California Drought Update

For February 2, 2017
by Patrick Ruckert

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http://www.californiadroughtupdate.org

https://www.facebook.com/CaliforniaDroughtUpdate

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"*I don't think there is any more valuable lesson for a President or member of the House and Senate than to fly as we have flown today over some of the bleakest land in the United States, and then to come to a river, and see what grows next to it...and know how vitally important water is. I hope that those of us who hold positions of public responsibility in 1962, are as farseeing about the needs of this country in 1982, and 1992, as those men and women were 30 years ago who began to make this project possible.*

President John F. Kennedy

Pueblo, Colorado-- August 17, 1962

Dedicating the Frying Pan-Arkansas reclamation project

A Note To Readers

Though there are about 100 million fewer living trees in California now than there were before the drought, too many, both in this state and in the nation, are still having a problem seeing the forest.

The jumping up and down by some and cheering by others of every action by President Trump, should remind us of the lost hiker solely focused on the next tree in his path. Not good. Instead, the focal point of our attention must be what policies will fundamentally change the nation, not the action of the day.

I shall just state my idea here, in summary, and then in the "Feature" section below provide some elaboration. A new world is now replacing the old world of empire, financial speculation,

globalization, regime change wars, and as Anthony Quinn put it in the 1964 movie *Zorba the Greek*, "the whole catastrophe."

That new world is at present defined by China, Russia and almost 100 other nations who have created a system based on the cooperation of nations for their common good in building the greatest array of infrastructure projects in human history, raising millions out of poverty each year. As President Xi of China put it a couple of weeks ago at the Davos conference, "Global connectivity must be developed in order for all to reach prosperity." The center of this "globalization" is development, and development is based on increasing productivity driven by the development of science and technology, Xi said. "This is a product of all of us and not the product of one individual alone," Xi said. Quoting Abraham Lincoln (and Sun Yat Sen, without mentioning either), Xi said "Development is of the people, by the people and for the people." Xi at Davos Places Development at Center of Global Governance

For the United States to put millions to work productively once again requires more than convincing a few manufacturers to return production to our shores. It requires a complete reorganization of the financial economic system, beginning with restoring the Glass-Steagall banking law; it requires joining with China and Russia in building the new system of which President Xi spoke. That is the battle within and outside of the Trump administration that, at least until now, has gone largely unmentioned, except in the fight over the confirmation of Treasury Secretary nominee Stephen Mnuchin, a snake within who has been a partner with George Soros for most of the past two decades: "Keep George Soros' Ally Steven Mnuchin Away from Trump Treasury!"
https://larouchepac.com/sites/default/files/20170126-keep-soros-away_0.pdf

FLASH: A Glass-Steagall bill was introduced into the House of Representatives yesterday, February 1, by a bi-partisan group of 26 members of Congress:
https://larouchepac.com/20170201/glass-steagall-bill-reintroduced-115th-congress-hr-790

For without that first step there will be no building of the required infrastructure the nation must have. There will be no great water projects on the scale of the Central Valley Project or the California State Water Project. And this drought, or the next one, will once again throw the state into chaos, lost production and suffering-- all avoidable if we choose to make it so.

That leads me to another element of this week's "Feature:" Early in the last century the head of the Los Angeles Department of Water and Power, William Mulholland build the Los Angeles Aqueduct. He did what humans had been doing for centuries: Built the water management system required to make a single river and its watershed useful to mankind. The Central Valley Project and the California State Water Project demonstrated mankind's capability to bring multiple watersheds and rivers into a single water management system. In this case the Sacramento, the San Joaquin and the Colorado River basins.

The next step, as was planned during the President John Kennedy administration, was to create a single, continental water management system by building the North American Water and Power Alliance (NAWAPA). That project was aborted in the years following the assassination of the President.

President Donald Trump does have a big ego, and he does want to do big things, and NAWAPA is a very, very big thing. It is even bigger than the gigantic "Bring South Water North Project," now two-thirds completed, being built by China.

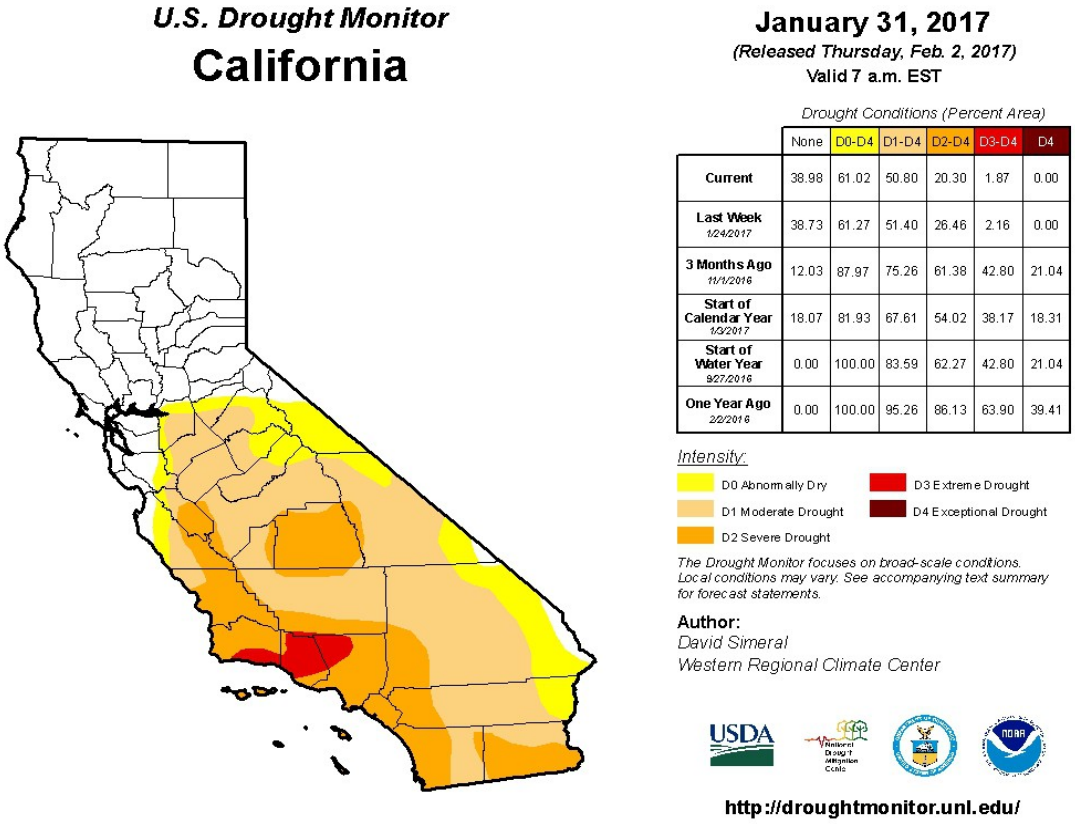
We must win the fight to guide the Trump administration to such policies.

As for our drought update for the week, I think it can be summarized with a few words: We are still in the drought, though it is not as severe as it was. In fact, as one report detailed below shows, more than one-third of the missing rain and snow we have lacked over the past five years has been repaid by the

huge storms over the past month or so. Though this report must be tempered with the acknowledgment that it is not over until it is over, and the long-term damage to the forests and the aquifers is very serious.

U.S. Drought Monitor

With only about two percent of the state now in “extreme” or “exceptional drought” now, and half of the state completely out of drought, we can finally say the glass is both half empty and half full. The snowpack, from which 30 percent of the water supplies of the state come is the deepest and water heavy experienced in 22 years. So, yes, things are looking better.



The Drought That Is and Was

The following excerpted release from NASA contains an abundance of interesting material on the snowpack, atmospheric rivers, the 17.5 million acre-feet of water deposited by the recent storms and more:

Storms filled 37 percent of CA snow-water deficit

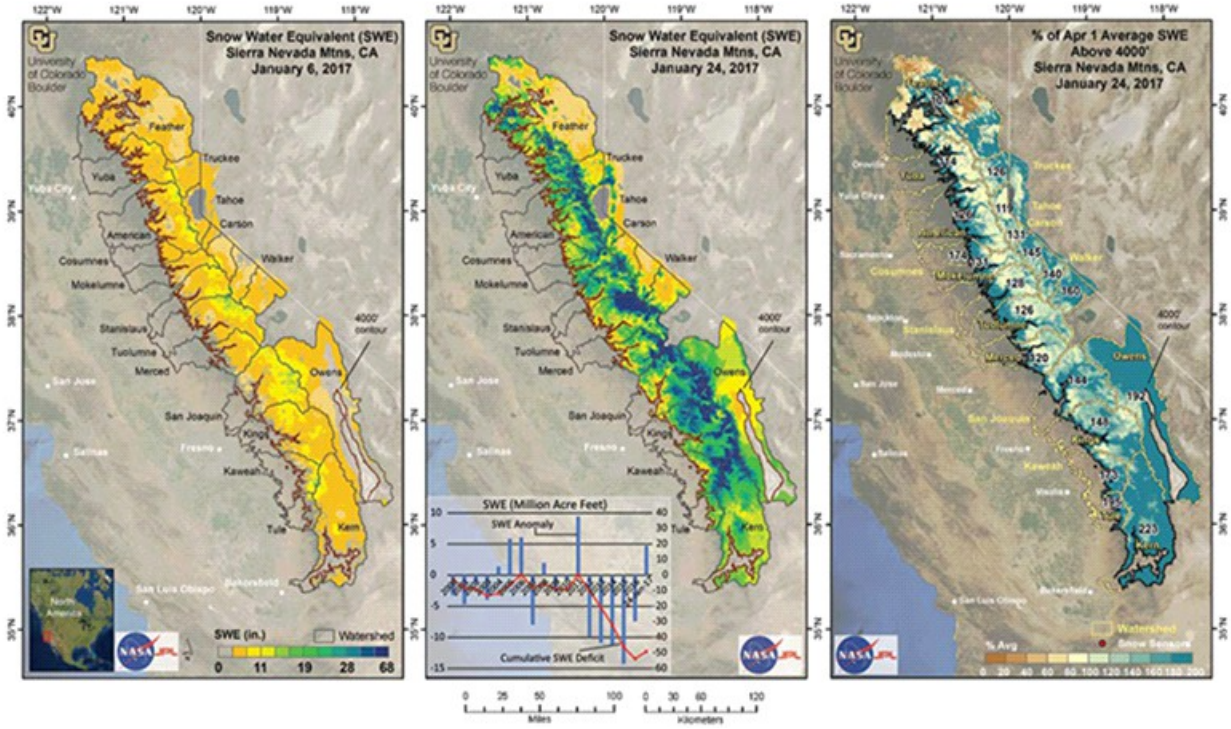
From NASA

January 28, 2017

http://climate.nasa.gov/news/2543/storms-filled-37-percent-of-ca-snow-water-deficit/

These maps below show how much water was stored in the Sierra snowpack on Jan. 6 (left) and Jan.

24 (center), 2017. Darker colors indicate more water. The inset bar graph in the center figure shows the annual snowpack water storage relative to the pre-drought average as well as the cumulative snow-water deficit. The map on right shows snowpack water storage on Jan. 24 as a percentage of pre-drought average snowpack water storage at its greatest. Areas in green are over 100 percent of average. Credit: CU/NASA. ***View larger image.***



The "atmospheric river" weather patterns that pummeled California with storms from late December to late January may have recouped 37 percent of the state's five-year snow-water deficit, according to new University of Colorado Boulder-led research using NASA satellite data.

Researchers at the university's Center for Water Earth Science and Technology (CWEST) estimate that two powerful recent storms deposited roughly 17.5-million acre feet (21.6 cubic kilometers) of water on California's Sierra Nevada range in January. Compared to averages from the pre-drought satellite record, that amount represents more than 120 percent of the typical annual snow accumulation for this range. Snowmelt from the range is a critical water source for the state's agriculture, hydropower generation and municipal water supplies.

While on the topic of atmospheric rivers, the linked article from *Water Deeply* on January 31, provides a more in-depth background for those who wish to explore the topic:

Atmospheric Rivers: Five Breakthroughs in Analyzing West-Coast Storms

You need to understand atmospheric rivers – airborne water streams that deliver as much rain as hurricanes or tornadoes – if you live in the West. Fortunately, scientists are developing a wealth of new tools to predict and explain these storms.

https://www.newsdeeply.com/water/articles/2017/01/31/atmospheric-rivers-five-breakthroughs-in-analyzing-west-coast-storms

One More:

Sierra Nevada snowpack is biggest in 22 years — and more snow is on the way

By Paul Rogers |
February 1, 2017

http://www.mercurynews.com/2017/02/01/sierra-nevada-snowpack-is-biggest-in-22-years-and-more-is-on-the-way/

After a month of huge blizzards and "atmospheric river" storms, the Sierra Nevada snowpack — source of a third of California's drinking water — is 177 percent of the historic average, the biggest in more than two decades.

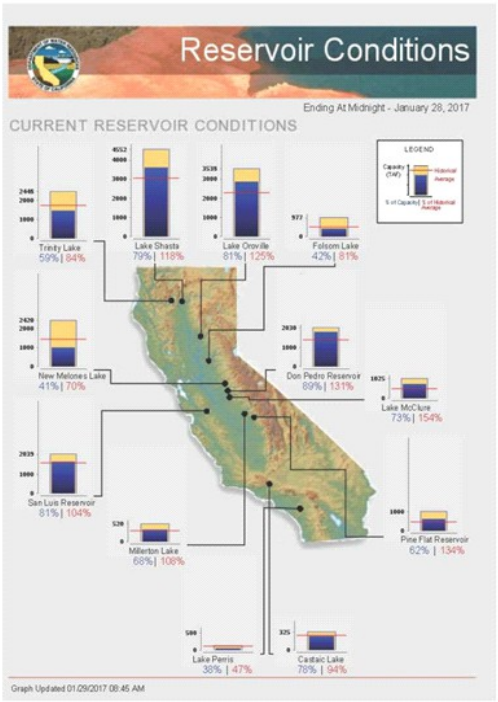
In a breathtaking shift for a state that had been mired in five years of punishing drought, 25 feet of new snow has fallen on Heavenly ski resort in South Lake Tahoe since New Year's Day. Freeways and schools across the Sierra have been closed at times, and firefighters are having trouble finding fire hydrants.

"*Some are buried under 12 or 13 feet of snow," said Eric Guevin, fire marshal at the Tahoe-Douglas Fire Protection District in Zephyr Cove, Nevada, just north of the California state line. "We've had to use metal detectors to find them."*

After a week to dry off, a new round of storms is set to roll into California. A Pacific system will dump up to 3 more feet of new snow in the Sierra by this weekend.

Reservoirs

In addition to the Reservoir map, below are photo comparisons of a two of the reservoirs showing the difference between 2015-2016 and 2017.



Drought over? Before-and-after photos show California reservoir's 110-foot rise

By Amy Graff, San Francisco Chronicle

January 26, 2017

http://www.sfgate.com/bayarea/article/San-Luis-Reservoir-full-capacity-fill-up-drought-10883450.php

San Luis Reservoir is part of the larger San Luis Reservoir State Recreation Area in Gustine, Calif., July 28, 2016. On this date, the water storage was 199,386 acre feet, 10% of total capacity, and 19% of historical average. San Luis Reservoir, impounded by Sisk Dam, lies at the base of the foothills on the west side of the San Joaquin Valley in Merced County, about 2 miles west of O'Neill Forebay. (Florence Low / California Department of Water Resources)

San Luis Reservoir, the vast artificial lake outside Los Banos that Bay Area residents pass on road-trips to Los Angeles, is on the verge of filling up for the first time in six years.

Before and After: The Rain's Impact on Three California Reservoirs

By Dan Brekke, Lindsey Hoshaw and Teodros Hailye January 25, 2017
https://ww2.kqed.org/science/2017/01/25/before-and-after-the-rains-impact-on-three-california-reservoirs/

Folsom Lake is the state's 11th-largest reservoir with a capacity just under 1 million acre-feet. The reservoir was filled for the first time in 1955. In late 2015, the drought reduced Folsom to its lowest level ever. In wet years, reservoir managers are often required to release water to maintain space for potential floodwaters. In fact, the volume of water in Folsom has dropped 40 percent over the past two weeks even as heavy runoff continues to cascade down the American River.

Folsom Lake on Oct. 26, 2015. Right: Folsom Lake on Jan. 14, 2017. (Images provided by Planet Labs)

My Usual Tempering of the Giddiness

Just a couple of items noting that the drought is far from over.

Even after epic storms, groundwater still depleted by drought

By Peter Fimrite, San Francisco Chronicle

January 30, 2017

http://www.sfchronicle.com/news/article/Epic-storms-said-to-wipe-out-37-percent-of-10895016.php

The blizzards that ravaged the Sierra Nevada in the past month wiped out more than a third of the California snowpack deficit that built up over five years of drought, a team of scientists said Monday, while encouraging state residents to continue conserving water.

The storms deposited roughly 17.5 million acre-feet of frozen water in the Sierra, or 37 percent of what's called the "snow water deficit" in the state, according to a study by the University of Colorado and NASA's Jet Propulsion Laboratory.

"*This winter, from my viewpoint, dropped an impressive amount of snowfall and made a significant dent in the water deficit, but it certainly didn't come close to relieving the total deficit for the entire drought period," said Noah Molotch, a research scientist at the NASA Laboratory and director of the University of Colorado's Center for Water, Earth Science and Technology.*

The problem, Molotch said, is that California pumped huge amounts of groundwater to keep people and crops hydrated during the drought, depleting what is essentially a water savings account.

"*It's pretty clear that we aren't going to be able to put water back into that savings account as fast as we were able to take it out," he said. "For three weeks' worth of snowfall it was pretty amazing, so*

there is reason for optimism, but one snowy winter will not be able to reverse multiple years of drought."

After drought, California urgently needs to focus on big picture of water management

By Jay Lund and Trina Wood

Sacramento Bee

January 27, 2017

http://www.sacbee.com/opinion/op-ed/soapbox/article129221644.html#storylink=cpy

Feature

More on Infrastructure, How to Fund It, and Alexander Hamilton

"...that he ardently wishes to see it incorporated as a fundamental maxim in the system of public credit of the United States, that the creation of debt should always be accompanied with the means of extinguishment. This he regards as the true secret for rendering public credit immortal."

Alexander Hamilton

First Report on the Public Credit

"To cherish and stimulate the activity of the human mind by multiplying the objects of enterprise, is not among the least considerable of the expedients by which the wealth of a nation may be promoted."

Alexander Hamilton

The Report on Manufactures

How were the first canals financed by the young United States in the first George Washington administration? And the first railroads during the Presidency of John Quincy Adams? How did Abraham Lincoln finance the Civil War, industrialize the north and begin to build the Transcontinental Railroad? The following excerpts from the transcript of the LaRouche PAC International Webcast of January 27 can provide guidance for your thinking about the $1 trillion infrastructure building policy that the Trump administration and some in the Congress are proposing. That was addressed by Jason Ross in the January 27 *LaRouche PAC* webcast. The link to the video is here:

https://larouchepac.com/20170127/friday-webcast

(From the transcript)

Jason Ross, after presenting the details of the various Congressional proposals for an infrastructure building program, continued:

Now, how did he propose to pay for that? They said that they were going for full Federal funding. That is, not public/private partnerships, but basically through allocations. Where's that money going to come from? One idea -- not that they actually said how they were going to get it -- they said cutting loopholes, perhaps, to get more taxes; that's an awful lot to get. One idea that's been promoted is the

idea of cutting the corporate tax rate in order to repatriate the very large amount of profits that US corporations have made overseas; that they've avoided bringing into the US, to avoid being taxed the corporate tax rate on it. So, one idea is to drop that tax rate and offer a special incentive for companies to repatriate their profits, and then use that to finance.

These programs aren't going to work; and there's a major flaw in them that is addressed by the Hamiltonian approach. So, just going back to what Hamilton had done as Treasury Secretary, two aspects: One was, he made good on the public debt. He developed a way to make sure the public debt was financed; and by doing that, at the time, turned it effectively into that much circulating capital. That IOUs from the government that were trading below face value because people were unsure whether they'd ever be repaid, by developing taxes to make sure those interest payments could be made, all of those IOUs, all of that public debt became effectively currency; and they could then be used in the economy for loans and that sort of purpose.

Hamilton also set up a national bank that was capitalized via this public debt, and then created a currency; national bank notes for the United States, to allow loans to go out to improve the productivity of the nation. It ended up being used in his bank and in the Second National Bank to finance infrastructure projects, to expand manufacturing, loans for businesses to develop and make capital investments, that sort of thing.

What we need to do today, there's a proposal for a new national bank. This is something Mr. LaRouche has called for – a top-down national banking approach. The specifics on this aren't necessarily exactly the way it would have to be, but in general, China, for example. China holds over $1 trillion in US Treasuries; they're not getting a very high rate of interest. The head of the Chinese Investment Corporation has himself said, "Gee, it would be nice to get a better return on these; to invest this in the United States in some way." So, the way this bank could work would be that holders of Treasury bonds and maybe long-term municipal and state bonds could use those to become stockholders in the bank; put them into the bank. Those stockholders would then be guaranteed a dividend as shareholders; and that dividend would be guaranteed by new or adjusted taxes. Then, the bank, having $1 trillion via this type of means, would be able to offer low-interest loans for specific projects. The bank will be directed by people who actually are familiar with industry. The benefit of this is that in stead of issuing $1 trillion in new debt at whatever interest rate that might require, $1 trillion of currently existing Treasury bonds can form the basis for the issuance of new currency at significantly lower interest rates.

If these projects -- say, a national high-speed rail network -- these are the types of projects that are going to take years to really bring about and get operating in a full way; they're not going to make an immediate payback. They're not going to generate funds immediately; some projects possibly are though, through user fees. So, how do you finance them? The important aspect on this is, via this new tax that would be proposed, given that the tax wouldn't be directly related to funds that come in from the projects; it's a way of financing or paying for projects based on the overall growth of the economy. So, using the example of the Tennessee Valley Authority, it sold bonds, it paid them back; it made good on its payments. But even indirectly, just through the increased income tax that came in from the region of the country that benefited from the TVA; indirectly the cost of the TVA was paid back through the increased productivity of the nation.

So, when we're thinking about the kinds of projects that are going to transform the economy as a whole, the payback is in an indirect sort of way. It can be in an indirect kind of way. Let's think about what some of those projects could be. When you think about the way the human species has developed over time, it's not smooth; it's occurred in jumps. The number of people that have lived on the planet has changed in dramatic ways due to very specific changes in the technologies available to us. The development of agriculture; the discoveries in health and industry; the Renaissance; the creation of science itself. These are the things that drive the human species forward.

As an aspect of that, we fundamentally transform our relationship to the physical world. One example is through our use of power. This [Fig. 1?] is a chart that you may have seen several times. This is the power available in the United States during the history of our country. You can see two things: One is that up through the killing of Kennedy, the power used per person increased from below 4 kilowatts per capita at the beginning of the nation, up to about 12 or so at its peak. So, more power being used; greater intensity of energy. The second aspect is that the type of power has changed; wood was replaced by coal, which could not only do all the things that wood could – like getting hot, and by being turned into coke, be used in metallurgy the way charcoal could. But coal also had the added benefit of either being a tremendous amount of it and not having to remove trees, which could serve other purposes like building furniture and houses. Oil and natural gas; oil allowed for internal combustion engines -- a new type of technology.

Fission -- the power of the nucleus -- never really was exploited to its full potential. But the power of the nucleus allows us to totally transform what we do; and go out into the stars with nuclear-powered rockets. Technologies we just haven't worked out; we just haven't implemented. The discovery of controlled nuclear fusion -- these are things we need to work on.

So, one aspect is that we've changed our power sources. We've also changed our relationship to the physical world. This [Fig. 2?] is a chart over the past 50-60 years of rare earth production. These are very special elements on the periodic table; as their name suggests, they're reasonably rare. Their use in the economy has only come about relatively recently. They're used in electronic components, in magnets, phosphors for screens -- computer screens, phone screens; they're used in metallurgy for very unique applications This is something where we've simply transformed our relationship to nature; to this spectrum of materials that we use in nature. The greatest step forward to be made, is the mastery of fusion. This is the inside of a tokomak [Fig. 3], a kind of nuclear test machine; and one of the potential ways that we're going to be able to develop the immense power of putting small atoms together to get far more energy out even than today's current nuclear plants, which offers a much better way moving forward for space travel, for rocket propulsion, for the ability to really get around inside the inner Solar System.

So, these kinds of jumps in what we're capable of, that's the backbone of what economics is as a human science. When we think about the ways of implementing this in the United States, some of the projects are somewhat simple. Some might say that crossing the Bering Strait isn't the simplest of projects; but it's reasonably straightforward. This is an engineering project that we know how to build; it might present a few unique challenges given its length and given the not so hospitable climate in the area. But this is the kind of project that deserves investment; linking the world together in this way. A national high-speed rail network. If we were to build in phases, 20,000, 40,000 miles of high-speed rail, we'll transform the way that we move about inside the country; we'll transform the productivity and the value of whole regions of the nation. And of the productivity and potential value of the nation as a whole, as China has seen from building its high-speed network, about half the trips now are generated trips; it's people going places they just would not have gone, had this high-speed rail network not been built. Meeting other people; actually getting around inside their country. The same thing that we can have here. Moving goods more efficiently; moving people more efficiently; and just simply having connections that don't [currently] exist.

A water management approach to the continent; taking on the drought that's been challenging and causing quite a bit of trouble in the south and southwest of the United States; west of the United States. The ability to use desalination directly from the ocean, if needed; to get water from the Pacific and make it available. To move water along the continent as a longer-term project; to continue with studies about transforming water in the atmosphere; of inducing rainfall; of changing weather patterns. These are the kinds of broad-scale projects that aren't simply repaving a road and removing the potholes.

These are the kinds of projects that mean that we are really going to develop a whole new potential as an economy.

In terms of what it means to finance these things, the importance is in understanding what value is; and I think this is the real central key problem in economics. Lyndon LaRouche has identified in his economic textbooks and his writings over decades, that a real definition of economic value, of the creation of wealth, comes in those activities that speed the increase of the potential population density of the human species. A physical measure of value; not what the market thinks something is worth, but a real metric that lies outside of what people seem to care about at the moment. This makes it into a real science.

The major aspect of that is that the value of everything in an economy lies in relation to how it is acting to bring about a future of that sort. And I think that via the capital budgeting approach made possible through a national bank of the type that we're proposing, in part via the indirect nature of its financing, via a tax that isn't on projects financed by the bank specifically; but in a more general way to make these finances possible. And then also to capitalize, to benefit from the overall increase in productivity of the nation. It makes sense to think about investments paying for themselves. Some of them pay directly -- a business expands and makes greater profits. But when it comes to the economic platform, the infrastructure that the country as a whole relies upon, these benefits – the benefits of science, of the space program, of going to the Moon. Going to the Moon generated incredible profits for the nation; incredible development for the nation by opening up new types of manufacturing and new technologies. But it wasn't NASA that made the money; the whole economy benefited, and not only in a monetary type of way.

If we get away from public/private partnerships, if we get away from the idea that we're going to have some kind of deal to repatriate profits overseas -- which might in part be a good idea; but the real concept behind credit, as opposed to money, is the difference between thinking about value lying in what it creates for the future, versus what the market thinks something is worth today.

More background:

The United States Requires a Hamiltonian National Bank

https://larouchepac.com/20170126/united-states-requires-hamiltonian-national-bank

20170126-national-bank.pdf

Here is an update on fusion and the space program:

Fusion and Space Exploration: The Next Step in the Destiny of Mankind

https://larouchepac.com/20170126/fusion-and-space-exploration-next-step-destiny-mankind
20170126-fusion-mans-destiny.pdf

January 26, 2017

by Megan Beets and Kesha Rogers

And a new book with all of Hamilton's reports:

The Vision of Alexander Hamilton: Four Economic Reports by Alexander Hamilton Paperback – October 26, 2016

by Alexander Hamilton and Lyndon H Larouche

Now available from Amazon

https://www.amazon.com/Vision-Alexander-Hamilton-Economic-Reports/dp/0943235030/

This republication of Hamilton's four great economic works comes at the instigation of American economist Lyndon LaRouche, who has stressed the urgency for an understanding of Hamilton's economic outlook to confront the profound economic crisis now erupting within the trans-Atlantic financial system.

Hamilton's vision for the newly created United States was of an industrializing nation in which the human ability to develop and grow would lead to new technologies, new resources, and a national commitment to the future. This outlook, and the lessons to be learned from Hamilton's success, are of timely importance today.

These four writings comprise three reports to the Congress--his Report on Public Credit, Report on a National Bank, and Report on Manufactures--and his Opinion as to the Constitutionality of the Bank of the United States. Together, these documents represent the kernel of Hamilton's thought, and the basis upon which the United States grew from a small agricultural nation to the world's leading economy. Applying this outlook to the present, we include, following Hamilton's writings, Lyndon LaRouche's 2014 policy proposal for "Four New Laws to Save the U.S.A. Now."

This is a handbook for needed economic growth today.