

California Drought Update

For March 31, 2016
by Patrick Ruckert

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A Note To Readers

March has come and gone; gone too is the “rainy” season for California. The March 30 snowpack survey finds only 87 percent of the average the Sierras have on this date. With 30 percent of the state's water provided by the snowpack, few now speak those silly words flying around a couple of weeks ago that the drought is over. Far from it, as we are now half-way through the fifth year of California's worst drought mankind has measured. Perhaps we should remind readers of the more long-term picture.

The normal climate of the state for the past 1,200 years is characterized by alternating mega-droughts and mega-floods. The past 150 years or so have been anolmanous, with the last mega-flood being that of 1861-1862, when Sacramento was under 10-20 feet of water for a month or two. Two years ago I wrote a review of the book, “The West Without Water: What Past Floods, Droughts, and Other Climatic Clues Tell Us About Tomorrow,” by B. Lynn Ingram and Frances Malamud-Roam of the University of California at Berkeley. As I wrote then, it is “a book that provides the reader with, at least, some useful education in the paleoclimatic history of the West and an understanding of the dynamics of the secondary causal processes that determine weather and climate, but glosses over the real controlling mechanism of climate-- galactic processes and the Sun....” The full review is here: http://larouchepub.com/eiw/public/2014/eirv41n19-20140509/48-52_4119.pdf

Following this week's installment on physical economy, the drought, the reservoirs and the snowpack numbers for the week make it clear that it is only going to get worse. An excellent summary presents that idea.

Remaining sections of this report include a statement from California's Congressional representatives on the need to pump more water into storage, the water situation in Southern California, and the exciting developments ionization of the atmosphere show for producing precipitation.

Real Economics-- Part VI

Infrastructure Creates a Revolution

The following is adapted from my report, “*The Fight to Build the Grand Coulee Dam and the Economic Revolution that Transformed the Nation.*”

<http://amatterofmind.org/ca-drought-pdf/Grand%20Coulee%20Dam%20Report.pdf>

One of the best examples of how the building of infrastructure lifts the entire economy to a new, higher platform of productivity and literally revolutionizes entire nations is the building of the Grand Coulee Dam on the Columbia River. Located in the north-central region of the state of Washington, the Grand Coulee Dam is the largest single producer of electricity in the United States, and irrigates a million or two acres of formerly desert land.



The Grand Coulee Dam

The story of the more than 15 year battle by one man, Jim O'Sullivan, to bring the project from a dream to reality is told in the report mentioned above. The building of the dam became one of the "Four Corner" projects of President Franklin D. Roosevelt. Construction began in 1933, and the dam began providing electricity in early 1942. Opposition to the building of the dam came from the private utility interests who opposed all such government-led projects. The foolishness of such opposition was demonstrated by *Business Week* in July, 1933, as they wrote, "*Grand Coulee Dam is typical of those things that won't have any more usefulness than the Pyramids of Egypt.*"

But those who understand the principles of the development knew better. U.S. Senator Clarence Dill wrote in June, 1933: "*Some say there is more power being produced now than we can sell. Of course there is, and why? Because of the profiteering prices charge by the power trust subsidiaries that are paying dividends on watered stocks. Bring down the price of power to what Tacoma pays with municipal ownership and we will increase power used in Washington by 100 percent.*" Senator Dill was right, but under-estimated just what that increase would be. It was thousands of percent.

As construction proceeded, FDR visited the dam site on August 3, 1934. First he visited the Bonneville Dam site, then Grand Coulee. There were 20,000 people there to greet him. Always looking toward the future, in his speech FDR said, "*We are going to see, I believe, with our own eyes, electricity and power made so cheap that they will become a standard article of use....*"

Three years later, on October 2, 1937, FDR again is at the dam. He was astounded at the progress of the dam that was now widely referred to as, "the eighth wonder of the world."

By 1938, FDR began preparing the nation for war, and construction was speeded up. The year before saw the creation of the Bonneville Power Administration (BPA), created to generate, transmit and sell the power from the Grand Coulee and Bonneville dams. The Bonneville Dam, south of the Grand

Coulee on the Columbia River was completed in 1937. The Act stipulated that the new power agency would market and transmit power from federal dams and “...*give preference and priority in the use of electric energy to public bodies and cooperatives.*” Bonneville's rates were set very low and uniform across the region, no matter how far it had to be transmitted. The BPA worked closely with the Rural Electrification Administration. By 1940, 30 public utilities had been formed in Washington, Oregon and Idaho, serving more than 40,000 people who had not been hooked up to electricity until then.

Over the next few years thousands of miles of power lines were strung throughout the Northwest, just in time for turning the region into an arsenal for democracy. Utilization of electricity suddenly, and rapidly, increased. In 1939, 2.65 billion kilowatts of electricity were used by all industry in the Northwest. By 1947, 4.75 billion kilowatts were used by aluminum plants alone, and over 9 billion by all industry.

World War II Mobilization in the Northwest

In May, 1940, as part of the defense mobilization, aluminum companies began moving into the Northwest for the cheap power. Other industries did the same. Soon steel plants and other metals processing industries were building along the Columbia River and on Puget Sound.

In 1941 ship building companies moved into the region. Some of the Republicans began breaking the hold of partisanship and backing FDR on everything he asked for for defense, including full funding for Grand Coulee Dam. In early 1941, the US Defense Advisory Commission declared the Pacific Northwest to be a key defense industry region.

In August, Roosevelt's Interior Secretary, Republican Harold Ickes, was back at Grand Coulee, where he stated, “*the Grand Coulee Dam is the best investment that the government has ever made.*”



The pouring of molten aluminum around a steel slab in the carbon anodes used in the smelting of aluminum at a plant near Wenatchee

On December 7, Pearl Harbor brought the US officially into World War II.

In January, 1942, the War Production Board began building a ferro-alloy plant in Wenatchee to produce steel and magnesium. A steel rolling mill was built on the Columbia. Even more aluminum plants were

built, now by the federal government itself. The ship yards in Portland and Vancouver were gearing up and building new facilities. New electric welding technology cut the time required to build a war ship from 100 days to 20 days. Liberty ships rolled into the water at a rate of one per day. More than 50,000 combat planes were produced in Seattle, 30% of the entire national production. There were 50,000 people working there, rolling a new plane off the assembly line every hour and one-half.



*Early model B-17 Flying Fortresses production
at Boeing Plant in Seattle*



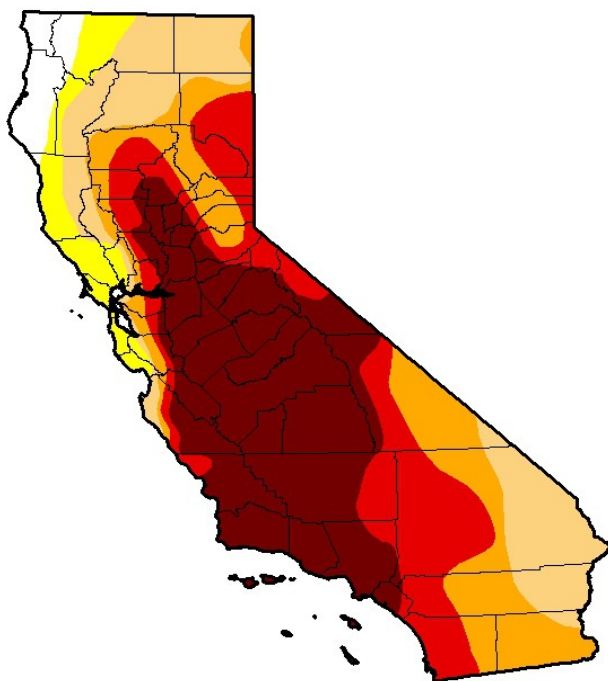
*Oregon Shipbuilding Corporation
shipyards during World War II*

The Drought: Here Are the numbers

The drought, the reservoirs and the snowpack

Below is the U.S. Drought Monitor for March 29, 2016. With 45 percent of the state in “Exceptional Drought” and 55 percent in “Extreme Drought,” we begin the dry season little better than we did one year ago, despite El Nino.

U.S. Drought Monitor California



March 29, 2016

(Released Thursday, Mar. 31, 2016)

Valid 8 a.m. EDT

Drought Conditions (Percent Area)

	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	3.55	96.45	90.58	72.82	55.25	34.74
Last Week 3/22/2016	1.16	98.84	91.55	72.86	55.31	34.74
3 Months Ago 12/29/2015	0.00	100.00	97.33	87.55	69.07	44.84
Start of Calendar Year 1/2/2016	0.00	100.00	97.33	87.55	69.07	44.84
Start of Water Year 9/29/2015	0.14	99.86	97.33	92.36	71.08	46.00
One Year Ago 3/31/2015	0.15	99.85	98.11	93.44	66.60	41.41

Intensity:



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

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U.S. Department of Agriculture



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

As for the snowpack, here is an excerpt from the release on March 30 by the *Department of Water Resources*:

Statewide snowpack average is only 87%

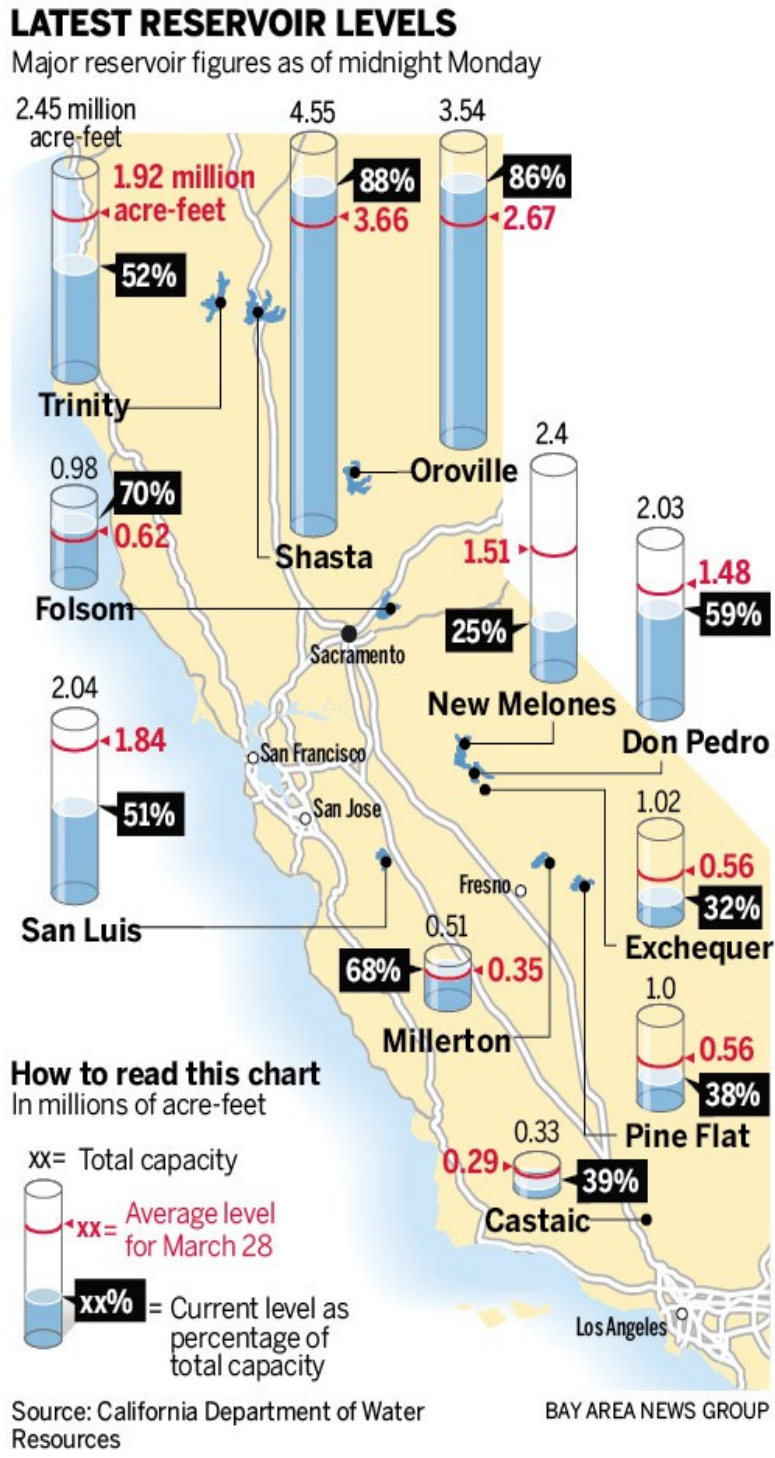
From the Department of Water Resources:

California's statewide snowpack usually reaches its peak depth and water content each year around the first of April, after which the snow begins to melt as the sun's path across the sky moves a little further north each day. Therefore, conditions today were just about as good as they're going to get this year when the Department of Water Resources (DWR) conducted its media-oriented snow survey at Phillips Station in the Sierra Nevada east of Sacramento.

The same is true for the statewide snowpack, which some had expected to benefit more than

it has from El Niño conditions. Statewide, water content of the mountain snowpack today is only 87 percent of the March 30 historical average....

The state's reservoirs remain as they were last week. The northern reservoirs are full, or nearly so, while the central and southern ones are well below average for this date. Here is a picture from the state Department of Water Resources:



El Nino Has Come and Gone, and What Did We Get?

The *San Francisco Chronicle* article, “Unimpressive El Niño leaves California in water limbo,” by Peter Fimrite and Kurtis Alexander on March 29, gives the best picture. Excerpts follow.

<http://www.sfchronicle.com/bayarea/article/Unimpressive-El-Ni-o-leaves-California-in-water-7216166.php?t=67d1659392f294ee0d&cmpid=twitter-premium>

The rain storms and blizzards that were supposed to come with El Niño were conspicuously non-biblical in California this winter, leaving the state in an ecological limbo that has regulators thinking about easing water-use restrictions in some places but not in others.

While the weather cheered ski resorts hit hard by the historic drought and brought some reservoirs to their highest points in years, in the end it dropped less snow than average in the Sierra, where more than a third of the state’s water comes from.

The water content of the snow statewide is 87 percent of average for this time of year, according to electronic measurements taken Tuesday, a benchmark when the spring melt historically begins and water spills into the reservoirs.

With El Niño’s biggest deluges hitting the northern part of the state, water officials said that next month they’ll consider relaxing the governor’s unprecedented rationing program, which now requires communities to cut back as much as 36 percent from their 2013 water use.

But much of the southern part of the state has remained as dry this year as it was last year, so any easing of forced conservation might be limited to Northern California.

What’s clear is that one mediocre winter is not likely to revive the 58 million trees statewide suffering severe water loss and bark beetle infestations. Salmon, sea lions and aquatic birds — and farmers — will continue to struggle as atmospheric irregularities continue, climate experts say.

The monthly snow survey in the Sierra shows that the snowpack is 98 percent of normal in the north, 88 percent in the central part of the state and 72 percent in the south. For the drought to be over, state water officials figured the snowpack needed to be at least 150 percent of normal by April 1. Last year’s measurement on the critical date was the lowest in the Sierra since records began almost a century ago.

While the water situation improved relative to the past few years, the El Niño did not live up to expectations.

As a result, Northern California’s big reservoirs are fuller than they’ve been in years, with Lake Shasta at 109 percent of average and Lake Oroville at 113 percent of average — both spilling to make room for spring runoff. Reservoirs farther south, though, aren’t as full as normal, with New Melones Dam on the Stanislaus River at 25 percent of capacity and Pine Flat on the Kings River at 38 percent.

In general, the recent weather may be an anomaly in California, said Francisco Chavez, a biological oceanographer for the Monterey Bay Aquarium Research Institute. He warned that a long-term trend of drier weather may return this year.

“My forecast,” Chavez said, “is that we will have continued drought — I don’t know how severe that will be — for several years to come.”

Now, What Do We Do With the Water We Have?

The California State Constitution, for those who may be unfamiliar with it, states clearly that all the water in the state belongs to all the people of the state. There is no “northern water” or “southern water.” The often heard complaint that Southern California “takes Northern California's water” is a claim that has no foundation in law or practice. The California State Water Project, which transfers up to two million acre-feet per year from the north to the south symbolizes that “we are all in this together.”

But, if water is not pumped from the Delta to storage at the San Luis Reservoir (and it is only half full today) the question raised by the article in the *San Gabriel Valley Tribune* by Steve Scauzillo on March 21, may get a negative answer. Here are some excerpts: <http://www.sgvtribune.com/general-news/20160321/will-el-nixflos-water-bounty-in-northern-california-provide-for-dry-southern-cities>

Will El Niño's water bounty in Northern California provide for dry southern cities?

The so-called March Miracle has unleashed the largest allocation of water from Northern California in four years, more than doubling the flow of imported water from the State Water Project into Central and Southern California.

By increasing the official allocation from the State Water Project from 5 percent in 2014 to 45 percent today, the state Department of Water Resources has sent signals the drought is easing, although far from vanquished.

“After some trying times in the past few years, it is welcome news,” said Bob Muir, spokesman for the Metropolitan Water District of Southern California, the largest wholesale water agency in the nation responsible for providing water to 19 million customers.

MWD, one of 29 contractors pulling water out of the state aqueduct, will take 900,000 acre-feet this year, up from 400,000 acre-feet last year and a low of 100,000 acre-feet in 2014, Muir said. (One acre-foot equals the amount of water a local family of five uses in a year.)

In the aggregate, the 29 urban and agricultural contractors have requested 4.2 million acre-feet for 2016. With the 45 percent take, they'll receive about 1.9 million acre-feet, according to the DWR. The allocation is up significantly from 2015, the second-lowest since 1991.

A historic four-year drought, combined with warmer temperatures due to global climate change, forced MWD to use reserves since 2013. That dropped the Diamond Valley Lake, a reservoir storing imported water from Northern California, to a low 300,000 acre-feet today. Because of the new allocation, MWD will start refilling the giant reservoir in Perris for the first time in several years later this week, he said.

Yes, Water Is Still Not Being Sent to Storage

As put in a recent post from *Families Protecting the Valley*, “Latest numbers show over 6 million acre feet flowing out to the ocean since mid December. San Luis Reservoir holds about 2 million acre feet. It's half full. It doesn't make sense.”

Even Senator Feinstein and the Congressional Republicans are demanding more pumping. Together they issued a joint statement on March 24. Here is an excerpt from the Feinstein side of the statement:

From the Office of Senator Dianne Feinstein:

I ask you to direct the Bureau of Reclamation, Fish and Wildlife Service, and National Marine Fisheries Service to maximize pumping in the Sacramento-San Joaquin Delta to the maximum extent allowed under the Endangered Species Act and biological opinions. Water flows in the Sacramento River are the highest they have been in four years. Just last week, flows in the Sacramento were as high as 76,000 cubic feet per second. We've only seen flows that high twice in the past ten years, and not once during this drought. Yet the Bureau of Reclamation and Fish and Wildlife Service are now considering reducing pumping due to concerns about larval smelt.

Beyond Desalination

Over the past few years experiments have been ongoing to enhance rainfall by the artificial ionization of the atmosphere. An April 1, 2015 article by Ben Deniston published by *LaRouche PAC* is excerpted directly below. Falling that is an updated report, also by Deniston, published by *Executive Intelligence Review* on March 29, 2016.

New Perspectives on the Western Water Crisis

larouchepac.com/20150401/new-perspectives-western-water-crisis

It is mankind's mission and obligation on this planet to improve the conditions for life – to develop and improve the planet, by understanding, managing, and improving the systems and processes at play. That is what mankind naturally does, what he must continue to do, and the global water system is a critical case in point.

Ultimately the hydrological cycle is a single global system. For mankind, the most fundamental characteristic of this is the evaporation of ocean water; the transport of atmospheric water vapor; the precipitation of atmospheric water over land, and the eventual flow of surface and ground water back into the oceans.

In terms of bulk energy input, the electromagnetic radiation from the Sun drives the entire global water cycle, by pumping the atmosphere full of water vapor via evaporation. Another solar system process contributes to the circulation of the atmospheric water vapor, the rotation of the Earth.

If we can learn to better understand the microphysics of these processes, perhaps we could begin to manage and control the atmospheric ionization and electrical conditions affecting cloud formations and precipitation.

One method has been developed and demonstrated in a number of locations (Mexico, Australia, Israel, Oman, Abu Dhabi, etc.) utilizing ground-based atmospheric ionization systems.

These systems require running only a relatively small amount of power through a system of wires connecting a small array of towers, altering the ionization of the local atmosphere. The challenge is tuning the system to provide the correct ionization and electrical effects required to tap into these atmospheric reservoirs.

From what has been demonstrated already, some of these systems can induce condensation and rainfall over a 100 kilometer radius, and, perhaps most important, can utilize a small array of such stations to create pressure gradients which draw more atmospheric moisture inland (from over the ocean).

Here is the update report from *Executive Intelligence Review*:

Water Production Success by Atmospheric Ionization

http://www.larouchepub.com/pr/2016/160328_water_ionization.html

March 28, 2016 (EIRNS)—Another successful proof of principle, of producing increased precipitation by ionizing the atmosphere, was reported today by Benjamin Deniston of the LaRouche Science Team.

The final results of an ionization experimental project in Oman, conducted by the company Australian Rain Technologies for 140 days in 2014, replicated the successes of earlier lengthy tests in Mexico, in particular.

2014 was the second year of a five-year project by Australian Rain Technologies. Results are also reported for 2015 now. But in 2014, operating four ionization stations for 140 days, the company increased rainfall by 33% over a 16,000-km² area, equivalent to a medium-size U.S. state. They generated an estimated increase of 96 million cubic meters in surface water flow.

Most amazingly, the four stations used 500 watts each (at 70kV), totaling only 2 kW needed to power the entire ionization process. It produced 180 million gals/day of precipitation over that period, 3.5 times the output of the new Carlsbad, CA, desalination plant, which uses 35 MW of power!

Although the precipitation area was not an established watershed, and rainfall was therefore dispersed and not all collectible, it would be useful over a potentially agricultural area. The astonishing power efficiency of the atmospheric ionization technology in producing water, was 50,000 times that of the new desalination plant.