

California Water and Infrastructure Report

Formerly, the “California Drought (and Flood) Update”



For April 19, 2018

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

"Wisdom is merely the science of happiness, or that science which teaches us to achieve happiness. Happiness is a state of permanent joy.... Nothing serves our happiness better than the illumination of our understanding and the exercise of our will to act always according to our understanding.... Helping each other in the search for truth, the knowledge of nature, the multiplication of human powers, and the advancement of the common good.... For only so much of our life is to be valued as truly living as the good we do in it."

Gottfried Leibniz essay "On Wisdom" (~1700)

A Note To Readers

Leibniz is the source of the phrase in the Declaration of Independence that defines the U.S. republic with the unique wording of “Life, Liberty and the pursuit of Happiness:”

We hold these truths to be self-evident, that all men are created equal, that they are endowed by their Creator with certain unalienable Rights, that among these are Life, Liberty and the pursuit of Happiness.

Given the insanity that passes for the U.S. media these days, Leibniz's appeal to “search for truth” is a damn good idea. For little is found in the discussions and debates about virtually anything.

So, please go back and read the quote once again, and then reflect upon how you shall proceed to spread happiness, understanding, truth, and the “advancement of the common good.”

In This Week's Report

The U.S. Drought Monitor shows virtually no change from the previous week. The unusual April showers has given us a little break.

But, some are calling the well-below snowpack a “snowdrought.” So, with that, the second section of the report this week has several articles which develop some of the elements of the climate, the weather and the geography of the region in relation to drought. Concluding with a picture of the broader Southwest region, which is no question already in a serious drought.

The Oroville Dam update includes the Department of Water Resources recent report on its construction plans and schedule.

“Still trying to argue for more water storage” is the title of the next section of this report, and includes a myriad of reports on the status of water storage projects, the political battle around them and related areas like the aquifers and the new ground water regulatory system.

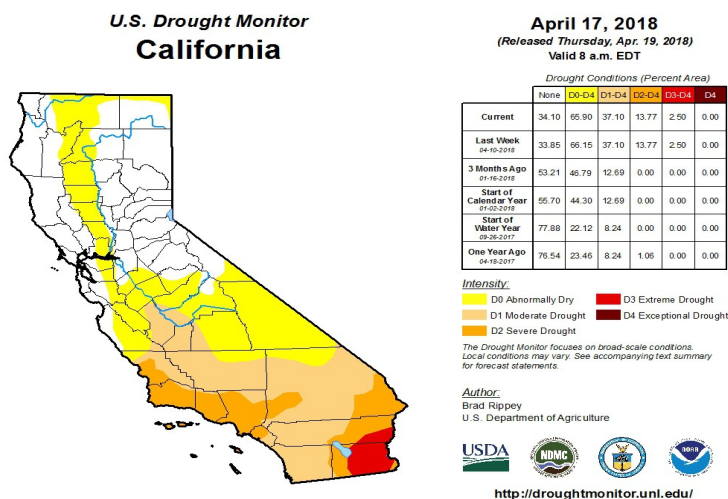
But, all the sound and the fury around this leaves something very serious on the sidelines:

The labors of Sisyphus shall be seen by the people of the future as having paled into insignificance when the story of those who fought for building more water storage in California in the early years of the 21st century is told.

Yes, some are making a heroic fight to raise Shasta Dam and build the Temperance Flat and Sites reservoirs, and we acknowledge their effort. But, while those projects must be built and on an accelerated schedule, I must once again remind us all that without really, really big projects like the North American and Water and Power Alliance, and the building of very large nuclear-powered desalination plants by the dozens, we will not serve those in the future who will be part of the 70 or 80 million people living in the state. Yes, the population of the state shall double from its present 40 million in just a few decades. And as President John Kennedy, inaugurating water projects in the west in 1962-63, repeatedly stated, what we build today is not for ourselves but for those who will come after us two or three generations into the future.

The feature this week has two sections: New reports on the progress of fusion power research and some background on how to fund infrastructure with Federal credit.

U.S. Drought Monitor



Water and the Drought: This Week's Picture

California's snow drought is a recipe for danger

Scant snowfall is fueling drought, floods, wildfires and mudslides.

By [Jeremy Deaton](#) [Nexus Media](#) April 10, 2018

Sequoia National Park, part of the Sierra Nevada mountains.

California is likely facing another year of water woes. The Sierra Nevada [snowpack](#), which supplies up to a third of California's water, is exceptionally meager this year. Experts found around [half as much](#) snow on the mountains as they typically would in early April, when the snowpack is historically most voluminous.

Not only does the dwindling snowpack put California's [water](#) supply at risk, it also portends more [floods](#), [wildfires](#), and [mudslides](#) over the coming year. This is precisely what makes climate change so dangerous. Even small changes in weather can have cascading effects, multiplying the risk of natural disaster.

Climate change is [depriving](#) California of needed precipitation, and it is also causing more precipitation to come down as rain instead of snow. The result is that, over time, the Sierra Nevada see [less and less snow](#), with consequences for the Golden State. Every spring and summer, that snow melts, feeding the streams and rivers that supply California's reservoirs. Less snow means less water for farms and cities. Making matters worse, [warmer temperatures](#) mean that snow melts in late spring and early summer, leading to shortages later in the year.

3 Things to Know about California Droughts

[Alvar Escriva-Bou](#)

Public Policy Institute of California

April 10, 2018

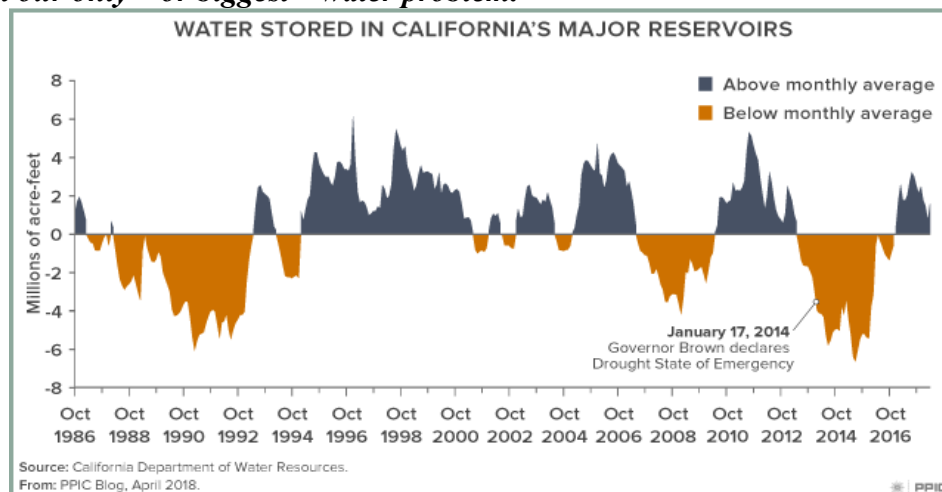
<http://www.ppic.org/blog/3-things-know-california-droughts/>

Here are three things about droughts that every Californian should know.

Rain, snow, and water in storage are the conditions that define a drought in California.

Drought vulnerability varies across the state.

Drought is not our only—or biggest—water problem.



As the figure shows, during successive dry years we rapidly draw down storage in reservoirs. By year two or three of a drought, reservoir releases are cut back and water scarcity becomes a problem, particularly in many agricultural regions. Groundwater helps reduce the impacts of drought, but it isn't sufficient for extended droughts, and significant cutbacks in water use are required.

Drought continues to expand across American Southwest

By [Associated Press](#)

April 17, 2018

<https://www.williamsnews.com/news/2018/apr/17/drought-continues-expand-across-american-southwest/>

ALBUQUERQUE, N.M. (AP) — Drought is stiffening its hold across the American Southwest as extreme conditions spread from Oklahoma to Utah.

The federal drought map released April 12 shows dry conditions intensifying across northern New Mexico and expanded in Arizona.

According to the National Drought Mitigation Center, nearly half of New Mexico and Arizona are facing extreme drought or worst conditions while around 60 percent of Utah is under severe drought.

On the southern high plains, Oklahoma remains ground zero right now for the worst drought conditions in the United States. About 20 percent of the state is facing exceptional drought conditions — the worst possible classification.

Most of Colorado also is under severe drought and almost all of the Texas Panhandle is seeing extreme drought or worse conditions.

Oroville Dam Update

Lake Oroville Construction Updates April 18

Published: Apr 18, 2018

<https://www.water.ca.gov/News/News-Releases/All-News-Articles/Lake-Oroville-Construction-Updates-April-18>



Construction of the roller-compacted concrete splashpad continues uphill toward the concrete weir of the emergency spillway. April 17, 2018/DWR

SACRAMENTO – Today the Department of Water Resources (DWR) provided an update on construction-related activities for the Lake Oroville Spillways Emergency Recovery Project.

Update to the 2018 Operations Plan

DWR has updated the [2018 Lake Oroville Operations Plan](#) to begin construction as soon as possible this spring and maximize the 2018 construction window to ensure the main spillway is fully reconstructed before next winter. The plan was submitted yesterday to the Federal Energy Regulatory Commission (FERC) and the California Division of Safety of Dams (DSOD) for approval.

Construction on the Main Spillway

- DWR has requested approval from FERC and DSOD to close the main spillway gates on May 8 to allow construction to resume for the remainder of the construction season.
- Prep work to resurface, or mill, the top layer of the roller-compacted concrete (RCC) middle chute is targeted to begin on April 25, which will create a uniform surface to prepare for placement of steel-reinforced structural concrete slabs. Crews will remove up to five inches of the surface of the RCC section of the chute.
- Overall plans for Phase Two construction on the main spillway include:
 - Demolition of the original 730 feet of the upper chute leading to the radial gates and reconstruction with steel-reinforced structural concrete slabs and walls.
 - Placement of three-foot, steel-reinforced structural concrete slabs over the RCC middle chute, and placement of a drainage system.
 - Removal of the RCC walls in the middle chute and replacement with structural concrete walls, with a permanent drainage system.
 - Hydro-blasting and resurfacing of the energy dissipaters at the base of the main spillway.

Construction at the Emergency Spillway

- DWR has requested approval from FERC and DSOD to begin removal of the remaining surface layer of the grouted rip rap on the emergency spillway hillside on April 25. This is the rip rap that was placed as part of the February 2017 emergency response.
- Crews are currently placing a concrete cap, or grade beam, on the recently completed underground secant pile cutoff wall. The cap will reinforce the structural concrete piles and secure the wall to the RCC splashpad. The secant pile wall is 1,450 feet long and located 750 feet downhill of the emergency spillway with concrete piles at depths of 35 to 65 feet.
- Crews continue to construct the RCC splashpad, which will cover the hillside between the emergency spillway and secant pile wall. The splashpad, in conjunction with the secant pile wall, will armor the existing hillside to significantly reduce the type of uphill erosion that occurred during the February 2017 incident.
- Later this year, an RCC buttress will be constructed at the base of the emergency spillway structure to provide further reinforcement.

To view photos and video of the Lake Oroville Spillways construction, visit DWR's [Oroville Spillway photo gallery](#) and [YouTube channel](#).

And here is a press report covering the same material:

Oroville Dam phase two of construction expected to start May 8

By [Risa Johnson](#), Chico Enterprise-Record

Posted: 04/18/18, 5:44 PM PDT | Updated: 8 hrs ago

<http://www.chicoer.com/general-news/20180418/oroville-dam-phase-two-of-construction-expected-to-start-may-8>

Still Trying to Argue for More Water Storage

I repeat the following from the introduction on page 2:

The labors of Sisyphus shall be seen by the people of the future as having paled into insignificance when the story of those who fought for building more water storage in California in the early years of the 21st century is told.

Yes, some are making a heroic fight to raise Shasta Dam and build the Temperance Flat and Sites reservoirs, and we acknowledge their effort. But, while those projects must be built and on an accelerated schedule, I must once again remind us all that without really, really big projects like the North American and Water and Power Alliance, and the building of very large nuclear-powered desalination plants by the dozens, we will not serve those in the future who will be part of the 70 or 80 million people living in the state. Yes, the population of the state shall double from its present 40 million in just a few decades. And as President John Kennedy, inaugurating water projects in the west in 1962-63, repeatedly stated, what we build today is not for ourselves but for those who will come after us two or three generations into the future.

Commentary: Past two winters underline need for water storage

April 18, 2018

By *Chris Scheuring*

<http://agalert.com/story/?id=11796>

As the state's population grows toward 50 million people, and as our environmental sensibilities sharpen, we're going to need a full spectrum of solutions for our water problems. That includes a continued push on conservation and further increases in irrigation efficiency; new technologies in desalination and reuse; and better use of existing supplies to support multiple needs through conjunctive use. We also must adopt efficiency standards about how much, where and exactly how we use environmental water for maximum benefit.

Even if we do all these things right, though, it won't be enough if we don't enhance storage to capture more of the heavy rains we had in winters like we had a year ago.

(Chris Scheuring is managing counsel for the California Farm Bureau Federation. He may be contacted at cscheuring@cfbf.com.)

White House, Congress side with California growers over raising Shasta Dam

By [Carolyn Lochhead](#)

April 14, 2018

<https://www.sfchronicle.com/science/article/White-House-Congress-side-with-California-12834955.php>

WASHINGTON — Congress and the Trump administration are pushing ahead with a plan to raise a towering symbol of dam-building's [20th century heyday](#) to meet the water demands of 21st century California — a project backed by San Joaquin Valley growers but opposed by state officials, defenders of a protected river and an American Indian tribe whose sacred sites would be swamped.

The fight is over Shasta Dam, at 602 feet the fourth-tallest dam in California and the cornerstone of the federal Central Valley Project, which provides water to cities and farms throughout the state. One of its biggest customers is the Westlands Water District in the arid western San Joaquin Valley, which distributes water to numerous large farms.

With enthusiastic support from Westlands, the Trump administration and Republicans in Congress want to raise the dam 18½ feet to store more water and guard against losing farmland to future droughts. Some farmers in the valley received no water at all from the Central Valley Project for two straight years during the five-year drought that ended with the winter of 2016-17.



Shasta Dam

Last month, Congress gave the \$1.3 billion project a \$20 million cash infusion for design and other preliminary work, and the Interior Department declared that construction would start next year.

The project has been on the boards for years, but President Barack Obama's administration shelved it because it would flood part of the McCloud River. California law protects the river as wild and scenic because it sustains "one of the finest wild trout fisheries in the state." Congress would have to declare in separate legislation that federal interest in raising the dam supersedes the state's authority.

The resurrection of the Shasta project was made possible by a 2016 law sponsored by House Majority Leader Kevin McCarthy, R-Bakersfield, and Sen. Dianne Feinstein, D-Calif. It instructed the interior secretary to take the lead on recommending water storage projects and moving ahead on [dam building](#) throughout the West.

Acting under this new authority, Interior Secretary Ryan Zinke put Shasta at the top of his list. McCarthy then inserted the \$20 million that Zinke requested for Shasta in a catch-all spending bill that Congress passed last month.

"Enlarging Shasta Dam will provide water supply, water quality and fishery benefits," said Tom

Birmingham, general manager of the Westlands Water District.

Westlands supports raising the dam “for the simple reason that it is the most cost-effective surface water storage project currently being evaluated in the state,” Birmingham said.

“There are people who are opposed to any project that will help sustain irrigated agriculture, particularly on the west side of the San Joaquin Valley,” Westlands’ Birmingham said. “Environmental groups can and will file lawsuits for many often spurious reasons. Whether they win those is another question.”

Westlands isn’t the only district that would welcome the Shasta expansion. The San Luis and Delta Mendota Water Authority, which supplies water to Santa Clara County, told federal officials that it wanted to share the cost of raising Shasta dam. Doing so would provide a critical state partner for the project.

“This project was dead,” said Stork of Friends of the River. “Some people were thankful for that because their project then has a chance for more money.

“Then the election happened.”

Deep Water in Deep Trouble: Can We Save California’s Drying Aquifers?

By Glen Martin

California Magazine

<https://alumni.berkeley.edu/california-magazine/just-in/2018-04-02/deep-water-deep-trouble-can-we-save-californias-drying>

Indeed, California’s reservoirs are mostly full, and it seems the state will get through the coming year without Draconian water restrictions. But both rainfall and snowpack remain below normal, and that’s a stark reminder that any relief in this semi-arid state is temporary at best. A dry spell could return at any time, and last as long—or longer—as the great drought of 2011-2017. And it’s clear that California’s water infrastructure is inadequate for such crises. There aren’t enough reservoirs in the state to slake the thirst of our cities and sprawling agricultural complex when the rainy season is anything but.

That has led, predictably, to a call for more reservoirs, particularly from Central Valley farmers. But virtually all of the rivers in the Sierra Nevada that can be dammed have been dammed. A scheme to add an extra dam to the upper San Joaquin River would cost billions and store about 1.26 million acre feet in the best of circumstances: insufficient for needs, say critics, given the cost and the likelihood that full capacity would be hit-and-miss. (One acre foot is equivalent to 326,000 gallons, enough water to sustain a family of four for a year.)

One thing is certain: short of constructing massive desalinization plants from Eureka to San Diego, we’re not going to “make” new water in any appreciable quantity. One way or the other, we’re going to have to manage the stuff that falls from the sky in a more judicious fashion. And the solution, it seems, is under our feet.

Friant Water Authority: 'California's water math does not compute'

California has little time to create solutions to water sustainability

[Todd Fitchette](#) | Apr 17, 2018

<http://www.westernfarmpress.com/water/friant-water-authority-californias-water-math-does-not-compute>

A growing shortfall of irrigation water in California's San Joaquin Valley could lead to over 700,000 acres of land retirements, even with new conveyance and Temperance Flat reservoir, a water official says. With possible construction of dams like Temperance Flat a minimum of 20 years away, there seems to be little to stop what could be a mass fallowing of farmland within the next decade.

Jason Phillips, chief executive officer for Friant Water Authority, says there is a myriad of necessary steps state and federal officials must take to ensure that farmers have the water they need to grow the estimated 400 crops California can produce. These changes need to come quickly, as implementation of the State Groundwater Management Act (SGMA) will begin setting severe limits on groundwater pumping as soon as 2020.

During the Friant Water Authority annual meeting at Fresno, Phillips illustrated farm water losses that have occurred since implementation of the Central Valley Project Improvement Act in the early 1990s. He also spelled out the political reasons for those losses, and the difficulties in correcting them, since some of the reductions came about through federal court decisions.

Phillips is an engineer. He explained to an audience of about 250 district members and guests that the water math doesn't compute: The Valley's annual demand for 13.3 million acre feet of water is not being met by existing supply

Achieving sustainability is a matter of math — and the numbers continue to not add up, Phillips says. The largest factor in achieving a sustainable water balance must come through new surface water storage.

He cautions people to not view irrigation efficiency or recycling as means to achieve water balance. "These just won't help." While agreeing that water efficiency is good, he emphasizes that farmers are already doing this, and that there's little added benefit, or increased water, that will result from complete adoption of water-thrifty irrigation systems.

Moreover, reduced groundwater recharge and soil health have become unintended consequences of these systems. Furrow and flood irrigation that once recharged aquifers, while watering crops, no longer happens. Further, natural soil salts that were once flushed past root zones by these irrigation practices now concentrate at the surface, choking out crops and making land difficult to farm.

The National Battle to Build Infrastructure

Combined Water Sector Gathers In Washington To Demand Infrastructure Funding, Research Support

<https://www.wateronline.com/doc/combined-water-sector-washington-demand-infrastructure-funding-support-0001>

The nation's leading water organizations are gathering in the nation's capital next week to call on Congress and the Trump Administration to increase investment in water resources, specifically water infrastructure and research, and to elevate water as a national priority.

Hundreds of drinking water, wastewater, and stormwater leaders and professionals, representing the largest water organizations in the country, will take to Capitol Hill during Water Week 2018 (scheduled

for April 15 -21) and meet with lawmakers to advocate for national policies that advance clean, safe, affordable and sustainable water for all Americans. (Full events list follows).

Water sector organizations are calling on Congress to:

- *Double the funding for the Drinking Water and Clean Water State Revolving Loan Funds*
- *Pass legislation to reauthorize and boost funding for the Water Infrastructure Finance and Innovation Act*
- *Increase funding for the National Priorities Water Research Grant program to \$20 million*
- *Strengthen protection of the nation's waters in the 2018 Farm Bill*
- *Increase funding for USDA's rural water/wastewater loan and grant program*
- *Increase funding for the Bureau of Reclamation's water recycling program to \$60 million*

Water Week 2018 comes as the nation's water resources and systems face growing challenges that include aging infrastructure, increased water quality concerns, workforce shortages, and climate change impacts. These challenges have been visible in recent events, such as the drinking water crisis in Flint, Michigan, harmful algal blooms in Ohio and Florida, severe drought conditions in California, and hurricane impacts in Texas, Florida, Louisiana and Puerto Rico.

Access to clean, safe and reliable water is a vital need that touches every American, without exception, every day. And now more than ever, it is critical to elevate water as a national priority.

Feature:

Point Four of LaRouche's Four Laws-- Fusion Power

Italian Energy Company, ENI, Is Banking on Fusion (Literally)

April 14 (EIRNS)--Fusion R&D company Commonwealth Fusion System, created by fusion scientists from MIT, may get another investment from Italy. As Reuters reported yesterday, Italian energy company ENI, which made a \$50 million investment in the new fusion company, announced last month, is considering raising the amount.

"After the transition to renewable energy, the real breakthrough technologically is nuclear fusion," said Robert Casula, head of ENI development operations and technology. He estimates that it will cost \$3 billion to develop a 200 MW reactor by 2033. The scientists at Commonwealth Fusion System are a bit more optimistic, with the stated goal of a small pilot reactor in five years, and a 200 MW reactor in ten years. The Commonwealth scientists are extending the fusion research they did at MIT, developing a compact high magnetic field tokamak. They are taking advantage of new developments in superconducting magnets for their fusion machine design.

Clearly optimistic that fusion will become a viable commercial energy source, ENI has signed an agreement with the company giving it the right to use the project's intellectual property.

Will China beat the world to nuclear fusion and clean energy?

By Stephen McDonnell BBC News, Anhui Province

18 April 2018

<http://www.bbc.com/news/blogs-china-blog-43792655>

In a world with an ever-increasing demand for electricity and a deteriorating environment, Chinese scientists are leading the charge to develop what some see as the holy grail of energy.

The BBC's Stephen McDonell was given rare access to their facility in Anhui province.



China says it's ahead in the global race for nuclear fusion

On Science Island in Eastern China's Anhui Province, there is a large gleaming metal doughnut encased in an enormous shiny, round box about as big as a two-storey apartment. This is the Experimental Advanced Superconducting Tokamak (or EAST).

Inside, hydrogen atoms fuse and become helium which can generate heat at several times the temperature of the sun's core.

Powerful magnets then control the reaction, which could one day produce vast amounts of electricity if maintained.

Around the globe, they are trying to master nuclear fusion - in the United States, Japan, Korea, Brazil and European Union - but none can hold it steady for as long as the team in Anhui.

Because it carries such a hefty price tag and because it is so hard, the pursuit of fusion is seeing a fair amount of international collaboration.

For example, China is one of the countries contributing to the ambitious International Thermonuclear Experimental Reactor (ITER) project in southern France which - apart from European nations - draws in India, Japan, Russia, South Korean and the United States. It is expected to start testing in 2025.

In the meantime China is also making leaps and bounds on its own.

Image caption The project still requires huge breakthroughs from scientists and engineers

The proposed next step for this team is to design a fully-fledged nuclear fusion test reactor capable of generating electricity. To eventually work properly it would have to be much bigger than what we've seen and able to contain a plasma reaction indefinitely rather than for a minute-and-a-half.

"The demand for energy is huge in every country and China has a roadmap for fusion-generated power," says Mr Song. "We want to complete the design for a test fusion reactor within five years. If we succeed it will be the world's first fusion reactor."

The eventual hope is that fusion might produce electricity in volumes beyond mankind's wildest dreams.

It may be some way off but Beijing is taking the challenge very seriously meaning that, if it can get it to work, China could end up having the edge over all others when it comes to the power generation of the future.

Point two of LaRouche's Four Laws: Federal Credit for Infrastructure

<https://larouchepac.com/credit-system>

Some Background on the History & Future of the U.S. Credit System

Throughout the 226 years since the U.S. constitutional system was ratified, the American people and their government have amazed the world with periods of some of the most unprecedented scientific and technological growth the world has ever seen. In 1789-1801 first Treasury Secretary Alexander Hamilton oversaw the revolutionary transformation of the young republic's war debt into guaranteed-return internal improvement investments, and later, under the guiding hand of President John Quincy Adams and Nicolas Biddle the rapid construction of new roadways and canals which opened up the North American continent for development was facilitated by the founding of the 2nd National Bank throughout the 1820s.

"A national debt... will be to us a national blessing.

First Treasury Secretary Alexander Hamilton

In 1861-1869, Abraham Lincoln invoked the same authority to simultaneously finance the war that ultimately defeated, not just the Confederate South, but the British Empire's international slave trade, at the same time sponsoring the transcontinental railroad and the settlement of the West through land grant universities. And finally, from 1933-1944, Franklin Roosevelt asserted the sovereignty of the U.S. government and its economic interests over those of Wall Street, thereby overpowering the forces which had dried up the lending capabilities of commercial banks and unleashed an unparalleled industrial renaissance that still runs the country today.

What each of these moments in American history have in common with each other, is the expression and utilization of the sovereign power of federal credit endowed in the U.S. Constitution by Alexander Hamilton. Today, however, is not one of the those periods. Currently, as in the periods interspersed throughout these enormous leaps of growth in our country's history, U.S. economic policy has been subverted by monetarism. Unless the United States learns from its history, and how, as in the case of Andrew Jackson, sound economic policy has repeatedly been corrupted by populist denigration of the federal authority in charge of economic growth and the illusion of money making money, we will, as a nation, never actually win the battle our founders set out to win