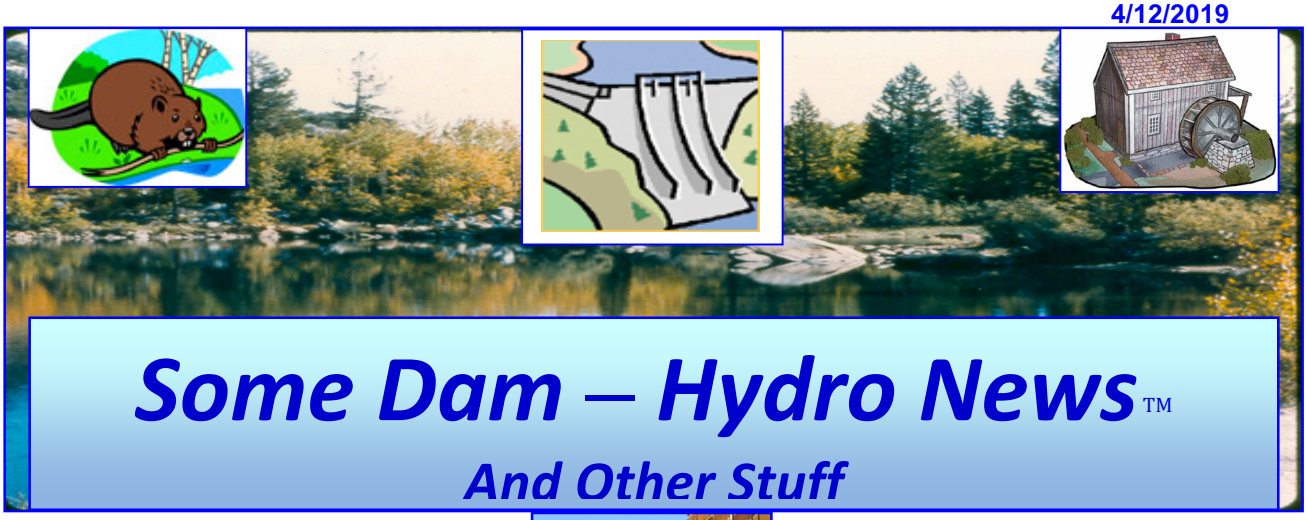
4/12/2019



Some Dam – Hydro News™

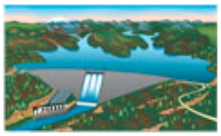
And Other Stuff

i

Quote of Note: *"A mistake is simply another way of doing things." - Katharine Graham*

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 u***nder 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: **2016 La Crema Pinot Noir "Willamette Valley"**
"No nation was ever drunk when wine was cheap." - - Thomas Jefferson



Dams:

(Dams provide benefits that can't be had without them.)

It's time to let go of this dam technology

By DANIEL OROPEZA — 3/13/19, theaggie.org

The environmental impacts of dams

Once called the Ninth Wonder of the World, the Oroville Dam is the tallest dam in the United States. Standing at 770 feet — 40 feet taller than the Hoover Dam — the Oroville Dam was built in 1967 in response to major floodings of the Sacramento Valley in the 1950s. The Oroville Dam now stores water for agricultural use downstream from Lake Oroville, including the San Joaquin Valley, during the dry seasons. The Oroville Dam also generates hydroelectricity for municipal and industrial water supplies all the way in Southern California.

The only "wonder" I have is when we're going to phase out this ancient technology. Since their invention in ancient times, dams have been instrumental in suppressing floods and directing water for irrigation. They've also provided water for industries, aquaculture and hydropower. Hydropower generates electricity in 48 states and is the biggest source of "clean" energy in the country. It accounts for 52 percent of the nation's renewable electricity generation and 7 percent of the total electricity generated. We've all benefited from dams in some way. But at what cost? As environmentalist David Brower once said, "If you are against a dam, you are for a river." To ignore the impacts of dams is to turn a blind eye on the importance of rivers for the environment. Rivers function as a circulatory system in a landscape; they drain waste products off of the land and carry that sediment to structure the habitats in rivers. Once the sediments reach the coast, beaches and other offshore environments are born. Anything that disrupts the flow of a river is detrimental to the ecosystem. According to the organization International Rivers, dams disrupt and slow the free-flowing river ecosystem to an artificial, slack-water reservoir habitat. This disruption affects the temperature, chemical composition, oxygen levels and physical properties of the upstream habitat. As a result, many aquatic plants and animals that evolved with the river are no longer optimally suited for their environment. Some dams have even led to the extinction of many fish and aquatic species, the disappearance of birds in floodplains, huge losses of forests and wetlands, and the erosion of coastal deltas.

The Oroville Dam is no stranger to these impacts: it reduces the streamflow of the Feather River from 5,834 cubic feet per second to an average of 1,086 cubic feet per second. This negatively affects the river habitat in many ways and limits fish migration up the Feather River. Current environmental impacts might not be the worst or most costly yet. Climate change reports predict more severe weather extremes, but these predictions might already be coming true. In 2017, California experienced unusually high rainfall in a short amount of time. This lead to the Oroville Dam overflowing and the evacuation of 188,000 Sacramento Valley residents, costing $1.1 billion in reconstruction repairs. Unfortunately, dam problems don't stop there. Human-induced reservoirs have been linked to more earthquakes, and the Oroville Dam is no exception. A few years after the dam was built in 1967— creating California's second largest reservoir — the area was struck by a 5.7 magnitude earthquake. A U.S. Geological Survey investigation into the recent Oroville Dam crisis proved that using spillways to prevent overflow can also trigger earthquakes.

We don't think of the environmental impacts we cause until the ground under our feet starts shaking. We have been using the environment to our benefit without regard for the cost since before the first dam was created. It's time to rethink the idea of dams as a "clean" renewable energy source. It's time to look back at history and learn from our mistakes. It is not sustainable to live by creating personal benefits at the expense of the environment. Just as we're rethinking our use of coal and nuclear power, we must also question our use of hydropower from dams. If we sit too comfortably with this historic technology, we rob ourselves of the opportunity for innovation. If we can learn to shop for our food in-season because it's a more sustainable way of living, why can't we act similarly when we build our communities or acquire our energy? It might take years to get out of the hole we've dug; we've built our homes and businesses along the depleted rivers that these dams block. We might have wed ourselves to dams, but divorce is imminent.

Disclaimer: The views and opinions expressed by individual columnists belong to the columnists alone and do not necessarily indicate the views and opinions held by The California Aggie.

(More for Klamath R. Dam Removal.)

Local Opinion: Not just another dam story

By Opinion submitted by Jack Trout, Mount Shasta, Mar 23, 2019, siskiyoudaily.com

I have been a proud Siskiyou County resident and business owner for more than 25 years. Like many of you, I want what's best for our region's precious natural resources – our mountains, air and water. It's why we chose to live, work and raise our families in this beautiful part of the state. As a fly fisherman, I am especially connected to nature as I

spend more than 100 days a year out on the Klamath River guiding fly-fishing adventures, giving scenic tours and sharing the great outdoors with people from all over the world. I started fishing Northern California streams and rivers as a child alongside my father, a fishing guide on the Feather River in Portola. It is with this experience that I plead for support to remove the lower Klamath dams.

Over the years, I have seen a dramatic decline in the Klamath River salmon populations. Once upon a time, our local rivers, streams and creeks rivaled the salmon runs in Alaska, with an abundance of Chinook (Kings), Coho (Silvers), Kokanee, Sockeye, Chums and Humpbacks. Now all we have left are the memories of this incredible local resource. The Klamath dams are in their first 100 years of existence and their useful life is determined by just that, their usefulness. But there comes a point when we need to evaluate what we're sacrificing and what we're gaining in return. Here's what we know. The lower Klamath dams and reservoirs do not provide multipurpose water storage, flood protection, or irreplaceable energy. What they do provide are major barriers to fish migration, toxic blue-green algae and fish disease (C. shasta). The dwindling fish populations are proof. We must move forward with removing the dams and restoring the Klamath to the free-flowing river it once was.

Believe me, I do not take this lightly. My livelihood is at stake. During the dam removal process, my fishing guides and I will suffer from lost business for at least two years. However, that is a sacrifice we are willing to make as we want what's best for the Klamath River and the salmon who live in it, and we know our long-term future as guides will be so much better when the river is chock full of fish. The salmon were here before me and I hope they will be here long after I am gone. This is our chance to show future generations how to honor our environment and our native salmon populations and the chance to make the Klamath River, once again, the best salmon river in California.

(Better late than never except for the 300 people dead or missing.)

Time to talk about tailings dams

By Molly Lempriere, 27 MARCH 2019, mining-technology.com

A horrendous accident in Brazil this January claimed the lives of hundreds after a tailings dam operated by Vale collapsed, releasing a deadly wave of iron tailings and mud. Tailings dams are notoriously dangerous and have claimed lives before, so are there other alternatives and what can be done to make them safer? Since the year 2000, there have now been 11 serious dam failures.

The collapse saw 12 million cubic metres of mud and sludge spilled into the local environment. Credit: TV NBR, via Wikimedia
Over 300 people have been killed or are unaccounted for following the disaster. Credit: Diego Baravelli, via Wikimedia
Since the year 2000, there have now been 11 serious dam failures. Credit: Diego Baravelli, via Wikimedia

On 25 January, a tailings dam at the Córrego do Feijão mine in Brumadinho, in the Minas Gerais region of Brazil collapsed, spilling 12 million cubic metres of mud and sludge. At the time of writing, 215 people were confirmed dead, with a further 91 are missing. "The Brumadinho dam failure in Brazil is a human and environmental tragedy and our thoughts are with those who have lost loved ones, or have family members, friends or colleagues who are still missing," says International Council for Mining and Metals (ICMM) CEO Tom Butler. Vale CEO Fabio Schvartsman said: "Most of those affected were Vale employees. I'm completely torn apart by

what happened." This tragedy is far from the first time a tailings dam such as this has collapsed; in 2015 another Vale affiliated dam in Samarco also collapsed, killing 19 people and releasing 50 million tons of iron mining waste into the Doce River. Until the Brumadinho collapse, Samarco was considered Brazil's worst ever single environmental disaster.

Notoriously dangerous

Tailings dams have a long history of ruptures and collapses. In this century alone, there have now been 11 serious dam failures. This number also appears to be on the rise, according to figures produced by researchers at World Mine Tailings Failures (WMTF). "Without major changes to law, regulation, and to industry practices, as well as without new technology that substantially reduces risk and increases loss control, our current prediction is for 19 very serious failures between 2018 and 2027," states the WMTF. Tailings dams have been used for over a hundred years and are the most common disposal system for mining waste, having really taken off in the second half of the 20th century as technology improved. "They enable large scale and long-term storage of waste from the mineral extraction process," explains Butler. They are colossal structures, generally considered to be some of the largest man-made structures on Earth, and are huge feats of civil engineering. Brazil's largest tailings dam, the Maravilhas II dam, for example, stands 90m high and has been built up over 20 years. But they are much more likely to collapse than water dams, largely due to their industrial function.

"Embankment dams are prestigious structures used to profitably store water, whereas tailings dams are required for the storage of unwanted waste, desirably at minimum cost," states the report 'Tailings Dams: Risk of Dangerous Occurrences', published in Geoenvironmental Engineering. Furthermore, the dams tend to be altered throughout their lifespan, generally increasing in size as the mine life is extended. This gradual building process increases the chance that conditions could change, or supervision could fail. There are multiple reasons why a tailings dam may collapse. These include "excessive amounts of heavy rain or poor foundations," explains GlobalData mining analyst Alok Shukla. "Or tailings liquefaction, which can also lead to leakages into surface and groundwater and are a threat to wildlife." Brazil seems to be worst affected by tailings dams collapses, with the Samarco disaster, among others, still very present in the country's consciousness. "Since the year 2000, there have been around 50 tailings dam failure related cases around the world; of these Brazil accounted for 14% cases," says Shukla. "Brazil has over 80 upstream tailings dams; these are the cheapest to build and are generally less stable than other types of tailings dam."

Do they need to improve or be removed?

Tailings dams are the most common means of waste disposal in the mining industry because of their ability to hold huge amounts of material, as well as their cost effectiveness. However, there are alternatives that will undoubtedly receive renewed interest from mining companies following the recent disaster. "Riverine tailings disposal is used at a small number of operations," says Butler. "In some situations, tailings have been disposed of in inland lakes. Deep sea tailings disposal may be an option depending upon the location of a mine. Tailings can also be stored underground in mined out voids by a process commonly referred to as backfill." However, all of these options have downsides, and most are inappropriate for mine operations of the scale of those such as at Brumadinho. The mine produced iron ore, and while it was one of Vale's smaller mines, it still produced 7.8 million tons of iron ore in 2017 and had been running for years. The dam was set to be decommissioned, as it was no longer in operation having reached capacity. While tailings dams are inherently risky, there are things that can be done to try and ensure their safety.

"Certain points can be taken into consideration in order to make tailings management much safer," says Shukla. "These are minimising water held in the tailings storage facility; thickening or filtering of tailings; widening the dam crest to prevent the dam's erosion; placing the sand to infill natural voids and cracks; [and using a] monitoring system equipped with latest technologies even to detect the slightest movement in soil. "After a mine's closure, reclaim the site with vegetation and erosion resistant surfaces, as well as rely on qualified and experienced professionals to take

care of tailings dam's operations." The Brumadinho tailings dam was considered safe by an independent auditor, German firm TÜV SÜD, as recently as September 2018, which has raised questions as to whether even following best practice is enough to ensure safety.

The beginning of the end for tailings dams disasters?

The exact cause of the Brumadinho dam disaster is as yet uncertain, although static liquefaction is generally considered the most likely source. However, it is currently hard to learn lessons from it, which will undoubtedly come as more details about the collapse become clear. "Clearly the industry has a challenge in this area," says Butler. "Despite the two major failures in recent years that resulted in loss of life, tailings dam failures are low probability events, albeit with devastating consequences. We need to find out what has happened in this incident and respond accordingly. This is a sentiment Shukla agrees with; he predicts that the disaster could lead to the adoption of alternative waste disposal systems. "Certainly this tragedy will push miners to be extra careful when coming to manage the tailings dam operations. Tailings dam failures cause huge loss of life, as well as being some of the worst environmental disasters miners face and cause huge economic losses. Miners will certainly be looking at adopting more stable dam types, as well as dam monitoring systems equipped with the latest and most sensitive devices that can detect even minute soil movements. Furthermore, they will be hiring qualified and experienced professionals to look after tailings dam operations," he says.

Already, Brazil is looking to ban upstream dams in an effort to improve safety; of the country's 740 tailings dams, there are 88 upstream ones currently in operation. Vale itself has taken action since the disaster to speed up the decommissioning of its 10 upstream dams. "Upstream dams are waterlogged and therefore susceptible to cracks that can cause bursts," says Shukla. "Recently Brazil's mining agency announced its plan to ban upstream tailings dams used for storing mining waste." Other mining companies have shared plans to rethink their use of tailings dams following the Brumadinho disaster, and experts have reaffirmed that if waste management practices don't change, this will not be the last tailings dam disaster. "We conduct regular monitoring audits and our dams are subject to independent third-party reviews," said Simone Niven, Rio Tinto's head of corporate relations. "Even so, our technical teams are working very hard, right now, to consider what more we can and should do. We will take part in any industry-wide response." For now, Vale has established two teams to investigate the cause of the collapse: the Extraordinary Independent Consulting Committee for Support and Recovery and the Extraordinary Independent Consulting Committee for Investigation. Meanwhile, work is still underway to recover the bodies of those still lost in the mud, before the clean-up of the area, as large as 300 football pitches, begins.

(Without dam – you have problems.)

Boyne River Dam washes out, causing concerns for residents

By Cole Marten, March 27th 2019, upnorthlive.com

CHARLEVOIX COUNTY, Mich., (WPBN/WGTU) -- A dam collapse on the Boyne River has a Charlevoix County couple holding their breath. The land near a rental cottage is collapsing and there is also concern about what this is doing to the river's habitat. Robbie and Doug Weiss said it was three weeks ago when they first noticed something was wrong with the dam near one of their four rental cottages along the Boyne River. That's when they asked for some help, but it was too late.

"We were hoping it would hang in there but it just got pushed out of there. The ice like an ice jam just took it all out," said Robbie and Doug Weiss. With the dam out, the Weiss' said the water level on the river dropped and that's when the soil gave way near the cottage's back porch.

“Team Elmer's and DEQ were throwing ideas around and they are going to come up with some drawings and that’s their main concern to pin that house up so we don’t have a problem with that and some of these embankments," said the couple. Another concern is all the dirt and silt that is now in the river and flowing downstream. “We are all crossing our fingers here," said President of Friend of Boyne River Adam Kennedy. "We don’t know what kind of impact this may have had on the fish habitat or any other macro invertebrate species which we check twice a year, but that will be determined down the road.” The Department of Environmental Quality, Tip of the Mitt Watershed and the Michigan Department of Natural Resources are all teaming together to take the next step to fix the issue.

(FERC made them do a fix many years ago.)

Town of Lake Lure seeks aid to fund urgent dam repairs

By Rob Bradley, March 27th 2019, wlos.com

LAKE LURE, N.C. (WLOS) — The town of Lake Lure is seeking state and federal assistance to fund repairs to the "High Hazard" Lake Lure Dam, which is inching closer to its 100th birthday. That's according to Mayor Kevin Cooley, who spoke to News 13 Wednesday following a series of six reports delivered to town officials and residents on Tuesday. Cooley said residents were relieved to hear the report's findings. "People are concerned, what is the integrity of the dam, is it going to fall down anytime soon, and I think the answer we get from our engineers is no, not at all," Cooley said. "The dam has performed very well. It's graded to be in fair condition based on its age."

Cooley says the report indicated most of the necessary repairs are a result of increased safety standards, adopted in the 1970s, which take into account the possibility of a moderately sized earthquake and an extreme rainfall scenario. However, some of the repairs are because of wear and tear. Inspections from the Department of Environmental Quality, originally reported on by the Carolina Public Press, indicated, among other issues, excessive leaks through aging concrete joints, steel deterioration and poor stability in the dam's bays. Cooley said the town will focus on the items of "high concern" first, including some large piping and a hoist and motor structure that need to be replaced. Those items are expected to cost the town just under $1 million, though Cooley could not give an exact estimate. Previous reports indicated the town was prepared to spend up to $5 million for all necessary repairs, but the mayor said officials still do not have a total estimate. The town expects to have one in a few months. Cooley says he believes Gov. Roy Cooper has already included state funds to assist the town with the repairs in next year's budget proposal. He also indicated the town may qualify for a loan through the U.S. Department of Agriculture. Cooley also indicated he hoped the town could use money generated by the dam to pay for repairs, which he says is typically around $30,000-40,000 a month. "This is a big issue, challenge for our town, and, what I would say is, we’re seeking some outside assistance from the state, federal government. Our dam and this lake serves a very widespread and regional purpose."

(This is about public safety, not dam safety. Dam Safety Week is upon us.)

NewsDam Safety Week is upon us.) release FOR IMMEDIATE RELEASE

Media Contact: Scott Reigstad (608) 458-3145,

Alliant Energy to observe Dam Safety Awareness Week in Wisconsin

Gov. Evers joins hydro power companies, WDNR in promoting public safety at dams

MADISON, Wis. – March 25, 2019 – It seems that spring has finally arrived in Wisconsin, and warmer temperatures are bringing higher water flows on area rivers due to melting snow and spring rain. These flows are reminders of how strong the forces of nature can be and how important it is to stay safe when you are involved in recreational activities on rivers. Alliant Energy is joining with other Wisconsin hydro power companies in observing Dam Safety Awareness Week from April 1 through April 7 to promote public safety awareness near dams and prevent accidents throughout the boating and fishing seasons. The Wisconsin Department of Natural Resources (WDNR) has been joined in promoting safety awareness by Gov. Tony Evers, who has proclaimed April 1 through April 7 as Dam Safety Awareness Week in Wisconsin.

The purpose of Dam Safety Awareness Week is to heighten safety awareness of recreational and fishing enthusiasts as they return to the waterways. Many accidents and fatalities occurring near dams could be prevented by practicing safety, staying clear of dams and understanding the dangers to be found near them. Alliant Energy, WDNR personnel and local safety officials urge people to use common sense to stay safe on rivers and near dams:

- Understand the dangers near dams
- Stay away from hazardous areas
- Obey all warning devices such as signs, lights, sirens and verbal warnings
- Wear an approved personal floatation device
- Keep your boat motor running when near a dam so you can quickly leave or maneuver
- Stay clear of the dam spill area, where unpredictable water conditions make boat control difficult
- Never anchor boats below a dam because water levels can change quickly
- Do not cross buoy lines
- Bring a cell phone and call 911 in an emergency

Alliant Energy wants anglers, boaters, outdoor enthusiasts and visitors to enjoy the many exceptional recreation resources to be found on rivers and around dams in the region. People are urged to practice safe use of the areas so that they can be enjoyed over and over again. For more safety information, visit Alliant Energy's Dam Safety page at alliantenergy.com/damsafety.

(A novelty, someone against dam removal.)

Support the Mon Maq Dam, attend meeting

Mar 28, 2019, bing.com

Editor:
A Department of Natural Resources survey sent to residents in November states $800,000 in grant funds were "to be used for fish passage and hazard reduction with the intent of restoring natural conditions while offering recreation." Justifications given to destroy the historic Mon Maq Dam appear erroneous:

1. Other dams on the Maquoketa River are allowed to remain with fish passage unaddressed, while ours is targeted. If fish passage is truly a goal or necessity, it is achievable without destroying the dam. DNR should work toward a compromise: A bypass channel restores river function and offers fish passage while keeping water running over the dam and preserving the historic site.

2. The hazard argument is a complete misrepresentation. DNR grant money should go to communities whose dams have dangerous hydraulics resulting in loss of life. The Mon Maq Dam is one of a kind in Iowa because of its "apron," which reduces the potential for circulating currents. The rare times that recirculation does exist is during floods when the entire river is dangerous. There have been no incidents or fatalities in over 100 years at our dam.

3. Recreation and visitors from all over the US and world will continue with the dam in place. But fishing, as we now know it, could be damaged forever by removing the dam. With the available money, there could be improvements to the current dam site: preservation, historical kiosk and signage, handicap accessible access, canoe access, road access improvement, picnic area, family-oriented park development, etc. Let's explore Jones County heritage tourism and promote the Mon Maq Dam site rather than contribute to its destruction. If it is not justifiable by common sense, leave the dam alone. Show your support of the dam by attending the public meeting conducted by Jones County Conservation, Thursday evening, April 4, from 6 p.m. to 8:30 p.m. in the Durgin Pavilion at Camp Courageous, 12007 190th Street, Monticello. *Mike Davies, Anamosa, Iowa*

(Another Brazil dam failure)

New dam collapse in Brazil; no casualties reported

By THE ASSOCIATED PRESS, MARCH 30, 2019, newsobserver.com

RIO DE JANEIRO - Brazil has suffered another mining dam collapse, though this time there are no reports of dead or missing.
The Rondonia state environment secretary says the dam in Oriente Novo gave way after a waterspout damaged its structure on Friday. Authorities say there's no risk of contamination from the water, sand and clay that spilled from the dam owned by the Metalmig company.

A dam owned by mining giant Vale collapsed on Jan. 25, killing at least 217 people and leaving 84 missing in Minas Gerais state. Vale said last week that auditors have determined that another dam in that state could collapse at any time and people in three cities practiced evacuation drills on Wednesday.

(Video on Jan. 25, 2019 Dam failure. Pretty dramatic.)

Death Toll reaches 217 in Dam Tragedy in Brazil

VIDEO: https://abcnews.go.com/International/video/200-feared-missing-dam-collapse-brazil-60631963

(There's always something new.)

Download Analysis Of Dam Failures Development Of A Dam Safety Evaluation Tool for FREE

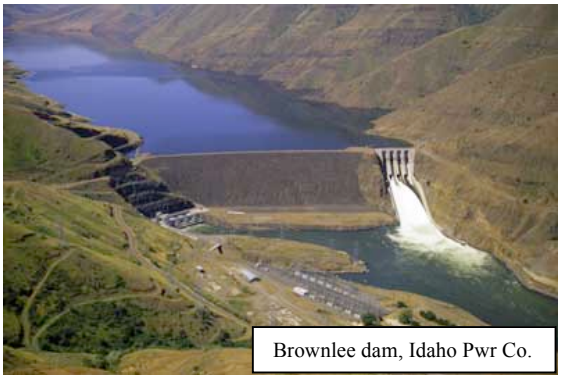
Download site: http://pdf.bigbooks.download/analysis-of-dam-failures-development-of-a-dam-safety-evaluation-tool-printable-2019.pdf

Hydro:

(This guy cherry-picks the answers that support his argument. You won't get there without hydro. The main studies on methane gas were on dams in S. America where they didn't clear the reservoir area of trees and other vegetation. We clear reservoir areas. Look at the photo, do you see a lot of vegetation?)

Idaho Power has good intentions, but calling hydropower 'clean' energy is a bit of a leap

BY BEN LZICAR, MARCH 29, 2019, idahostatesman.com


Brownlee dam, Idaho Pwr Co.

I've spent my entire life enjoying the lands that Idaho and Oregon have to offer, especially kayaking and fishing the secluded rivers of my two home states. I love technology and development, but also protecting our public lands for future generations to enjoy. Regarding Idaho Power's recent announcement for a goal of 100 percent "clean" energy by 2045, it is certainly ambitious – but not for the reasons most people would think. Idaho Power CEO Darrel Anderson said, "We have a great head start, thanks to our clean hydropower plants that produce almost half the energy our customers use." The claim that hydropower is a "clean" source of energy is concerning given the numerous environmental impacts of this energy source.

So what, exactly, does Idaho Power consider clean?

Just a few months ago the Idaho Statesman wrote an article about how Idaho steelhead "could be gone in a generation," and this isn't because of wind turbines or solar power, it's because of Idaho Power dams. Not only are the lives of native Idaho salmon teetering thanks to these "clean" sources of energy, but the health of our Pacific orca populations is suffering because of the ever-declining salmon numbers as well.

Even if we forget about the salmon and orcas threatened by the existence of these dams, we need to remember that hundreds of miles of healthy and vital riparian habitat was destroyed when they were constructed over half a century ago. This forever altered our regional landscape, and displaced countless other species with a ripple effect on the local habitat. Using "clean" to describe the destruction of important ecosystems is a new and alarming low. Dam proponents also like to tout the idea that they don't produce greenhouse gases, but there have been studies that show dams produce C02 and methane gases from the bodies of water that are backed up. Billions of tons annually as a matter of fact, about 1.3 percent of all human-caused releases. And while this number seems small, when you consider that hydropower produces only about one-tenth of the world's energy, that 1.3 percent becomes a significant number, and it's certainly not a "clean" number.

I am not trying to detract from the vital goal of relying entirely on clean energy, and I applaud Idaho Power for all of the other great strides the utility has made with solar and wind plants. But moving the goalposts back by calling dams "clean" isn't doing anyone good. If we're really going to start caring about the impact we have on our environment, we really need to look from the ground up – or if we were salmon, from the dam up.

(You gotta have some hydro to get there. We did this at the FERC over 25 years ago, so this is not the new idea they claim.)

More than a half million pumped-hydro sites for a world of 100% renewables

A recent Australian National University study shows that newly developed geographic information system algorithms can identify prospective sites for off-river pumped hydro projects throughout the world. The researchers, who identified around 530,000 potential sites, said pumped-hydro installations could enable large-scale energy time-shifting, as well as a range of ancillary services such as frequency regulation, which could help to integrate high levels of PV and wind into electricity systems.

April 1, 2019, BY EMILIANO BELLINI, pv-magazine.com

Scientists from Australian National University (ANU) have identified 530,000 locations throughout the world that could be suitable sites for 22 million GWh of hydro-pumped storage capacity. ”The perception has been there are limited sites for pumped hydro around the world, but we have found hundreds of thousands,” the research team said. The researchers also said the sites — which relate to closed-loop pumped-hydro energy storage projects, located away from rivers with little environmental impacts — were identified through a global audit that relied on geographic information system (GIS) algorithms. The algorithms helped to identify dry-gully or turkey’s nest sites, which include upper and lower reservoirs with hypothetical tunnels between them. The researchers were able to look at data such as latitude, longitude, altitude, water volume, energy storage potential and approximate relative cost.

PS-potential sites around the world

The scientists also said that the cost of building pumped-hydro storage systems can be broken down into two major components: the cost of machinery parts such as turbines, generators, transformers and switchyards, which can be calculated in $/kW; and storage capacity components that must be calculated in $/MWh. “While a wide range of factors such as geology and hydrology are involved in site selection and dam construction, the topography of a site is always a critical issue which decides the type, height and shape of a dam, as well as the amount of earthwork required to build it,” the researchers wrote. The team’s automatic GIS-based procedures have contributed to the development of a mapping tool, called Stores, which is said to highlight ideal regions for pumped-hydro deployments, while identifying sites with high water-to-rock ratios, which means large reservoir volumes with less earthwork. “Only a small fraction of the 530,000 potential sites we’ve identified would be needed to support a 100% renewable global electricity system. We identified so many potential sites that much less than the best 1% will be required,” said the researchers. At the end of 2016, there were over 160 GW of pumped-hydro storage systems in operation around the world, according to the study. Most of this capacity is located in Europe, with more than 50 GW, followed by China at 32 GW, Japan at 26 GW and the United States at 23 GW.

(At least one state has their head on straight,)

Mont. Senate Votes To Expand Alternative Energy Tax Credit

By Abraham Gross · April 1, 2019, law360.com

The Montana Senate has passed a bill that would expand an income tax credit for alternative energy to include certain hydroelectric generators. S.B. 337, which passed the Senate on Friday

Water:

(You *must* read this article! It puts global warming in perspective and where it should be. We don’t know enough to say why the weather changes. (Don’t forget to hold down the control key [ctrl] when you click on the link.)

https://patriotpost.us/opinion/62060?mailing_id=4164&utm_medium=email&utm_source=pp.email.4164&utm_campaign=digest&utm_content=body

(What to do with the water – the big deal.)

Columbia River Treaty set to expire

The transboundary agreement has governed flood risk management and hydropower production for more than five decades.

By Eric Barker of The Lewiston Tribune, Mar 18, 2019, union-bulletin.com

LEWISTON — The way dams and storage reservoirs on the Columbia River and its tributaries are managed could change dramatically in a short five years if negotiators from the United States and Canada don't strike a deal. At issue is the Columbia River Treaty, a transboundary agreement that has governed flood risk management and hydropower production for more than five decades. The treaty is evergreen, meaning it doesn't have an end date unless either nation decides to sever the agreement following a 10-year notice. Neither side has given that notice, but both are engaged in talks led by the U.S. State Department and Global Affairs Canada aimed at updating the treaty, The Lewiston Tribune reports. Under the current terms, the way flood risk is managed changes dramatically in 2024, and that could affect Idaho water. Right now, three huge storage reservoirs in Canada and one in Montana do much of the heavy lifting when it comes to reducing flood risk in places like Portland and Vancouver, Wash. The treaty was precipitated in part by the 1948 Vanport Flood near Portland, Ore., that killed 15 people and displaced more than 18,000 who lived in a low-lying development. The dams are managed jointly by the U.S. and Canada, and the treaty dictates that reservoirs behind Mica, Arrow and Duncan dams in British Columbia are drafted to hold back more than 15 million acre-feet of water during spring floods. The water captured by the dams is released later in the year, and Canada is compensated for 50 percent of the released water's potential hydropower production as it moves downstream through U.S. dams.

Flood control

Starting in 2024, the Canadian dams will no longer be obligated to provide downstream flood control protection unless the United States first demonstrates it has done all it can to reduce flood risk by capturing spring flows in its reservoirs. Once that happens, the U.S. can "call upon" Canada to capture water behind its dams. Under such a scenario, reservoirs in the U.S. would likely be drawn down much lower than they are now prior to spring runoff, threatening the potential for them to refill. And it's not clear which U.S. dams would have to participate. The U.S. believes its large storage dams named in the treaty — Libby, Hungry Horse and Kerr in Montana; Dworshak, Brownlee and Albeni Falls in Idaho; Grand Coulee in Washington and John Day Dam in Oregon — would have to be tapped to provide additional flood control. Canada interprets the treaty to say all dams on the Columbia River and its tributaries south of the border would have to play a bigger role in flood control. Under that scenario, dozens of other dams and reservoirs would be involved. For example, dams that provide local flood control or capture water for summer irrigation may have to help in systemwide flood control. Nor do the two sides agree on what constitutes a flood large enough for the U.S. to "call upon" Canada for help. The U.S. side believes flows projected to reach 450,000 cubic feet per second at The Dalles Dam in Oregon would meet the requirement. Canada believes projected flows would have to reach 600,000 cubic feet per second.

The flood control regime isn't the only difference negotiators are trying to bridge. The treaty gives Canada the right to half of the hydropower that can be produced in the U.S. by the water the Canadian dams hold back and then ultimately release — known as the Canadian entitlement. Depending on market prices, the power can be worth $150 million to $300 million per year. Those power payments, plus 30 years of hydropower purchased by U.S. companies at the onset of the treaty, paid for the construction of the dams in Canada. But the U.S. believes the formula that decides the power value of Canadian water is outdated. Because the formula doesn't account for things like how much of the Canadian water is spilled at U.S. dams to improve fish passage, American hydropower interests say the power payments sent to Canada are as much as 10 times what they are actually worth. U.S. interests want the treaty changed to reflect that actual value of the Canadian water.

Canadians also have identified issues they want to solve in negotiations. The dams have dramatically altered local ecosystems and inundated communities and valuable bottomland behind the dams. The Canadians think they should be compensated for that. When Canadian dams are drawn down, water levels fluctuate dramatically, disrupting recreation, fish and wildlife habitat and exposing huge mud flats that can produce dust storms. The construction of Washington's Grand Coulee Dam prior to the treaty, which Canada did not object to at the time, blocked salmon that once returned to British Columbia rivers, harming Canada's First Nations. They want fish passage and salmon reintroduction to be considered. The Canadians also say their dams allowed lucrative floodplain development around Portland. They would like compensation for that service. The Canadian government wants to retain the post-2024 flood control regime that alleviates pressure on its dams and reservoirs. They also want more say in the way Libby Dam in Montana is managed. The dam backs up the Kootenay River more than 40 miles into Canada and creates Lake Koocanusa. (The river is spelled Kootenai in the U.S. and Kootenay in Canada.) Talks between the two countries began last May. Those talks are centered on the future of flood control, hydropower generation and ecosystem function, which would be a new aim of the treaty.

(Gotta find out where the water goes.)

In Our View: Columbia River Treaty complex – but worth it

By The Columbian, March 27, 2019, columbian.com

In Pacific Northwest history, the catastrophic Columbia River flooding of 1948 looms as large as the 1962 Columbus Day Storm or the 1980 eruption of Mount St. Helens. A repetition would devastate communities up and down the Great River of the West and its major tributaries, and deal a major blow to agriculture and salmon. In other words, an annual cost of $150 million to $300 million for preventing a catastrophic flood might seem like a bargain. Because of that, flood mitigation must be the focal point of negotiations between the United States and Canada to renew the Columbia River Treaty.

The treaty has governed flood management and hydropower production throughout the Columbia River basin since the mid-1960s. Three reservoirs in Canada and one in Montana hold back water during the spring flood season, and that water is released later in the year. In exchange, Canada is compensated for 50 percent of the released water's potential hydropower production as it moves through U.S. dams along the Columbia River system — known as the Canadian Entitlement. That is where the figure of up to $300 million a year comes into play. Depending upon market prices, the power is worth that much, and the numbers provide one of the sticking points in ongoing negotiations. As The Lewiston (Idaho) Tribune reported recently: "The U.S. believes the formula that decides the power value of Canadian water is outdated. Because the formula doesn't account for things like how much of the Canadian water is spilled at U.S. dams to improve fish passage, American hydropower interests say the power payments sent to Canada are as much as 10 times what they are actually worth. U.S. interests want the treaty changed to reflect that actual value of the Canadian water."

There are other issues, as well. Starting in 2024, Canadian dams will not be required to provide flood control unless the United States demonstrates it has reduced flood risk with its own reservoirs, which would alter how Northwest dams are managed. And there is talk about ecosystems and the restoration of salmon runs. For the United States, the most important issues are avoiding the 2024 change to the flood-control guidelines and reducing the cost of the\ Canadian Entitlement. Meanwhile, changes to ecosystem regulations could face opposition in the Senate, which will have to ratify any new treaty. Sen. Jim Risch, R-Idaho, chairman of the Senate Foreign Relations Committee, said any plans to increase water flow for the benefit of fish or to reintroduce salmon to certain areas will not receive consideration. It is no wonder that treaty negotiations are complicated. The Columbia River basin is roughly the size of Texas, affecting Washington, Oregon, Idaho, Montana, British Columbia and Alberta while even stretching into Nevada and Wyoming. That inevitably creates numerous interconnected issues. Parties from the United States and Canada have held five rounds of talks, with the next one scheduled for April 10-11 in British Columbia. Along the way, common ground must be cultivated. The treaty has served both nations well, and flood control beginning near the headwaters of the river is particularly important for Washington. So, while the cost of maintaining the Columbia River Treaty could be high, the cost of allowing the deal to lapse would be even greater.

(It's a very big deal!)

Editorial: A most important treaty

Mar 28, 2019, capitalpress.com

Farmers are closely watching the Trump administration as it negotiates new trade treaties with Asian nations such as China and Japan. But another treaty negotiation closer to home could have an equally far-reaching impact on farmers in the Pacific Northwest. The Columbia River Treaty talks between the U.S. and Canada will profoundly impact how the linchpin of the region's economy is managed. Any major changes in the agreement will touch nearly every farmer in Washington state, Oregon, Idaho, Montana and British Columbia. Any changes will likely affect the availability and price of electricity and water. If negotiations are allowed to expand into other aspects of managing the Columbia and Snake rivers, all bets are off.

A U.S. flag flies over the Grand Coulee Dam on the Columbia River in Washington state.

Everything from fish passage to river transportation could be impacted. The original treaty, signed in 1961, was negotiated in the wake of catastrophic floods that destroyed the second largest city in Oregon. Floodwaters wiped out Vanport in 1948, killing 15 people and displacing 18,000. The treaty had one main goal: preventing future flood disasters. That was done by building four treaty dams — the Arrow, Duncan and Mica dams in Canada and the Libby Dam in Montana. Under the treaty, Canada prevents flooding of the Columbia by draining the reservoirs behind those dams to make room for snowmelt in the spring. To compensate Canada for the lost revenue from electricity generation, Canada receives payments from U.S. utilities. Besides flood management, how that compensation is priced and calculated is the other main part of negotiations over the new treaty. Those negotiations stem from a provision in the original treaty that said in 2024 the system now used to reduce the risk of floods will change. Instead of being the first lines of defense against flooding, the Canadian dams will only be called on the hold back rising waters of the Columbia once the U.S. has done all it can to control them with its dams. In other words, U.S. dam reservoirs may have to be drawn down in the early spring in anticipation of snow runoff. That could impact the amount of water available later in the year for everything from

hydro power to irrigation and salmon passage. That means the U.S. and Canada must come to terms over how best to prevent flooding without turning management of the entire river system on its ear.

In addition, the U.S. Entity — diplomat-speak for the Bonneville Power Administration, U.S. Army Corps of Engineers and the U.S. Department of State — came up with a regional recommendation that was developed after years of consultation with farmers, utilities, cities, Native American tribes and others. In a 2013 letter to the British Columbia Hydro and Power Authority and Global Affairs Canada, the U.S. entity included "ecosystem-based function" as a primary purpose of the treaty, along with flood control and power compensation. At least one member of the U.S. Senate, which must approve any new treaty, has stated that he doesn't want ecosystem function to be part of the deal. Sen. Jim Risch, chairman of the powerful Senate Foreign Relations Committee, says he will pull the plug on the treaty if ecosystem function is included. The Idaho Republican told the Lewiston Tribune that he sees too much room for mischief threatening the lifeblood of his state's economy. He is correct. Ecological concerns such as salmon passage are already being litigated in court. Including them in the treaty negotiations would only make the likelihood of an agreement that much more remote. Delaying the treaty beyond 2024 would be a disaster for flood management, electricity generation — and salmon recovery.

(Not enough water to satisfy everybody.)

Senate committee chair vows quick vote on Colorado River drought plan

By The Associated Press, March 27, 2019, reviewjournal.com

U.S. Sen. Martha McSally or Arizona vowed Wednesday to take quick action on a plan to shore up the drought-stricken Colorado River, which serves about 40 million people in the West and Mexico. Seven states, including Nevada, are asking Congress to pass legislation to implement drought contingency plans that would mean voluntary cuts to keep two key reservoirs on the river from falling so low that their dams could not deliver water or produce hydropower. The drought contingency plans that states have spent years negotiating got a first hearing\ Wednesday before a subcommittee that McSally, R-Ariz., chairs. She said she'll introduce a bill soon and expects strong support. "Now that the states have completed their work, it's time for Congress to take it across the finish line," she said.

A marina sits high and dry due to Lake Mead receding

Arizona, California, Colorado, Nevada, New Mexico, Utah and Wyoming recently agreed to push for the federal legislation. Their goal is to have it approved by April 22 so that Mexico's water contributions also kick in next year. The drought plan for the lower basin, which includes Arizona, California and Nevada, would have those states leaving water in Lake Mead when it hits certain levels. Under current guidelines, Arizona and Nevada would lose water when Lake Mead drops to 1,075 feet in elevation because California has the most senior rights. On Wednesday, the lake created by Hoover Dam on the Arizona-Nevada border was at nearly 1,090 feet — the point at which water contributions would kick in under the drought plan and eventually loop in California. Las Vegas relies on the Colorado River for 90 percent of its water supply. Nevada expects to meet the conditions of the drought plan with relative ease because of previous water conservation measures and storing eight years' worth of water, said John Entsminger, general manager of the Southern Nevada Water Authority. "We're in a strong position to not only help the rest of the river

but to protect ourselves as well," he said. But the Imperial Irrigation District of Southern California objected to the plan, saying it does not comply with environmental laws and regulations. The district, the biggest single user of Colorado River Water has said it won't commit to the plan unless it secures $200 million in federal funding to help restore the Salton Sea, a massive briny lake southeast of Los Angeles.

The drought plans also create incentives for storing water, rather than removing it, when lower basin states believe it could be stranded in Lake Mead if water levels drop too low. Unlike the upper basin states, Colorado, New Mexico, Utah and Wyoming in the lower basin historically haven't used their full allocations of Colorado River water. They use Lake Powell on the Arizona-Utah border as a bank to store water when hydrology is good to ensure they can deliver water through Glen Canyon Dam to the lower basin in drier years, meeting obligations under a 1922 compact that divvied up the water. "If we cannot get water past that dam, we violate the compact," said Wyoming state engineer Pat Tyrrell. Tyrrell said diminishing flows in the Colorado River have increased the threat that upper basin states might need to curtail their use of water, or move water from large reservoirs in Utah, Colorado and New Mexico to Lake Powell when it's needed. The ability to store water in the reservoirs upstream from Lake Powell without charge is also part of the plan, Tyrrell said. Another hearing on the drought plans is scheduled Thursday before a House subcommittee.

Other Stuff:

(We won't make it in 10 years. Thought we had 50 States.)

Solar and wind firms call the 'Green New Deal' too extreme

By Valerie Volcovici, Nichola Groom, Mar 21, 2o019, reuters.com

WASHINGTON/LOS ANGELES (Reuters) - U.S. solar and wind power companies may have the most to gain from the Green New Deal, an ambitious proposal backed by several Democratic presidential candidates to end U.S. fossil fuel consumption within a decade. But do not expect the renewable energy firms to endorse it. Representatives of America's clean energy companies are withholding their support for the climate-fighting plan, calling it unrealistic and too politically divisive for an industry keen to grow in both red and blue states. The cool reaction reflects the difficulty that progressive politicians vying for the White House may have in selling aggressive global-warming policy to the business community and more moderate voters. It also underscores a new reality for U.S. solar and wind power companies long associated with the environmental left: As they have improved technology and lowered prices, their growth is shifting from politically liberal coastal states to the more conservative heartland, where skepticism of climate change and government subsidies runs high. "If you just broadly endorse the Green New Deal, you are liable to upset one side of the aisle or the other. And that's not constructive," said Tom Werner, the CEO of SunPower Corp, one of the nation's biggest solar power companies.

"The idea that you could go 100 percent (clean energy) in 10 years would require a lot of things happening perfectly, simultaneously," he said. "You'd have to have bipartisan support, 52-state support." The Green New Deal was introduced last month by Alexandria Ocasio-Cortez, a Democrat Congresswoman from New York, along with fellow Democrat Senator Edward Markey of Massachusetts. It has since become the center of a renewed debate in Washington about how vigorously the government must act to address climate change. The Congressional resolution, which has no force of law, calls for the federal government to make investments to achieve net-

zero greenhouse gas emissions in a decade by meeting 100 percent of America's power demand with clean, renewable sources such as solar, wind, hydroelectric, or geothermal energy. It also calls for massive investments in green infrastructure projects like "smart grids" to improve efficiency, along with a guarantee of millions of high-wage jobs with paid vacations, medical leave and retirement security. The resolution does not get into detail about how subsequent legislation would achieve these goals. So far, at least eight Democratic presidential hopefuls – including senators Bernie Sanders of Vermont, Elizabeth Warren of Massachusetts and Amy Klobuchar of Minnesota – have endorsed the plan as they seek to stand in stark opposition to the pro-drilling policies of President Donald Trump. Trump's fellow Republicans have widely panned the Green New Deal, saying it would cost trillions of dollars of taxpayer money, may be technically unfeasible, and smacks of radical socialism.

(They are way ahead of us.)

Four innovative green technologies that shows how Scandinavia leads the way in renewable energy

By Sam Forsdick, compelo.com, Apr. 2, 2019

From floating solar panels to electric planes, Scandinavia leads the way in many emerging renewable energy innovations. Scandinavia may be better known for its intense crime dramas and scenic landscapes, but the northern European region is also pioneering innovative green technologies. Nordic countries are known for being progressive and this is particularly true when it comes to taking action on climate change. Norway is one of the biggest investors in electric vehicles, with 58% of all new cars sold in March being fully electric, and Denmark is a world leader in wind energy. Looking to the wider Scandinavian Peninsular, Iceland produces 99.99% of its electricity through renewable sources, while the Finnish capital of Helsinki is planning to remove the need for cars altogether.

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