

California Drought (and Flood) Update



For July 20, 2017

by Patrick Ruckert

Published weekly since July, 2014

<http://www.californiadroughtupdate.org>

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

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First, I believe that this nation should commit itself to achieving the goal, before this decade is out, of landing a man on the moon and returning him safely to the earth. No single space project in this period will be more impressive to mankind, or more important for the long-range exploration of space; and none will be so difficult or expensive to accomplish. We propose to accelerate the development of the appropriate lunar space craft. We propose to develop alternate liquid and solid fuel boosters, much larger than any now being developed, until certain which is superior. We propose additional funds for other engine development and for unmanned explorations-explorations which are particularly important for one purpose which this nation will never overlook: the survival of the man who first makes this daring flight. But in a very real sense, it will not be one man going to the moon-if we make this judgment affirmatively, it will be an entire nation. For all of us must work to put him there.

President John F. Kennedy

*'Special Message to the Congress on Urgent National Needs'
May 25, 1961*

A Note To Readers

Today, July 20 marks the 48th anniversary of the day American astronaut Neil Armstrong took that “one giant leap for mankind,” as he stepped onto the surface of the Moon. Those were the days when Americans thought big and acted to bring those big thoughts into reality. It was eight years after President Kennedy announced the goal of achieving, “*before this decade is out, of landing a man on the moon and returning him safely to the earth.*”

Over the following few years we landed men on the Moon six times. Today the U.S. cannot even send our own astronauts to the International Space Station. Oh, how we have shrunk!



Live TV shot of Neil Armstrong taking his first step onto the moon on July 20, 1969

But, we need not accept that state of affairs, or that state of mind. On the narrower issue of space policy, the President has stated that his intent is to send Americans back to the Moon. Even that statement is something our previous President ruled out with his statement that we had, “been there, done that.” But, like President Trump's intent to build infrastructure, intent must be followed by action, and, so far, there is no action in sight. And unless the President will, one, create the only funding mechanism by which such great projects can become real (A Hamiltonian credit system), then there will be no return to the Moon, nor even a dent made in the \$8 trillion price tag a real infrastructure building policy requires.

Again this week, and each week into the future, the last section of this report will focus on that topic.

This Week's Report

The U.S. Drought Monitor remains where it has been these past three months, with just eight percent of the state being in the mildest category of drought. With three to four more months of expected dry weather, I forecast that by October 1, the picture provided by the Monitor will significantly change.

Then comes our weather report on the “record breaking” temperatures, followed by what else but the wildfires that really are becoming serious.

The Oroville Dam update this week features two videos and an item on the latest Board of Consultants Report.

Next, I use a report on the evaporation of large amounts of water from Lake Shasta to discuss the water cycle.

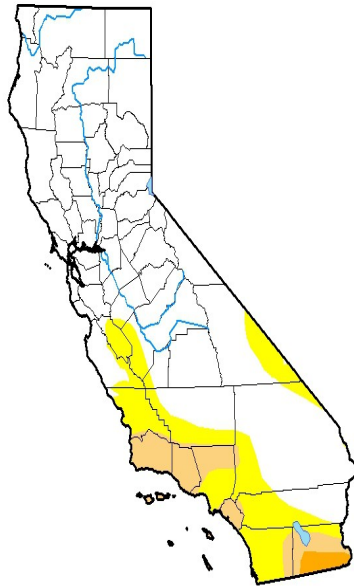
The governor's Water Fix looks as if it is in serious trouble with the Westlands District expressing even stronger doubts about signing on to paying for it. Three articles present the picture.

Our concluding section on infrastructure, national banking and the threat of a new, even bigger than that of 2008, financial crisis gets to the heart of what must be done and how to do it.

U.S. Drought Monitor and Reservoir Graph

U.S. Drought Monitor California

July 18, 2017
(Released Thursday, Jul. 20, 2017)
Valid 8 a.m. EDT



Drought Conditions (Percent Area)

	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	75.69	24.31	8.24	1.06	0.00	0.00
Last Week 07-11-2017	76.46	23.54	8.24	1.06	0.00	0.00
3 Months Ago 04-18-2017	76.54	23.46	8.24	1.06	0.00	0.00
Start of Calendar Year 01-01-2017	18.07	81.93	67.61	54.02	38.17	18.31
Start of Water Year 09-27-2016	0.00	100.00	83.59	62.27	42.80	21.04
One Year Ago 07-18-2016	0.00	100.00	83.59	59.02	42.80	21.04

Intensity

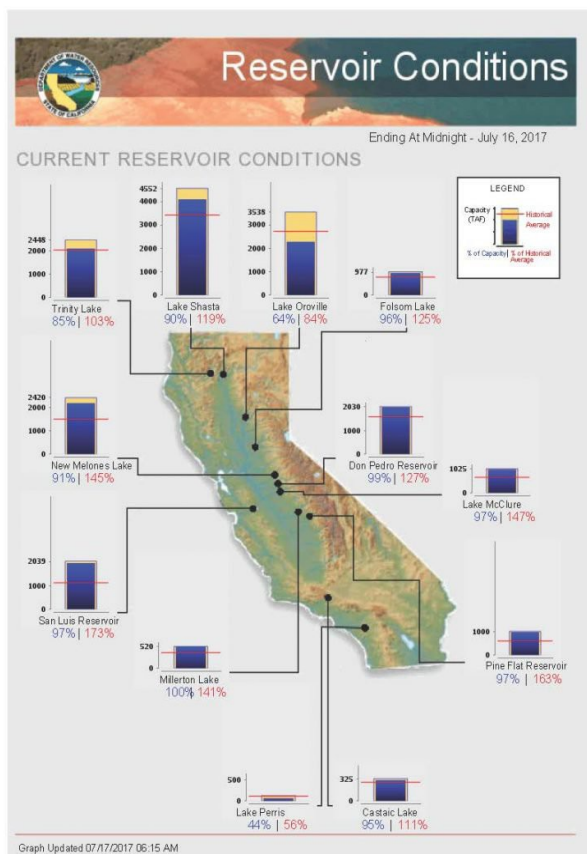
- D0 Abnormally Dry
- D1 Moderate Drought
- D2 Severe Drought
- D3 Extreme Drought
- D4 Exceptional Drought

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

Author:
Richard Heim
NCEI/NOAA



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



The Heat Brings Out the Best and the Worst

With 100 degree plus temperatures almost a daily dose throughout this month, both thoughtful and useful reporting on the phenomenon is matched by the “man-caused global warming” drivel. The excerpted articles below have a mixture of both elements. While temperature records are being broken, what I found interesting is that many of the records broken or approached may be those of 50 years ago, not last year or even the last decade.

Heat wave has summer 2017 off to blazing start

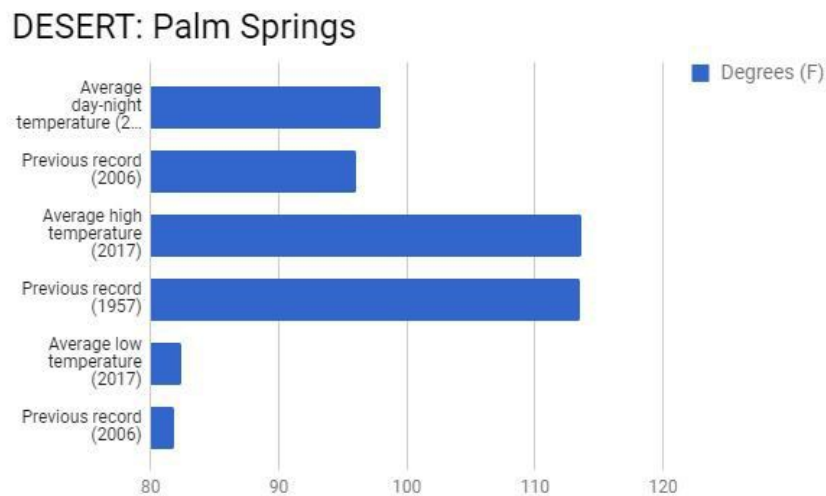
By David Downey
The Press-Enterprise
July 18, 2017

<http://www.pe.com/2017/07/18/heat-wave-has-summer-2017-off-to-blazing-start/>

If you thought summer was off to an insanely hot start, you'd be right.

Meteorologists already are comparing it to the record-crushing summer of 2006. And they say temperatures in the mountains and deserts have been hotter, on average, than they've ever been the past 30 days.

In short, said Bill Patzert, a climatologist at NASA's Jet Propulsion Laboratory in Pasadena, the first month of summer 2017 has been characterized by “a very high misery index.”



“It’s been an unusual month,” Patzert said. “June gloom has definitely been a disappointment. We’ve had just the opposite. We’ve been dominated by hot and humid air coming off of the Mexican desert.”

We’ve gone from heat wave to heat wave to heat wave, he said, as stubborn high pressure has persistently scorched Southern California.

“This high pressure system — it’s really been stationary for almost six weeks now,” Patzert said. “It’s been continuous with a few days of minor relief.”

And that stubborn streak is showing up in [record books](#).

Meteorologists at the weather service office in San Diego, which oversees Riverside, San Bernardino and Orange counties, found that, for the 30-day period ending Monday, Palm Springs and Big Bear Lake were hotter than in any previous year.

On July 7, Palm Springs came within a degree of its all-time high of 123.

It's not the heat, it's the longevity

By [Alex Breitler](#)

Record Staff Writer

July 14, 2017

<http://www.recordnet.com/news/20170714/its-not-heat-its-longevity>

It's true: Less than halfway through the hottest months of May through September, Stockton has already seen 16 days at 100 degrees or more, and is likely to suffer through days 17 and 18 this weekend.

Eighteen days is normal for an entire summer. And it's only mid-July. Federal officials say there's a good chance for above-normal temperatures to persist through September, so it's conceivable that Stockton could endure 30 days of triple-digit misery for the first time since 2005.

The causes are complex. [Bill Patzert](#), an oceanographer with the NASA Jet Propulsion Laboratory in Pasadena who has been dubbed the "Prophet of California climate," cites both manmade climate change and natural cycles that affect ocean temperatures.

Even though California's recent El Niño is over, the ocean remains warmer than usual due to a longer-term phenomenon known as the [Pacific Decadal Oscillation](#), he said.

What does that have to do with temperatures in Stockton? A warmer ocean means warmer air temperatures over the ocean, contrasting less with the warm temperatures over land.

The less the contrast in temperatures over the ocean and over the land, the less likely it is that a refreshing Delta breeze will kick in each afternoon and provide relief for the scorching Valley.

This, combined with a jet stream that is stalled far to the north, and "crushing" high-pressure systems over the West, has contributed to our recent extreme heat, Patzert said.

But even if you disregard temporary factors like warm ocean temperatures and stubborn high-pressure systems, overall temperatures continue creeping upward — a sign of the influence of manmade climate change, he said.

"Every year we're always breaking high records, not low ones," Patzert said. "This is going to go down as, I think, one of California's hottest summers."

Wildfires Are Us

Some may have noticed that I do devote what may seem to be a lot of attention to wildfires. There is a reason for that. As the saying goes, "once a fireman, always a fireman." During the summers of 1962 and 1963 I was a member of a forest fire fighting crew in Central Oregon, working for the U.S. Forest Service. That should explain it.

For California this summer is already a serious fire year, with more than 186,000 acres burned, which is "about 50 percent more than this time last year and nearly double the five-year average." The Detwiler Fire near Yosemite Park, as we write is already over 70,000 acres and out of control.

A couple of articles are excerpted below.

Wildfire near Yosemite grows to more than 70,000 acres

By [Evan Sernoffsky](#) and [Kurtis Alexander](#)

Thursday, July 20, 2017

<http://www.sfgate.com/bayarea/article/Wildfire-near-Yosemite-grows-to-more-than-70-000-11302446.php>

MARIPOSA — A wildfire ripping through California's Gold Country grew by more than 24,000 acres overnight as thousands of evacuees remained in emergency shelters uncertain if their homes were destroyed.

More than 3,000 firefighters battling the Detwiler Fire just west of Yosemite National Park have only reached 10 percent containment on the blaze that started Sunday and spread to 70,096 acres by Thursday morning.

The fire has destroyed at least 45 structures, many of them homes, and is threatening more than 1,500 residences, according to the [California Department](#) of Forestry and Fire Protection.



Mariposa, the southernmost town in the Gold Country region, a collection of old saloons and bygone buildings that now peddle mostly ice cream and local wine to tourists, stood nearly empty Thursday as thousands of locals were forced to flee.

Flames from the fast-moving fire were tearing across a grassy ridgeline just above the 1850s-era community, burning homes as it charred thousands of acres of foothills to the north and leaving residents and visitors anxious about the fate of historical town.

The past few weeks have brought hot, dry weather to the Sierra, often in the triple digits, which has combined with erratic winds in recent days to fuel the Detwiler Fire. The heat is not expected to let up, with temperatures forecast to warm slightly in coming days.

The blaze, which began Sunday several miles north of Mariposa, is another mark of California's late but extraordinarily busy peak fire season. While a wet winter left hills and valleys much moister than normal this year, once they dried out, a bumper crop of grass and brush emerged as easy prey for fire, particularly at lower, hotter spots like Mariposa.

Also, the Mariposa area is ground zero of the state's tree mortality epidemic. Tens of millions of trees have died because of the recent drought and a bark beetle infestation in the central and southern Sierra, a die-off that authorities fear only intensifies fire.

About 186,000 acres have burned across California this year, according to state and federal figures — about 50 percent more than this time last year and nearly double the five-year average. The Detwiler Fire ranks among the biggest so far. The cause remains under investigation.



Photo credit: Getty

Southern California wildfire forces thousands to evacuate

*USA Today Network Staff report
July 15, 2017*

<https://www.usatoday.com/story/news/nation-now/2017/07/15/southern-california-fire-evacuates-thousands/481873001/>

Nearly 3,000 people have been evacuated in Southern California as [a week-long fire there continues to burn](#).

More mandatory evacuation orders were issued Friday near the Whittier Fire in Santa Barbara County, bringing the evacuee total up to 2,700 people.

Officials said eight homes and 12 outbuildings had burned. The fire also caused a highway to close.

The fire, which started July 8, is in the Santa Ynez Mountains on both sides of Highway 154. The fire is burning an area that has not burned since 1955, Cal Fire said. That area was one of the more intense fronts of the blaze on Friday, according to the agency.

Oroville Dam Update

A short update this week, which leads with two video updates from the Department of Water Resources. The excerpted article should be of interest to those following the technical details.

Oroville Spillway July 11, 2017

<https://www.youtube.com/watch?v=JfzseIrY0D4>

Published on Jul 12, 2017

Pumped concrete is being placed between the stay-in-place concrete forms, part of the new concrete foundation and drainage system for the Lake Oroville flood control spillway. Demolition and rock cleaning continue, as does work on the emergency spillway.

Oroville Spillways Update for July 14, 2017

<https://www.youtube.com/watch?v=TLCn2L-UEu4>

Published on Jul 14, 2017

Recovery efforts continue on the Lake Oroville spillways project, with excavation and rock cleaning to prepare the spillway's foundation.

Board of Consultants tweaks former Oroville Dam design recommendation

By Risa Johnson

July 13, 2017

<http://www.chicoer.com/general-news/20170713/board-of-consultants-tweaks-former-oro-dam-design-recommendation>

Sacramento >> In its [eighth memorandum released Thursday](#), the independent board analyzing the redesign of the Oroville Dam spillways commends the construction contractor's work and makes slight tweaks to former recommendations.



Foundation concrete is placed Wednesday between the forms for the drainage system on the lower chute of the Lake Oroville flood control spillway. Brian Baer — California Department of Water Resources

“The BOC is favorably impressed with the Contractor’s general approach, use of the job site and the mobilized equipment,” the memo reads.

Why Don't We Stop the Sun From Stealing Our Water?

That is a question I would expect from some, especially those who believe water is a limited resource. While all resources mankind utilizes are relatively finite in supply, the more important point it is we who define what is a resource through scientific discovery and technological progress. Oil was not a valuable resource until the development of the internal combustion engine. And uranium not until we discovered how to split the atom.

Water, on the other hand has always been a necessary resource for all life. But its relative finiteness is

defined only by our determination to both move water where it is needed and our willingness to push the boundaries of the process of creating fresh water by desalination, for example. For the water cycle of precipitation, surface water flows, evaporation is continuous process that sees, for example, a single drop of water while on land being utilized many times.

The following excerpted article discusses at least one side of the water cycle.

Lake Shasta loses hundreds of millions of gallons daily through evaporation

*By Damon Arthur
Record Searchlight*

July 13, 2017

<http://www.redding.com/story/news/local/2017/07/14/lake-shasta-loses-hundreds-millions-gallons-daily-through-evaporation/472147001/>

The lake can lose more than 200 million gallons of water each day to evaporation during the summer.

“There’s not a solution for mitigating that, that I’m aware of,” Bader said.

There may not be a solution, but there are people thinking about how to tackle evaporation on lakes.

“This is certainly a problem that the water resources engineering community has dealt with,” said Sally Thompson, an associate professor of environmental engineering at the University of California at Berkeley.

On July 10, the lake lost 330 cfs to evaporation, or more than 215 million gallons of water. Bader said that is just a fraction of the amount of water flowing into the lake daily replacing what is lost through evaporation.

The bureau measured 3.5 billion gallons of water flowing into the lake on July 10.

And this article below gets at another angle of the water cycle. During the drought alarmist stories were circulated about how it requires one gallon of water to grow one almond. And since a large portion, in fact most of the California almond crop is exported, it was claimed we were exporting millions of gallons of water incorporated in those almonds. Few asked the obvious question: Is there a gallon of water in that little almond? Of course not, the water, having helped to grow the almond is recycled back into the water cycle, and that same gallon may provide the water for a fish to swim in or be part of that glass of water you drink.

China to become the biggest buyer of U.S. almonds

By [Phil Lavelle](#)

[@phillavelle](#)

Published July 14, 2017 at 10:11 PM

<https://america.cgtn.com/2017/07/14/china-to-become-the-biggest-buyer-of-u-s-almonds>

California’s almond farmers are seeing huge demand from China. As the middle class grows and becomes increasingly willing to spend money on traditionally more expensive health foods, it means almonds are in huge demand. CGTN’s Phil Lavelle Reports.

It's a huge industry in California – with 80 percent of the world's almonds coming from that one U.S. state. And more than two thirds of those grown there end up abroad. China had been the number one export market – with a record 104.3 million kilograms exported there five years ago.

But then California fell into a persistent state of drought, which had a huge and negative impact on the state's massive agriculture industry. Some almond farmers found themselves having to buy in water to keep their trees alive, paying exorbitant prices for something that they once got free.

Water is essential for the almond harvesting process, with one gallon being used to harvest each almond. Production dropped, yields fell and as prices rose, China lost its appetite. Spain and India became the biggest consumers. But now the drought is officially over and things are returning to normal, it seems China has regained its taste for California's favorite nut. More than 60 million kilograms have been shipped already so far this year. With increases of around 20 percent year on year, at the going rate, China is expected to become the number one market for American almonds by the end of the year.

The Water Fix, or Not Fix

As the September/October deadline nears for a decision by those agencies and districts that will pay for the two tunnels through the Delta, The Westlands District (the second largest that would receive water) is expressing even more doubts about whether they will sign on than they expressed previously.

Without the Westlands District the Water Fix is as good as dead. So, the excerpted items below give some of the details of the Governor's perhaps doomed plan. The second article of the three provides some historical background to the California Water Project of Jerry's father Pat Brown. The third article comes from the Environmental Defense Fund, so its intent as a so-called environmentalist organization should be noted.

These farmers say they may not pay for Delta tunnels pushed by Gov. Brown

By Dale Kasler

Sacramento Bee

July 17, 2017

<http://www.sacbee.com/news/state/california/water-and-drought/article161881208.html>

The governor's proposed Delta tunnels ran into a roomful of skeptics Monday – an influential group of San Joaquin Valley farmers who remain unconvinced the controversial project will deliver the water they need at a price they're prepared to swallow.

Three weeks after the tunnels received a crucial green light from federal environmental regulators, the \$17.1 billion project got a cool reception from nearly 100 growers who farm in the powerful Westlands Water District. Provided with detailed financial projections at a Westlands board meeting for the first time, the farmers suggested they aren't ready to sign onto the plan.

Investment bankers from Goldman Sachs & Co. said debt repayment could balloon farmers' water costs to as much as \$495 an acre-foot under the most expensive scenario, or about triple what Westlands growers currently pay. However, the Goldman bankers said the costs could be reduced to the \$200 per acre-foot range depending on how the debt is structured.

Those figures were too rich for Todd Neves, a Westlands board member.

“My initial thought, right off the bat, is no way this will work,” the tomato and almond farmer said in an interview. “Those numbers might work for a city, Metropolitan and them. For a farmer, none of the crops that I grow can support these numbers.”

“It’s a lot of money for not a lot of water,” said William Bourdeau, a Westlands board member and an executive with Harris Farms, whose well-known hotel and restaurant near I-5 served as a venue for the board meeting.

Without Westlands’ support, the tunnels’ fate would become far more uncertain.

Much of the farmers’ reluctance revolves around the project’s myriad complexities, and the fact that the tunnels might not generate a substantial amount of additional water for them.

However, the exact amount of water that could be pumped won’t be known for years, largely because many of the environmental regulations governing Delta pumping operations are still evolving.

A consultant from the state Department of Water Resources said the Delta pumps would likely be able to deliver an average of 4.7 million to 5.2 million acre-feet of water south each year if the tunnels were built. The range could be considerably wider depending on environmental restrictions.

The current average is 4.7 million acre-feet.

The lack of specificity was clearly frustrating to the Westlands farmers.

“We can’t make a definitive assessment based on the information we have today,” said Don Perrachi, president of the Westlands board. He said the board wouldn’t take on “billions of dollars of debt without reasonable assurance” that the tunnels will provide a significant amount of affordable water.

Jerry Brown's tunnels would cement his family legacy

[Jeremy P. Jacobs](https://www.eenews.net/stories/1060057083), E&E News reporter Greenwire: Monday, July 10, 2017

<https://www.eenews.net/stories/1060057083>

Sixty years ago, California Gov. Edmund Gerald "Pat" Brown built the biggest waterworks the world had ever seen.

The State Water Project transformed California, moving billions of gallons of water from the wet north to the dry south using dozens of dams, pumping stations and a 400-mile-long man-made river. It serves 25 million people and irrigates hundreds of thousands of acres of cropland.



California Gov. Jerry Brown (D) and his father, Pat (left), at the 1976 Democratic National Convention, when Brown first ran for president.

But spectacular as it was, the project was flawed. It failed to deliver as much water as promised,

mainly because a key piece was missing: a way to move water around the Sacramento-San Joaquin River Delta, a 738,000-acre ecosystem where California's two main rivers meet before they flow to San Francisco Bay and the Pacific Ocean.

Now Gov. Edmund Gerald "Jerry" Brown Jr. is seeking to complete his family's water legacy.

His "California WaterFix" would build two tunnels 40 feet in diameter, buried 15 stories underground to take water from the Sacramento River and move it 35 miles around the eastern edge of the delta. The price tag for the largest U.S. water project in decades: more than \$17 billion.

Governors after Brown — George Deukmejian (R), Pete Wilson (R), Gray Davis (D) — did all they could to avoid the issue. Gov. Arnold Schwarzenegger (R) revived the concept in 2007, but he lacked the political capital to move it forward.



Four entities would be the main beneficiaries of the project: Metropolitan, the Santa Clara Valley Water District in the Bay Area, and two primarily agricultural providers in the San Joaquin Valley: Kern County Water Agency and Westlands Water District.

The politically powerful Westlands has been reluctant to commit to the WaterFix, saying its board will likely vote on it in September.

"If the analysis performed after release of biological opinions for the project does not demonstrate a significant water supply benefit, I am confident the Westlands board of directors will decide to not participate in the project," Westlands General Manager Tom Birmingham said in an email.

"Westlands has consistently stated that it will not obligate itself to billions of dollars of debt unless it is reasonably certain that the district's water supply will be restored."

Op-Ed: Doug Obegi: Goldman Sachs Underestimates WaterFix Costs for Westlands

By [NRDC](#) -

July 19, 2017, 03:03:59 PM

<https://yubanet.com/california/op-ed-doug-obegi-goldman-sachs-underestimates-waterfix-costs-for-westlands/>

July 19, 2017 – Doug Obegi is Senior Attorney, Water Program, Natural Resources Defense Council

The Sacramento Bee [reported](#) this week that the Board of Directors of the Westlands Water District were skeptical of paying for the Delta tunnels project (WaterFix). This shouldn't come as a surprise, given that [prior analyses](#) have shown that the project is not cost-effective, particularly for agricultural water users. But after digging into the [presentation](#) by Goldman Sachs to the Board of Directors of Westlands, it appears that the cost numbers for WaterFix are likely to be significantly higher than what Goldman Sachs presented.

Even taking Goldman's numbers at face value, WaterFix would increase the average cost of all water exports from the Delta by \$260 per acre foot in 2033 (assuming a 30 year repayment period without capitalized interest). That would be double or triple the cost per acre foot that Westlands is [paying to the Bureau this year](#). They also analyze costs under a range payback periods, with and without capitalizing interest during the construction period, and depending upon the amount of federal taxpayer subsidies that could help reduce financing costs.

However, several of the assumptions in Goldman Sachs' presentation appear unreasonable and would significantly underestimate the costs of financing the tunnels for those districts that participate in the project. The presentation from Goldman Sachs includes analysis based on both the cost of incremental water supply gained by the project, as well as cost analysis based on total water exports from the Central Valley Project and State Water Project.

Finally, Westlands and other contractors would have to pay for the cost of constructing WaterFix [even in drought years](#) when they get very little or no water supply from the Delta. Goldman Sachs' analysis doesn't discuss the difficulty of paying for WaterFix during droughts or dry years, while [previous analyses](#) have identified this as a significant problem for agricultural contractors.

It's no surprise that WaterFix is a bad deal for the environment and for water users. But these unreasonable assumptions indicate WaterFix is likely to cost Westlands and other contractors far more than Goldman Sachs' analysis shows.

Do You Want Infrastructure, Then We Must Have a National Credit System

First up today is this article from LaRouche PAC on the real state of the financial system and economy. Here is a short excerpt and the link to the whole article:

It Need Not Be a Summer of Hell

<https://larouchepac.com/20170720/it-need-not-be-summer-hell>

July 20, 2017

October period has historically been one of extreme instability, bankruptcy, and crises in the financial system, Helga Zepp-LaRouche warned yesterday. An imminent collapse of the entire trans-Atlantic banking system is hanging over our heads like a sword of Damocles, with a \$1.5 quadrillion derivatives bubble which cannot conceivably be sustained, even if Social Security, Medicare, and Medicaid were all wiped out three times over—which seems to be the outlook of many of our Congressmen and Senators.

The Trump administration, for all of its excellent work in standing up to British geopolitics and re-establishing working relationships with China and Russia, has not delivered on its promises to pass

Glass-Steagall, and to rebuild America's infrastructure. Treasury Secretary Steve Mnuchin—a banker's boy, if ever there was one—is still in the government. It is sheer folly to pretend that we can somehow stumble along without investing in 50-, 75- and 100-year-old infrastructure. If we don't replace it, it will crumble, whether we like it or not, and perhaps when we least expect it. That is one of the lessons of New York's Summer of Hell.

But it need not be so: the solution is, quite literally, sitting right in front of us in Washington, DC. Yesterday was the meeting of Chinese and American authorities on the Comprehensive Economic Dialogue between the two nations, which was set up at the April Mar-a-Lago meeting of Trump and Chinese President Xi Jinping. The Chinese have repeatedly extended an offer to the United States to join the Belt and Road Initiative: the U.S. could both participate in global infrastructure projects in other countries, and get urgently needed help to rebuild our own crumbling infrastructure here at home. What are we waiting for?

China is taking that approach into the most devastated corners of the planet, with undeniable success. Africa is beginning to see progress in reducing poverty, for the first time in decades, if not centuries—with Chinese help. China is offering its "wisdom" and its Belt and Road Initiative to help solve the numerous crises in the Middle East as well.

Now some discussion of the real economy:

What Makes Productivity Grow?

July 17 (EIRNS)—The period from the mid-1920s to 1970 is called by many economic historians the “golden age of American productivity.”

*A 2016 book, *The Rise and Fall of American Growth: The U.S. Standard of Living since the Civil War*, by the very well-known Northwestern University economist Robert J. Gordon, documents very ably the special nature of this period in the transformation of American economic activity by the spread of industrial electricity, the internal combustion engine, and telecommunications. On the basis of these and other inventions, Gordon traces the growth of what is called total factor, or multi-factor, productivity. This is economic growth not accounted for by applying more capital, more labor, or more educated labor, but by the greater efficiency with which industry uses all three of the above—caused by technological advance, including the use of technologies not previously present in the industrial sector at all.*

While showing that productivity growth has progressively abandoned the Western industrialized economies since 1970, and accurately downplaying the effects of “Internet age” inventions, Professor Gordon unaccountably does not focus on the role of new infrastructure based on new technological advances. Thus, he does not credit NASA or the Manhattan Project with contributing to U.S. overall productivity.

But a thorough report on total factor productivity (TFP), by the National Bureau of Economic Research (NBER), found the following. The decade of most rapid total factor productivity growth in U.S. history, by a significant margin, was the 1930s—not the war-mobilization 1940s, though that was second best. What caused the extraordinary 3.3% average annual TFP growth in the 1930s? “This was due to the very strong growth in electric power generation and distribution, transportation, communications, civil and structural engineering for bridges, tunnels, dams, highways, railroads and transmission systems; and private research and development.” This was the 2005 NBER Report, “Sources of TFP Growth in the Golden Age.”

Such great infrastructure projects as FDR's "Four Corners" challenge industry to spread technological progress in order to build them; a phenomenon being seen in China's building of extraordinary bridges, fully automated ports, high-speed rail lines through deserts and over the world's highest mountain ranges, etc. A later 2014 NBER report estimated that TFP in China's economy grew at 3.1% annually from 1998-2011.

And, what not to do:

These Policy Steps on U.S. Infrastructure Qualify as Insane

July 17 (EIRNS)—With transportation infrastructure visibly breaking down in two of the nation's three largest cities, as well as in the vital Northeast Rail Corridor, the House Transportation/ Housing and Urban Development appropriations bill, reported out of the Appropriations Committee on July 14, eliminated the Federal Transportation Investment Generating Economic Recovery (TIGER) grants completely, from \$500 million to zero. The bill, now going to the House floor for a vote, cut the overall budget of the Transportation Department by 8% in absolute terms.

TIGER grants are also used to improve port infrastructure; and inland waterway dams and locks are renewed by a Federal loan program through the U.S. Army Corps. of Engineers (ACE), a program cut by 54% in the same appropriations budget. American agriculture exports are beginning to be threatened not by price competition or unfair trade, but by crumbling inland waterway infrastructure, which was given a D+ mark by the American Society of Civil Engineers report card.

The Coalition for Americas Gateways and Trade Corridors (CAGTC) on July 14 released its second in a series of white papers that describes the decline of national freight infrastructure. Called "The Vital Role of U.S. Transportation Infrastructure in Moving Agriculture Forward," reviews the impact of deteriorating infrastructure on U.S. agricultural competitiveness, focusing on soybeans grown in Illinois and Iowa. There has just been a very large sale of soybeans to China, but 58% of soybeans pass through locks on the Illinois, Ohio and Mississippi Rivers and leave the United States through Gulf of Mexico ports. "More than half of the locks are over 50 years old. The LaGrange Lock on the Illinois River is 80 years old, with concrete crumbling and other critical components difficult to maintain.... "Between 2000 and 2014, the average delay per lock nearly doubled and ... 49% of vessels experienced delays in 2014," which has grown since.

The backlog of inland waterway maintenance to be done by the Army Corps keeps growing—it is now at \$600 million—and the time to schedule and make a major renovation and replacement has grown to decades.

Meanwhile, renewing city and town water infrastructure across the United States requires at least \$50 billion in annual spending over decades; but Federal funding for it is just 25% of what it was 40 years ago, in real terms. A \$500 million loan fund for rural towns is likely to be eliminated by Congress this year. So 48 public water/sewer utilities were sold to private companies in 2015; 53 more in 2016; 23 more in the first quarter of 2017.

Now a word on the re-run, but bigger than 2008, developing financial crisis that you will find only in the specialized financial press:

Do You Think the U.S. Won't Have a New Financial Collapse Soon?

July 17 (EIRNS)—Signs of growing defaults are showing across the range of ultimately unpayable debt bubbles in the United States economy, while underlying economic growth continues in the crater of a

1.5% nominal GDP annual rate.

The July 17 Wall Street Journal featured a report of an “unheard of event”—a Houston-based private equity fund once “worth” more than \$2 billion, is now worth zero. Even following the report in the July 11 Houston Chronicle that defaults throughout Texas corporations are shooting up and exceed even 2009 economic collapse levels, securities funds of this size losing all their value remains “unheard of”; 25% maximum losses are typical when large PE funds go bust. Yet, the Journal quotes one expert, “several other energy-focused funds are in danger of doing so.” Big losers in the evaporation of \$2.1 billion EnerVest Ltd. include Canada’s second-largest pension fund, the Teamsters Western Conference Pension Fund, various high-roller charitable foundations like Getty Trust, MacArthur Foundation; and Wells Fargo bank, which loaned EnerVest Ltd. \$1.3 billion to leverage its investments in oil securities.

In the consumer debt bubble, auto loan (90-day) delinquencies have reached just under 4% (3.96%) for all \$1.3 trillion of auto loans, comparable to the mortgage sector in late 2006. Bloomberg News today reports on growing fraud in auto lending, as well as lax to non-existent underwriting standards, as well as spreading securitization of payments (and thus of defaults) in the entire sector. The volume of both auto and mortgage lending is dropping as the biggest banks head for the exits, according to a separate report in Credit Union Times.

The falling economy is making tax revenues sink. Some 33 states reported shortfalls in projected revenues in their fiscal year 2017, which ended June 30. This was similar to the budget-collapse year 2010. But less publicized has been the fact that the Federal government deficit is ballooning this Federal fiscal year 2017 (which ends Sept. 30) because of much lower tax revenues than expected, as well as forced restatement of the value of student debt—because of mass defaults and delinquencies—which counted as a loss of nearly \$90 billion for the Federal government in June.

Again, in honor of today being the day when Mankind first set foot on the Moon, this:

Former NASA Chief Advises Trump: Return to the Moon, Work with China, and Get NASA Funding

July 19 (EIRNS)—Following a speech in Huntsville, Alabama, on July 14, former NASA Administrator Charles Bolden was interviewed by Lee Roop from the Alabama Media Group, which publishes the Huntsville Times. A most interesting point was made regarding the Moon, where Bolden proposed that a manned lunar mission should be carried out, and that in cooperation with China—tossing aside years of having to defend the Obama space program takedown, which had removed manned lunar missions. “We don’t need them to go to Mars right now,” he said. “We do need them to help get humans back on the surface of the Moon in this 10-year decade of time, the ’20s, when we really need to be making sure that the technology to take us to Mars is going to work.”

By the end of his years at NASA, which stretched through both of Obama’s terms in office, Bolden saw every other space-faring nation start planning manned lunar exploration missions. Over the years, he had become increasingly frustrated with the Congressional ban on space cooperation with China, which he expressed in public, with no way to do anything about it.

Bolden’s advice to the President was blunt. “Everybody likes space,” he said, but “put your money where your mouth is. If you want to know what’s important to you, look at the budget.” He also advised that former Huntsville Marshall Space Flight Center Director Robert Lightfoot, who has been NASA’s Acting Administrator, be appointed as administrator, so that NASA has the leadership it needs to accomplish the task.