, DEC determined it was in the best interest of customers to sell the facilities. Financial terms of the

transaction, which will result in net savings for customers over time, are not being disclosed presently. DEC will seek approval from state regulators to establish a regulatory asset for the retail portion of the difference between sales proceeds and net book value. The completion of the transaction is subject to approval from the Federal Energy Regulatory Commission (FERC) to transfer the hydroelectric licenses to Northbrook Energy, as well as other state regulatory approvals

(The more hydro, the better.)

Technology Roadmap - Hydropower: Foldout

Download: <https://webstore.iaea.org/login?ReturnUrl=%2fdownload%2fdirect%2f505>
webstore.iaea.org, 5/23/18

Hydropower could double its contribution by 2050, reaching 2,000 GW of global capacity and over 7,000 TWh. This achievement, driven primarily by the quest of clean electricity, could prevent annual emissions of up to 3 billion tonnes of CO₂ from fossil-fuel plants. The bulk of this growth would come from large plants in emerging economies and developing countries.



Water:

(It's spring and the snow is melting fast.)

Great Falls dams handling significant run-off this season

May 18, 2018 by: Margaret DeMarco - MTN News, krtv.com

"The thing that I love about all our hydro sites, a lot of them are very old they're very historic. We have the opportunity to manage a facility that's over 100 years old in some cases," Clotfelter said. NorthWestern Energy operates the five dams from Black Eagle to Morony Dam. Clotfelter says this year's significant run-off started a little later due to the high snow pack and cooler weather. But only so much water can go through the plant at any given time "Here at Rainbow that is 8,000 cubic feet per second. For every cubic foot above 8,000, then we have to pass through or over the dam," Clotfelter said.



Clotfelter says about 17,000 cubic feet per second is going over Rainbow Dam right now. Per their operating license, whatever water that comes into Black Eagle they have to match the flows through the other dams leading all the way to Morony. They are also able to control the elevation of the reservoirs and they are prepared for the water that is coming toward the dam. "On a year like this they can fill completely and then the volume of Canyon Ferry will help keep our flows up after run off, through July, August, September, and October. It does give us some benefits, not today, but through the season," Clotfelter said. Clotfelter says they also keep an eye on the sticks and logs that are floating down the river. There are two ways they deal with debris: one is the intake screens that feed into the power plant. They will rake the screen and dispose of the martial that is collected there. The second is letting the debris go through the dam so it keeps going down stream. "We have very experienced, very skilled crews that know how to deal with that. They do it quite often. If they have to take some extra care in getting something through they can certainly do it," Clotfelter said. There is only one place of concern when it comes to the high runoff this season. "Where I think the real risk is on the river stretches and the valleys, where the normal river channel may not be able to handle the flow that is in the river. That is beyond our control," Clotfelter said.

(Dams get you thru drought years.)

Dams and droughts: What's the connection?

By Megan McNeil, May 17, 2018, kjct8.com

PALISADE, Colo. (KKCO/KJCT) -- Believe it or not, some dams in the Valley still make electricity with water. With low river flows and snowpack, how does that affect making power? At the Orchard Mesa Irrigation District, they have a hydroelectric plant. That means they make electricity from water, certainly not a new concept. The plant has been making electricity since the 1930s. However, it is a little unique because low water won't affect the plant's ability to make electricity.



"It's user-friendly, it is renewable energy," said Max Schmidt, Orchard Mesa Irrigation District. Water is diverted from the De Beque Canyon, and driven through a power canal. "That power canal delivers to my hydroelectric plant and my hydro pumping plant," said Schmidt. The hydroelectric plant can make about 4 megawatts an hour—that's about what the town of Palisade uses every 60 minutes. The electricity relies on the water flowing in the Colorado River. "The problem with water," said Schmidt. "The two things you can count on are gravity and greed." Gravity because that's how the water gets to irrigation canals and crops. Greed comes into play when people overuse water during droughts. "When people hear drought, they rush out, push the button on their half horse sprinkler pump," said Schmidt.

Colorado is in a drought now, but the Western Slope should be okay for this year because of the reservoirs and the senior water rights ag users have. "If we ever get two of these years back to back, everyone will be hurting," said Schmidt. If two drought years happen, the Orchard Mesa plant could still make power. "It would have to be a pretty low river to cut back our energy production," said Schmidt. They can borrow from other water agencies, and more importantly, return the water back to the river. That's big because the water they use for energy and irrigation feeds peach orchards, grape vines and crops. "Drive north and cross the last canal, and it's desert," said Schmidt. "Without the water, there wouldn't be a Grand Valley." About a third of the water the Orchard Mesa Irrigation District takes from the river goes to irrigation, the rest goes to making electricity, and then back into the river. 2002 was the worst drought Colorado has seen since at least the 90s. 2012 was another dry year, and the irrigation district said the river levels now are close to what they were in 2012.

(A very important treaty.)

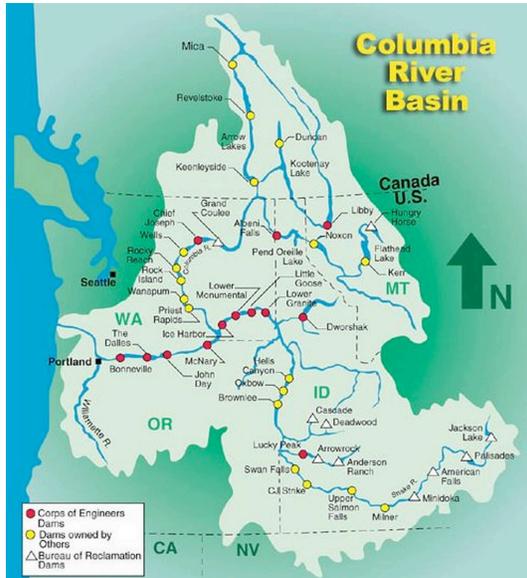
Columbia River flood control and power rates will depend on these talks

BY ANNETTE CARY, tricityherald.com, May 22, 2018

KENNEWICK, WA - Long-awaited negotiations to modernize the Columbia River Treaty between the United States and Canada will kick off May 29-30 in Washington, D.C., the U.S. Department of State announced on Tuesday. The announcement drew praise from Sens. Patty Murray and Maria Cantwell, both D-Wash., and Reps. Dan Newhouse and Cathy McMorris Rodgers, both R-Wash. The treaty, signed in 1964, provides the framework for flood control and coordinated hydropower generation on the 1,200-mile Columbia River. It also has contributed to other benefits, including supporting the river's ecosystems, irrigation, municipal and industrial water use, navigation and recreation, according to the State Department.

"The Columbia River Treaty is integral to so much of the Pacific Northwest way of life — from our economy, to our environment, to our culture and heritage — so it's hard to overstate the importance of updating this treaty to meet modern-day issues," Murray said. Newhouse called the negotiations long overdue.

There are more than 250 reservoirs and around 150 hydroelectric projects in the Columbia River Basin, including 18 main-stem dams on the Columbia and its main tributary, the Snake River, according to the Army Corps of Engineers. Washington state's congressional delegation has urged the federal government since as early as 2014, when either country could move to end much of the treaty's provisions by giving 10-years notice. Other provisions, such as a requirement that Canada provide downstream flood control, expire in 2024. Newhouse is concerned that an equitable arrangement is reached to benefit both countries. The Bonneville Power Administration and the U.S. Army Corps of Engineers developed a regional recommendation that calls for the historic focus of power generation and flood control to be expanded to also include ecosystem goals, such as stream flows with appropriate timing, quantity and water quality for salmon. The



recommendation also called for reconsideration of the "Canadian Entitlement," the deal that is providing Canada with \$250 million to \$350 million a year worth of electrical power in exchange for storing water in huge reservoirs that can be released to boost U.S. hydropower generation. The benefit is higher than anticipated by the United States when the treaty was signed. "It's my hope we can update and rebalance the terms of this agreement so it can remain mutually beneficial into the 21st Century," McMorris Rodgers said.

The current treaty requirements for providing power to Canada place an unfair burden on consumers in the Northwest, according to her staff. Cantwell call the start of treaty negotiations a positive step. "This is a very positive step. The State Department and Canada must now work to include input from all parties," she said. Treaty negotiations will include the State Department,

along with the BPA and Army Corps of Engineers Northwest Division, the two agencies that implement the treaty in the United States. Also at the negotiating table will be the Department of Interior and the National Oceanic and Atmospheric Administration. The U.S. government plans public town halls as negotiations proceed. No dates or locations have been announced.



Environment:
(Regulation change.)

FERC Proposes Reforms to Hydropower Recreational Use Requirements

May 18, 2018, natlawreview.com



On May 17, 2018, the Federal Energy Regulatory Commission ("FERC") issued a Notice of Proposed Rulemaking to eliminate the Licensed Hydropower Development Recreation Report, or FERC Form No. 80 (Form 80) and revise certain public notice requirements ("Hydro Recreation NOPR"). For licensees, the proposed elimination of Form 80 would save the expense of compliance with a regulatory requirement that the Hydro Recreation NOPR itself concedes is otherwise provided to FERC pursuant to license conditions or other requirements. The Form 80 requirement dates back at least to 1966 when FERC amended its regulations to compel licensees to compile a report of the use and development of recreational facilities at each development contained within a licensed project every six years.[1] The Hydro Recreation NOPR represents a comprehensive reassessment of how recreational use of licensed projects is measured, evaluated and administered. In addition to proposing to

eliminate the Form 80, FERC seeks to modify how licensees communicate their recreational use practices with the public.

Elimination of Form 80

Form 80 requires licensees to report the number of visits, the use capacity, and the total annual cost to develop, operate, and maintain the public recreation facilities. All licensees must comply with the Form 80 requirements unless they obtain an exemption for developments with minimal potential recreational use. **The Hydro Recreation NOPR proposes to eliminate the filing of Form 80 because it contains largely duplicative information and lacks specificity.** The Hydro Recreation NOPR notes that FERC's modern practice is to gather information related to a development's recreational use through specific license conditions, sometimes through the requirement to develop and administer a recreation plan for the project. In practice, FERC staff utilizes the recreational information obtained through these license conditions, thereby obviating the need for the Form 80. Removing the Form 80 obligation will not relieve licensees from other existing requirements including providing public access and monitoring recreational resources.

Website Posting of Recreation Information

The Hydro Recreation NOPR also proposes to update licensee public communication with respect to recreation by requiring licensees to post information relevant to recreational use and development, including a statement of license conditions relating to recreation, to the licensee's existing project-specific website. **Licensees would only be subject to this requirement if they already have a project website and the proposal would not obligate a licensee to create a new website specifically for this purpose.** This proposal is intended to provide the public with greater access to the recreation-related information. **In addition, the Hydro Recreation NOPR would require licensees to include copies of approved recreation plans, recreation-related reports, and the entire license instrument on any existing project websites.** Licensees are already required to make this information available for public inspection at its local offices, and this proposal would provide an alternate method for the public to obtain this same information for licensees with existing project websites.

Recreational Signs

Lastly, the Hydro Recreation NOPR would reduce the amount of information licensees are required to include on signs at each public access point for a project. Under existing regulations, a licensee is required to post a sign at each public access point that includes project-related information and public recreation areas, times and recreation-related regulations. The Hydro Recreation NOPR would reduce the required sign information to include:

- The project name;
- The project number;
- A statement that the project is licensed by FERC;
- The licensee name and contact information for obtaining additional information; and
- Permissible recreation times and activities.

Next Steps

The Hydro Recreation NOPR was issued by FERC on May 17, 2018. **A 60-day comment period will commence from the proposed rule's publication in the Federal Register.** Even if comments on the Hydro Recreation NOPR display large areas of consensus, the time frame for further FERC action to finalize or modify the proposals in the Hydro Recreation NOPR is unclear, given that FERC has a number of competing priorities.



Other Stuff:

(Primer on energy storage.)

Different Types of Power Storage Stations

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The storage of electric energy on a large scale has become an area of increasing interest, especially when considering the growing demand of developing renewable energy sources that can be stored for extended periods of time. Since electricity cannot be stored directly, and must be instead be converted to other forms of energy until future conversion to electricity, current energy storage systems are limited in their ability to store an ideal quantity of energy for future use. To date, numerous energy storage systems currently exist and operate in a variety of different mechanisms to provide energy on an as needed basis.



Pumped Hydroelectric Storage

Pumped hydroelectric energy storage facilitates store energy in the form of water through the use of two reservoirs at different elevations. When the supply of energy exceeds the demand of the energy, water is pumped into the upper reservoir, however when the demand of energy exceeds the supply at the facility, water is released into the lower reservoir and run downhill through turbines that provide electricity in a manner that is similar to conventional hydropower stations¹. There are currently 40 pumped hydroelectric storage projects currently taking place in the United States alone, providing approximately 20 GW of energy, or 2% of the capacity of the electrical supply system. These types of energy storage systems provide energy-balancing and stable grid options when necessary



Battery Energy Storage Systems

Although batteries are commonly used in a wide variety of applications, these energy storage systems are required to exhibit a high energy density and power, as well as long charge-discharge cycles, high round-trip efficiency and safety, all the while maintaining a competitive cost against other battery types.

Lithium Ion Batteries

As of 2015, lithium-ion (Li-ion) batteries accounted for approximately 51% of all newly developed energy storage systems (EES), and are often found in laptops, cell phones and other portable muscle devices². As one of the most energetic rechargeable batteries that are currently available on the market, Li-ion batteries are typically composed of the lightweight yet highly reactive element lithium, which accounts for its ability to store a high amount of energy within its atomic bonds, as well as some carbon concentrations.

Zinc Bromide Flow Battery Modules (ZBM)

The zinc-bromine battery primarily stores energy by plating a zinc metal as a solid onto the anode plates within the electrochemical stack during charge, thereby allowing for the maximum energy storage capacity of the battery to be dependent upon the area of the electrode, or stack size, as well as the size of the electrolyte storage reservoirs. Originally developed by Exxon during the 1970s, this hybrid redox flow battery offers one of the highest cell voltages and energy densities as compared to other currently used flow batteries³. While useful for these properties, the zinc-bromide batteries often require highly expensive materials to withstand the highly toxic and oxidative properties of bromine, thereby limiting its practicality in many applications.

Aluminum-Ion Batteries

When considering the element aluminum on its own, it is associated with transferring energy at a more efficient rate as compared to lithium, as this element gives up its electrons to flow freely through the external wires to power a given device. As a battery, aluminum-ion batteries (AIBs)

have been associated with a lower flammability and higher capacity as compared to Li-ion batteries⁴. Although AIBs exhibit a reduced cathodic performance as compared to Li-ion batteries, researchers have become increasingly interested in developing AIBs of a higher density for potential applications in technological devices. For example, a team of researchers from Clemson University in South Carolina has recently developed the “few-layer graphene” energy storage device, which is a novel battery technology that combines aluminum foil with thin sheets of graphite that allows the electrode to store the electrical charge from the efficiently packed aluminum ions within the graphene layers⁵.

Compressed Air Energy Storage

Compressed air energy storage (CAES) systems utilize compressed air that is stored during off-peak times in underground caverns that, when necessary, is eventually fired with natural gas in a combustion turbine to generate electricity⁶. By utilizing only 30% of the natural gas that is required in traditional energy methods, CAES plants operate at an efficiency of approximately 70%.

Thermal Energy Storage

The storage of thermal energy is typically used to generate electricity by transforming solar power, even when the sun is not shining. Thermal energy plants capture the heat from the sun and store this thermal energy in water, molten salts or other fluids for the future generation of electricity⁷. Currently, thermal energy storage plants have been successfully implemented in California, Arizona and Nevada, in which a California molten salt storage plant has successfully provided power to approximately 68,000 homes. Thermal storage technologies have also been used in the reverse by freezing water at night through the use of off-peak electricity, and then releasing the stored cold energy from the ice to assist with air conditioning during the day.

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(Clean energy.)

West boasts the cleanest electric grid

By Allyn Svoboda, Guest Commentary, 5/20/18, telluridenews.com

Commentary

The western United States has the cleanest electric grid, according to electric power generation data published by the U.S. Electric Energy Administration (EIA) earlier this year.

Hydroelectric, wind power and solar photovoltaic (PV) now generate about 42 of every 100 kilowatt hours in the West. Hydropower supplied about 26 percent of the western U.S. electricity supply in 2017. Non-hydro renewables — variable wind and solar — combined added about 16 percent. Hydropower generation in the West was greater than normal in 2017, due to wet conditions, according to EIA.

In February, Western utilities delivered about 55 terawatt hours of electric energy to consumers (one terawatt hour equals 1 billion kilowatt hours). The U.S. Central region ranks second in renewable-source power production. EIA’s predictions for 2018 and 2019 show growth in wind power, solar PV and natural gas-fired power plant electricity generation. EIA expects variable

non-hydro renewable electric power generation (wind and solar PV) for the entire U.S. to reach 10 percent of total power production in 2019. U.S. wind power generation will exceed hydropower for the first time in 2019, assuming precipitation and snowpack do not vary from recent years. Natural gas-fired power generation in some parts of the U.S. will increase in 2018, while coal-fired electric power declines again.

"Power plant operators are scheduled to bring 20 gigawatts (GW) of new natural-gas fired generating capacity online in 2018, which, if realized, would be the largest increase in natural gas capacity since 2004. Almost 6 GW of the capacity additions are being built in Pennsylvania, and more than 2 GW are being built in Texas," according to a Jan. 22 EIA statement. "In contrast, about 13 GW of coal-fired capacity are scheduled to be retired in 2018. These changes in the generating capacity mix contribute to the continuing switch from coal to natural gas, especially in Southern and Midwestern states." (One GW equals 1,000 megawatts or 1 million kilowatts.) Renewable power sources are expected to comprise 36 percent, or about 11 GW, of the total new 2018 generating capacity, according to EIA.

Utilities in the Eastern U.S. will add several natural gas-fired turbines, and smaller wind-power and solar-PV sites. The West and Texas will add mostly wind-turbines and solar-PV power generation to power generation fleets. Texas leads the nation in wind-powered generation capacity with more than 21,450 megawatts. Since 2014, Texas wind turbines have produced more electricity than both of the state's two nuclear power plants, according to the EIA in its Short-Term Energy Outlook released this month, the EIA compares 2017 actual electric power generation from various fuels and sources with its predictions for 2018 and 2019. The 2019 predictions vs. 2017 are 34 percent (up 2 percent) for natural gas-fired power plants, 29 percent (down 1 percent) for coal-fired, 20 percent (no change) for nuclear, 11 percent (up 1 percent) for non-hydro renewables (wind and solar) and 7 percent (slight decrease) for hydropower. U.S. renewable-source power generating capacity additions exceeded new fossil-fuel power plants in five of the past nine years. Carbon dioxide emissions from electric generation are expected to increase. "After declining by 0.9 percent in 2017, EIA forecasts that energy-related carbon dioxide emissions will increase by 1.4 percent in 2018 and by .4 percent in 2019. Energy-related emissions are sensitive to changes in weather, economic growth, and energy prices," according to the report. *Editor's note: Allyn Svoboda is a candidate in the SMPA District 3 election. He resides in Rico, and was system engineer at two Colorado electric cooperative associations similar to SMPA for 34 years.*



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