California Water and Infrastructure Report

Formerly, the "California Drought (and Flood) Update"

For April 4 , 2019

by Patrick Ruckert

Published weekly since July, 2014

An archive of all these weekly reports can be found at both links below:

http://www.californiadroughtupdate.org

https://www.facebook.com/CaliforniaDroughtUpdate

patruckert@hotmail.com

"April 2 (EIRNS)—The Upper Missouri-Mississippi River Basins flooding is rightly called "historic," compared to the terrible episodes in the region over the past couple centuries. The cause for the damage is not bad luck or "climate change," but the lack of infrastructure which had been proposed, specifically since the 1944 "Pick-Sloan" plan for integrated water management throughout the region, and was never built. Nor was the plan fully built for the Upper Mississippi infrastructure; and the Upper Watershed Dam program of the Agriculture Department was way underfunded for decades."

Midwest Flooding Hits U.S. Agriculture Production Capacity, Food Supply in Major Way

A Note To Readers

While thousands of square miles of the mid-west are experiencing one of the worst floods recorded in U.S. history, the shortsightedness and actual criminal refusal of governments beginning with Harry Truman's presidency (with the exception of President John Kennedy), to invest and build the necessary infrastructure to protect our population and to upgrade the productivity of the entire economy, once again, is smacking us in the face.

The next to final section of this week's report tells the story of how, had the "Pick-Sloan" plan for the entire Mississippi-Missouri River systems been built, the devastation that has put a huge chunk of the nation under water, would have been prevented. Included is the entire article our quote above is from.

Also In This Week's Report

We begin with reports on the snowpack of California which, as of April 1, is 162% of what is considered average. So, while the rains that has accompanied the snow has caused some flooding in California, the 30 atmospheric rivers that has hit the state since October, have been mild enough and spread out enough to prevent devastating flooding.

So we have lots of snow, the reservoirs are full, but still the two great water projects in the state, the Central Valley Project and the State Water Project, will provide a maximum of 55% of what water contractors have requested. With optimal winter precipitation, and this must be really taken seriously, the state cannot provide its citizens, cities, factories and farms with the water required. Yes, build more storage capacity, but that is not enough. As I have reported again and again, we must build the North American Water and Power Alliance (NAWAPA) and lots of desalination plants.

Following almost two years of repairs and costing $1.1 billion, the rebuilt Oroville Dam spillway saw water flow down it on Tuesday, April 2. Videos and reports on the event are included in the report.

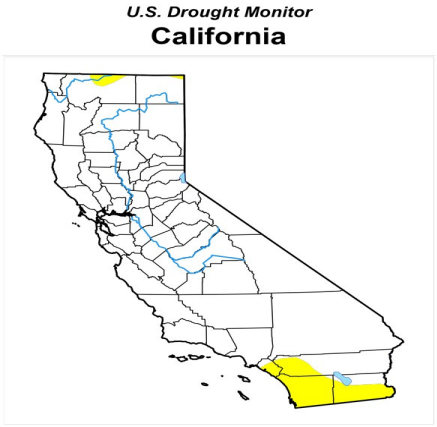
Under my title, “Water Wars,” The federal government is now suing the State of California over a water grab plan to increase water flows in the Lower San Joaquin River that has a high likelihood of New Melones Reservoir — based on the planned diversion and historic hydrology on the Stanislaus River Basin — going dry 12 times every 95 years. While supported by farmers and those throughout the Central Valley, other interests, especially the environmentalist bureaucracy of Sacramento, I am sure, is really pissed that the Trump administration is intervening on the side of human beings in this case.

Land subsidence caused by severe groundwater overdraft during California's historic drought has led to the Friant-Kern canal dropping by as much as an inch per month. And with the new law on groundwater pumping, the water the canal provides is critical for agriculture in the area. A California Senator proposes $400M bill to repair sinking Friant-Kern Canal.

On to the Moon, once again is the mission that President Trump announced last week. If you want to see the building of not only infrastructure in the nation, but for us once again be capable of driving the economy forward and upward, then such an aggressive program announced by the President, similar to that announced for the Apollo Project by President Kennedy, is the way it will be done. Accompanying that is an increased investment for nuclear power and fusion research and development.

Snowpack and the End of This Drought

U.S. Drought Monitor



April 2, 2019
(Released Thursday, Apr. 4, 2019)
Valid 8 a.m. EDT

Drought Conditions (Percent Area)

	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	93.42	6.58	0.00	0.00	0.00	0.00
Last Week 03-26-2019	93.42	6.58	0.00	0.00	0.00	0.00
3 Months Ago 01-01-2019	7.77	92.23	75.17	14.12	2.10	0.00
Start of Calendar Year 01-01-2019	7.77	92.23	75.17	14.12	2.10	0.00
Start of Water Year 09-25-2018	12.18	87.82	47.97	22.82	4.94	0.00
One Year Ago 04-03-2018	22.99	77.01	40.90	12.72	2.50	0.00

Intensity:
D0 Abnormally Dry
D1 Moderate Drought
D2 Severe Drought
D3 Extreme Drought
D4 Exceptional Drought

The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. See accompanying text summary for forecast statements.

Author:
Curtis Riganti
National Drought Mitigation Center

http://droughtmonitor.unl.edu/

Sierra Snowpack a 'Supply Dream' at 162% of Average

April 2, 2019 *MATTHEW RENDA*
https://www.courthousenews.com/sierra-snowpack-a-supply-dream-at-162-of-average/

(CN) – The Sierra Nevada snowpack stands at 162% of average, California water managers said on Tuesday following the final measurement of the water year.

The snowpack measurement – which the California Department of Water Resources conducts around the first of each month of winter at the Phillips Station near Lake Tahoe – demonstrates the spectacular shape of California's water picture.

"With full reservoirs and a dense snowpack, this year is practically a California water supply dream," department director Karla Nemeth said in a statement.

And the winter fun isn't done yet: Forecasts call for another atmospheric river to strike the Golden State on Friday.

Atmospheric rivers are large storm systems with high moisture content created in the Pacific Ocean, and can mean the difference between a state replete with water and one dogged by persistent drought.

This winter, more than 30 atmospheric rivers marched through California, six in February alone. The state's snowpack water content has tripled since Feb. 1.

Snowpack is 162% of average statewide

April 2, 2019

From the Department of Water Resources:

> *The Department of Water Resources (DWR) today conducted the fourth Phillips Station snow survey of 2019. The manual survey recorded 106.5 inches of snow depth and a snow water equivalent (SWE) of 51 inches, which is 200 percent of average for this location.*
>
> *Statewide, the Sierra Nevada snowpack is 162 percent of average. California has experienced more than 30 atmospheric rivers since the start of the water year, with six in February alone, and statewide snow water equivalent has nearly tripled since February 1. Snow water equivalent is the depth of water that theoretically would result if the entire snowpack melted instantaneously. It is an important tool used by water managers across the state to estimate anticipated spring runoff.*
>
> *"With full reservoirs and a dense snowpack, this year is practically a California water supply dream," said DWR Director Karla Nemeth. "However, we know our long-term water supply reliability cannot rely on annual snowpack alone. It will take an all-of-the-above approach to build resiliency for the future."*
>
> *Snowpack is an important factor in determining how DWR manages California's water resources each year to meet demands. On average, the Sierra snowpack supplies about 30 percent of California's water needs as it melts into streams and reservoirs in the spring and early summer to meet water demands throughout the year. The April results are a key indicator for the rest of the year's water supply. The snowpack's water content typically peaks around April 1, after which the sun's higher position in the sky begins to accelerate snow melt.*

The state's largest six reservoirs currently hold between 106 percent (Oroville) and 132 percent (Melones) of their historical averages for this date. Lake Shasta, California's largest surface reservoir, is 109 percent of its historical average and sits at 89 percent of capacity.

DWR conducts up to five snow surveys each winter – near the first of January, February, March, April and, if necessary, May – at Phillips Station in the Sierra Nevada just off Highway 50 near Sierra-at-Tahoe. The Phillips snow course is one of hundreds that is surveyed manually throughout the winter. Manual measurements augment the electronic readings from about 100 snow pillows in the Sierra Nevada that provide a current snapshot of the water content in the snowpack.

Rebuilt Oroville Dam Spillway Works Well

Following almost two years of repairs and costing $1.1 billion, the rebuilt Oroville Dam spillway saw water flow down it on Tuesday, April 2. What follows are several videos of the event (one from the DWR) and a statement from the DWR prior to the action. Also a couple links reporting on it, which, as you can see by the headlines and the content, the cynicism of the culture is so bad that even successful projects receive negative content.

OROVILLE SPILLWAYS UPDATE April 2, 2019

https://www.youtube.com/watch?v=VNy0YAiPk_U

California DWR
Published on Apr 2, 2019

The Oroville Dam main spillway is being used for the first time since repairs were made

KCRA News

https://www.youtube.com/watch?v=73p_1lDUaf4

Raw Video: Oroville Dam Spillway Initial Water Test

KPIX CBS SF Bay Area

Water thundered down the rebuilt Oroville Dam spillway Tuesday for the first time since it crumbled in a near catastrophe that sent 180,000 local residents fleeing from their homes in 2017. (4//2/19)

https://www.youtube.com/watch?v=jgqGl4IEqNQ

Oroville Dam Rebuilt Spillway Carries Water for the First Time

Video of the first water down the rebuilt spillway on Tuesday, April 2, 2019

Thanks to Zack Rodriquez for the video

https://www.facebook.com/SkepticalZack/videos/2390751224291588/?hc_ref=ARRGRTt9cffjMQIkREEVAnxFjDzR7hqD8PQo9KdvIpOLa4XZuMNMB7c48veSYvamNXE

DWR to open up Oroville Dam spillway at 11am

April 2, 2019

The California Department of Water Resources continues to release water from the Edward Hyatt Powerplant with an outflow of over 10,000 cubic feet per second (cfs) into the diversion pool that runs past the newly completed Lake Oroville main spillway in Butte County, California. Photo taken March 26, 2019. Kelly M. Grow / California Department of Water Resources, FOR EDITORIAL USE ONLY

From the Department of Water Resources:

> Due to forecasted storms and growing snowpack, the California Department of Water Resources (DWR) will begin to release flows at 11 a.m. today from the Oroville main spillway. By early afternoon, releases from the main spillway will be about 8,300 cubic feet per second (cfs). This will be the first time the spillway is used since it has been reconstructed and its use will provide room for flood storage within the reservoir.
>
> "Protecting communities from flooding is a vital part of the Department's mission," said DWR Director Karla Nemeth. "Today we inaugurate the reconstructed spillway to serve that essential purpose and to prepare us for the future."
>
> "The Oroville main spillway was rebuilt using modern engineering practices with the oversight of state and federal regulators on site and a team of experts assisting the Department," said Joel Ledesma, Deputy Director, State Water Project for DWR. "With an average concrete thickness of seven and a half feet, 12.4 million pounds of reinforcing steel, and approximately 7,000 anchors, the main spillway is ready to handle flows."

Two years and $1.1 billion later, water flows down Oroville Dam spillway

By Dale Kasler and

Ryan Sabalow

April 02, 2019 11:52 AM, Updated April 02, 2019 01:21 PM

https://www.sacbee.com/news/local/article228619034.html

It worked.

Oroville Dam's main flood-control spillway reopened for business Tuesday morning, releasing a gentle sheet of water into the Feather River for the first time since the 2017 crisis that sent 188,000 people fleeing for their lives.

The initial water release was a mild one: about 3,300 cubic feet per second, or a fraction of what the reservoir was releasing when the main spillway fractured in 2017. The releases were scheduled to ramp up to 8,300 cfs in the afternoon, and increase in volume in the coming days and weeks.

Officials also insisted they weren't nervous about using the spillway, saying the immense structure had been rebuilt to state-of-the-art standards, using technology that didn't exist during original construction.

"We're prepared; we've spent the last two years restoring full functionality," said Joel Ledesma, the agency's deputy director. "The industry has learned a lot since this (dam) was built 50 years ago."

The crisis began Feb. 7, 2017, when a crater opened roughly halfway down the 3,000-foot-long concrete chute as water was being released during a heavy storm. Dam operators reduced water releases to limit the damage, which allowed the water in Lake Oroville to rise to unprecedented levels. On Feb. 11, water poured over the nearby emergency spillway, which rests atop a natural hillside, for the first time since the dam opened in 1968.

Barely a day later, the hillside began eroding, prompting fears that the emergency spillway would crumble and billions of gallons of water would cascade into the Feather River and swamp downstream communities. Officials ordered 188,000 residents to evacuate as dam operators frantically ramped up water releases from the main spillway.

The strategy worked: Lake levels dropped and water stopped flowing over the emergency spillway. In the weeks that followed, DWR officials continued to pour water down the battered main spillway. By the time the spillway was shut off for good May 19, 2017, much of the lower half of the structure was gone and an enormous ravine had been carved into the adjacent hillside.

Since then, DWR's main contractor Kiewit has replaced the entire main spillway and lined a portion of the hillside beneath the emergency spillway with concrete. Kiewit has poured more than 1.2 million cubic yards of concrete — enough to fill 372 Olympic-sized swimming pools — and installed a state-of-the-art drainage system designed to prevent a repeat of the 2017 debacle. The work on the emergency spillway won't be completed until later this year, although Ledesma said it could function safely this winter if needed.

The water level behind the dam sat at 854 feet, about 50 feet below the level at which water would flow over the emergency spillway. The reservoir is about 80 percent full.

The entire crisis has cost $1.1 billion, including $630 million for the spillway repairs, $310 million for dredging concrete chunks and other debris from the river; and $160 million for responding to the immediate emergency in early 2017.

An exhaustive 2018 report by a panel of independent engineers said the crack in the spillway was the result of "long-term systemic failure" dating to the design and construction. Citing the panel's conclusions, FEMA last month refused to reimburse California for $306 million worth of repairs to the upper end of the main spillway, saying its weaknesses were caused by "pre-existing conditions." California officials are appealing FEMA's decision. Any costs that California must absorb will be

passed on to the regional water districts that store water behind the dam.

Oroville Dam holds up as officials christen new spillway two years after near disaster

By Hannah Fry and Alejandra Reyes-Velarde
Apr 02, 2019
https://www.latimes.com/local/lanow/la-me-ln-oroville-dam-spillway-20190402-story.html

Bystanders were met with the rumble of rushing water as Oroville Dam's gates released millions of gallons of water down a newly reconstructed concrete spillway on Tuesday for the first time since the structure failed two years ago.

The reconstructed spillway can handle water flowing at a rate of 270,000 cubic feet per second, which is much greater than the amount officials would ever expect to release at a time, said Erin Mellon, a spokeswoman for the Department of Water Resources.

California Water Wars

We have covered here for months the attempt by the state to cut back the water to cities and to agriculture by increasing the free flow of the the Lower San Joaquin River in the Central Valley. The Trump administration has now jumped into this battle, suing the state to stop its plan. Cheered by farmers and some others, this move is sure to create even more court battles in the never-ending saga of "water wars."

By necessity, the following reports are excerpted severely, so if you wish to really get into it, go to the links.

WATER FIGHT HEATS UP

Federal lawsuit against state over plan that would devastate water supplies for SSJID farmers, Manteca, Lathrop & Tracy
by DENNIS WYATT
Manteca Bulletin
March 29, 2019
https://www.mantecabulletin.com/news/local-news/water-fight-heats/

The federal government is suing the State of California over a water grab plan to increase water flows in the Lower San Joaquin River that has a high likelihood of New Melones Reservoir — based on the planned diversion and historic hydrology on the Stanislaus River Basin — going dry 12 times every 95 years.

If implemented the plan would cut back available water to 52,000 acres of farmland within the South San Joaquin Irrigation District as well as the cities of Manteca, Lathrop, and Tracy. In drought years the potential would exist for severe rationing. The same consequences face Oakdale Irrigation District. The two districts share legally adjudicated water rights to the Stanislaus River watershed that supersedes any other jurisdictions including the state and federal governments.

The state water plan is designed to increase Chinook salmon populations. The SSJID and OID have tried to share more than a decade of scientific research that demonstrates there are more effective ways at boosting the survival rates of native salmon.

The U.S. Department of Justice filed suit Thursday in Sacramento federal court to block the

contentious plan approved in December to increase river flows in the San Joaquin River and three tributaries — the Stanislaus, Merced, and Tuolumne rivers — to help revive dwindling salmon populations. The lawsuit said the plan was arbitrary and the state failed to analyze impacts on the environment and would reduce water coming out of the New Melones reservoir for farms, cities, businesses and hydroelectric operations.

The plan as passed would increase unimpaired flows to 40 percent in a bid to expand the Chinook salmon population. Some environmental groups supported the plan, while other conservation groups and fishing groups said it fell short in providing enough water for habitat.

At the same time another mandate from Sacramento — groundwater sustainability meaning more water cannot be pumped from an aquifer in a given year than what is replenished — will sustainably impact water supplies in San Joaquin County.

United States Files Lawsuit Against California State Water Resources Control Board for Failure to Comply With California Environmental Quality Act

FOR IMMEDIATE RELEASE
Thursday, March 28, 2019

https://www.justice.gov/opa/pr/united-states-files-lawsuit-against-california-state-water-resources-control-board-failure

The Department of Justice and the U.S. Department of the Interior (DOI) today filed civil actions, in both federal and state court, against the California State Water Resources Control Board for failing to comply with the California Environmental Quality Act (CEQA).

On Dec. 12, 2018, the California State Water Resources Control Board (the Board) approved and adopted amendments to the Water Quality Control Plan for the San Francisco Bay/Sacramento–San Joaquin Delta Estuary (amended plan) and the related Substitute Environmental Document (SED). According to the complaint, the Amended Plan fails to comply with CEQA and, once implemented, will impair DOI's ability to operate the New Melones Dam consistent with Congressional directives for the project.

"The environmental analysis by the California State Water Resources Control Board hid the true impacts of their plan and could put substantial operational constraints on the Department of the Interior's ability to effectively operate the New Melones Dam, which plays a critical role in flood control, irrigation, and power generation in the Sacramento region," said Assistant Attorney General Jeffrey Bossert Clark for the Department of Justice's Environment and Natural Resources Division. "The Department of Justice will continue to advocate on behalf of our federal partners, especially when it comes to the proper application of federal and state environmental laws."

The Federal Government Challenges the State Water Board's Amended Bay-Delta Water Quality Control Plan

April 2, 2019

Written by Kristian C. Corby

https://www.somachlaw.com/policy-alert/the-federal-government-challenges-the-state-water-boards-

amended-bay-delta-water-quality-control-plan/

On March 28, 2019, the United States Department of Justice and the Department of the Interior (collectively, "Federal Government") filed lawsuits in both federal and state court challenging the State Water Resources Control Board's (State Water Board) recent amendments to the Water Quality Control Plan for the San Francisco Bay/Sacramento-San Joaquin Delta Estuary (Amended Plan). The Federal Government's lawsuits allege that the State Water Board violated the California Environmental Quality Act (CEQA), and set the stage for another battle between the Federal Government and the State of California over how water resources should be managed in the Bay-Delta.

Farmers welcome federal agencies' suits on flows plan

April 3, 2019

By Christine Souza

http://agalert.com/story/?id=12864

Federal agencies that sued the State Water Resources Control Board over its unimpaired-flows plan for three Central California rivers say the plan would harm the agencies' ability to manage New Melones Reservoir on the Stanislaus River, shown above in a file photo from October 2018.

> Now that the federal government has filed its own lawsuits against an unimpaired-flows plan for San Joaquin River tributaries, farmers and other parties to the lawsuits wait to learn where they will be heard--and prepare for a lengthy court battle.

California Farm Bureau Federation Senior Counsel Chris Scheuring said the federal government has "a substantial interest" in water supplies on the Stanislaus River because of New Melones.

CFBF filed its own lawsuit against the unimpaired-flows plan in February, also charging the water board had failed to follow CEQA and had underestimated the harm the plan would cause to agricultural resources in the Central Valley.

"A number of our members are served ultimately by the federal projects on the river," Scheuring said, "so in a certain sense (the federal agencies) are articulating some of the same interests."

"We have always believed the state water board was asserting too much control over a federal reservoir by dictating operations counter to federal intent," OID General Manager Steve Knell said.

SSJID general manager Peter Rietkerk said environmental and human water supply needs from the Stanislaus River "hinge on a sustainable operation of New Melones."

Since late last year, close to a dozen lawsuits have been filed challenging different aspects of the water board's flows plan, filed by irrigation districts and urban water suppliers that depend on the three rivers, and by environmental and fishing groups that say the plan does not go far enough in redirecting water to fish.

Continuing Fall-out From the Five Year Drought

We focus this time on land subsidence.

California Senator proposes $400M bill to repair sinking Friant-Kern Canal

Joshua Yeager
Visalia Times-Delta
Feb. 27, 2019
https://www.visaliatimesdelta.com/story/news/2019/02/27/california-senator-proposes-400-m-bill-fix-sinking-friant-kern-canal/3005805002/

State Senator Melissa Hurtado (D-Sanger) is proposing a $400 million bill to lift the sinking Friant-Kern Canal.

On Wednesday, Hurtado said Senate Bill 559, will "help secure California's water supply by investing $400 million toward restoring lost (delivery) capacity on the Friant-Kern Canal, one of the San Joaquin Valley's most critical water delivery facilities."

The Friant-Kern Canal delivers on average one million acre-feet of water, and 2.2 million acre-feet in wet years, to more than 18,000 farms across the Central Valley every year.

The canal has been slowly sinking.

Subsidence caused by severe groundwater overdraft during California's historic drought has led to the canal dropping by as much as an inch per month.

A few inches may seem insignificant, but Friant officials say it's enough to reduce water flow through the canal by up to 60 percent.

SB 559 would ensure that the canal returns to full capacity, and give back water districts "that operational flexibility and the ability to properly manage our critical water resources," Larsen added.

Tulare County's ag dominance relies in large part on the canal's flows. Industry leaders caution that a failure to repair the canal now, could devastate the region's ag economy in years to come.

"The Friant-Kern Authority disperses 50 percent of all water to rural communities and agriculture in Tulare County," said Tricia Stever Blattler, Tulare County Farm Bureau chief. "This has to be an investment we make sooner rather than later, especially during a wet year like this one."

Subsidence shrinks Friant-Kern Canal capacity by 60 percent

tfitchette | Jan 09, 2018

https://www.farmprogress.com/irrigation-systems/subsidence-shrinks-friant-kern-canal-capacity-60-percent

Subsidence along the Friant-Kern Canal is nothing new. However, a five-inch drop within the past year in southern Tulare County is troublesome as it caused a 60 percent reduction in deliveries to districts along the lower half of the canal system.

Canal capacity in the area is now about 1,750 cubic feet per second, down from a designed capacity of 4,000 cfs.

Survey shows areas of land subsidence in Sac Valley

Colusa County Sun-Herald

January 29, 2019

https://www.appeal-democrat.com/colusa_sun_herald/survey-shows-areas-of-land-subsidence-in-sac-valley/article_660b589c-2435-11e9-8393-83dd6fd0f229.html

According to the Sacramento Valley GPS Subsidence Netwrok Report and accompanying fact sheet, most of the valley has experienced little to no subsidence, however, land in the Arbuckle area has sunk 2.14 feet compared with baseline measurements recorded in the same location in 2008, according to a press release from the Department of Water Resources.

The report was led by DWR in coordination with 19 state and local agencies.

Land subsidence can damage critical infrastructure, including water delivery systems, levees, roads and bridges. In 2017, DWR worked with NASA to release a report on San Joaquin Valley subsidence citing areas along the California Aqueduct that have experienced almost two feet of subsidence over three years.

The Sacramento Valley survey results were collected as groundwater levels were recovering from the severe drought of 2012-16, which saw groundwater levels in much of the state reach historic lows, according to the press release. Compared with 2011 pre-drought groundwater levels, the largest decreases were observed in Glenn and Colusa counties at 58 to 43 feet, respectively. Field work indicates that ground water levels have recovered an average of seven feet, but more frequent and more comprehensive monitoring is needed to more accurately detail the impacts of droughts and high-water years on groundwater levels and subsidence.

Mid-west Flood Demonstrates Once Again the Foolishness of Not Building Infrastructure

The failure to complete all the projects of the 1944 Pick-Sloan plan for integrated water management throughout the Missouri-Mississippi River systems. For about $6 billion investment over the 1940-1790 period, the tens of billions of damage from the floods of 1993, 2011 and now once again right now.

First, a summary article on the present flood and its near catastrophic damage. Then a link to an article published in 2011 in the *Executive Intelligence Review* on the "Pick-Sloan" plan of 1944. One thing is clear, the areas of both rivers in which the specific projects of the plan were completed have had no damage in any of the floods over the past 30 years.

It clear that if the Pick-Sloan Missouri River Basin Plan had been followed through, which was approved by the U.S. Congress, but was shut down after Kennedy's assassination--there would have been another 147 dams and reservoirs built, 38 hydro-power plants (that we don't have today), and a navigational channel 9' deep and 300' wide all the way from St. Louis to the Mississippi River, to get the water out of here. If all this infrastructure had have been built, it would have cost a fraction of what it will cost now to rebuild and replace the current damage, if even it can be done at all today.

Midwest Flooding Hits U.S. Agriculture Production Capacity, Food Supply in Major Way

April 2 (EIRNS)—The Upper Missouri-Mississippi River Basins flooding is rightly called "historic," compared to the terrible episodes in the region over the past couple centuries. The cause for the damage is not bad luck or "climate change," but the lack of infrastructure which had been proposed, specifically since the 1944 "Pick-Sloan" plan for integrated water management throughout the region, and was never built. Nor was the plan fully built for the Upper Mississippi infrastructure; and the Upper Watershed Dam program of the Agriculture Department was way underfunded for decades.

Now, as Iowa Sen. Chuck Grassley (R) said on the floor of the Senate last week, "With more

precipitation, snowmelt, saturated soil, frozen ground and massive ice jams—we are in store for significant Spring flooding that may reach 200 million Americans."

The following selected specifics demonstrate an idea of the hit to food production and future capacity.

• An estimated 55% of U.S. corn and 60% of soybean crop areas are at risk of flooding. Spring plantings will be disrupted for certain in large parts of this cropland. Land under water now is almost surely not going to be seeded. The debris ranges from metal shards, to rocks, to silt and sand. After the 2011 big floods, some of the debris wasn't cleared for a few years. From county to county, 5-15% more corn and soybeans were in storage in on-farm bins than in recent years, because farmers have been holding it off market, in hopes of getting a higher price. Now, the crops are destroyed. Very little is insured. Plus, the metal bins are busting out—exploding—from the pressure of the water-swollen crop inside. The grain itself is unusable. Even ethanol plants aren't buying flooded corn.

• The core Missouri Basin states which are hit very hard—Nebraska, Iowa, South Dakota, Missouri and Kansas—account for 27% of U.S. cattle, or about 26 million head. The larger region—Iowa, Minnesota, Illinois, Nebraska, Missouri, Kansas and South Dakota—have 48% of all U.S. hogs. Egg production is concentrated here, with 34% of all U.S. egg output in the six states of Iowa, Minnesota, Illinois, Nebraska, Missouri and South Dakota. (USDA Economic Research Service)

• Thousands of livestock have perished either due to extreme cold weather, blizzard conditions, or extreme flooding. The fact that the disaster comes during calving season has increased the animal losses everywhere. Flood waters went through feed lots, and hog and poultry barns. Surviving cattle are suffering significant trauma after-effects, including disease susceptibility and lack of weight gain. There are increases in clostridial (mainly blackleg) and leptospiral infections.

• The loss of water supplies in many areas has caused big concern for large cattle, swine and chicken operations. The farms and feed lots could not be accessed due to flood water, and drinking water for the animals has had to be trucked in.

• In Nebraska, cattle feedlots lost an estimated $36 million in feed supplies. Nebraska National Guard Chinook helicopters dropped hay for flood-stranded cattle, which, they report, hasn't been done in 50 years. Cattle feedlots report losses running at $1 million a day, from the increased transportation costs involved.

Here is the link to the article from *Executive Intelligence Review*, including a few paragraphs from the opening pages. This article originally appeared in the *New Federalist American Almanac* on June 27, 1994

No More Floods! Build the Missouri River Development Project

by Anthony DeFranco
https://larouchepub.com/eiw/public/2011/eirv38n23-20110610/13-27_3823.pdf

"The Upper Mississippi-Missouri flood of Summer 1993 was an enormous tragedy. Rising to record levels, the two rivers claimed 0 lives, damaged or destroyed 100,000 homes, inundated 1,00 square miles—an area the size of Switzerland—and dam-aged or ruined 8 million acres of farmland. Nine states were declared Federal Disaster Areas. The total dollar loss was put at $20 billion, but there is no cost-accounting the millions of manhours spent sandbagging and rescuing people and livestock, or the suffering inflicted.

"The great flood of 1993 never should have happened. Nearly 0 years ago, plans to tame the Missouri were completed by the U.S. Army Corps of Engineers: the Pick-Sloan Missouri Basin Project. By 1993, the upper Missouri flood control was in place; but rains struck the unprotected lower section of the

river, causing the worst flood in history.

"For a total investment of $ billion, flood protection could have been built for the entire lower Missouri. In the great flood of 1993, the damage done along the Missouri River and its tributaries was $10 billion. The Federal government has spent or allocated $ billion in flood relief for the Mississippi-Missouri. This does not count the billions lost in state, local, and Federal tax revenues.

"The Pick-Sloan Plan, named for its engineer-creators, is high on the list of those urgent projects. When completed, it will irrigate over million acres, provide .1 million kilowatts (kw) of electrical power (enough for a city of million), protect 1, 00,000 acres of prime farmland and cities on the river with 1, 00 miles of levees, save 9,000 acres of topsoil from being washed away every year, and provide naviga-tion as far north as Williston, North Dakota. And the Missouri, "Big Muddy" as the Indians called it, will never flood again."

Back to the Moon, Nuclear Power and Fusion

Last week President Trump announced that the U.S. will put humans on the Moon, once again, within five years. This week the administration announced a new initiative to recapture the U.S. as the world's leading nuclear power promoting nation, which also includes a more focused approach to fusion power research and development. The President has now adopted the Fourth Law of Lyndon LaRouche fully.

But, the U.S. is not alone in beginning to create what is required: A "crash program" at the frontiers of science and technology, as the only human means of increasing the productive powers of labor and the economy.

The following reports highlight just some of the recent developments.

NASA's Bridenstine Affirms Moon-Mars Program Is 'Once in a Lifetime Opportunity'

April 1 (EIRNS)—In an agency-wide NASA Town Hall this afternoon to discuss the U.S. plans for going to Moon and then to Mars, Administrator Jim Bridenstine made a very short opening statement, saying there are a lot of questions, discussion, and excitement. The program is doable he said, "given the resources and tools." Then he went right "to open the discussion, the dialogue, about how we're going to achieve it."

The agency town hall was broadcast on NASA TV, and also streamed on its website.

Most impressive was 1) Bridenstine's understanding of the hesitation, if not pessimism, on the part of the workforce who had worked on two previous, cancelled Moon-Mars missions. He will overcome that to the extent he can assure NASA people that this administration will follow through. And 2) his ability to respond to technical questions and answers, which is not inconsequential for a science and technology agency, or to the people who have to solve such questions.

Bridenstine's major points:

On whether the program will be backed up with funding, the Administrator addressed what is on people's minds, as he has been reminded of "hundreds of times" about the fact that programs to go to the Moon got cancelled "because the resources didn't materialize." (Both George H.W. Bush and George W. Bush had Moon-Mars programs, which NASA people attending the live town hall had worked on, that got cancelled.) Bridenstine assured the workforce that "the administration is committed" to carry it through. Asked again about commitment, and programmatic "whiplash," Bridenstine, a former congressman, pointed out the consistency of support on the part of Congress, and the "level of certainty while Trump is still there."

He affirmed later that he "believes we're going to meet the deadline" of 2024; it is so "important to the administration" that the deadline is in "Trump's second term," meaning he will be held accountable if it fails.

Asked about "schedule over safety," on the minds of NASA staffers who went through two Space Shuttle accidents, Bridenstine said "the number-one mission is schedule with safety." We won't go in 2024 "if it's not safe," he said.

To conclude, Bridenstine said this is a "big charge," which we should "embrace, and give it full force."

Town Hall with NASA Administrator Jim Bridenstine

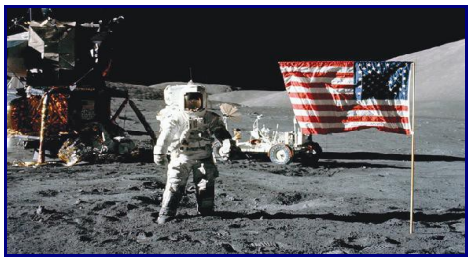
https://www.youtube.com/watch?v=o2gz2E-Wrws&feature=youtu.be&t=160
NASA
Published on Apr 1, 2019

Headquarters hosted an agencywide town hall with NASA Administrator Jim Bridenstine on Monday, April 1, at 1:30 p.m. EDT. NASA HQ employees were invited to join the Administrator in the Webb auditorium for this important discussion on our Moon to Mars plans.

Open the Age of Reason

This article appears in the April 5, 2019 issue of ***Executive Intelligence Review.***

https://larouchepub.com/other/2019/4613-open_the_age_of_reason.html



NASA: Jack Schmidt poses beside the U.S. flag on Apollo 17 mission on December 11, 1972.

There, in the stars, lies mankind's entry into the long-awaited Age of Reason, when our species sheds at last the cultural residue of the beast.

—Lyndon LaRouche, 1985

March 31—In unveiling his five-year U.S. manned Moon mission and the succeeding international Moon colonization and Moon-Mars missions, immediately after the collapse of the "Russiagate" coup against him one week ago, President Donald Trump acted exactly as Lyndon LaRouche might have advised him—if only LaRouche were still alive to see these signal victories for his ideas.

The Moon-Mars mission, which is now active United States policy after Lyndon and Helga LaRouche, Krafft Ehricke, and other great leaders have promoted it for decades, will raise up the human species to what LaRouche called a revolutionary new "platform." Those who would bring this about, should study the interrelated ways in which science, industry and economy, as also education and culture, must interlace and unite in a well-designed crash program, to cause economic shock-waves of sudden advances. This not merely in the United States and other spacefaring powers, but in countries without space programs as well. LaRouche spelled this out in his 1985 "Private Initiative for Colonizing the Moon and Mars."

He began by estimating that for at least the next 50 years, "all scientific and technological progress will be shaped primarily by the interrelationship among three presently well-defined frontiers of scientific research: (1) controlled thermonuclear fusion, (2) coherently directed electromagnetic impulses, and (3) optical biophysics." Yet these are precisely the three core tasks required for interplanetary colonization! As LaRouche's scientific and physical-economic reasoning progresses through his dense, 12-page article, it becomes clear that nothing could benefit the world's economy more than commitment to this Moon-Mars mission—which today should be combined with the policy of Strategic Defense of Earth from extra-planetary threats.

Economic shock-waves will spread from special toolmaking workshops within industry, devoted to production at the most-advanced frontiers of science, as combined with rises and spikes in physical (not financial) levels of profit. From this orientation, it becomes clear that our "make-anything" industry which we call the auto industry, will be revived not simply as it was in the past. It will build modular fission and fusion reactors among myriad other new products, while inventing and using tools based on scientific principles still unknown today.

Crash-programs always depend upon young people. During the Apollo program, NASA's average age was 27. Flight controller Gene Kranz was an "elder statesman" at 35. (Now the average age is 52.)

Today, clearly, we have a great task ahead to rescue our youth from the effects of pernicious electronic entertainments, total miseducation, and drugs of all sorts. It dwarfs the problem Franklin Roosevelt tackled with his CCC camps. But having come this far, will we let that stop us—that or any other obstacle?

Space Nuclear Propulsion Is Making a Come-Back

March 29 (EIRNS)—The Pentagon's Defense Advanced Research Projects Agency (DARPA) is requesting $10 million in FY20 to start a "Reactor on a Rocket" program. The goal is to develop a nuclear thermal reactor system, which the U.S. had under development in the 1960s. That project was shut down when the manned Mars mission was taken off the table. According to DARPA's budget document, the nuclear-propelled rocket will "expand the operating presence of the U.S. in space to the cislunar space volume and enhance domestic operations to a new high-ground, which is in danger of being defined by an adversary." (Clearly, this technology will be transferrable to space exploration endeavors beyond the Moon.)

The "Implementation" section of the document states: "The program will investigate on-orbit assembly techniques to safely assemble the individual [nuclear] core element subassemblies into a full demonstration system configuration, and will perform a technology demonstration." No dates are mentioned in this brief description.

China To Build a New Fusion Research Center and Fusion Engineering Test Reactor

April 2 (EIRNS)—It has been announced this week that the Institute of Plasma Physics of the Chinese Academy of Sciences has the go-ahead to build a new Fusion Research Center, in order to test large fusion reactor components, such as superconducting magnets, as well as to conduct studies of plasma behavior. It will be an integrated research facility, which the Institute of Plasma Physics, home of the Experimental Advanced Superconducting Tokamak (EAST), says is key for fusion systems. As World Nuclear News reports April 1, the center is "one of the major scientific engineering projects" in China's 13th Five Year Plan.

The Engineering Test Reactor, which will be smaller than the International Tokamak Experimental Reactor (ITER) being built in France, will nonetheless be comparable in performance. It is projected to go into operation in 2030. Hopes are for the capability to have fusion power reactors by the time of

2050.

The integrated center will be in at the Institute of Plasma Physics in Hefei, Anhui province.

Beijing Will Accelerate Its Nuclear Builds, Using Its Own Technology

April 2 (EIRNS)—After a three-year freeze in the approval to construct new nuclear power plants, following safety reviews in the wake of the 2011 tsunami-caused nuclear accident in Japan, China will quicken the pace of plant construction, mainly by using its indigenous technology. The aim is to avoid the delays and cost increases that have characterized the nuclear plants China has imported.

A review of the nuclear power situation and goals came out this week at the China Nuclear Energy Sustainable Development Forum taking place in Beijing.

China's plan has been to have 58 GW of nuclear capacity online by 2020. Due to the three-year hiatus, it will come up short by just 5 GW. But construction will be accelerated, to meet the goal of 137 GW by 2030, and 200 GW by 2035. At the present time, the U.S. has just under 100 GW of nuclear generating capacity.

During the China Nuclear Energy Sustainable Development Forum, Chen Hua, CEO of China National Nuclear Power company explained that China's Hualong One reactors will be faster to build and easier to maintain than foreign designs because it will be made at home. One factor that has created delays, is the diminished state of the nuclear supply chain, due to lack of capital investment, especially in the United States.

For example, construction on the Westinghouse AP1000 reactor at the Sanmen site has been suspended after a problem arose in a coolant system pump. As the part was still under warranty, there will be no added cost, but the delay will add up to eight months.

China Announces Beginning Construction of Small Modular Reactors To Start at Year End

March 31 (EIRNS)—China's Ministry of Environment is proceeding with environmental impact assessment for a project to build an ACP100 small modular reactor (SMR) at Changjiang, Hainan, with construction to begin by the end of this year. According to the Chinese publication Nuclear World, the first concrete is to be poured on Dec. 31, World Nuclear News reported. The construction of the SMR is expected to take a little less than five-and-a-half years, with the first electricity expected to be produced by May 31, 2025. Hainan is an island, and a high-tech center, which is also the site of China's newest space launch complex, which will be open to the public and include facilities for tourists to watch launches, a museum, and a space theme park.

The 125 MW ACP100 was identified as a "key project" in China's 12th Five-Year Plan, and is developed from the larger Generation III ACP1000 pressurized water reactor. The design, which has 57 fuel assemblies and integral steam generators, incorporates passive safety features and will be installed underground.

A number of countries, including the United States, Argentina, and Canada, among others, have begun actively developing small modular reactors. The Portland, Oregon-based company NuScale Power has announced that its design of a small modular nuclear reactor has completed the Phase 1 review of its design certification application by the U.S. Nuclear Regulatory Commission. What NuScales' SMR is offering is twelve 50 MW reactors combined, scaled-down versions of large light water reactors, that can be put together module-by-module to develop a generating capacity of 600 MW. (See EIR, "Mass Production of Modular Nuclear Reactors To Industrialize Developing Countries Until Fusion Power Comes Online," Nov. 16, 2018.)

The S.3422 bill for rejuvenation of nuclear power in the United States, presented by a bipartisan group of Senators last week, pushed for rapid advancements in high-assay low-enriched uranium fuels, which several small modular reactors under development require, but for which no domestic production capability currently exists.