7/8/2016

Some Dam – Hydro News™

And Other Stuff

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Quote of Note: *"People who are crazy enough to think they can change the world, are the ones who do." - Apple*

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"Good wine is a necessity of life." - -Thomas Jefferson
Ron's wine pick of the week: **2013 Lang and Reed Cabernet Franc "North Coast"**
"No nation was ever drunk when wine was cheap." - - Thomas Jefferson

Dams:

(Dam removal of the week. So fish can swim.)

Columbia Dam in Knowlton to be removed, opening the Paulinskill to migrating fish

By Bruce A. Scruton New Jersey Herald, Jun. 23, 2016, njherald.com

KNOWLTON, NJ -- The certificate that decommissions the Columbia Dam is expected to be soon in the hands of the Nature Conservancy, a milestone for the conservation group's plans to remove the dam, opening up the lower end of the Paulinskill to fish species migrating up the Delaware River. The dam removal has become an item of controversy in the township with the Township Committee approving a resolution against the dam removal, setting a non-binding public vote in November and asking the state Division of Fish and Wildlife, which owns the dam and nearly 1,100 acres around it, to hold a public hearing. The Nature Conservancy sees the dam removal as one piece in the larger picture of increasing water quality of a major tributary to the Delaware River. Along the 40-mile length of the Paulinskill, which begins in Newton, the conservancy is working with other partners on a variety of projects aimed at returning the river to a clear, cold stream capable of harboring native trout and carrying that high-quality water into the Delaware. "The Paulinskill is the third largest tributary from New Jersey," said Barbara Brummer, state

director for the Nature Conservancy. The second-largest is the Musconetcong, which flows out of Lake Hopatcong. The longest tributary is the Rancocas Creek in southern New Jersey if the length of the North and South branches are combined as part of the total.

The 1,094 acres along the river banks above and below the Columbia Dam are part of the Columbia Wildlife Management Area. The state Department of Transportation also owns a right-of-way on either side of Interstate 80 as well as Route 46. The dam, which crosses the river within the management area, has been owned since 1986 by Great Bear Hydropower Inc., whose owner, Terry McDonnell, a Vermont resident, has always balked at the idea of selling the dam and the small hydroelectric power plant that intermittently spun out about half a megawatt of power through its two turbines. It was one of just three hydro-electric plants in the state, dwarfed by the nearby Yards Creek facility, which produces 453 megawatts, and the 3-megawatt facility at Great Falls. McDonald's mind was changed, however, when he obtained estimates of how much work would be needed when his license would be up for renewal in 2020. Among the improvements would be a fish ladder for migrating fish, structural improvements to the dam and, likely, additional work on the turbines. As she stood near the dam recently, Brummer pointed to the power house and said, "We want to keep that. It's a pretty impressive building inside."
She said negotiations will allow McDonnell to pull out equipment, including the turbines worth about $300,000 each, to sell to another facility.

The Knowlton Township Committee passed a resolution in late May against the dam removal and also set a public referendum for the township-wide November ballot. That referendum is non-binding, Mayor Adele Starrs said. The Nature Conservancy made a presentation to the committee in December, and there were two public meetings on the plans, which she described as "packed." "They (the public) were truly against it," Starrs said. The committee's vote was 4-0 with one member absent. Among objections was that the township's people were unaware of the plan until just recently; the lake serves both economic land recreational benefits; and there were concerns by local businesses that removing the dam would remove the lake and take away some business. "The fire chief also raised the issue that the department gets water to fight fires from that lake," Starrs said. "There's concern the fire insurance rates could go up." And, at the heart of the issue, she said, is that removing the dam would be an expense on the taxpayers, and it would "be simpler and easier to put in a fish ladder." The dam is about a quarter-mile from the Paulinskill's confluence with the Delaware River, a major migration route for several fish species, such as shad and eels.

The dam is about 320 feet wide and 18 feet high. At peak production, the one-half megawatt is enough to power about 165 homes. The power went directly into nearby Jersey Central Power and Light lines. "We're not thrilled about taking out hydro power," Brummer said, but added that another project being overseen by the conservancy at the Pequest Trout Hatchery involves a solar installation that will power that facility as well as put electricity into the regional grid.
During the tour, Brummer pointed out that the money for this project is coming from grants from private foundations and possibly from the federal National Oceanographic and Atmospheric Administration. The cost could be around $4 million, which includes removal of the main dam, taking down a remnant dam just downstream, and work along the new stream channel.
"We believe the new channel will be about where the river runs now," Brummer said, noting that what was originally a lake behind the dam has become clogged with silt being washed downstream. A tour by airplane over the area showed large sandbars, overgrown with weeds and grass, taking up much of what had been the lake's surface. The airplane tour was provided by LightHawk, a group of volunteer pilots who provide rides to scientists working on environmental projects and journalists covering those issues. Brummer also pointed out that the state will allow additional recreation opportunities within the management area, such as additional walking or biking trails, and fishing spots. "We have a wonderful group of people and partners working on this," Brummer said. "It's an important project for everyone in the region."

(Fix ‘er up.)

Blackwood Dam Work, Flood Damage Prevention to be Discussed During Gloucester Township

By Anthony Bellano (Patch Staff) - June 26, 2016, patch.com

Gloucester Township, NJ -- Remington and Vernick says it is prepared to take steps to make necessary fixes to the Blackwood Dam, and that it has already repaired some of the seepage in the dam. Following the discovery of an eighth gas main and water main at the location of the proposed jet grout wall, the engineering company proposes taking the following steps, at the recommendation of Dam Safety:

- Developing a new process for filling voids and consolidating looser soils behind the dam’s southeast retaining wall;
- Analyzing the void between the timber platform and the spillway, and developing recommendations; and
- Reviewing Montana Construction’s recommendations and negotiating a final change order with them, which Remington and Vernick believes will reduce the overall cost of the project.

The entire process would be coordinated and approved by Dam Safety. Recommendations were made in a letter to the township dated June 14, 2016.Remington and Vernick is already being paid $63,180 for the work it has performed so far. Cost for the additional proposed work is $36,740, bringing the new overall cost of the project to $99,920, according to the letter. Remington and Vernick has already sealed some cracks and repaired some spalls previously identified, and repaired additional deficiencies they say came in the wake of Montana Construction’s excavation. This work has taken care of any seepage problems that were present, Remington and Vernick said.

(People just don’t realize the danger.)

Dangerous dam blamed in drowning of 13-year-old

By Drew Douglas | Jun 26, 2016, ky3.com

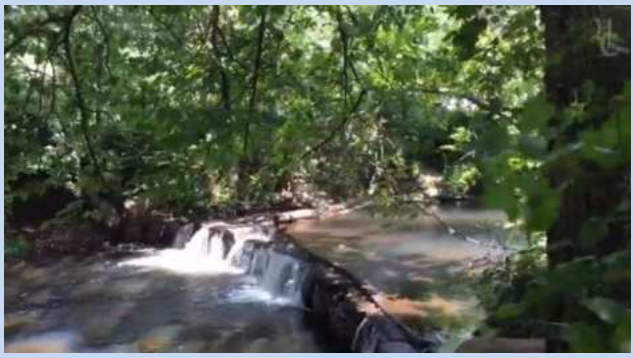
TECUMSEH, Mo. (KY3) There have now been 11 drowning deaths around the Ozarks just since May 10th. The most recent is 13-year-old Springfield girl Chloe Butcher, who drowned in a dangerous spot on the North Fork River on Saturday. "My heart goes out to the family, I pray for you, I cannot imagine the pain you're going through," says Jim Cody, one of the men who tried to help rescue Butcher. The Dawt Mill is a popular swimming hole on the North Fork River, but the dam there is known to be dangerous. Saturday, Jim Cody and Russell Vinson were finishing a float trip when they saw 13 year old Chloe Butcher clinging to the dam. "And then all of a sudden we heard a help, help, help," Vinson says.

The Missouri State Highway patrol says the girl was trying to rescue another swimmer, who was unharmed, when the current pulled her into a hole in the dam. Several people jumped in to try to rescue her, but she disappeared under the water and never came back up. "I was able to get ahold of her hand, but the current was too strong for me to be able to pull her out," Vinson says. "I just wish I could have done more. I mean you can only stay under water so long but I feel for that family," says Cody. The management of the Dawt Mill Resort told KY3 on Sunday that they have been advocating that the Corps of Engineers either repair or completely remove the dam, saying safety for people on the river should be the top priority. "The corps needs to fix it or tear

that dam down, one of the two," Vinson says. Cody and Vinson hope something is done before someone else drowns there, even though it's just one of the places where people have drowned this summer all around the Ozarks.

(Out with the old. Not much of a dam.)

Quinnipiac River Dam Being Removed In Southington
Century-old dam coming out of Quinnipiac River In Southington
Bill LeukhardtContact Reporter, 6/28/16, courant.com



SOUTHINGTON, CT — Work should begin next month to remove a dam across the Quinnipiac River to reopen the river to fish and other wildlife. "We are getting all the permits done to start the work in July if possible," John Champion, co-coordinator of Green Projects for Save The Sound, a program of Connecticut Fund for the Environment, said Monday. "It will allow blueback herring, alewives and American eels to migrate the final 15 miles upstream." The Clark Brothers factory dam in Southington is one of two dams the nonprofit Green Projects for Save The Sound has advocated to be removed. The second is the larger Carpenter Dam a few miles south in Meriden. The goal is to improve water quality on the river by removing two obstructions that now block wildlife and recreational use. Champion said Monday that all the municipal permits the group needs to do the work have been received, most recently 7-0 approval last week from the Southington Planning and Zoning Commission for the Clark Brothers dam demolition. The dam is off Route 10 near the Apple Valley bowling property.

The last permit the group needs is likely on its way from the federal Army Corps of Engineers, which oversees dam removal nationwide and the use of inland waterways. Money to take down both dams is administered by the U.S. Fish and Wildlife Service. The money is part of penalties paid after a toxic spill decades ago at the since-closed Southington landfill. At the June 21 zoning meeting, Champion said dam removal will allow fish to swim upstream from the mouth of the river in New Haven at Long Island Sound all the way to the headwaters of the river. The Clark dam is small, less than 70 feet long and no more than 6 feet high and has long had a channel that allowed silt to flow downstream and not clog up behind the dam. "It should take about a week to take down the Clark Brothers dam," Champion said Monday. The Carpenter Dam is bigger and harder to access so that job will likely take a month to do, he said.

The dam, built in the late 1800s by the Clark Brothers Bolt Co., spans the Quinnipiac River at its narrow turn by Route 10. The area often floods in heavy rains, a chronic condition that would lessen once the stone structure is removed, applicants said. Taking out both dams will improve water flow in the Quinnipiac, which flows 45 miles from its origin in a swamp near New Britain to Long Island Sound. Taking down both dams should allow people to paddle kayaks from Southington to Hanover Pond in Meriden, created by a dam across the Quinnipiac. The river's watershed covers 166 square miles in mostly urban south-central Connecticut. The Quinnipiac is the fourth-largest river in the state and flows southward through portions of 18 municipalities to New Haven Harbor.

(This will cost a bundle if it sticks.)

Appeals court: Washington must fix salmon-blocking culverts

By GENE JOHNSON Associated Press, JUNE 27, 2016 — startribune.com

SEATTLE, — In a case that could have big implications for dams and other development in the Northwest, a federal appeals court panel said Monday that Native American tribes have a right

not only to fish for salmon, but for there to be salmon to catch — a ruling that affirms the duty of the United States to protect the habitat of the prized fish under treaties dating back more than 150 years. Three judges from the 9th U.S. Circuit Court of Appeals reached their unanimous decision in a case involving culverts, large pipes that allow streams to flow under roads but which also can block migrating fish. They upheld a lower court's 2013 ruling ordering Washington state to replace hundreds of the pipes with more fish-friendly structures, such as bridges that allow streams to flow naturally underneath them.

"The Indians did not understand the Treaties to promise that they would have access to their usual and accustomed fishing places, but with a qualification that would allow the government to diminish or destroy the fish runs," Judge William Fletcher wrote for the panel, adding that territorial Gov. Isaac Stevens "did not make ... such a cynical and disingenuous promise." The ruling, praised by the tribes, was the second major court decision in as many months concerning salmon habitat in the Northwest. In May, a federal judge in Portland, Oregon, ruled that a massive habitat restoration effort by the U.S. government doesn't do nearly enough to improve Northwest salmon runs — and that federal law may require federal authorities to consider removing four huge dams on the lower Snake River in Eastern Washington. "These are significant rulings from courts that are saying this business about protecting salmon is serious," said Todd True, a lawyer with the environmental law firm Earthjustice, which is involved in both cases. "It's going to require some real effort."

Twenty-one Washington tribes sued the state over the culverts in 2001. The pipes can block fish in several ways, typically because the downstream end is elevated above the level of the stream, the angle is too steep for them to navigate, or because they become clogged with debris. Seattle U.S. District Judge Ricardo S. Martinez ruled that culverts diminished salmon runs by blocking access to about 1,000 linear miles of suitable streams, and in 2013 he ordered the state to replace hundreds of the highest-priority culverts within 17 years. The state appealed, arguing that its treaties with the tribes created no obligation to restore salmon habitat. During oral arguments last fall, a judge asked Washington Solicitor General Noah Purcell if the state had the right to dam every salmon-bearing stream that flows into Puget Sound. Purcell responded that while the state would never do that, nothing in the treaties would prevent it — an interpretation the appeals court rejected.

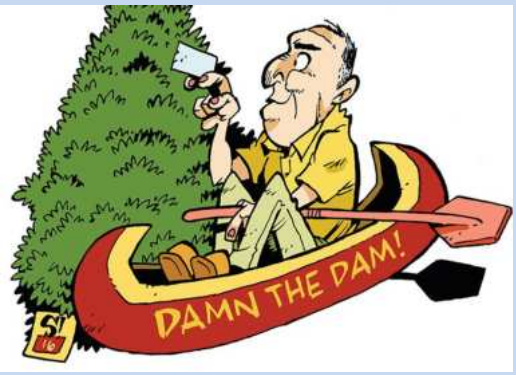
Washington agrees that replacing old culverts is one important part of restoring salmon runs and notes that is has spent hundreds of millions of dollars to fix fish habitat. But the state called Martinez's 2013 order too sweeping and expensive, and said it would force the state to focus on fixing culverts even when salmon-restoration dollars could be spent more effectively elsewhere. The state is reviewing the decision and did not have any immediate comment, a spokesman for the Attorney General's Office said in an email. Officials argued during the case that if the tribes had a right to habitat restoration, they could conceivably sue the state for virtually anything that impairs salmon, such as state or utility district-owned dams that block salmon passage. Fawn Sharp, president of Quinault Indian Nation on the Olympic Peninsula, agreed that the court's logic could apply to dams or other development that diminishes fish runs. She said she expected the ruling to bolster the tribe's arguments against a state proposal to dam the Chehalis River to help with flood control. "It's always been our position that when our ancestors signed those treaties and reserved certain resources and activities, that those would be protected forever, from the beginning of time to the end of time," Sharp said.

(Here's a man on a mission.)

Blotter: Undamming the dams

By Dustin Waters, June 29, 2016, charlestoncitypaper.com

Blotter o' the Week: A man suspected of stalking was questioned by police only to reveal his greater mission to save America. The man stated that he was traveling the country by canoe trying to spread his beliefs about "undamming the dams" across the country, according to an incident report. The levee leveller told police that he was leaving his business cards in bushes and near homes around town to connect with supporters.



Hydro:

(Hydro can't get a break.)

Lake Zoar Inlet Affected By Hydroelectric Operations

June 24, 2016, by Andrew Gorosko, newtownbee.com

The town is seeking to resolve a group of Anthes Avenue area residents' complaints about low water levels that they repeatedly encounter at a shallow inlet on Lake Zoar at the Housatonic River, about one mile upriver of the Silver Bridge. George Benson, town director of planning, said June 22 that in response to those residents' concerns, he plans to meet on June 24 with representatives of FirstLight Power Resources in seeking a solution to the problem. "It's a complex issue," Mr. Benson said. FirstLight operates a series of hydroelectric power stations along the Housatonic River, CT, including the power station at Stevenson Dam, where the level of Lake Zoar is lowered, or allowed to rise, as needed, as part of hydroelectric operations.
Norman Gardner of 4-A Anthes Avenue said this week he has property with frontage on the Lake Zoar inlet. Mr. Gardner said that FirstLight's control of the water level at Lake Zoar for hydroelectric purposes has often resulted in that inlet being drained of much of its water, posing environmental problems, as well as navigational problems for people with boats there.

Normally, the inlet's depth is about 3½ to 4 feet, he said. The lake's water level fluctuations are frequent and rapid, he said, adding that on Sunday, June 19, the water level in the inlet dropped suddenly and left about a dozen large carp stranded in shallow water. Mr. Gardner said that he and others then worked to rescue those floundering fish and place them in deeper water to revive them. Mr. Gardner said he has lived at Anthes Avenue for 23 years, adding that the fluctuating low water level situation has been a problem for the last few years. Last year, Mr. Gardner and some neighbors met with FirstLight and town officials in seeking to resolve the water level issues.
About 15 neighbors have formed an ad hoc group known as the Zoar Waterfront Association to seek a solution to the problem, Mr. Gardner said. The group's goals are to protect and maintain the lake's shoreline, as well as preserve its wildlife habitat and recreational value, he said.
Gary Fillion, a Newtown member of the Lake Zoar Authority, who lives downriver of Anthes Avenue in the Riverside section of Sandy Hook, said that the authority has sought to resolve the conflict between the Anthes Avenue residents and FirstLight. Mr. Fillion said that Lake Zoar is deep near the dock at his home, so he does not experience the low water level problem there.
Mr. Fillion said that other areas on the lake, where there is shallow water, experience loss-of-navigation problems when the water level is lowered. FirstLight needs to pay attention to problems such as those experienced in the inlet at Anthes Avenue, Mr. Fillion said. People who own land with Lake Zoar frontage bought that land to enjoy the recreational aspects of the lake, he noted.

FirstLight: "We Are Fully Complying"

Leonard Greene, a FirstLight spokesman, noted that Mr. Gardner lives next to an inlet on the lake that is shallow. FirstLight operates the Stevenson Dam power station in full compliance with Federal Energy Regulatory Commission (FERC) regulations, Mr. Greene said. "We are fully complying with all licensing requirements," he added. Mr. Greene said he is unsure whether there is a remedy for the Anthes Avenue water level situation. Sedimentation of that inlet may be occurring, he said. "I understand his frustration," Mr. Greene said of Mr. Gardner's complaints. FirstLight's FERC permit requires the water level of Lake Zoar be kept somewhere between 100.5 feet and 103.0 feet above sea level, he said. FirstLight thus seeks to keep the water level at somewhere between 101.5 feet and 102.5 feet above sea level, in view of the recreational uses of the lake, he said. The company seeks to address the lake's recreational and environmental issues, he said. Besides FERC requirements, the firm is in compliance with the state Department of Energy and Environmental Protection's (DEEP) fishery requirements, Mr. Greene said.

First Selectman Comments

First Selectman Pat Llodra said that FirstLight needs to raise and lower Lake Zoar's water level in generating electricity. But the rise and fall of the lake's level poses ecological and recreational issues, she said. Mrs. Llodra said that a series of photos taken on June 19 depicting fish that were stranded in low water near Anthes Avenue are "heartbreaking." This summer is the third summer that town officials have been addressing complaints about the low water levels at the inlet, she said. The town is seeking to balance the competing interests concerning that water level issue, but the town has not been able to resolve the problem, Mrs. Llodra said. "I don't know that there's an easy resolution here," she said. A long-range plan that resolves the conflict between the competing interests is needed, said Mrs. Llodra. While it is FirstLight's business to produce electricity, the recreational aspects of Lake Zoar are very important, she added.

(Sometimes the two can work together.)

State fish hatchery cold-water pipeline near Quabbin will generate hydropower; Baker, Beaton attend Belchertown groundbreaking

By Mary Serreze | Special to The Republican, June 24, 2016, masslive.com

BELCHERTOWN, MA — A new, mile-long cold-water pipeline will improve conditions for trout at the state's McLaughlin Fish Hatchery, increase flows to the Swift River below the Quabbin Reservoir, and generate 60 kilowatts of hydroelectricity through a gravity-fed turbine system. Gov. Charlie Baker and environmental affairs secretary Matt Beaton attended the project's groundbreaking Friday. They were joined by Department of Fish and Game Commissioner George Peterson, Quabbin Reservoir director Bill Pula, MassWildlife deputy director Mark Tisa, Massachusetts Water Resources Authority director Fred Laskey, and many others who represented interests ranging from fly fishing to drinking water to clean energy.

"This really is a home run, because it covers four bases," said Laskey. "It will increase the flows downriver, eliminate the threat to the hatchery from warm water, eliminate the need for pumping, and allow us to create electricity from the water coming through the dam at the Quabbin." Laskey said the project has been ten years in the making, and supporters had to overcome early skepticism, but that eventually, a coalition of state agencies worked together to advance the idea. The McLaughlin hatchery accounts for half of the brook, brown, rainbow, and tiger trout raised by the state annually. The fish are stocked in around 500 lakes, rivers, streams, and reservoirs throughout Massachusetts. "This project represents the ultimate fusion of energy and

environment," said Beaton, who spoke of his own love of fly fishing. He said 200,000 anglers licenses are sold every year in Massachusetts, and that fishermen and women appreciate the state's stocking program. Baker noted the many cooperating agencies behind the project. "This is really a team sport," he said. "It's an imaginative solution to a very legitimate problem." Currently, the hatchery's water comes from the Swift River, and is also drawn from four wells on the property. The Swift River water is variable in temperature and quality, which is not good for the fish. What's more, the withdrawal stresses the Swift River. The pipeline will instead draw six-million daily gallons of cold, pure water from the head of the Chicopee Valley Aqueduct, a large transmission main. After sluicing through a turbine, the water will be mixed with fresh, on-site well water before rushing through a series of linear raceways at the hatchery. The water will then be discharged into the Swift River, which currently sees constricted flows.

The Massachusetts Water Resources Authority must maintain a 20 million gallon-per-day flow on the Swift River at Bondsville, downstream from the Quabbin spillway. So when the hatchery starts drawing water from the aqueduct, instead of from the river, it will eliminate one stressor. The water, after circulating through the hatchery, will be discharged into the river, increasing flow even more. "Not since the Quabbin was first licensed in 1929 have we seen full flows to the Swift River," said Laskey.

The hydro turbines are expected to generate 441,000 kilowatt-hours of electricity per year, and also eliminate the need for electric pumps at the site, saving $80,000 per year. The project will also generate renewable energy credits, or RECs, which may be sold for their green energy value, said Pam Heidell, policy and planning manager at the state's water resources authority. The $4.4 million project is funded by a $2.2 million environmental bond authorization, $1 from the Massachusetts Water Resources Authority, $700,000 from the Massachusetts Clean Energy Center and the Department of Energy Resources' "Leading By Example" program, and $500,000 from MassWildlife's Inland Fish and Game Fund. "We support this pipeline project one-hundred percent, and think it's a wise use of fishing license funds," said Bill Rose, president of the Western Massachusetts Fly Fishermen. "It's good for the trout, and it looks like a great solution to the problem of varying water temperatures and the constant need to clear river debris from pump station intake screens." Tisa said the project was first envisioned when the hatchery was designed and built in the 1960s, "but somehow never got built." He said conversations started up about ten years ago to implement the plan. "What's great about this project, is it's not just people sitting around talking," he said. "We pulled together in a positive way and we're actually making it happen. This is big."

(Sometimes good comes out of all that rain.)

Central Texas rains lead to spike in hydroelectricity

By Asher Price - American-Statesman Staff, June 26, 2016, mystatesman.com

Highlights

Hydroelectricity is a small part of LCRA's power portfolio but a big part of its history.
Across Texas, rains translate into swollen waterways and hydroelectricity.
Lower Colorado River Authority sees heavy hydropower in first half of 2016.

The rains that have raked Central Texas this year have replenished reservoirs and soaked long-parched soils.

Less obviously, they're responsible for an uptick in an old-school style of electricity. Agencies like the Lower Colorado River Authority, working to manage teeming waterways, have released water through dams across the state, generating hydroelectricity in the process. So far this year, LCRA has generated more hydroelectricity than it did in the previous four years combined. Because of recent heavy rains, as much as 26,000 cubic feet of water were moving every second through Tom Miller Dam, which impounds Lake Austin, earlier this month — enough to fill 15 Olympic swimming pools a minute, according to John Hofmann, LCRA's executive vice president for water. Hydroelectricity facilities take advantage of all that churn, capturing the energy of falling water to generate electricity: The water turns a turbine, which turns a metal shaft in an electrical generator, which produces electricity.

Hydroelectricity amounts to a small portion of the generation portfolio of LCRA, a nonprofit utility that sells wholesale power to a host of electric cooperatives around Central Texas. But hydroelectric power is intimately tied to the utility's history. Once, the river authority won political clout through its hydroelectric power. Lyndon B. Johnson, then a young congressman, gained a name for himself by working with the river authority to build a series of dams to control flooding in the Austin area. Electricity generated by the water rushing through those dams was delivered to the Hill Country, drastically improving the standard of living in what was one of the poorest pockets of America. A half-century ago, the LCRA's hydroelectric capacity made up roughly half of its overall generating capacity. Nowadays, it's a mere sliver as the river authority has embarked on more ambitious energy generation projects, including power plants fired by coal and natural gas.

In 2015, about 48 percent of LCRA's energy output was generated from natural gas, about 47 percent from coal and about 5 percent from renewable sources, including wind and hydroelectric dams. "When we have to move water, that's free fuel to generate electricity," Hofmann said. "We want to take advantage of that when we have the opportunity." He said the overall cost to produce hydroelectricity and the rates of its sale was proprietary information. Apart from being available should an energy emergency strike the state, hydroelectricity is basically an afterthought, a byproduct of other river operation activities such as releases for agricultural use or to meet environmental needs — or to relieve swollen waterways. Electricity is generated as water is released along the Colorado River through Buchanan, Inks, Wirtz, Starcke, Mansfield and Tom Miller dams. A megawatt-hour is roughly the amount of electricity used by an average home each month.

The last time LCRA generated more in hydroelectric power than it has this year was 2007, when hydroelectric generation accounted for 413,000 megawatt-hours. That was the year of the so-called rain bomb in Marble Falls, when more than 19 inches of rain drenched the Hill Country community in a matter of hours. At nearby Canyon Dam in Comal County, hydroelectric generators managed by the Guadalupe-Blanco River Authority were turned off in April 2011 as the drought intensified; they weren't turned back on until May 2015. "During the years of drought, GBRA, just as a number of other river authorities and entities, was limited in its capacity to produce hydroelectricity," said LaMarriol Smith, a spokeswoman for the Seguin-based river authority, which provides water to Buda, Kyle, San Marcos, Lockhart and Luling, among other communities. Between January and May of this year, the Guadalupe-Blanco River Authority generated roughly 10,000 megawatt-hours of hydroelectricity. More rain — and more hydroelectricity — could be on the way.

(Hydro's roots. Love old mills. Must be good food. Sourdough bread used to be one of my favorites too.)

From grain to bread: McConnell's Mill hosts gristmill baker

By Rachel Sapienza, Jun 27, 2016, ncnewsonline.com

Hikers at McConnell's Mills State Park, PA got a little taste of history Sunday afternoon. Gristmill baker Stan Malecki from the Old Stone House in Slippery Rock visited the Old Mill courtyard to serve afternoon park-goers some Western Pennsylvania history and more importantly, authentic gristmill bread.

Malecki, who lives in Evans City, has been traveling to state parks and festivals for more than eight years, sharing historic stories and recipes. Using cast-iron baking, Malecki and his daughter, Missy Newman, cook up a variety of breads and pancakes using charcoal and wood-burning ovens and skillets. Malecki's favorite recipe, sourdough buckwheat pancakes, were the first goods to go at Sunday's presentation.

"Sourdough is my favorite, it's the most unique," Malecki said. "Buckwheat isn't a flour, it's a weed that is like rhubarb, and it's grown only here in Butler County." According to Malecki, Zanella Gristmill in West Sunbury is the only mill to still ground fresh buckwheat. Malecki explained that all of the products he makes are representative of grains that use to be milled at McConnell's Mill.

"The most fascinating part is this mill. I have a picture of Mr. McConnell standing in this very doorway and the mill looks exactly the same. No cracks in the structure, nothing," he said.

While Malecki offers a variety of breads, including a rosemary faccacia served with homemade honey butter, he also distributes pre-ground bags of grain with traditional recipes attached. He uses his cast-iron skillet, lined with lard and with charcoal underneath, calling the process "as easy as it gets." For the rosemary bread, Malecki's grains, a little water and time in the refrigerator serves up a fluffy, no-knead dough that can last up to seven days in the refrigerator. Malecki said the do-it-yourself recipe is always a hit, especially with his multiple grandchildren.

"I made 16 faccacias ahead of time for today. I laid down on the couch for a little while and when I got up, I found one had evaporated into thin air," he said. "The kids got to it, they really do love it."

Malecki's next appearance at the park will be during the McConnell's Mill Heritage Festival, happening at the end of September with the dates and times to be announced later.

(Doing its job.)

Garrison Dam & Lake Sakakawea

nwo.usace.army.mil

Hydropower at Garrison

Since its opening in 1960, Garrison Dam has provided the hydropower and flood control potential envisioned by Colonel Pick and others who directed its development. USACE has worked with the Bureau of Reclamation to use Garrison pool to irrigate 250,000 acres. The Garrison Dam has also provided a steady flow of water for navigation as well as generating hydropower. The power plant has five generating units that produce an annual average 2.6 million mega-watt hours of electricity, valued in excess of $39 million in revenue. Electricity is transmitted from the power plant through seven transmission lines to various substations and is marketed by Western Area Power Administration.

Characteristics and Value

Characteristics and Value	
Generators/Turbines	5 Francis Turbines, 90 rpm
Nameplate Capacity	583.3 MW · 3 units: 121.6 MW · 2 units: 109.3 MW
Percent of NWO Capacity	23.32%
Average Gross Head Available	161 ft
Number & size of conduits	5-29' dia.- 25' penstocks
Surge Tanks	65' dia. - 2 per penstock
Discharge Capacity	150 feet at 41,000 cfs
Average annual energy	2,259 M kWh

Water:

(A drought has many effects.)

A record 66 million trees have died in Calif., increasing fire risk

By Doyle Rice, USA TODAY, June 23, 2016, usatoday.com

California is a tinderbox of dead trees, which is fueling the fire risk in the state. According to a report released Wednesday, 26 million trees have died in the southern Sierra Nevada since October 2015. The deaths are in addition to the 40 million trees that died across the state from 2010 to October 2015, bringing the total to at least 66 million dead trees. The report, which was prepared by the U.S. Forest Service, was released as several wildfires continue to char thousands of acres across the state, with thousands of Californians ordered to flee their homes.

Four straight years of severe drought in California, a dramatic rise in bark beetle infestation and warmer temperatures are leading to historic levels of tree die-off, according to the report. According to the forest service, only 77,000 trees have been felled. "Tree dies-offs of this magnitude are unprecedented and increase the risk of catastrophic wildfires that puts property and lives at risk," said U.S. Department of Agriculture Secretary Tom Vilsack in a statement. The forest service is part of the Agriculture Department. A 2014 study from the forest service said there were an estimated 11 billion live trees on forest land in the entire state of California. "While the fire risk is currently the most extreme in California because of the tree mortality, forests across the country are at risk of wildfire and urgently need restoration requiring a massive effort to remove this tinder and improve their health," Vilsack said.

(Too much water can be worse than not enough.)

Floods cause evacuations in Richwood, water seeps over Summit Lake dam

June 23, 2016 - bnonews.com

The City of Richwood in West Virginia is being evacuated due to heavy rains and flash flooding, causing water to seep over the top of the Summit Lake dam, officials say. Other communities are also affected. The National Weather Service said Doppler radar and automated rain gauges indicated that heavy rain was falling over the area. The NWS initially reported that the Summit Lake dam had breached, but it later issued a correction, saying the dam is intact but water is seeping over. As a result, a flash flood warning is in effect and people along the Cherry River and in the city of Richwood have been urged to evacuate and head to higher grounds. "Flash flooding is already occurring," the NWS said in an alert. Photos and video from the area showed some areas inundated with water, including fields at Richwood High School.

(Terrible flooding in WV. When people ask me if I like that babbling brook, I always say yes. When people ask me if I would live next to it, I always say no. This is why.)

Flooding Kills 18 in West Virginia

More than 100 homes destroyed

By Newser Editors and Wire Services, Jun 24, 2016, newser.com

(NEWSER) – As a deluge swamped southeast West Virginia—a disaster that killed at least 18 people—Ronnie Scott's wife called him and told him their house was filling up with water. She fled to the attic with two dogs and a cat and waited. She smelled natural gas. Then, the house blew up. Belinda Scott was able to break a vent and get out onto a porch, then make it onto a tree, which she clung to for hours before being rescued by state police, Ronnie Scott told the AP on Friday. His wife was in the hospital with burns on 67% of her body. The pets did not make it out alive. "My wife was out there four and a half hours hanging in a tree with a house burning right beside her, flood waters running all around her," said Scott, who was not at the White Sulphur Springs home when the waters rose.

Early reports indicate about 9 inches of rain damaged or destroyed more than 100 homes and knocked out power to tens of thousands of others, Gov. Earl Ray Tomblin. About 500 people were stranded overnight in a shopping center when a bridge washed out, and dozens of other people had to be plucked off rooftops or rescued from their car. "Our focus remains on search and rescue," the governor said during a news conference. He added: "It's been a long 24 hours and the next 24 hours may not be much easier." The deaths included an 8-year-old boy and a 4-year-old boy who were swept away in rushing creek waters in different counties, authorities said. Currently 200 National Guardsmen were assisting in eight counties, helping local crews with swift water rescues, search and extraction efforts and health and welfare checks. The governor declared a state of emergency in 44 of 54 counties and authorized up to 500 soldiers to assist.

(Recent headlines on WV flooding.)

Death Toll Rises to 24 in Devastating West Virginia Floods

BY PHIL HELSEL AND THE ASSOCIATED PRESS, nbcnews.com, 6/25/16

(Good news and bad news.)

Researchers Just Found a Giant Cache of Water Underneath California

By Ria Misra, 6/27/16, gizmodo.com

Last year, researchers estimated that California had lost 63 trillion gallons of water over the course of 18 months of drought. Now, a huge reservoir of underground water—three times bigger than engineers thought—has been found under California. But it still won't solve the state's drought troubles.

Researchers from Stanford University announced their find in a paper today in Proceedings of the National Academy of Sciences. Up until now, estimates of the amount of water beneath California's Central Valley were less than a thousand cubic kilometers. Now, researchers say the reservoir contains 2,700 cubic kilometers of usable water, or approximately 713 trillion gallons. That's several times what the state has reportedly lost. So why won't it solve California's drought woes? Part of the problem is where it was found.

Earlier estimates of the size of the reservoir were low, in part, because most studies had only looked up to 1,000 feet underground. That made sense based on old technologies, but, as the state dried up and our digging tech got better, water companies have been able to go deeper and deeper. Most of the water found by the Stanford researchers in this survey was between 1,000 and 3,000 feet below the surface. That's still close enough to the surface to retrieve, study leader Stanford's Rob Jackson told Gizmodo. "It's a little more expensive to use, but some towns and businesses are already using groundwater 1,000 feet or more deep," he noted. The problems, however, aren't just getting to the water; there are also questions about the quality of that water once we get there. About 30 percent of the underground water supplies that the Stanford researchers found run right into drilling sites for either oil or natural gas—and that means that they could easily be contaminated. There's also the possibility that, by tapping so deeply into the reservoirs, we could cause the ground to noticeably sink, a process the researchers say has already begun from relatively shallow tapping in the Central Valley. But even if we could find a way to get to the water easily—and found it to be relatively clean when we did—it still wouldn't yet be time to fill our pools with a slurry of bottled water and almonds. "We need to be careful about using it," Jackson told us. "California's groundwater pumping has been in overdraft for years, especially during the drought. Finding more water than expected doesn't mean we should waste it." Plus, California's drought is just one of the worldwide droughts we're seeing. It's no anomaly. In our new, hotter climate, droughts are normal, even expected. This reservoir, then, doesn't need to just help compensate for California's current drought—it needs to help prepare for the next one, and all the ones after that.

Other Stuff:

(This will give you sinking feeling. They predict the big one is coming.)

Earthquake omen: Land around San Andreas Fault rising, sinking

By Rong-Gong Lin II, Los Angeles Times, June 22, 2016, seattletimes.com

For the first time, a computer image shows huge sections of California rising and sinking around the San Andreas Fault from seismic strain that will be ultimately released in a large earthquake.

Photo shows a valley eroded along the San Andreas Fault in the Carrizo Plain. The downstream segment of the channel on the west side (far side) of the fault has been displaced a kilometer or more from the upstream segment (left out of view). (USGS)

LOS ANGELES — For the first time, scientists have produced a computer image showing huge sections of California rising and sinking around the San Andreas Fault. The vertical movement is the result of seismic strain that will be ultimately released in a large earthquake. The San Andreas Fault is California's longest earthquake fault, and one of the state's most dangerous. Scientists have long expected that parts of California are rising — and other parts sinking — around the fault in a way that is ongoing, very subtle and extremely slow.

Such vertical movement makes a lot of sense. California sits on the border of two gigantic tectonic plates — the Pacific and North American — that are constantly grinding past each other.

But actually observing how California's landscape is rising and falling from seismic strain has been an elusive goal, until now.

Earthquakes may be unpredictable — but they are also inevitable. Here are some tips to help you get ready before the next one hits. In a study published in the journal Nature Geoscience on Monday, scientists found that much of the Los Angeles Basin, Orange County, San Diego County and the Bakersfield area are sinking 2 to 3 millimeters a year — a couple of penny-widths annually. By contrast, Santa Barbara and San Luis Obispo counties, and a large portion of San Bernardino County, are rising at the same rate. The areas closest to the San Andreas Fault, however, remain locked in place. When the next big earthquake strikes, the different parts of Southern California will lurch back to the same level.

"Once there is a major event, all of that energy gets released," said Sam Howell, a doctoral candidate in geophysics at the University of Hawaii at Manoa and the lead author of the report. Besides Howell, the other co-authors of the study were Bridget Smith-Konter and Neil Frazer, also at the University of Hawaii; Xiaopeng Tong of the University of Washington; and David Sandwell, of the Scripps Institute of Oceanography at the University of California, San Diego.

The region of the San Andreas Fault between Monterey County and Imperial County hasn't moved in a significant way in more than 150 years, and other parts of the fault have been accumulating stress for more than 300 years. The last big earthquake on the southern San Andreas Fault, a magnitude 7.9 temblor, ruptured from Monterey County through Los Angeles County in 1857. Further south, the section of the San Andreas between San Bernardino County and Imperial County hasn't ruptured in a major way since about 1690.

Howell said the time span for a large rupture on the southern San Andreas is, on average, once every 150 years or so. But the actual interval can vary over the centuries, and that's why it's hard to say exactly when the next big one will hit. Howell said a better understanding of how California is being warped as a result of this accumulating seismic strain is helping scientists "understand more about how the fault is behaving and the effect it's going to have in the surrounding region." The study, however, isn't expected to help scientists suddenly predict the precise time and location of the next devastating quake. "It's pretty much impossible to say when the next one will happen," Howell said.

GPS data provided the raw information of how the earth is moving subtly from seismic pressure. Howell said it has been easy for scientists to see how California was moving in north, south, east and west directions, but it was much harder to show how the state was moving vertically due to seismic forces. The big problem was that there are other factors that can influence whether land is rising and falling, such as changing groundwater levels. Some parts of California are sinking as groundwater is pumped out for irrigation. The breakthrough accomplished by Howell and his team involved writing a computer code that filtered out how the land was rising or falling from non-seismic factors. “We wrote a computer code that could try and find the broad, large-scale signal,” Howell said. “It’s trying to find the smooth trend.” The study received funding from the National Science Foundation.

(Don’t wanna live there.)

The 10 Worst US Cities to Call Home

Life isn't so sunny in Miami

By Arden Dier, Newser Staff, Jun 29, 2016, newser.com

The Miami skyline is seen in 2010. (AP Photo/Wilfredo Lee, File)(NEWSER) – Think life is sunny in Miami? Not so, according to 24/7 Wall St. The city tops a ranking of the worst US cities to call home based on various economic and social factors—including the affordability of housing, employment growth, crime rates, educational achievement, and nearby attractions and restaurants. The worst of the bunch:

1. Miami, Fla.
2. Detroit, Mich.
3. Paterson, NJ
4. Hawthorne, Calif.
5. Fall River, Mass.
6. Birmingham, Ala.
7. Memphis, Tenn.
8. Flint, Mich.
9. Cleveland, Ohio
10. Gary, Ind.

Click for the full list - http://247wallst.com/special-report/2016/06/28/the-worst-cities-to-live-in/2/ or a list of the best cities to live in America - http://realestate.usnews.com/places/rankings-best-places-to-live

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