

California Drought Update



For January 5, 2017
by Patrick Ruckert

Published weekly since July, 2014

<http://www.californiadroughtupdate.org>

<https://www.facebook.com/CaliforniaDroughtUpdate>

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“This is a fast trip, but if it had no other benefit than to permit us to look at this valley and others like it across the country, where we can see the greenest and richest earth producing the greatest and richest crops in the country, and then a mile away see the same earth, and see it brown and dusty and useless, and all because there’s water in one place and there isn’t in another. I know of no better trip for any President or any Member of the House or Senate, or indeed any citizen, particularly those of us who live in the East, where water is everywhere and is a burden, to realize how very precious it is here in the western United States.

*President John F. Kennedy
San Luis Dam dedication
August 18, 1962*

A Note To Readers

Two more weeks and “the one” will be gone. The new President, Donald Trump, like President Franklin D. Roosevelt in 1933, has stated that his first “100 Days” shall define a new direction for the nation. Following the U.S. Drought Monitor and the Reservoir Conditions graph, and coming from, for some, a surprising source, China's *Peoples' Daily Online* presents some excellent advice to President-elect Trump on how to finance and build the infrastructure he has championed.

Our feature this week elaborates on Law #3 of Lyndon LaRouche's Four Laws, developing further the excellent advice from China, and demonstrating that it is only by President Trump's adoption of a Hamiltonian banking and credit policy can his pledge to rebuild America's infrastructure actually be met.

Are we now coming out of the most serious drought California has experienced since records have been kept for more than 120 years? The short answer is, “that remains to be seen.” But, with a series of atmospheric rivers slamming into the state this week and into next week, threatening severe flooding,

perhaps it is time to recall to peoples' minds that the predominant climate of the state for the past several thousand years is one of alternating mega-droughts and mega-floods-- droughts lasting a century and floods that turned the Central Valley into a lake. Have we, as the question was asked a couple of years ago, returned to the “normal” climate for this region? To examine this question in more detail, here is my review of the book “The West Without Water: What Past Floods, Droughts, and Other Climatic Clues Tell Us About Tomorrow,” by B. Lynn Ingram and Frances Malamud-Roam.

http://larouchepub.com/eiw/public/2014/eirv41n19-20140509/48-52_4119.pdf

Here is a link to a *Scientific American* article by Ms. Ingram on the 1862 mega-flood:

California Megaflood: Lessons from a Forgotten Catastrophe

A 43-day storm that began in December 1861 put central and southern California underwater for up to six months, and it could happen again

By [B. Lynn Ingram](#) on January 1, 2013

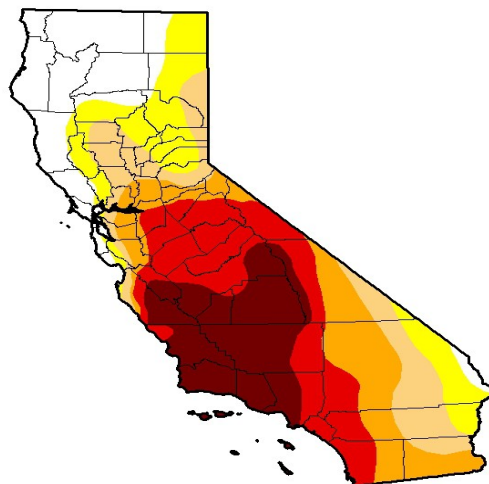
https://www.scientificamerican.com/article/atmospheric-rivers-california-megaflood-lessons-from-forgotten-catastrophe/?wt.mc=SA_Facebook-Share

Following some coverage of the weather, this week's report follows up on several ongoing battles. Those include the Substitute Environmental Plan that would require water users to leave significantly more water in the San Joaquin River and its tributaries, and the Delta Tunnels plan, which has taken “a step forward,” and also received a push from the federal government. While Obama gave Brown a gift here, he stabbed him in the back on his rail project. I guess Obama's “Salt the Earth” policy these last few weeks even takes out some of his friends.

U.S. Drought Monitor

Again this week there is a slight improvement in the drought conditions in California. Only two-thirds of the state remains in drought, and the portion of the state in the most serious category of drought is down to 18 percent. With atmospheric rivers about to smack us this week, next weeks monitor should even be better. But, no celebration yet. It must be remembered, once again, that the big dark blotch on the map-- the two most serious categories of drought-- are not getting the deluge the north is receiving.

U.S. Drought Monitor California



January 3, 2017
(Released Thursday, Jan. 5, 2017)
Valid 7 a.m. EST

	Drought Conditions (Percent Area)					
	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	18.07	81.93	67.61	54.02	38.17	18.31
Last Week 12/27/2016	17.47	82.53	68.87	57.79	40.60	18.31
3 Months Ago 10/03/2016	0.00	100.00	83.59	62.27	42.80	21.04
Start of Calendar Year 1/2/2017	18.07	81.93	67.61	54.02	38.17	18.31
Start of Water Year 8/27/2016	0.00	100.00	83.59	62.27	42.80	21.04
One Year Ago 1/5/2016	0.00	100.00	97.33	87.55	69.07	44.84

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

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

Author:
David Miskus
NOAA/NWS/NCEP/CPC



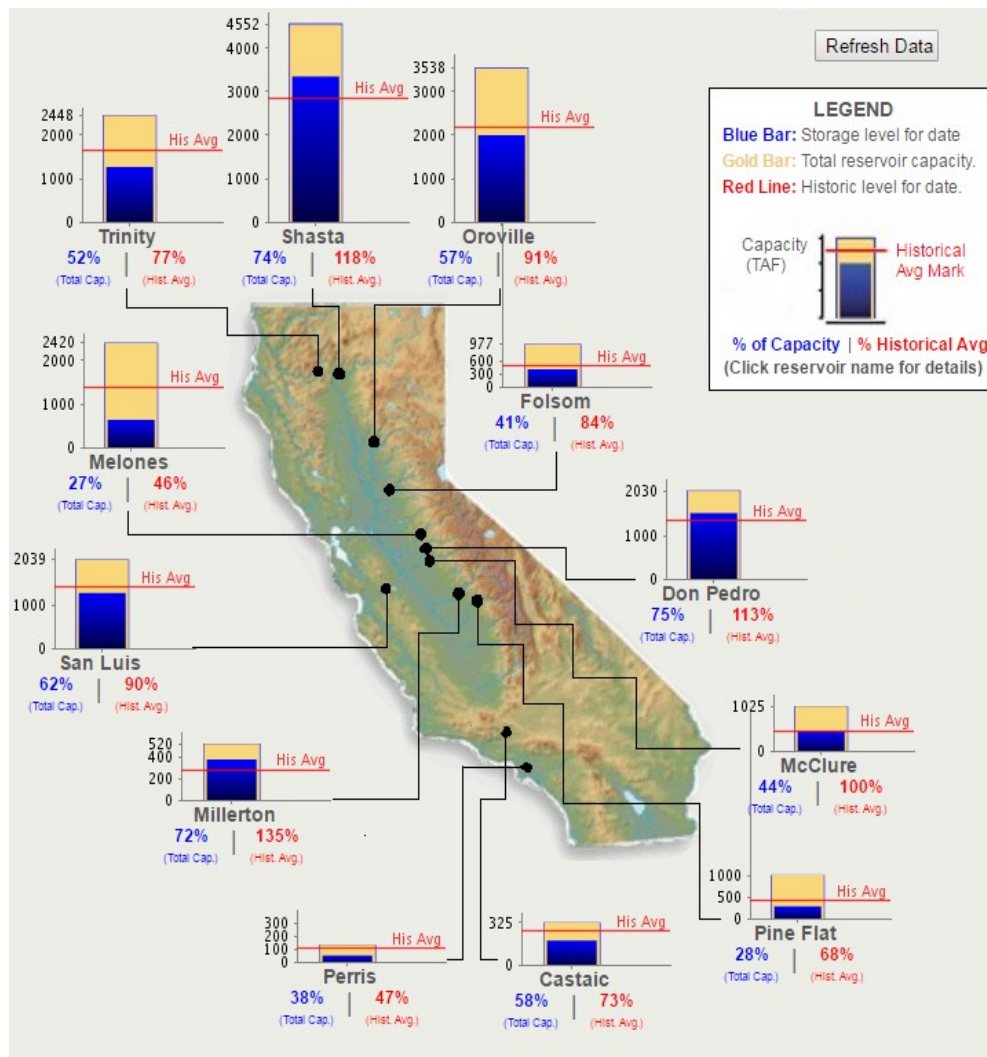
<http://droughtmonitor.unl.edu/>

Current Reservoir Conditions

January 3, 2017

From the Department of Water Resources

Generally, the reservoirs are in the best shape they have been in for several years. In fact some are being lowered right now to make room for the expected storms this weekend.



President Trump: California Water and Building Infrastructure

Just because Obama will be gone in two weeks does not mean citizens can wait around and “see what Trump will do.” As I have stated before, he must take on Wall Street by signing a bill passed by Congress reestablishing the Glass-Steagall banking law. Then we can build some infrastructure.

Here is an excerpt from the *San Diego Union-Tribune* Editorial Board statement of December 23, 2016, which does not say much but reflects the simple fact that no one knows what the new President is actually going to do:

Trump, water policy and California: Big changes coming?

By the San Diego Union-Tribune Editorial Board

December 23, 2016

<http://www.sandiegouniontribune.com/opinion/editorials/sd-trump-water-central-valley-nunes-20161223-story.html>

President-elect Donald Trump has made job creation and retention a heavy priority. He doesn't feel constrained either by establishment criticism or by what past presidents have done. Given this history, Gov. Jerry Brown's push for his \$16 billion twin tunnels project may not be the only big water headline next year; 2017 could see a host of historic — and risky — changes in how California divvies up its water. "If I win, believe me, we're going to start opening up the water so that you can have your farmers survive, so that your job market will get better," is what Trump said at a rally in Fresno in May.

More useful is this item from the *People's Daily Online*, offering the new President both China's financing for building U.S. infrastructure and China's technical help, since that nation is the world's leader in building high-speed rail and other elements of infrastructure. I include the entire article here:

Op-Ed: Fixing America will require Trump to be bold, and work with China

By Curtis Stone (People's Daily Online) 15:03, December 30, 2016
<http://en.people.cn/n3/2016/1230/c90000-9161240.html>

In U.S. President-elect Donald Trump's book, Great Again, he said, "You go to countries like China...and you look at their train systems and their public transport. It's so much better. We're like a third-world country." Despite his tough talk, Trump admires China for its GDP growth and for its infrastructure investment and engineering. He sees that, while America is aging and falling behind in certain areas, China is growing and moving forward. The U.S. can learn from China on infrastructure building, and benefit from its successes.



China is leading the world in infrastructure investment and engineering. China's Beipan River bridge, which connects Guizhou and Yunnan provinces, is a 4,400-foot-long cable-stayed suspension bridge that hangs 1,854 feet in the sky. That is equivalent to 200 stories, roughly the height of four Trump Tower's stacked.

America may be the contemporary example on building a great country, but China is the contemporary example on rebuilding a great country. The two massive bridges in Guizhou are a tiny example of China's strength in infrastructure investment and engineering. No other country in the world has lifted more than double the size of America's entire population out of poverty in such a short period of time. Since then, China has opened the Asian Infrastructure Investment Bank, and is building the Silk Road Economic Belt and the 21st Century Maritime Silk Road. These are massive cooperation projects, and the hallmark of modern-day China. Meanwhile, America cannot even realize high-speed rail after years and years of planning. Rather than bash China, perhaps America should learn from and work with China.



Another example is Guizhou's high-speed railway bridge connecting Shanghai and Kunming. This amazing achievement caught the attention of some foreign scholars. Duke University Professor Ralph Litzinger (@BeijingNomad) said, "Serious infrastructure investment in China. Makes the [U.S.] look like a backward country." Kingston University Professor Steve Keen (@ProfSteveKeen) called it an example of China's impressive engineering and said Trump "could learn a lot from [China] about infrastructure planning."

Trump wants to spend \$1 trillion on infrastructure upgrades in America to rebuild the nation and put people back to work. The problem is how to pay for it and how to do it. China knows how to fund and carry out serious infrastructure building, and deep-pocketed Chinese investors want to invest billions more in America. One way for Trump to realize his plan would be to use Chinese funds and technology. This would help return some of America's investment in China back to America for the benefit of America, and strengthen the bilateral relationship. Trump's plan to rebuild America is bold, but it remains to be seen if he will be bold enough to do what is best for America.

Rain, Snow: Dam(n) the Floods

Part I: The 'snow drought'

January 2 was the first of the monthly snow surveys (January-May) by the Department of Water Resources to measure the snowpack. The headlines and excerpts from the following articles tell the story. Then in Part II of this section we shall see that it may not be as bad as the survey showed.

Despite recent storms, California's 'snow drought' continues

By Dale Kasler, Ryan Sabalow and Phillip Reese

Sacramento Bee

January 3, 2017

<http://www.sacbee.com/news/state/california/water-and-drought/article124387999.html>

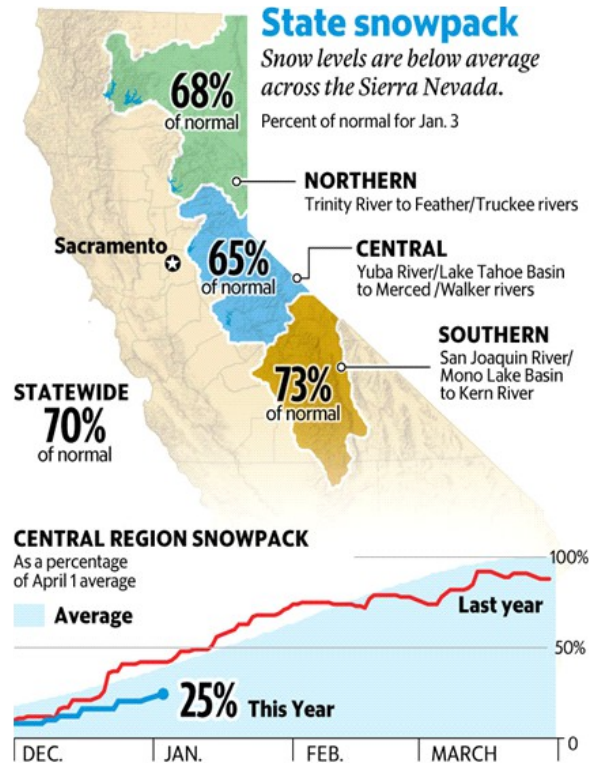
Around the start of each year, California water officials make a big show out of measuring the Sierra Nevada snowpack for reporters. Tuesday's measurement before a throng of cameras was fairly bleak: Water content in the snowpack stood at just 53 percent of average, about a third as much water as the same time last year at that site.

But as snowflakes drifted down, Frank Gehrke, director of snow surveys for the Department of Water Resources, struck a positive tone after taking the state's first official manual snowpack reading of 2017 near Echo Summit.

“I think it’s a very encouraging start to the winter,” he said.

The last two winters have offered some return to normalcy in Northern California after precipitation hit record lows in 2014 and 2015. But climatologists note that much of the Sierra precipitation has fallen as rain rather than snow, coinciding with warmer winter temperatures in the mountains. The average temperature at Squaw Valley, elevation 7,200 feet, was 36 degrees between October and March during the last 10 years. The average temperature over the prior 100 years was 33 degrees, according to data kept by the Western Regional Climate Center in Reno.

“We’re in this low-elevation snow drought right now,” said the climate center’s Dan McEvoy.



Source: Calif. Dept. of Water Resources
The Sacramento Bee

Tuesday’s survey marks the 20th time in the last 30 years that snow water content at the Phillips site fell below historical averages for Jan. 1, according to a review of Department of Water Resources data. Around two-thirds of California, largely in the southern half of the state, remains in drought conditions, according to the U.S. Drought Monitor. Last year at this time, about 97 percent of the state was in drought.

THIS JUST IN ... Despite recent precipitation, snowpack’s statewide water content is below average – just 70% statewide

January 3, 2017 Maven Breaking News

<https://mavensnotebook.com/2017/01/03/this-just-in-despite-recent-precipitation-snowpacks-statewide-water-content-is-below-average-just-70-statewide/>

From the Department of Water Resources:

Today’s Department of Water Resources (DWR) manual snow survey at Phillips Station in the Sierra Nevada range found a snow water equivalence of 6 inches, which is 5.3 inches less than the average early-January snow water equivalence of 11.3 inches as measured at Phillips since 1964.

Snow water equivalence is the depth of water that theoretically would result if the entire snowpack melted

instantaneously. That measurement is more important than depth in evaluating the status of the snowpack. (Measurements of snow water equivalence and depth at Phillips and other nearby snow courses are posted in the table below.)

More telling than a survey at a single location, however, are DWR's electronic readings today from 105 stations scattered throughout the Sierra Nevada. Measurements indicate the water content of the northern Sierra snowpack is 7.2 inches, 68 percent of the multi-decade average for the date. The central and southern Sierra readings are 7.4 inches (65 percent of average) and 6.6 inches (73 percent of average) respectively. Statewide, the snowpack holds 7.2 inches of water equivalent, or 70 percent of the January 3 average.

On average, the snowpack supplies about 30 percent of California's water needs as it melts in the spring and early summer. The greater the snowpack water content, the greater the likelihood California's reservoirs will receive ample runoff as the snowpack melts to meet the state's water demand in the summer and fall.

Part II: Here Come the Atmospheric Rivers

There have been many articles the past few days warning that atmospheric rivers will shortly deluge the state with rain and snow. For those who wish a more in-depth understanding I include the links to several of these articles. Otherwise, I'll just include some excerpts from one of them.

Atmospheric river events will dump 15 feet of snow on California

<http://mashable.com/2017/01/03/atmospheric-river-20-feet-snow-california/#ddONC4aoCmqb>

By [Andrew Freedman](#)

January 4, 2017

Both these storms have the potential to cause significant flooding, wind damage and other hazards. They are tied to narrow highways of moisture in the sky known as atmospheric rivers. These phenomena transport huge amounts of water vapor — the gas form of liquid water — toward the West Coast, where it will be wrung out in the form of rain and snow.

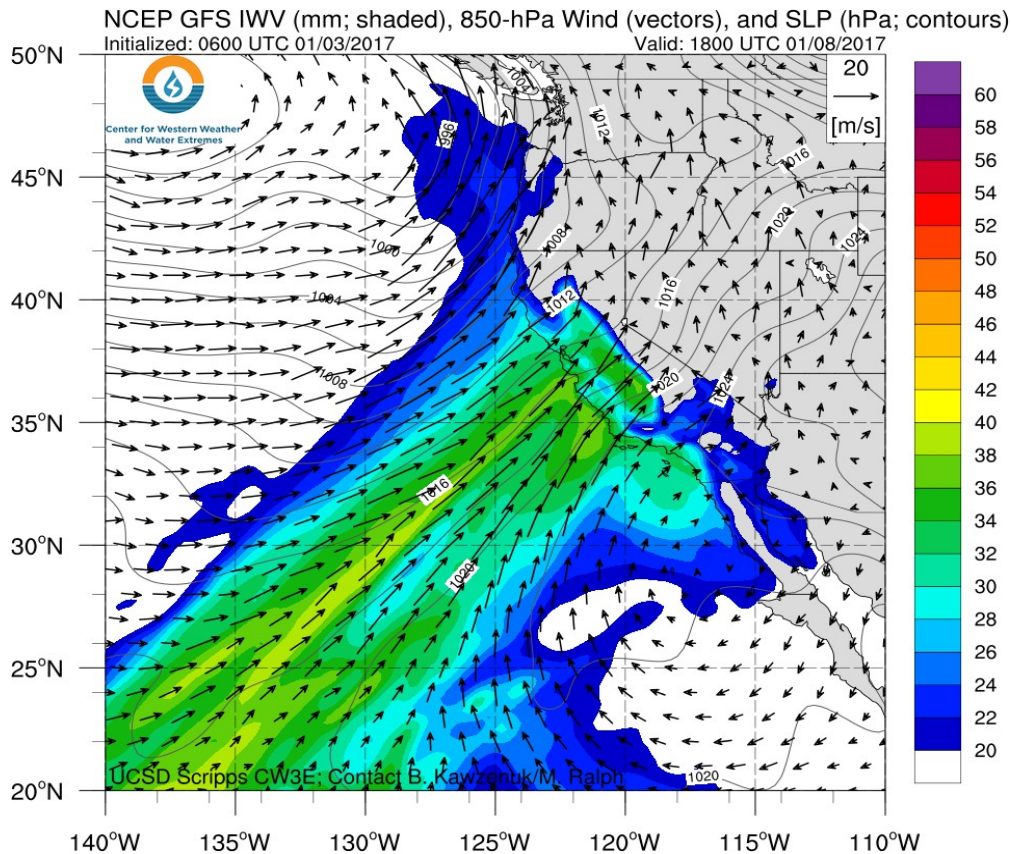
Even with these atmospheric river events, California's drought won't be over. It would take several more such events to make a more significant dent in the long-term precipitation deficit the state has accrued.

The National Weather Service is predicting snowfall totals of 5 feet or more through Thursday alone, with the potential for 5 to 10 feet from the next storm. It is too early to pinpoint precise 5-to-7-day snowfall totals from these events, but computer model projections are showing the potential for 15 feet in some parts of the Sierra Nevadas.

Extreme amounts of rainfall are projected for lower elevations as well, with the potential for at least 7 inches of rain through Monday in central California.

Such amounts are not unheard of in atmospheric river events, but they would be remarkable in the context of the state's worst drought on record, which began in 2012.

Some [research shows](#) that extremely prolific atmospheric rivers could become far more common — perhaps twice as common as they are now — in parts of California by the end of the century, though this is still a matter of scientific debate. If this occurs, water managers will have to adjust to accommodate more precipitation extremes and avoid severe floods.



Water vapor transport projection for Jan. 8, 2016, showing deep plume of moisture aimed at northern California.

Atmospheric river will blast California with heavy rain and snow ‘measured in feet’

By [Angela Fritz](#)

January 3

https://www.washingtonpost.com/news/capital-weather-gang/wp/2017/01/03/atmospheric-river-will-blast-california-with-heavy-rain-and-snow-measured-in-feet/?utm_term=.6c0bee444bfb

California braces for 'once-in-10-year' storm amid fears of flooding, avalanches, blizzards

By Paige St. John and Joseph Serna

January 5, 2017

<http://www.latimes.com/local/lanow/la-me-ln-atmospheric-river-prepare-20170105-story.html>

California Pummeled by Multiple Atmospheric Rivers Bringing Flooding Rain, Feet of Sierra Snow Into Next Week

By Jon Erdman

Published Jan 4 2017 08:46 AM EST

weather.com

<https://weather.com/forecast/regional/news/california-atmospheric-river-sierra-snow-flood-forecast->

[jan2017](#)

But, then we have this paragraph from *weatherwest.com*, pointing out that all that snow may just be rained away as temperatures in the Sierras rise.

Series of atmospheric river storms to bring risk of significant California flooding

By Daniel Swain

January 3, 2017

<http://weatherwest.com/archives/4842>

This system will also be drastically warmer than its predecessor, and while snow levels could actually start out unusually low (locally in the 2,000-2,500 foot range), they will skyrocket as very strong warm advection occurs Saturday into Sunday. It's possible that the models are currently presently overestimating the amount of airmass warming that will occur over the weekend, but given the subtropical origins of this atmospheric river snow levels could rise above 9,000 or perhaps even 10,000 feet at the height of the event. This is above essentially all Sierra Nevada passes, and more importantly well above the majority of the recently-fallen snowpack in the 3000-8000 foot range. In fact, 850mb temperatures could rise to around +10C at this time—would be very bad news indeed for the snowpack. The highest elevations of the Sierra Nevada could see tremendous snowfall totals, likely over 100 inches. And it's true that storm #1 will drop quite a lot of snow at much lower elevations over the next 24 hours. But much of this snowpack could be erased by 24 hours of warm rain later this weekend.

This Fight Will Not Go Away

While the Association of California Water Agencies makes a milktoast statement on the state's plan to allow 350,00-400,000 acre-feet of the San Joaquin River system just flow to the Bay, it merely disguises the real anger and the oncoming serious fight. Excerpts from a couple item follow:

San Joaquin River Flows Proposal Examined in Hearing

The Association of California Water Agencies

Submitted by Pamela Martineau

01/03/2017

<http://www.acwa.com/news/water-quality/san-joaquin-river-flow-proposal-examined-hearing>

As part of its draft update, the State Water Board has published a draft [Substitute Environmental Document](#) that would require water users to leave significantly more water in the river and its tributaries from Feb. 1 through June 30 each year for fish and wildlife beneficial uses and salinity control. The proposal has generated strong opposition among water users that rely on the San Joaquin River and its tributaries

“The current “unimpaired flows” approach will not help the state achieve these objectives, and will actually undermine established state policies by increasing groundwater overdraft, making investments in storage projects irrelevant and negatively impacting disadvantaged communities,” Franklin testified.

Franklin added that the proposal also will have a “devastating impact on California’s economy, especially its agricultural economy, and the disadvantaged communities that comprise 40% of the area affected by this plan.”

CFBF president's message: Congress got it right, but will California regulators?

California Farm Bureau Federation

January 4, 2017

<http://agalert.com/story/?id=10447>

The board scheduled five hearings, starting with a Nov. 29 meeting in Sacramento and concluding with another Sacramento hearing on Jan. 3. Hearings were also held in Stockton, Merced and Modesto, where more than 2,000 concerned and irritated citizens showed up to voice their opposition to the board's proposed water grab in the name of increasing salmon populations.

It became clear the issue is not really about salmon, but rather about flushing increased amounts of water out to sea by reducing the amount of water that communities, farms and water districts can capture in reservoirs to provide water during drought. The financial impact to the impacted communities and the people who live in them will be in the billions of dollars. The SED itself has tagged the potential increase in salmon to be 1,103 fish, with an economic impact of \$250 million—or \$58,000 per fish.

In October, the water board announced plans to follow a similar path for increasing water flows in the Sacramento River as well, again resulting in reduced water storage in reservoirs. It's almost laughable that the studies show the impact from the increased flow requirements would have little impact in wet years, but significant hardships in dry years. No kidding, they needed to spend money on a study for that?

The very reason our grandparents invested in the water system we have today is the realization that there will be periods of drought, and that water stored in reservoirs, combined with groundwater and with wise, efficient use of resources, will see us through.

To Tunnel or Not to Tunnel: That is the Question

Several developments in the fight over the California Fix policy of Gov. Brown seem to be an attempt to ignore the pile-up of the negatives that threaten its very existence. And Obama coming in to aid Brown's project may just be the kiss of death-- sort of like how Obama delivered such a kiss to the Brexit a few days before the vote. Below are some excerpts of articles on the subject:

Jerry Brown plunges ahead on twin tunnels

By Dan Morain, Editorial page editor, political affairs columnist and editorial writer

December 20, 2016

<http://www.sacbee.com/opinion/opn-columns-blogs/dan-morain/article122344574.html#storylink=cpy>

Jerry Brown is jumping into the deep end, and he's asking the rest of us to take a leap with him.

On Thursday, California Department of Water Resources and the feds will release environmental studies of the \$15.5 billion twin tunnel project. Nine years in the making, the document runs 90,000 pages and goes by the catchy title "The Bay Delta Conservation Plan/California WaterFix Final Environmental Impact Report/Environmental Impact Statement." If printed, the opus would fill 40 boxes, at the cost of many trees.

To Tunnel or Not to Tunnel? Will There Ever Be an Answer?

REACTIONS: Governor Brown, water agencies, and organizations react to the release of the California WaterFix final environmental documents

[December 22, 2016](#)

<https://mavensnotebook.com/2016/12/22/reactions-water-agencies-and-organizations-react-to-the-release-of-the-california-waterfix-final-environmental-documents/>

Today, the [California Natural Resources Agency posted the final EIR/EIS for the California Water Fix project](#). Here are reactions, starting with the official press release from the Natural Resources Agency, Governor Brown's statement, and then organizations and interest groups listed in alphabetical order.

Obama says full speed ahead on Delta tunnels project

January 4, 2017

The Sacramento Bee

By Dale Kasler and Ryan Sabalow

<http://www.sacbee.com/news/state/california/water-and-drought/delta/article124507564.html#storylink=cpy>

Two weeks before President Barack Obama leaves office, his administration vowed to move full speed ahead on California's controversial Delta tunnels project, calling it essential for the state's water supply as well as its environment.

Interior Secretary Sally Jewell issued an order Wednesday directing federal officials to complete a preliminary environmental review this month of the massive twin tunnels proposed for the Sacramento-San Joaquin Delta. She also ordered them to work with California officials on related projects aimed at restoring water quality and habitat for Delta smelt and other endangered fish species in Central Valley river basins that have been pushed to the brink of extinction in recent years.

Jewell's order acknowledged that Obama's time in Washington is running out and that his successor will have final say on whether the \$15.5 billion tunnels project, known as California WaterFix, becomes reality. The final federal review of the tunnels won't occur until April, when [Donald Trump](#) occupies the White House. Trump has said he wants to see more water delivered to California's arid San Joaquin Valley farm belt but hasn't specifically addressed the tunnels proposal.

Obama: Apres Nous Les Deluge

During the Seven Years War, as the French recognized that they were going to lose it, Madame Popadour, the King's mistress and the real power behind the throne declared: "Apres Nous Les Deluge." That is, if we cannot rule the world we will blow it up.

So goes Obama out the door, wrecking what he can, and that includes even the projects of his friends:

Obama Denies Loan to Nation's Only High-Speed Rail Project

Dec. 30, 2016 (EIRNS)--A fiasco jointly created by dead-duck President Obama and California Gov. Jerry Brown may be shaping up for California's high-speed rail project.

The Obama Transportation Department on Dec. 20 refused a loan of \$15 billion requested by the California High-Speed Rail Authority for the only high-speed rail project under construction in the United States. The request was made "quietly" on Dec. 2, according to the {Los Angeles Times} of Dec. 24. The intention was to invest that loan fund in an East-West portion of the planned system, running from Los Angeles east to Bakersfield. It was hoped to be the basis for a "Federal judgment of creditworthiness" for further bond issues, as well as making further Federal loans possible.

But the Obama Department of Transportation blew the quiet request (i.e., informal probe) out of the water, by announcing that California "has not submitted a financing request as of this time."

The ARRA ("Stimulus Act") of 2009 gave \$3.5 billion to California for high-speed rail, but there has been no aid or loan since then. The state sold a \$9 billion bond issue in 2008, but a maze of senseless environmental and "consumer" conditions attached to it by the legislature, have prevented much of it from being spent. The Obama refusal to loan anything to CHSRA, creates a funding crisis for the whole system.

There are several underlying problems. There are no American suppliers for the electric locomotives, trainsets, or electrical overhead equipment; yet a Chinese offer for both the Los Angeles-San Francisco line and a Los Angeles-Las Vegas line was rebuffed by the Administration on "buy America" grounds!

Due in part to this, and to the many harassing rules and conditions for construction, the California system business plan budgets it at about \$65 billion total cost, for about 1,100 km of rail -- two and one-half times the international average cost of \$25 million/km of high-speed rail (China: \$24 million/km; Spain the lowest, \$18 million/km). The construction timetable runs from 2015-2040 for many stations and sections.

And finally, there is no actual overall funding plan, as EIR was told by the staff of one California Congressional supporter of it, who feared "a black eye for high-speed rail nationally." "I can see," he said, "how your [Hamiltonian] bank would handle it."

Feature

To Solve California's Water Problem, Revive the Space Program

Three weeks ago the "Feature" focused on step one of Lyndon LaRouche's comprehensive policy of returning the U.S. to the American System as created by our first Treasury Secretary Alexander Hamilton, the reinstatement of the Glass-Steagall banking law.

<http://www.californiadroughtupdate.org/pdf/20161215-California-Drought-Update.pdf>

Last week we focused on step two of LaRouche's Four Laws: The Hamiltonian Banking and Credit system: <http://www.californiadroughtupdate.org/pdf/20161229-California-Drought-Update.pdf>

This week we present Larouche's Third Law: Infrastructure

Concentrate on those areas of investment that most increase the energy flux density of the economy as a whole, including infrastructure, scientific and technological R&D. This means trillions of dollars in capital investment, to build a 21st century infrastructure grid along the lines of the World Land-Bridge.

An excellent discussion of this point and more can be seen in the LaRouche PAC Weekly Webcast of December 30, 2016

<https://larouchepac.com/20161230/friday-webcast-december-30-2016>

The fundamental question of economics and how a nation determines its economic policy must be "how to increase the physical productivity of the labor force and thus the entire economy." This has nothing to do with money, but with the types of investments that raise the productivity of the economy to a new, higher, platform of productivity. Think of the leap upward in productivity that occurred with the introduction of electricity into the productive process.

Under the title, "Federal Credit to Increase Physical Productivity," that concept is developed further: With a national banking system, federal credit must be provided according to the strict physical economic

standard of increasing quality and quantity of productive work, measured in terms of increases in the productive powers of labor and of energy-flux density. As Mr. LaRouche says in his Four Laws, this is based on “the essential human principle, which distinguishes the human personality from the systemic characteristics of the lower forms of life: the net rate of increase of the energy-flux density of effective practice.” While Franklin Roosevelt’s recovery programs serve as an indispensable precedent, the depths of the current crisis require the deeper understanding of the science of physical economic growth developed by Mr LaRouche.

On the LaRouche PAC website is a feature titled: “Frequently Asked Questions” on economics. I include below three of those Questions and Answers related to infrastructure: <https://larouchepac.com/econ-faqs>

4. Why do we need large investments in new infrastructure projects?

In one word, productivity. The U.S. economy has been mired in near-zero productivity growth for almost a decade. And that’s using the crudest measure—total Gross Domestic Product divided by total hours worked by the labor force—which hardly measures productivity advance at all. Measuring rather by technological productivity, the increases in productive power of labor which come from real technological advances, this zero-growth condition goes back decades. It goes back, in fact, to the end of the “golden age of U.S. productivity” which began with Franklin Roosevelt’s New Deal great projects, and ended when JFK’s Apollo Project space program was drastically cut back in the late 1960s.

That kind of productivity advance comes from renewing a nation’s economic infrastructure at a higher level: for example, by building a national and actually Continental high-speed rail grid for freight and passengers; by building scores of nuclear desalination stations to produce water across the drought-stricken West; by reviving deep-space exploration and developing the new propulsion and exploitation systems for it based on fusion power.

The truest definition of productivity—an economy which gives the greatest scope to the human mind’s powers of invention—arose from the *Report on Manufactures* of the great U.S. military leader, Constitutionalist and Treasury Secretary Alexander Hamilton, at constitution.org/ah/rpt_manufactures.pdf

5. Doesn’t new infrastructure mean smart grids, and solar and wind power?

No. Solar and wind power are giant steps backwards in the history of mankind’s power capacities. Their power densities are an order of magnitude lower than that of coal, still further below nuclear fission, and incomparably far below nuclear fusion. That means that productive processes powered by wind and/or solar have lower labor productivity (less production per capita) AND lower energy efficiency (less production per unit of energy used).

Electricity grids powered by a lot of wind and solar power installations—as already proven in several European countries, Germany in particular—are not smart grids; they are unstable grids. They take power from facilities which operate only intermittently—over a year’s time typically at 20-30% of capacity, compared to 90-98% of capacity for nuclear fission plants. And they supply electricity at extraordinarily high costs.

Forget desalinating water on any large scale with wind or solar power. And nothing is more important to the productivity of the U.S. economy than to conquer the western drought, which is shutting down our most productive agricultural base.

Worse, a “new” power infrastructure largely based on solar and wind power would block, effectively forever, our ability to make the breakthrough to fusion power. Such a “new” electricity infrastructure would not be able to generate the power pulses necessary to ignite a fusion reaction!

6. If we need a new economic infrastructure, and interest rates are so low that borrowing is “almost

free” for the Federal government, why doesn’t Congress have the Treasury borrow as much as is needed into a new infrastructure fund, to build the new infrastructure we need?

That is, essentially, what Franklin Roosevelt’s Administration did through the Reconstruction Finance Corporation (RFC). But the needs for investment to restore productivity in the current U.S. economy are far greater, even relatively, than Roosevelt faced in the Great Depression. Today, there has been half a century of complete neglect of even repair and replacement of existing infrastructure; of stagnant technology and technological productivity; of declining household income; of *deindustrialization* which has produced hopelessness and even suicidal behavior in large portions of the population; of the loss of skills and education in our labor force.

FDR’s RFC eventually sold bonds to the public for about \$50 billion over 20 years, from 1934-1955. Today’s need is to invest *100 times* that much, roughly *\$4-5 trillion dollars over the next five-ten years* in advanced infrastructure, reviving the NASA space program, reviving the fusion energy development effort to a crash program.

The increased productivity of the labor force and economy will return that investment, and much more, over 30-40 years. But should the Treasury borrow \$4-5 trillion through long-term bonds into a dedicated fund or agency for infrastructure investment?

It could not do that “virtually free,” as those people think who are deluded by Federal Reserve zero-interest money printing, or who would like to see the United States issuing devalued debt so that Wall Street hedge funds could speculate in it. Rather, it would have to borrow over that long term at 3-4%, gradually rising, and pay tens of billions in new interest annually, starting immediately. A tax to pay that interest in the short term, will be required. If a Wall Streeter is selling a scheme for “50-year infrastructure bonds at 1%,” or “helicopter money for infrastructure,” he is blowing smoke, or wants devalued and “distressed” Treasury bonds for “vulture fund” speculation.

But Congress, by creating a national bank on Hamilton’s principles, can leverage the already existing Treasury debt; the bonds and investment funds of states and cities which build infrastructure; and the investments of commercial banks and the public, to create the very large amounts of credit required for a new economic infrastructure—national, multinational, and back into human exploration of the Solar System.

Just as critical: Once the United States has such a national credit bank for these purposes, that bank can cooperate directly with the infrastructure banks and funds which the economic powers of Asia have been creating—China’s national development banks, the Asian Infrastructure Investment Bank, the BRICS Bank, the Silk Road Fund, and others.