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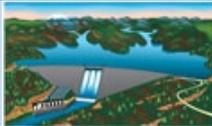
Some Dam – Hydro News™ And Other Stuff



Quote of Note: *“A fine quotation is a diamond on the finger of a man of wit, and a pebble in the hand of a fool.”* --JOSEPH ROUX

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“Good wine is a necessity of life.” - -Thomas Jefferson
Ron’s wine pick of the week: 2010 Masi Italy (Other Regional Reds) "Campofiorin"
“No nation was ever drunk when wine was cheap.” - - Thomas Jefferson



Dams:

(Looks like a hardy bunch! Wonder who these top power brokers are!)

News: Federal Utility Partnership Working Group tours Old Hickory hydropower

U.S. Army Corps of Engineers, Nashville District, Story by Mark Rankin, dvidshub.net

HENDERSONVILLE, Tenn. – Some of the country’s most powerful people visited Old Hickory Power Plant today as participants in a Federal Utility Partnership Working Group tour. The U.S. Army Corps of Engineers Nashville District hosted 22 members of the group, which requested to visit a hydropower facility during meetings held in Nashville organized by the Tennessee Valley Authority. Jamie James, program manager, Hydropower Rehabilitation Program manager and Ryan Frye, Hydropower maintenance engineer, provided the group with information and answered questions about the district’s hydropower mission and 20-year, \$1.2 billion program to rehabilitate 28 hydropower units during a 15-minute bus ride to the dam. The participants learned that the U.S. Army Corps of Engineers Nashville District produces about \$40 million annual revenue by converting water’s energy into 3.4 billion kilowatt hours of electricity in 28 generators at its nine Hydropower Plants in the Cumberland River Basin. In addition, they found out that the

district's hydropower plants have exceeded their typical design life of 35-40 years, having been in service on average more than 50 years, and the risk of component failure increases with time.

James shared that in 2011 the district joined forces with the Department of Energy, Southeastern Power Administration and their preference customers in signing a memorandum of agreement that funds rehabilitation, non-routine maintenance and modernization of the district's hydropower units.

The group listened and asked good questions, said James. "It is good to see their concern for the dam's operation, equipment improvements and how we maintain it," he added. Steven Crawford and Nicholas Pilcher, hydropower trainees at the Old Hickory Power Plant, then provided the group with a safety briefing and introduction of maintenance



spring conference for the Federal Utility Partnership Working Group, toured the Old Hickory power plant, Lock and Dam today.

tools and gear used at the power plant. Crawford also described the day-to-day power plant operations and the function of four large General Electric generators used for hydro generation. Crawford and Pilcher split the group in half and led them into the power plant. They explained the generator's functions and the group witnessed the operation of the turbine shaft and other major components and the large rotator assembly. L. Daryl Williams, TVA Industrial Services manager, said the tour is a great experience for attendees to look closely at the equipment used during operations and to have an opportunity to ask questions. "This is an excellent and well-kept facility," said Williams. "We can relate to how it is used because it was built or has the same vintage as many Tennessee Valley Authority dams in which we are familiar with." "This facility is larger than I expected and it is very clean," said Kazi Mamun, an executive with the Eaton Corporation. "It looks great for its age and the Corps has taken very good care of it."

Mamun recognized several aging Eaton Corporation pieces of equipment inside the dam near the generator doors on the tour throughout the dam "It's time for an upgrade," said Mamun. Williams said it was good for the group to see the power plant, and get a feel for needed improvements that could eventually qualify for upgrade funding from the U.S. Department of Energy. "All hydro generated dams need upgrades and repairs at some point in time," said Williams. Williams also explained that the FUPWG meets to discuss and maintain partnerships and facilitates communications among Federal agencies, utilities, and energy service companies that help with funding and solving energy problems. One of the group's missions is to help develop strategies that implement cost-effective energy efficiency and water conservation projects through utility incentive programs that help federal sites," he added. After a tour of the power plant, Crawford guided the group across the lock and dam structure, and the group watched the hydropower units and sluice gates churn large amounts of water. He even provided a short presentation on the importance of environmental stewardship and natural resource management at the district's lake projects. "I think this is a really cool facility," said David McAndrew, Federal Energy Program lead. He said he is very appreciative that the group was given the opportunity to take a look at the inside of the generator up close and observe the need to upgrade many pieces of equipment. "This tour was great," he added. "It brings to life the things we talk about at our conferences and brings motivation to the other agencies looking to work with us." "This was an extremely good visit for the Nashville District and provided the group with some insight on how we operate here at the Old Hickory dam," said Crawford. "I think they left with a good amount of knowledge and through their many questions, responses and comments, showed us they were happy." Pilcher added that the powerhouse operators set up a great segue to their next lecture in electricity when they spoke about the importance of transformers in stepping electricity up or down. "We enjoy it when groups

want to tour our facilities and take interest in our dams,” said Crawford. “Our powerhouse is always busy with projects and we enjoy and encourage school groups, clubs and other interests groups to schedule a tour with us.”

The exchange was a valuable continuation of the agencies’ initiative to share information about infrastructure development and maintenance, according to Williams. “This group was particularly interested in how the partnership works between the Tennessee Valley Authority, which owns many hydropower plants and navigation locks on the Tennessee River, and the U.S. Army Corp of Engineers, which operates and maintains the navigation locks,” said Williams. The Old Hickory dam visit was coordinated through TVA and the DOE to share knowledge and technology for conference attendees. For more information about Old Hickory Lock and Dam Tours or to schedule a group tour please contact the Old Hickory Lake Resource Manager’s Office at 615-822-4846. For more news, updates and information please follow the Nashville District on Facebook at <http://www.facebook.com/nashvillecorps>. Old Hickory Lake is also on Facebook at <http://www.facebook.com/oldhickorylake>. The Nashville District is also on Twitter at <http://www.twitter.com/nashvillecorps>.

(Where would CA be without the dinosaurs? How do you recharge groundwater without dams?)

Dams & reservoirs: The 'dinosaurs' of CA water storage?

Critics say projects are costly, offer limited supply for cities, farms

By Chris Nichols, May 3, 2015, utsandiego.com

SACRAMENTO — With dead almond trees propped on the Capitol steps and school children clutching signs that read “We need water. Build storage now!”, advocates for new dams and reservoirs in California offered a striking set of visuals in Sacramento last week. Legislation to advance those traditional GOP arguments, however, faded away faster than this year’s Sierra Nevada snowpack, rejected later in the day by Democrats who tightly control decisions under the Capitol dome. “I think (surface storage) is a dinosaur. The fact is it’s an inferior way to store water,” said Assemblyman Das Williams, D-Santa Barbara, who chaired a panel that rejected a Republican bill to speed up dam and reservoir construction last week. “It will be a piece of the future, but a very small piece.”



The construction of dams and reservoirs has slowed dramatically in California over the past 40 years due to stronger environmental regulations, the lack of remaining suitable sites and growing momentum for more cost-effective methods of storing water. But faced with a fourth straight year of drought and growing water shortages for agriculture, Republican lawmakers and Central Valley farmers say there’s no better time than now to build additional above ground storage, to ensure future drought’s aren’t so brutal. “(The drought) started in agriculture, but now it’s touched all parts of the state — we know the solution is water storage,” Assemblyman James Gallagher, R-Nicolaus, told the farmers, lawmakers and children at last week’s Capitol steps rally. Gallagher authored the bill, AB 311, to expedite reservoir construction. Like the almond trees on the steps, his legislation was dead just hours after the rally, defeated by a 6-3 party line vote in the Assembly Natural Resources Committee, with all Democrats opposed. Lacking in detail, and pursuing a solution Democrats simply don’t agree with, the legislation was flawed from the start, said William, the committee chair. “It was a political stunt,” Williams added of the rally.

History and high cost

California is home to more than 1,400 regulated reservoirs, the largest of which were built in Northern California by the state and federal governments from the 1950s through the 1970s. Since the completion of New Melones Dam in the Sierra foothills in 1979, however, only regional water authorities have invested in large-scale dams and reservoirs. "Big dam building has slowed a great deal," said Maury Roos, the state's chief hydrologist with the Department of Water Resources. "The best sites have been taken. There's a lot more opposition to building dams," Roos added, citing push back from both environmentalists who highlight the effects on migratory fish and American Indians concerned about the destruction of sacred tribal sites. Gallagher and other Republicans say without more reservoirs, the state will lose out on capturing billions of gallons of water that falls, during wet years, on sections of rivers without dams and then flows to the delta and ocean. Still, opponents say the argument against big new dams boils down to economics. "Water generated from big new storage projects costs substantially more than water from water use efficiency, stormwater capture, groundwater cleanup, and water recycling projects," Doug Obegi, an attorney for the Natural Resources Defense Council, an environmental advocacy group, wrote in a blog last year.

"They just don't pencil out," Obegi added in an interview. Citing a federal study to build a dam at Temperance Flat east of Fresno, Obegi said the \$2.5 billion project would yield up to 76,000 acre feet of water but cost taxpayers more than \$1,500 per acre foot. That would be about \$600 more per acre foot than the water generated by an Orange County groundwater replenishment system, he said. One acre-foot of water, or 326,000 gallons, is the approximate amount used by two typical single-family households. Building dams is not only expensive, it results in relatively low available supply for cities and farms, according to the California Public Policy Institute, a nonpartisan research group. "Five proposed projects — costing roughly \$9 billion — would expand statewide reservoir capacity by about four million acre-feet. However, these projects would raise annual average supplies by 410,000 acre-feet, or just one percent of annual farm and city use," according to a recent PPIC report. The supply from new reservoirs would be limited because these storage banks aren't dedicated solely to city and farm deliveries, explained Ellen Hanak, director of the institute's Water Policy Center. Much of their new space would remain empty in case it's needed to store flood water, some would be devoted to environmental water flows, and yet more would be dedicated for use only in droughts, she said. "That doesn't mean it's not useful," Hanak said, describing surface storage as one piece of California's complicated water supply puzzle.

San Diego region

Recognizing its lack of natural water supplies, the San Diego region has aggressively developed surface storage, both historically, and in recent decades. There are 25 reservoirs in the San Diego County Water Authority's service area, which includes 95 percent of the county's population. Last year, the region saw its biggest increase in water storage in history with the completion of the San Vicente dam raise. It raised the dam by 117 feet and added 152,000 acre feet of water storage capacity. In 2003, the water authority completed the Olivenhain Reservoir, producing 24,000 acre-feet of water. Given these recent expansions, there are no dam building projects through the water authority's 2035 planning horizon, according to an agency spokesman.

The Diamond Valley Lake reservoir in Riverside County has a capacity of 800,000 acre-feet and has been a key component of the Southern California water system since its completion in 1999 by the Metropolitan Water District, which supplies water to the San Diego authority.

State's water future

While dams do nearly all of California's waterways, there's money and some momentum for building at least one more large state reservoir in the near future — though perhaps not directly on a river. Voters in November approved the state's \$7.5 billion water bond. Needing Republican votes to put the measure on the ballot, Democrats including Gov. Jerry Brown agreed to include \$2.7 billion for water storage. The proposed Sites Reservoir, which would sit west of the Sacramento River about 60 miles north of the Capitol, has emerged as the top candidate, along with the Temperance Flat Reservoir. All sides in California's water debate are closely watching plans for the two reservoirs, with environmental groups at least not ruling out the Sites project,

Obegi said. The water bond allows the state to use a competitive process to select storage projects, pay for a maximum of half their cost. Half of any water bond money would be devoted to ecosystem improvements, the attorney said. Norman Crow, who grows almonds and walnuts on 1,000 acres in Crows Landing, named after his farming forefathers seven generations ago, said last week the state should take a close look at the cost of water storage. That doesn't mean, however, it should rule reservoirs out as it grapples with California's water crisis, he said. "We should look at the economics," Crow said following the water storage rally. "Let's (also) be accountable for the money we agreed to spend," in the water bond. "We don't want to be adversaries," the farmer added. "We want to bring everybody to the table and work this through."

(Guess there's a message in the photo somewhere!)

The Addicks and Barker Dams Won't Fail, Right? Right?!

By Sarah Rufca, May 3, 2015, houstoniamag.com

ALL QUIET ON THE WESTERN FRONT—West Houston, TX that is. Looking down into the Barker Reservoir from the edge of a flat-topped earthen wall of a dam, one spots deer and egrets, as well as stripes of freshly exposed wood on trees, telltale signs of industrious beavers. The green expanse before us feels like a nature park, even as nearby we hear the steady hum of 500 cubic feet of water rushing through a conduit each second. For a moment, we forget that if Houston ever faces disaster on a grand scale, the Barker dam—as well as the one in Addicks—may well be ground zero for the city's destruction.



Constructed in the 1940s near the modern-day intersection of I-10 and Highway 6, the dams were built in response to a pair of devastating floods in 1929 and 1935, the latter of which killed eight people and caused extensive damage after 17 inches of rain drenched the city.

The Army Corps of Engineers estimates that over the years the Addicks and Barker reservoirs have saved Houston from \$8 billion in flood damage. Yet the task of protecting the city from flooding has grown ever more difficult as the areas upstream of the dams have become more developed and more water runs off into waterways rather than being absorbed into the soil. And then there's all the development downstream, which creates its own runoff, limiting how much water can be released from the dams into Buffalo Bayou. The upshot? During extreme rain events, both reservoirs will fill more quickly and be expected to hold more water for longer periods of time.

"It's all applying additional pressures to the dams," says Richard K. Long, who supervises the Addicks and Barker dams' day-to-day operations for the Corps. That pressure became obvious after a heavy storm in 2009 dumped 8 to 10 inches of rain on West Houston. With the water in the reservoirs at record levels, engineers noticed water seeping through voids, or gaps, under the dams' conduits, which control how much water is released into Buffalo Bayou. That same year, the Addicks and Barker dams were rated "extremely high risk" by the Army Corps of Engineers—although the organization also noted that the dams were not "in imminent danger of failing." Confused? After Hurricane Katrina, the Corps changed the way it evaluated infrastructure, assessing not only structural risks but also the potential loss of life and property from a failure. How the formula is computed to arrive at this rating, and to what degree it is based on existing problems, is an area in which the Corps has been frustratingly vague. Even so, the designation has garnered national attention. Vice magazine, in a hard-hitting look at America's infrastructure problems last February, called Houston's two major dams one of seven American projects "on the verge of collapse." The prospect of failure is truly terrifying. If either dam were to fail during or

after a major storm, floodwaters rising from Buffalo Bayou could potentially submerge homes and businesses in the Memorial area, downtown, the Medical Center and beyond. For his part, however, Long adamantly insists that the dams' low ratings have more to do with potential consequences than structural problems. In any event, the Addicks and Barker dams are now "on the top of the money heap" when it comes to federal funding for improvement. Since 2009, the Corps has spent more than \$4.4 million on interim fixes like filling in the leaking voids. This fall they are expected to begin building new water control outlets, part of a three-year project that will cost between \$75 and \$100 million. These new conduits will be surrounded by man-made materials instead of Houston's sandy soil to create a perfect seal, and a second set of gates will be added to provide yet another layer of protection when the reservoirs are holding back a large volume of water. As the growth of Houston's far western suburbs continues apace, the reservoirs will likely spend more and more time as bodies of water and less as green space. But it's nothing the improved dams won't be able to handle, Long says. "It's a good facility for what it's designed for. It's being taxed more and more all the time, but I think it's got another 70 years in it. That's more than I've got in me."

(Oops changed my mind! Solutions are curious, Show me the money!)

Stanford University wants to keep controversial dam

May 04, 2015, The Associated Press, smdailyjournal.com

STANFORD, CA — Stanford University plans to keep a 19th century dam that environmental groups and water officials say is endangering local populations of steelhead trout and other species. A Stanford University task force released the school's long-awaited proposals for the future of Searsville Dam last week. Created in 1892, the dam's reservoir is now largely filled with sediment and has not been used as a public water source since 2013. The task force's report says the reservoir has become an important wetlands for local habitat, however, and should not be removed. The task force recommends opening a hole at the base of the dam to let water and fish flow. If that is not feasible, the school said, the best alternative would be letting the dam fill with sediment completely and providing a fish ladder for trout. The San Francisco Bay Regional Water Quality Control Board in late March expressed support for calls to remove the dam entirely, and expressed technical doubts about both alternatives that the school is proposing.

The water board called the dam a "complete barrier" to fish migration on the creeks controlled by the dam, and said the 65-foot-high structure places the local population of steelhead trout "at much greater risk of extinction." In a statement, dam opponent Matt Stoecker of Beyond Searsville Dam called the school's two proposals "ineffective Band-Aids" and predicted they would not secure government approval.

Stanford, in its own statement, said both alternatives would cost up to \$100 million, and the school would make a priority out of seeking funding.

The school would keep studying the matter to "ensure that we do the right thing, especially for the communities located downstream of the dam," the statement quoted Jean McCown, Stanford's director of community relations, as saying. The dam is upstream of multimillion-dollar homes in tech-industry center Palo Alto, including a residence of Facebook founder Mark Zuckerberg.

(Sometimes it's the other stuff that contributes to a dam's safety.)

EWEB to fix all 3 dam gates

A federal agency orders the complete replacement of troublesome motors at the Leaburg reservoir

By Christian Hill, The Register-Guard, MAY 6, 2015, registerguard.com

The Eugene Water & Electric Board will replace all the hydraulic motors that raise and lower the three rollgates that regulate the flow of water through Leaburg Dam. EWEB already has replaced the motor for rollgate No. 2, which failed in January 2012, and the dam's federal regulator has directed the utility to replace the motors on the other two rollgates after one failed and the other experienced a brief malfunction. The utility planned to replace the failed motor this year. It was

considering replacing the remaining third motor in the future, but the Federal Energy Regulatory Commission directive makes the decision for the utility and also puts that project on fast track. EWEB switched out the dam's electric motors for hydraulic ones more than a decade ago in an effort to raise the level of the reservoir behind the dam to generate more electricity. Now the utility is shifting back to electric motors to control the dam's three rollgates. After a brief discussion, EWEB commissioners on Tuesday approved amending the utility's contract with Knight Construction, headquartered near Spokane. The company replaced the failed hydraulic motor with the new electric motor and associated systems on rollgate No. 2, and is being tapped to do the same work on the other two rollgates. Knight Construction did not design or build the hydraulic motors. The commissioners' vote was unanimous. Commissioner Dick Helgeson was absent. Commissioners on Tuesday also met in a closed session to discuss litigation likely to be filed.



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The entire project is expected to cost more than \$5.7 million. The utility has said the costs are being covered from existing reserves and existing capital budgets. "We're pursuing all avenues for recovering all or part of our costs," EWEB spokesman Lance Robertson said. EWEB reported to FERC that an initial investigation showed that the hydraulic motors for rollgates 1 and 2 failed in a similar manner, with the rotor in each motor breaking in several places, records show. Knight Construction crews were repairing rollgate No. 2, located in the middle of the dam, when rollgate No. 1 slammed shut on Dec. 23 as operators were trying to clear a log that got wedged against rollgate No. 3 on the opposite side of the river. That incident followed heavy rains that sent a large amount of woody debris down the McKenzie River. The next day, operators were alerted that rollgate No. 3, which was raising and lowering automatically, was not responding to a command to open. They discovered wood debris in the rollgate's track. They were able to manually open the rollgate. Operators decided to lock rollgate No. 3 into place for about a month to prevent a potential failure of all three rollgates. They began operating rollgate No. 3, on Jan. 21, the same day they began testing the repaired rollgate No. 2. The No. 2 rollgate was deemed fully operational in automatic mode on Feb. 12.

In a Feb. 24 letter, the regional engineer for FERC's Portland office, Doug Johnson, directed EWEB to submit a plan and schedule for repairing the rollgate No. 1 motor. He also directed EWEB to replace the motor for rollgate No. 3 because "there is a high risk" of failure because of the problems with the other two motors. Joe Harwood, another EWEB spokesman, said Knight Construction will begin work on rollgate No. 1 next month. Its workers are scheduled to wrap up that project by late fall or early winter, and they are scheduled to begin work in earnest on rollgate No. 3 after the holidays. Workers are expected to finish the project by mid-2016. Under the amended contract, EWEB will pay Knight Construction \$1.5 million to repair rollgate No. 1 and \$1.1 million to repair rollgate No. 3. The cost to repair rollgate No. 1 is higher because it includes work to increase the functionality of rollgate No. 2, Harwood said. EWEB spent \$3.1 million to repair rollgate No. 2, which included the more than \$1.6 million it paid Knight Construction to swap out the motors and associated systems. Design and engineering of the new motor — and work by Eugene-based Wildish Construction Co. to build, install and remove a bulkhead to divert water away from the rollgate while it was under repair — encompassed the remaining expenses. Harwood said EWEB will contract with Wildish again in coming weeks to install and remove the bulkhead needed to divert water during the future repair projects. That cost is not yet known, Harwood said, but EWEB will save some money because Wildish can reuse the bulkhead it built for the first repair project. Leaburg Dam, 27 miles east of Eugene, was built in 1931.



Hydro:

(Don't you get nervous when Congress does anything, although this may be a good thing?)

Perry Amendment to Boost Hydropower and Create Jobs Passes U.S. House

May 1, 2015, by RealEstateRama, pennsylvania.realestaterama.com

WASHINGTON, D.C. – May 1, 2015 – (RealEstateRama) — U.S. Rep. Scott Perry (PA-4) continued his efforts this week to remove government barriers to the development of hydropower in the U.S. by sponsoring an amendment to H.R. 2028, the Energy-Water Appropriations bill for FY2016 that would restore funding for this vital energy resource. Hydropower is the largest source of clean, renewable energy in the U.S., creating thousands of jobs (including many in the 4th District) and providing power to millions of Americans at low cost. “This bipartisan amendment increases funding for hydropower development – without adding to our debt,” said Rep. Perry. “Hydropower is vitally important to reducing our dependence on foreign oil and unlike some other renewable energy sources; it’s reliable and available in every region of the country.” Rep. Perry joined Reps. Suzanne Bonamici (D-OR-4) and Chellie Pingree (D-ME-1) in sponsoring an amendment to restore \$9 million in funding to the Water Power Program and offsetting that cost by reducing funding for administrative costs at the U.S. Department of Energy. That amendment passed the House by voice vote Thursday. Rep. Perry had earlier introduced an amendment to increase funding even further, all of which was also offset by spending cuts elsewhere, but he agreed to the compromise amendment.

Hydropower is our nation’s most available, reliable, affordable and sustainable energy source. Of the approximately 80,000 dams in the U.S., approximately 3 percent currently generate hydropower. This represents a tremendous opportunity for our nation’s energy needs and is vitally important to reducing our dependence on foreign oil. The U.S. produces more electricity from hydropower than from any other renewable electricity source, accounting for 56 percent of renewable generation in 2012 and 7 percent of the nation’s overall electricity generation. Utilizing new technology at existing hydro sites represents an opportunity for enhancing this infrastructure and generating more sustainable power. Rep. Perry has long advocated that hydropower faces an overly burdensome regulatory approval process that includes multiple federal, state and local governments and other participants. 60,000 megawatts of preliminary permits and projects are currently awaiting final approval in 45 states. Pennsylvania’s potential for hydropower production is among the 10 highest in the U.S. and Rep. Perry will continue to seek avenues to remove government obstacles to unleash that potential energy.

(Looks a big hole in the ground right now.)

Update on the Hydroelectric Project

journalexpress.net, May 4, 2015

Steady progress continues at the site of the Red Rock Hydroelectric Project. Iowa as crews complete the downstream cofferdam and dike and the upstream diaphragm wall at the 760-foot lower bench level. The dry spring weather has provided good working conditions for the upstream construction of a 240-foot diaphragm wall that will hold back the earthen dam to provide a channel for water to enter the intake structure that sends the water to the turbine/generator. “There is always a concern about the level of the reservoir,” said Joni Livingston, Director of Member Services and Communications for Missouri River Energy Services. “If the water level comes near the 760-foot elevation work bench, current work activities would have to stop on the upstream side of the dam.”

"The water levels throughout April have ranged from 742 to 744 feet in elevation, well below the 760-foot temporary work platform where construction is currently taking place. Of course, one heavy, fast rain could quickly change everything," said Livingston. If the water levels remain steady, four more wall elements will be installed over the next two weeks, completing the lower bench work for now. Crews will then construct a temporary work platform at the 780-foot elevation to begin construction of five more diaphragm wall elements. The movement of rebar cages and resulting overnight short-term road closures has been a critical factor in building this retaining wall. "We are grateful to the public for their ongoing support and patience with the project," said Livingston. The cofferdam and closure dike on the downstream side of the dam are nearly complete, which will help keep water out of the site during the excavation and construction of the powerhouse. Excavation for the powerhouse is well underway, along with the installation of tie-back anchors and bracing in the retaining (secant pile) wall. With the safety of the public and construction workers in mind, the construction areas will remain closed to the public for the duration of the hydro project. Closed areas include the North Tailwater Recreation Area, the North Overlook Picnic Area, and the Volksweg Bike Trail from Howell Station Campground to the North Overlook Picnic Area.



(The whole west is dry.)

Less Water In Northwest Rivers Will Mean Less Hydropower

by Cassandra Profita OPB | May 5, 2015, opb.org

Water supply forecasts are looking bleak for many Northwest rivers this year. Managers say that means the region will generate less hydropower.

At a meeting in Portland this week, power managers with the Northwest Power and Conservation Council will hear an update on the region's snow pack and stream flow forecasts. Jim Ruff, manager of main stem passage and river operations for the Council, submitted a memo to the council saying dismally low snow pack in many areas of the Columbia River Basin will mean less water in rivers, and that will negatively affect fish and wildlife, agriculture and hydropower generation. John Fazio, the council's senior power systems analyst, said less water in Northwest rivers will mean less hydropower – but not so much less that the region won't generate what it needs.



Columbia River

"We're not anticipating a likelihood of a shortage or any problems for power supply this year," he said. "The lights will stay on, but the revenue will be less for utilities that have hydropower."

Ruff, who will present his report on water supply forecasts to the council on Wednesday, said snow levels in British Columbia and at higher elevations in the Rocky Mountains are OK, but they're low in many watersheds within the U.S. portion of the Columbia River Basin. Oregon's Owyhee, Deschutes, Willamette, John Day, Umatilla and Walla Walla river basins are among the lowest with less than 12 percent of the median snow levels. "Snowpack levels across the basin

have been steadily declining because of continuing warm and drier than normal conditions,” he said. “And many sites within these watersheds have no snow at all, so they’re showing bare ground, which is unprecedented.” Ruff said peak snow pack accumulation is usually measured in the beginning of April, and many snow monitoring sites were bare at that point this year. In Oregon, 76 snow monitoring sites were at their lowest snow pack levels on record as of April 1. In Washington, statewide snow pack is 19 percent of average, and 70 snow monitoring sites are at record lows. “That translates into below normal water supply forecasts for the Columbia River Basin,” Ruff said. “It looks like it’s going to be a fairly water-short year for the southern part of the basin.” Fazio said managers plan for hydropower generation based on the lowest water year on record. And this year doesn’t look like it will be nearly that bad. In good water years, he said, utilities including Bonneville Power Administration would use extra hydropower to replace more expensive electrical generation sources like natural gas or coal-fired power plants. And they would sell extra power to other areas such as California. This year, there won’t be as much extra hydropower to sell because there will be less water in Northwest rivers, Fazio said.

“Because we have less than average, the region will be making less revenue from sales,” he said. “Bonneville Power (Administration), in particular, probably won’t be making as much money because there isn’t as much power as in a normal year, but we’re still going to meet all of our demands.” Fazio expects Northwest dams will only produce about a quarter of the extra hydropower utilities would normally sell on the power markets. A key measurement for gauging water supplies for hydropower generation is the water runoff at The Dalles Dam on the Columbia River. Fazio said the lowest volume recorded there was 47.3 million acre feet in 1977. This year, the forecast is for 67 million acre feet. That’s well below the average of 89 million acre feet, but safely above the danger zone where power managers would have to consider paying industries to use less electricity to reduce the power demand in the region.



Water:

(Sounds like a good mystery novel!)

Sacramento water coalition works to avoid feared ‘dead pool’ at Folsom Dam

Water & Drought, MAY 2, 2015, sacbee.com

It happened last February, in year three of what state officials are now calling California’s millennial drought. Visitors to Folsom Lake found levels so low they could hike for miles on dry lakebed and explore remnants of a previously inundated Gold Rush village. At the same time, Sacramento water managers – the people responsible for transporting



water from the reservoir to half a million household taps – were hunched over their computers, alarmed by what they saw.

The lake was within months of becoming a “dead pool.”

For water officials, that’s as ominous as it sounds. The condition occurs when reservoir levels fall below the intake pipes near the base of the dam that funnel water to residents in Folsom, Granite Bay, Roseville and other communities in Sacramento, Placer and El Dorado counties, as well as Folsom Prison. It had never happened in the nearly 60-year history of Folsom reservoir. Many people hadn’t thought it possible. “It freaked us out,” said Tom Gohring, executive director of the Water Forum, a coalition of Sacramento-area cities, water districts, environmental groups and businesses that focuses on water supply. The federal Bureau of Reclamation, which operates Folsom Dam, considered floating a barge on the reservoir with a pump to push water up to the intake portal on the back wall of the dam. Suburban water agencies scrambled to secure access to groundwater. Some, like Roseville, considered rationing.

The crisis was averted when an unexpected burst of late-winter rain hit, offering last-minute reservoir replenishment. This spring, the reservoir level is notably higher after a better, although still below-average, rainfall season.

But 2014 served as a wake-up call. Faced with the prospect of drier winters ahead, Sacramento officials are proposing changing the way the dam is operated to keep more water behind its wall each year as drought insurance. They want the federal government to alter monthly releases from the dam so that an extra cushion of water remains stored each December to guard against a “dead pool” scenario come summer and fall. Gohring said his group is fine-tuning a proposal that would give local water districts the buffer they want, without running afoul of the water needs and rights of other agencies and downstream users. “We are at a point where we’re convinced it is doable,” Gohring said. He and other forum members, including several dozen Sacramento-area water agencies, say their proposal is not envisioned as a way for the region’s residents and businesses to avoid long-term conservation.

Efforts to cut water use are underway throughout the state, and more stringent conservation regulations are on the way. Citing unprecedented drought conditions, Gov. Jerry Brown last month ordered urban water agencies statewide to cut usage 25 percent by February, on average, compared with 2013, with the biggest per-capita users taking the biggest cuts. The State Water Control Board’s draft framework for carrying out that order divides the state’s 411 urban water agencies into nine tiers, based on their per capita water use between July and September last year. As proposed, nearly half of the Sacramento region’s 23 water districts would need to cut water use by 36 percent this year – the highest rung in the framework. All but two Sacramento-area communities would have to cut usage by at least 28 percent. The order mandating the cutbacks ends in February. But state water officials plan to launch discussions later this year on regulations for more permanent conservation goals. This year’s cutbacks should give Folsom reservoir some room to recover from several years of below-normal precipitation. But state officials say California faces warmer winters and more frequent droughts because of climate change. Even with bold conservation efforts, water demand in Sacramento is expected to increase as the region grows, putting more stress on the reservoir to deliver. A recent state Department of Water Resources analysis of tributaries that feed into the Sacramento-San Joaquin Delta suggests a “dead pool” at Folsom, once unthinkable, eventually could happen once every decade. That analysis, and last February’s scare, prompted Water Forum leaders to look for ways to “improve” reservoir management. The forum, founded in the 1990s by the city and county of Sacramento, has worked to improve water availability and water quality, with a focus on the reservoir and lower American River. Despite their proximity to Folsom Dam and the rivers that feed it, local water agencies have no assurance their proposal will get traction. Folsom Lake is part of a much larger system of dams and reservoirs that make up the state and federal water projects that pipe fresh water to cities and farms statewide, and provide the flows needed for fish and wildlife in the sensitive Delta estuary.

Changing dam operations would require buy-in from state and federal officials, as well as other water agencies with water rights in the reservoir and a stake in the timing and size of downstream flows. Reservoir operations are based on a series of sometimes hard-fought agreements among stakeholders across the state, including water agencies, farms, fisheries, electric utilities and environmental regulators. In addition, the dam's priority function is to keep Sacramento from flooding. The Bureau of Reclamation operates based on long-standing flood-control rules that require reservoir levels to remain low enough throughout the rainy season to ensure that outflows into the lower American River in a heavy storm would not overwhelm levees. This causes dam operators to release large pulses of rainfall in winter. Gohring of the Water Forum said the proposal is being fashioned with all those priorities in mind. A formal proposal likely will be ready for publication by early summer. It will call for dam operators to maintain between 285,000 and 365,000 acre-feet of water behind the dam every year in December. Holding more water in the dam in winter also would mean that releases throughout the year draw on colder water, which is beneficial to fish. The proposal sets a new minimum standard for flows on the American River: 500 cubic feet per second. Currently, flows rarely drop below 800 cfs, but the bureau has the authority to release less than 500 cfs in extremely dry conditions, according to Gohring. In many years, maintaining those storage levels would be easy. Despite the ongoing drought, the lake held 574,800 acre-feet last week. The reservoir's maximum storage is 977,000 acre-feet. Last year, however, the dam held only 150,000 acre-feet in February. Dead-pool level is just under 100,000 acre-feet. Bureau of Reclamation officials were guarded in their response to the proposal, but said they are open to discussing changes. "Reclamation is always interested in ideas that improve fishery protection and project operations," bureau spokeswoman Erin Curtis said in an email. "We are aware that the Water Forum has been preparing a proposal, but we do not have much information yet on the specifics." The concept has broad local support among water agencies that would benefit. Officials in Roseville and Folsom, communities heavily reliant on Folsom reservoir, are assisting, as is the Regional Water Authority, an association of 23 local agencies. Ron Stork, of the environmental group Friends of the River, also is involved. He said the proposal would help American River fish, because it assures minimal flows and releases of cooler water. "It's a long time in coming and needs to happen," Stork said. Lester Snow, director of the California Water Foundation, a Sacramento-based nonprofit that advocates for sustainable water management, cautioned that the proposal goes only so far. He said, in the long-term, the region needs robust water-conservation efforts and judicious management of its groundwater, an assessment that many regional water officials say they agree with. "There is not a single silver bullet," Snow said.

(Hydropower doesn't consume water, it just uses it.)

Colorado begins \$3.4 million effort to save ag water, use it to make power

By Bruce Finley, The Denver Post, 05/04/2015, denverpost.com

Colorado is embarking on a federally backed \$3.4 million experiment to transform the flood irrigation farmers use to grow crops: tapping diverted water more efficiently and generating electricity.

Agriculture Secretary Tom Vilsack kicked off the "small hydropower" project Monday in Denver and announced \$235 million in new federal grants nationwide to spur innovation around water, soil and drought. The Colorado experiment aims to pressurize flows of agricultural water, producing hydropower, and then deliver water more precisely to crops using sprinklers. If successful, this is envisioned as a way to help reduce the 85 percent share of water required to sustain



Copy obtained from the National Performance of Dams Program: <http://npdp.stanford.edu>

agriculture in semi-arid Colorado and other western states. "This is not only possible. It is going to happen," Vilsack said in an interview. "It is going to provide for more efficient irrigation, which is important as we deal with increased scarcity. It also is going to deliver hydropower, a renewable energy resource."

The federal Regional Conservation Partnership Program grants, building on \$394 million awarded in January, are designed to encourage local agriculture leaders to work with innovators at private companies, universities, non-profit groups and government agencies to solve environmental challenges. Congress created the program last year and funds it under the Farm Bill. In Colorado, state agriculture officials are coordinating the Pressurized Small Hydropower project, which will receive \$1.8 million in federal funds and assistance through the Natural Resources Conservation Service, in addition to \$1.6 million from American Rivers, the governor's energy office, the Colorado Rural Electric Association and others. "As water drops downhill, there's a lot of energy in it," Colorado Agriculture Commissioner Don Brown said at a signing ceremony. "We're going to capture some of that energy." Circular sprinkler systems that minimize water waste will be installed on farm fields that formerly were flooded, Brown said. Significant amounts of water will be saved, but it's too early to assess how much, he said. Vilsack said more than 600 groups have applied for conservation grants with 115 funded so far. Teaming with the private sector amplifies what the government could do, he said. "We need to figure out ways to use water more creatively and more efficiently." Small hydropower systems, typically generating 2 megawatts or less, have emerged as a way to supply electricity for power grid without emitting heat-trapping greenhouse gases, which scientists link to climate change. They rely on diversion of a small portion of a river or are constructed at dams.

(No kidding!)

We must increase our water storage capacity

Dan Newhouse, May 6, 2015, [dailysunnews .COM](http://dailysunnews.com)

REFLECTIONS FROM THE OTHER WASHINGTON

U.S. Congressman Dan Newhouse

The critical water shortage facing many drought-stricken western states is a cautionary tale: when nature intervenes, it tests whether water management planning is meeting demand and providing stable, adequate supply. According to the U.S. Drought Monitor for March 31, 2015, all or significant portions of 11 western states, including the state of Washington, are suffering from severe to exceptional drought. Faced with extreme drought conditions, California has resorted to fines for excessive water usage – however, conservation by rationing shrinking water supplies will only go so far. Washington, despite being blessed with the resources of the Columbia River, is also contending with a water shortage after a winter that brought the lowest snowpack in the Cascade Mountains in decades. Expanded water supply capacity is needed to meet the needs of the growing population of the West at large. Congress should respond not only in the short term, but also in the long term by creating a forward-looking process to facilitate the creation of new surface water storage projects in a strategic and timely manner.

One of my top priorities in Congress is to advocate for the importance of removing regulatory barriers and red tape that slow down the approval and completion of surface water storage projects. Currently, the process for approving new or expanded dams and reservoirs is time-consuming and needlessly bureaucratic. Last week, I introduced the Bureau of Reclamation Surface Water Storage Streamlining Act of 2015, which would require the Bureau of Reclamation, the federal agency charged with developing much of the West's water infrastructure, to accelerate feasibility studies of new or expanded surface water storage projects. The provisions in the legislation would improve accountability and transparency by giving the Bureau a three-year deadline and limiting spending to \$3 million for project feasibility studies. The Bureau of Reclamation is the agency responsible for building many of the nation's dams and is a major participant in completing vital irrigation projects in Central Washington: the Columbia Basin

Project and Yakima River Basin Water Enhancement Project. Both projects are critical for current and future water supplies for farmers, fish, ranchers and communities in Central Washington. Streamlining planning for projects like these across the country can help prepare more effectively for drought and provide adequate water resources for future development. Not only is it important to improve the planning process for future water storage projects, it is crucial to safeguard current dams and reservoirs such as those on the lower Snake River. I introduced an amendment that the House approved last week - with Rep. Paul Gosar (AZ) - to prevent the removal of any federally-owned or operated dam, including the four lower Snake River dams. These dams are a vital component of the water infrastructure in the West, and they help ensure access to clean water supplies for many rural and agricultural communities. They provide important water storage, irrigation and flood control functions while producing 1,110 megawatts of clean, renewable hydroelectricity. At a time when much of the West is facing what could be the worst drought in 100 years, it is more important than ever to plan for the future by increasing current water storage capacity.



Environment:

(Rivers do what they do best, act like a river!)

Rivers Recover Rapidly Once Dams Are Gone, Study Finds

By CASSANDRA PROFITA • APR 30, 2015; kuow.org

A new study sums up what scientists now know about the environmental effects of removing dams from rivers. It concludes that rivers and fish respond quickly after a dam is removed, and the results are mostly positive. "Heraclitus has said you can't step in the same river twice," said study co-author Gordon Grant. "Well, you don't get exactly the same river back after you take a dam off it that you had before, but you can come pretty close. In some cases, it can even be difficult to identify in just a few years where the dam was." Rivers often disperse the extra sediment from behind a dam within



Deconstruction of lower Elwha dam taken in January, 2012, about four months after the project began. For the second year in a row, salmon are swimming in streams above the site of the former Elwha Dam. - Katie Campbell

weeks or months of dam removal, the study finds. Migratory fish move swiftly to recolonize newly accessible habitat – at times swimming past the former dam site within a matter of days.

The research, published Thursday in the journal *Science*, compiles the findings of more than a hundred studies on individual dam removals. Grant, a research hydrologist with the U.S. Forest Service, said the number of dams removed has shot up in the past decade. In the U.S. 548 dams were removed from 2006-2014 compared with 298 dams removed from 1996-2005. That recent round of dam removal has included projects on Washington's Elwha and White Salmon rivers and Oregon's Sandy River. "We wanted to step back from the fray and assess: What have we learned?" he said. "What works, what doesn't, and what sort of guidance does the past give us in looking towards the future?" Grant said the effects of dam removal definitely vary depending on the size of the dam, the size of the river, and how much sediment was stored in what size reservoir. But he and his colleagues did find some common lessons. Before dam removal had

been studied, Grant said, scientists thought it might take decades for rivers to disperse the accumulated sediment. But that was not the case in almost all the documented cases. In most cases, it was only a matter of weeks or months. "Rivers appear very nimble in terms of being able to digest these meals of, in most cases, sediment that has been stored behind these structures, some of which have been in place for close to a hundred years," he said.

Study co-author Jeff Duda, a biologist with the U.S. Geological Survey, is studying the effects of dam removals on the Elwha River in Washington – the largest dam removal in history. He said the Elwha has been the biggest test case to date of how a river handles large deposits of sediment released by dam removals. That project started in 2011 and removed the last part of the Elwha Dam last August, releasing 21 million cubic meters of sediment altogether. "We've seen the river downstream handle that input of sediment, and it's now coming back," Duda said. "For a while, it was running pretty muddy, and still does during high flows, but if you go out there during periods of low flow it runs pretty clear again. So, the river is adjusting."

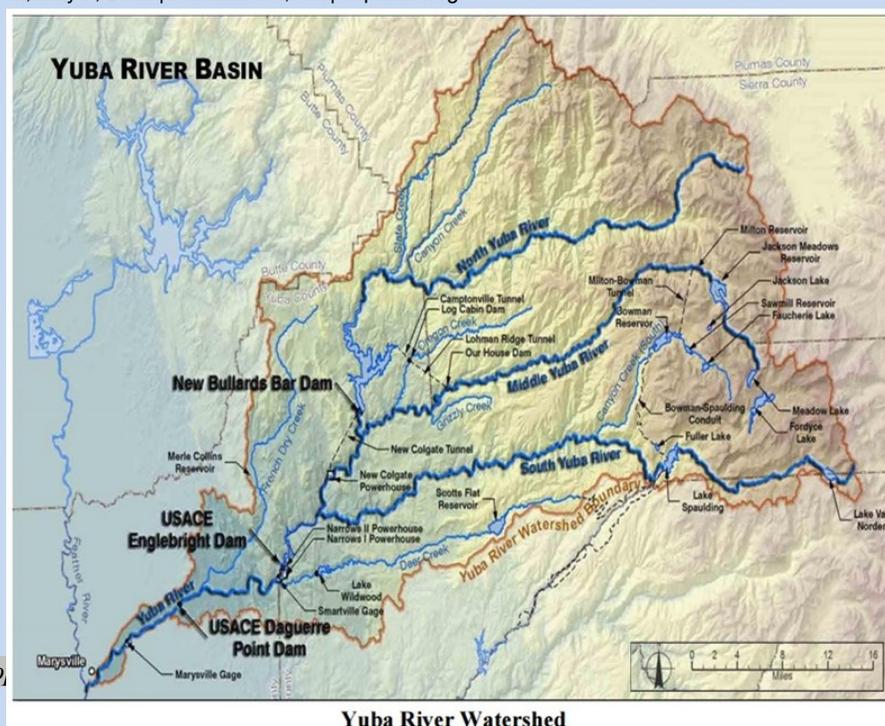
Duda said scientists are still tracking the long-term effects on fish in the Elwha, but it didn't take the fish long to reoccupy the habitat above the dams. "We saw fish here just upstream of Glines Canyon Dam within days of the final blast," he said. "If you give the fish a chance, if they're migratory, they will recolonize the streams above dams." Overall, Grant said, fish seem pretty well adapted to handling the short-term, large volumes of sediment moving downstream after a dam removal, as it's similar to what they might see during a flood or volcanic eruption.

"Generally, the fish are reasonably evolutionarily designed to handle disturbances of that kind," he said. "What we don't know, though, is whether you get back the sort of fish community you might have had before the dam." Researchers found removing a dam can release contaminants stored in sediment, and it's a good idea to check for that before removing a dam, Grant said.

In a case of "good dam removals gone bad," he said, the Fort Edward Dam removal on New York's Hudson River released so much contaminated sediment that the river was later placed on the Superfund list of the nation's most contaminated sites. While there have been many positive results documented from dam removals, Grant said, the benefits of dams for water storage and energy – especially in light of climate change – may continue to drive people to build new dams. "The future of dam removal has to be viewed against this context of a lot of places in the world where dams are still viewed as important steps in development as low-carbon energy sources," he said. "Our removals in the U.S. are offset in terms of total dams by a lot of new dam construction in South America, Southeast Asia and India."

Project Would Bring Salmon Back To North Yuba River

By Amy Quinton, May 7, 2015 | Sacramento, CA | capradio.org



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Dams have prevented spring-run Chinook salmon and steelhead from reaching their historic spawning habitat on the North Yuba River for 74 years. That may change under a new initiative undertaken by state and federal wildlife agencies and conservation groups. The goal of the Yuba Salmon Partnership Initiative is to create the first-ever collect and transport program in California. The idea is to collect spring-run Chinook salmon and steelhead beneath Englebright Dam on the North Yuba and reintroduce them upstream, then collect and transport the juveniles back downstream so they can migrate to the ocean.

Wildlife agencies say similar programs in Oregon and Washington have been used to successfully move salmon around dams too tall for fish ladders. "If we have a chance of bringing them back, this may be a way to do it, because 95 percent of their historical habitat is above these very large dams and they've been cut off from it in some cases almost a century," says Chuck Bonham, director of the California Department of Fish and Wildlife. Bonham says the reintroduction project could cost \$500 million over its 50 year lifespan. Yuba County Water Agency has agreed to pay up to \$100 million. It could be several years before the program would launch.



Other Stuff:

(Another use for a waterwheel!)

“Mr. Trash Wheel” Removes 4,000,000 Cigarettes from Baltimore Harbor

04/22/15, by: Discovery.com Staff, Adam Lindquist, Waterfront Partnership of Baltimore

A water wheel in Baltimore's Inner Harbor has removed 160 tons of garbage from the waterway in just under a year. That's 97,000 bottles, 80,000 potato chip bags and a whopping 4 million cigarettes removed from a waterway so polluted that it failed its 2014 water quality report card.

This remarkable photograph shows just how much of an impact the water wheel has already had in its short life. The photo on the left was taken on April 30, 2014, after a torrential downpour washed a harrowing amount of garbage into the harbor. A mere four million cigarettes later, a similar storm earlier this week had almost no recognizable impact on the Harbor.



(Wonder if this one will work. They keep trying.)

A GIANT WINDWHEEL IS COMING TO ROTTERDAM

Text by Mitchell Gilburne | | Rendering courtesy of Dutch Windwheel Corporation, April 21, 2015, architecturaldigest.com

The Dutch Windwheel is set to open in 2020 in the city of Rotterdam. Goodbye, windmill. The Dutch clean energy movement will soon have a new face: the windwheel. Come 2020, the shores of Rotterdam will be home to the 570-foot-tall Dutch Windwheel, a giant mixed-use structure distinguished by its unique circular shape and energy-positive output. The steel-and-glass creation, designed by BLOC and Meysters in collaboration with Doepel Strijkers architecture studio, will rise above Europe's largest port from a subaquatic foundation, giving the illusion of

buoyancy. Visitors will have a chance to experience the wheel firsthand with forty mobile cabins that transport travelers around the structure's circumference, offering views as far as Delft, The Hague, and Dordrecht. Upon its completion, the Windwheel will house both a 160-room hotel and a 72-unit residential development.

Function, however, is what will earn the Windwheel its acclaim. The wheel, known as the Electrostatic Wind Energy Converter (EWICON), will transform wind energy into usable electricity without mechanical input. Moreover, the building has been imagined with Rotterdam's residents in mind—its technology runs silently, without casting the distracting intermittent shadows often associated with wind energy. Above all else, the building will give the booming city of Rotterdam its own distinct landmark and is expected to draw 1.5 million new visitors annually.



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