California Drought Update

For November 3, 2016

by Patrick Ruckert

Published weekly since July, 2014

http://www.californiadroughtupdate.org

https://www.facebook.com/CaliforniaDroughtUpdate

patruckert@hotmail.com

A Note To Readers

Now we are just a few days from the election; an election featuring candidates beyond the pale of what anyone could have imagined just a few decades ago. Never before have the American people been subjected to such an abomination.

That said, I shall follow the advice of Lyndon LaRouche: Clinton must not be allowed anywhere near the White House. Trump, despite a personality that makes one want to retch, has, in the last week, risen above what he is. Last week Trump, in South Carolina, issued a call for a return to the Glass-Steagall banking law, which, as I am sure you all remember, is the first act required to begin to rectify the 15 years of Hell given to us by Bush and Obama.

Here is an excerpt from the *LaRouche PAC* statement of October 31 on Trump and Glass-Steagall:

Trump's Turn to Glass Steagall Opens Field for LaRouche's Four Laws

https://larouchepac.com/20161031/trumps-turn-glass-steagall-opens-field-larouches-four-laws

Candidate Donald Trump last week made a direct call for implementing the 21st Century Glass Steagall act, while also issuing a blunt warning that Hillary Clinton's insane demonization of Vladimir Putin, and her call for military confrontation with Russia in Syria, has already brought the world to the brink of nuclear war. Whatever Trump's motivation, this has put the issues identified internationally with Lyndon LaRouche at the center of the US political crisis.

The Glass-Steagall issue has now been basically re-infused into the Presidential elections at a critical kind of countdown moment before November 8th. And there's really no downside to that. Whatever the outcome

of the election, Glass-Steagall is an essential policy issue that must be implemented immediately. It's the first step of Mr. LaRouche's Four Cardinal Laws for how to carry out an economic recovery; and Mr. LaRouche's Four Cardinal Laws on based explicitly on the four key reports to Congress by Alexander Hamilton when he was Secretary of the Treasury.

A follow-up statement includes this: "Among millions of alert and intelligent citizens there is a groundswell for breaking up Wall Street's casino, by re-enacting the Glass-Steagall Act of Franklin Roosevelt — for justice, and for the possibility of investing credit in the economy for a productive recovery.

"This is shown in polls of Democratic voters; in Donald Trump's promise in an Oct. 27 speech to restore Glass-Steagall; in the parties' platforms; by candidates in Congressional races committing to restore Glass-Steagall and "Hamiltonian" credit for infrastructure." https://larouchepac.com/20161103/glass-steagall-immediately-after-election-day-obama-can-be-beaten

The Rest of This Week's Report

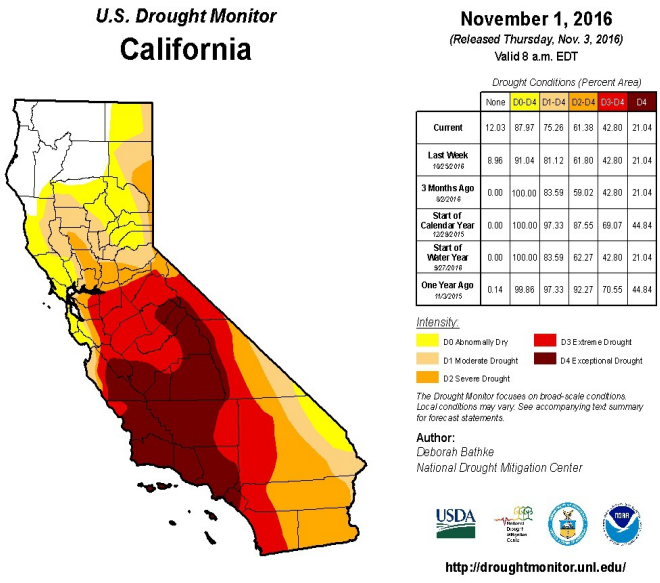
Two foci and an afterthought make up the bulk of the report this week. First, of course, is the weather, the climate and the drought. Some of what the climatologists are saying will surprise you.

The second topic is desalination, and we begin a fairly extensive coverage of it with a presentation to some engineers on the subject of infrastructure, in which this statement was made by the presenter Jason Ross:

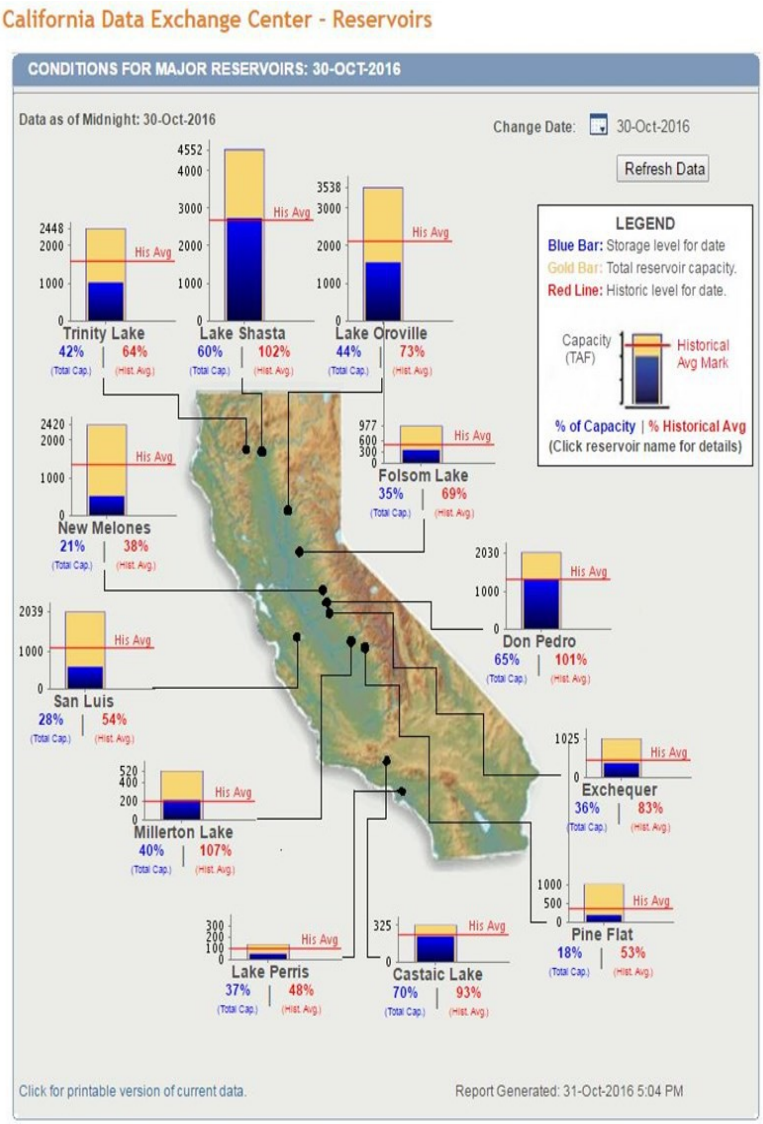
I just ran some very rough numbers. California has frequent and ongoing water crises; I just worked out some rough estimates: If all of the coastal counties in California provided all of their urban water needs by desalination, based on the price of the Sorek plant that was recently built in Israel a few years ago, the capital cost with the reasonable interest rate payback over 20 years, the capital cost would only be $20 cost per person for the coastal cities in California, to build enough desalination to provide all the urban water needs; including the power required, about 70 watts per capita for desalination, you're talking about $100/person/year to have all of coastal California's urban water needs satisfied by desalination! We can already do these things!

The afterthought takes us back to the ongoing crime of the Water Board moving toward returning the San Joaquin and the Sacramento Rivers to a condition of "unimpaired flow." This section is for those with strong stomachs.

The U.S. Drought Monitor and Reservoir Graph



Note, that even after the rains of October, 75 percent of the state remains in at least “moderate drought,” and 61 percent is in at least “severe drought.” Also, one-fifth of the state remains in “exceptional drought,” the most serious category.



The Weather To Come: Does Anyone Really Know?

As reported below, while the October rains have broken records going back more than a century, not one climatologist will commit themselves to saying that the rains will continue. Let us allow them to speak for themselves.

The *Washington Post* on October 27 probably has the most thorough coverage of this non-committal position. I don't think, with weathermen at least, we can relegate them as Dante would to the tenth circle of Hell reserved for those who are neutral.

An early look at what kind of weather California might see this winter

https://www.washingtonpost.com/news/capital-weather-gang/wp/2016/10/27/an-early-look-at-what-kind-of-weather-california-might-see-this-winter/
By Angela Fritz October 27

*The **National Weather Service** isn't holding much hope for drought-busting conditions this winter, especially in Southern California:*

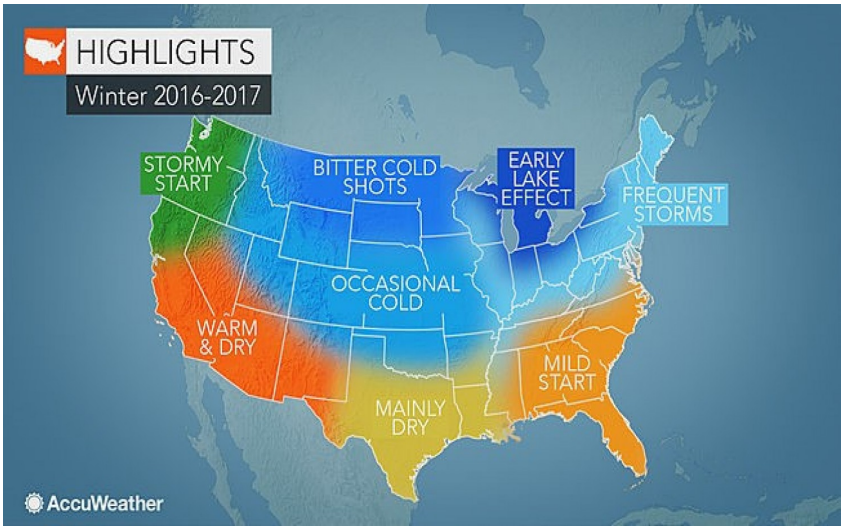
- *Drought will probably persist through the winter in many regions currently experiencing drought, including much of California and the Southwest*
- *Drought improvement is anticipated in Northern California, the northern Rockies, the northern Plains and parts of the Ohio Valley.*

*Daniel Swain, a postdoc climate scientist at the University of California at Los Angeles who runs the blog **Weather West**, doesn't have high hopes for a wet winter. In particular, he notes that the Ridiculously Resilient Ridge is likely to make a comeback. That persistent warm and dry pattern pushed the California drought into extreme territory in the winter of 2014-2015 (emphasis mine):*

> *How concerned should we be about a 2016-2017 return of the Ridiculously Resilient Ridge? Well, the tropical Pacific Ocean has been edging back toward a La Niña-like state, with relatively cool water in the eastern Pacific. Meanwhile, very warm conditions are expected to return to the tropical West Pacific over the next few months — a setup that is linked to unusually strong high pressure over the northeastern Pacific.*
>
> Extraordinary warmth continues across many areas — especially in the Arctic, where seasonal refreeze of the Arctic Ocean has been occurring at a record-slow rate (leading to record-low ice extent in October). *The unfavorable state of the tropical Pacific Ocean, plus the high likelihood of persistent warmth yet again this winter, suggests that we're still likely to be talking about the "ongoing California drought" well into 2017.*

***AccuWeather** is splitting the odds between Northern and Southern California. Like NOAA, it's seeing wet conditions in the north and dry conditions in the south. "I do think in the early part of the season we're looking good anywhere from San Francisco, Sacramento and into the mountains," said Paul Pastelok, a forecaster for AccuWeather.*

> *. . . warm and dry conditions will span much of the season for central and Southern California and the Southwest.*
>
> *For Southern California, the pattern will exacerbate ongoing drought conditions.*
>
> *What precipitation does fall in California will aim primarily for the north, though it will fail to have the significance of last January when the region was hammered by heavy rain and snow*



So, the map above from *AccuWeather* is the best we got.

Closer to home, Paul Rogers of the *Bay Area News Group*, has good coverage of the October rain, that rain's impact on the drought and, importantly the state of the reservoirs. Included in his article are the uncommitted comments of some state officials on what to expect over the winter months (excerpts):

Wet October doesn't mean rainfall year will be soggy

By Paul Rogers, Bay Area News Group

November 1, 2016

Enterprise-Record/Oroville Mercury-Register staff contributed to this report.

http://www.chicoer.com/article/NA/20161101/NEWS/161109971

Meteorologists stress that's it's only the very beginning of California's rainy season, so there are no guarantees that a wet October will bring a wet November, December, January or February. So far, though, October has been surprisingly wet across the northern part of the state, raising the hopes of drought-weary Californians.

And even more important, storms barreling in from the Pacific Ocean have been drenching key areas in rural Northern California, where California's largest reservoirs are located.

"This is a very good start of the water year," said Doug Carlson, a spokesman for the California Department of Water Resources in Sacramento. "We have no assurance it is going to be this good a month from now, but it's a good start and we have to rejoice."

Through Saturday, an average of 10 inches of rain had fallen over the eight Northern Sierra stations since Oct. 1. That's more than triple the historic average for October of 3.05 inches and just shy of the second wettest year — 1950, which had 11.06 inches. But it's still short of the wettest year — 1963 — when 17.1 inches fell in October.

The heavy rains near the big reservoirs haven't increased water levels in a major way yet. Much of the rain has soaked into very dry soils, Carlson noted. And typically in October, water levels in Northern California's big reservoirs drop because water has to be slowly let out into rivers for salmon and other fish, as well as for farmers and cities to consume.

Lake Oroville is still just 44 percent full, 73 percent of what's normal for Oct. 31. It's actually down about 55,000 acre-feet since Oct. 1. Shasta Lake is in better shape at 61 percent full and 103 percent of average for this time of year, but it dropped more than 38,000 acre-feet during October.

What is California's drought status right now?

The state remains in a drought emergency that Gov. Jerry Brown declared on Jan. 17, 2014. Last winter was the wettest in five years, but brought only average rainfall in Northern California, leaving Southern California with another parched year.

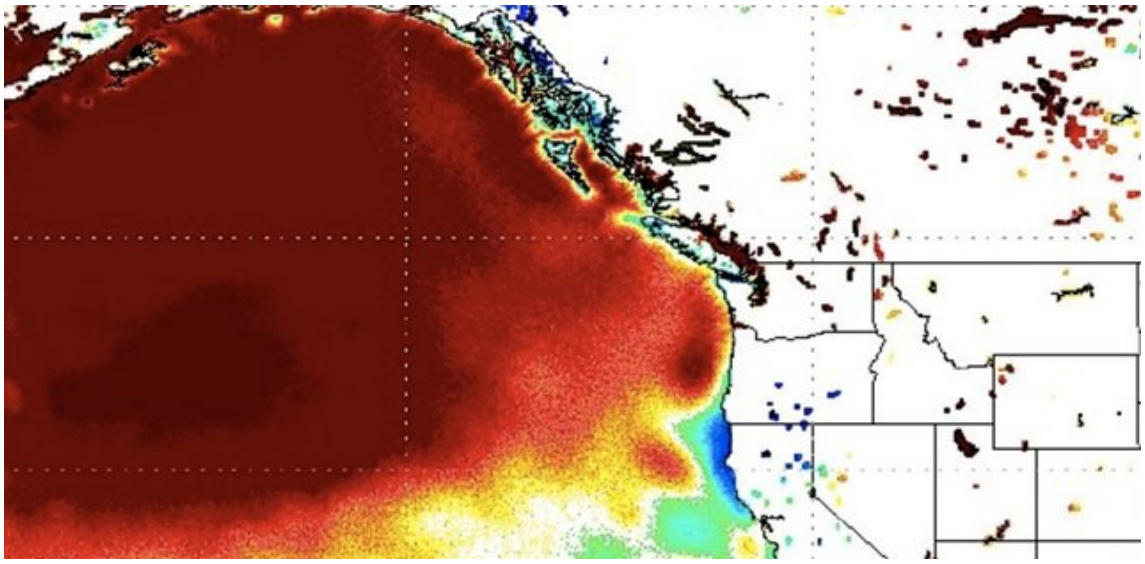
That pattern is continuing. October's rain in Los Angeles is just 74 percent of normal.

Recently, the Pacific Ocean has shifted to a mild La Niña, the condition in which ocean temperatures near the equator are cooler than average. Historically, during mild La Niña winters rainfall totals across California are slightly lower than the historic average.

Not only La Nina, but as the headline from *Water Deeply* highlights, "'The Blob' Is Back: What Warm Ocean Mass Means for Weather, Wildlife," from their website on October 31. Since this phenomenon may be the real force determining this winter's weather, I include here some excerpts from the article.

Unusually warm waters along the Pacific Coast, dubbed "the Blob," have severely disrupted weather and wildlife since 2014. Meteorologist Nicholas Bond explains the phenomenon.

https://www.newsdeeply.com/water/community/2016/10/31/the-blob-is-back-what-warm-ocean-mass-means-for-weather-wildlife



This illustration of temperature in the northeast Pacific shows the status of the "Blob," a warm-water phenomenon, as of September 2016.Image courtesy NOAA

Since 2014, a mass of unusually warm water has hovered and swelled in the Pacific Ocean off the West Coast of North America, playing havoc with marine wildlife, water quality and the regional weather.

Earlier this year, weather and oceanography experts thought it was waning. But no: The Blob came back, and it is again in position off the coast, threatening to smother normal coastal weather and ecosystem behavior.

The Blob isn't exactly to blame for California's drought, though it certainly aggravated the problem. But it is to blame for seriously disrupting the ocean food chain and for creating conditions that fed unprecedented algal blooms in the coastal Pacific.

With the Blob back in play again, what does it mean for the winter ahead? To find out, Water Deeply spoke with Nicholas Bond, a research meteorologist at the University of Washington in Seattle and Washington's state climatologist. In June 2014, Bond named this persistent weather phenomenon, and later wrote the first scientific paper characterizing it.

Infrastructure and Desalination

The several reports in this section begin with Jason Ross's recent presentation on infrastructure to a group of engineers in New York City. Ross includes in his presentation a discussion of the potential of desalination in California, demonstrating that for $100/person/year all of coastal California's urban water needs can be met by desalination.

The second report gives some background on the Sorek Desalination Plant in Israel, the most advanced plant in the world.

A Renaissance in World Infrastructure: A Presentation to Engineers on the World Land-Bridge by Jason Ross

https://larouchepac.com/20161026/renaissance-world-infrastructure-presentation-engineers-world-land-bridge

Earlier in the day Ross presented as a case study the near miraculous building of a doubling of the Suez Canal in Egypt in one year.
Video of Part I: The New Suez Canal and the SC Economic Zone: a case study
https://larouchepac.com/20161102/new-suez-canal-and-sc-economic-zone-case-study

According to the American Society of Civil Engineers, the United States has an infrastructure backlog of $3.5 trillion, while most of the world is acting from the tremendous potential for a new paradigm of commitment to, and financing for infrastructure projects led by China's One Belt One Road program. This topic was recently presented by Jason Ross to a group of civil engineers in New York City. This presentation covers the potential of the World Land-Bridge, and the kind of political fight necessary to make it a reality, including in the United States.

You can read or watch the entire presentation from the link above. Here I will just include a few of Jason's opening remarks and then the short section in which he discusses desalination in California, which is highlighted.

JASON ROSS: For this second half, I'm going to be taking up some of these global themes that we touched on at the first. Now, we can look at the world context, in which the Suez Canal is a part, but really, in its own right, the programs of the World Land-Bridge, the New Silk Road, or the One Belt, One Road project as China calls it, the World Land-Bridge/New Silk Road as I and my colleagues call it.

To do this we're going to be looking at a few different aspects. The first aspect is that we're going to talk about economics in general, what's economics, how do we measure economic growth? Second, I want to go through an overview of the projects that are involved in this proposal for a New Silk Road, for the World Land-Bridge; I want to talk about how these can be financed, which we touched on already, and projects for the U.S. specifically, what can we be doing here to have this as part of our outlook, — since the current U.S. political outlook leaves much to be desired, like a trashcan.

For starters let's think about, only human beings have economies. No biologist has discovered a species of snails that has an economy; cows don't have economies, squirrels don't have economies. They certainly don't have anything we would call economic growth.

If you look at some type of life, some type of organism, say, a rabbit, for a certain species of rabbit, in a certain kind of habitat there's a concept that we call "carrying capacity," — everybody's heard that, right? Carrying capacity: Only so many rabbits can live per acre of pleasant meadow, and there's only so much food, and there's going to be predators if there's going to be more than that many rabbits; so there's a carrying capacity.

I don't think humans have a carrying capacity, not the way animals do.

For human beings we have, rather than a carrying capacity, I'd say that we have a potential carrying capacity, or potential population-density: how many people could be supported in a certain area, and that's a function of our knowledge and of our culture. What ways have we discovered of working together? What have we discovered about the physical universe that changes how we live with it? Are we able to purify water? Can we treat diseases? Have we mastered the use of agriculture? Do we use beasts of burden? Have we developed steam power?

I just ran some very rough numbers. California has frequent and ongoing water crises; I just worked out some rough estimates: If all of the coastal counties in California provided all of their urban water

needs by desalination, based on the price of the Sorek plant that was recently built in Israel a few years ago, the capital cost with the reasonable interest rate payback over 20 years, the capital cost would only be $20 cost per person for the coastal cities in California, to build enough desalination to provide all the urban water needs; including the power required, about 70 watts per capita for desalination, you're talking about $100/person/year to have all of coastal California's urban water needs satisfied by desalination! We can already do these things!

Proposals for integration in a region that sorely needs development and integration. Imagine, instead of various forces financing lunatics to destabilize other people that they don't like, and all of the mess that's going on here, if instead we took the advantage, the opportunity to have cooperation and economic development, that's one of the greatest opportunities to fight against lunacy is potential for a future. Proposals going back to the '90s for desalination as a major part of peace in the Israel/Palestine region, where there is a common enemy: the desert! With an opportunity, with water, you have development, there's a potential to build a joint future.

The Sorek desalination plant

The Sorek desalination plant in Israel that Ross referred to was completed in 2013 and provides water for 1.5 million people. For those who wish to know more, here are a couple of links:

Sorek Desalination Plant: The World's Largest and Most Advanced SWRO Desalination Plant

http://www.ide-tech.com/blog/b_case_study/sorek-project/

The Sorek desalination plant sets significant new industry benchmarks in desalination technology, capacity and water cost. It provides clean, potable water for over 1.5 million people, comprising 20% of the municipal water demand in Israel.

World's Largest SWRO Desalination Plant Now Fully Operational

IDE and Hutchison Water's Sorek desalination plant produces high quality water at low cost

http://www.waterworld.com/articles/2013/10/world-s-largest-swro-desalination-plant-now-fully-operational.html

KADIMA, ISRAEL, Oct. 21, 2013 -- The world's largest and most advanced seawater reverse osmosis (SWRO) desalination plant is now fully operational, announced IDE Technologies.

IDE Technologies recently announced that the world's largest and most advanced seawater reverse osmosis (SWRO) desalination plant is fully operational. The Sorek plant is capable of producing 624,000 m3/day (with provisions for future extension) of potable water, of which 540,000 m3/day are currently supplied to Israel's water distribution system. The plant sets significant benchmarks in desalination capacity and water cost, resulting in substantial savings for the local water market while alleviating the country's water shortage problem.

The Carlsbad Desalination Plant

Built by the same company that built the Sorek plant, we should not forget that the largest desalination plant in the Western Hemisphere is in Carlsbad, California. Also on the agenda, if it can get through the permit process is a matching plant to be built in Huntington Beach.

Here is a link to more on the Carlsbad plant:

The Largest Desalination Plant in the Western Hemisphere and a Complete Game Changer for Desalination in the US

http://www.ide-tech.com/blog/b_case_study/carlsbad-project/

What Was Planned, but Never Built

That the United States, and especially California does not provide a few million acre-feet of water to the coastal cities by desalination now is another crime to lay at the feet of the "cultural revolution" against science, technology and the building of infrastructure that began to strangle the nation following the death of President John Kennedy.

In 2013, 21st Century Science and Technology published a special report titled, "**Nuclear NAWAPA XXI: Gateway to the Fusion Economy.** http://21stcenturysciencetech.com/Nuclear_NAWAPA.html

The chapter in that report named, "The Nuclear NAWAPA XXI and the New Economy" by Michael Kirsch, included the following:
http://21stcenturysciencetech.com/Nuclear_NAWAPA_XXI/Nuclear_NAWAPA_New_Economy.pdf

The most advanced research for large-scale desalination was launched under John F. Kennedy, but was never implemented. To this day, these designs are the most ambitious, rational, and scientific, and are therefore the model for today.

In January 1963, Kennedy formed a task group with the Executive Office of Science and Technology to investigate the use of large nuclear reactors for desalination. Working closely with the Atomic Energy Commission (AEC) and the Department of Interior, the task group issued its report in March 1964, five months after his assassination. Their report estimated that if an appropriate research and development program were actively pursued, large-scale dual-purpose installations could produce 1,000 to 1,900 megawatts of electricity and 500 to 800 million gallons of water per day (.6-.9 million acre feet per year (MAFY). The report also suggested a program to develop and demonstrate a plant operating with an 8,300-MWt reactor, producing approximately 1,400 megawatts of electricity and 600 million gallons of water per day (.7 MAFY).

This 8,300 MWt reactor was the 1975 goal. The 1970 goal was set for plants of intermediate size....

Following through on what happened to Kennedy's plans is this report I wrote in 2015. A short excerpt follows:

Nuclear-Powered Desalination in California

http://www.californiadroughtupdate.org/2015/05/29/nuclear-powered-desalination-in-california-parts-i-iv/

In the fall of 1966, the U.S. Congress passed legislation to build a massive nuclear-power-desalination plant off the coast of Orange County, California. Had that authorized program been acted upon in subsequent years the present water crisis in the state would not exist today. The members of Congress who pushed through that legislation understood that while the then under construction California State Water Project would begin delivering water in 1972, that by 1990, new sources of water would be required to meet the needs of the state's growing population.

Other Voices

This past week has seen a couple of other voices weigh in for the building of desalination plants. First is Richard Rubin, writing for *foxandhoundsdaily.com*. Some excerpts follow.

Time to Re-think State's Failing Water Policies

http://www.foxandhoundsdaily.com/2016/11/time-re-think-states-failing-water-policies/

By Richard Rubin
November 2, 2016
With rising demand for water, there is enough history already to show that the Pollyannaish notion that we can simply conserve our way out of the current dilemma notwithstanding expectation of even more severe droughts simply does not wash.

The time is past when we should be looking at alternative sources of water not merely during emergencies but also to meet the daily needs of our communities and businesses.

One very promising innovation is hardly a blip on the radar screen. It is commonly known as desalination —the conversion of salt water into safe and reliable drinking water. It is now in use in 120 countries worldwide Which countries have desalination among them, Algeria, Chile, Spain, Egypt, the United Kingdom, Iran, Israel, South Africa, Portugal, Greece, Italy, India, China, Japan, and Australia.

With trillions of gallons just off our long coast line, there is an infinite supply ready to tap.

The largest plant in North America is now fully operational in Carlsbad, south of Los Angeles, and is supplying water to more than 15% of the San Diego County population. This will enable it to reduce its water purchases from the Metropolitan Water District of Southern California by 66% over the next 15 years.

The second voice is this:

Gonzalez and Lopez: 80% of OC Latino Voters Want HB Desalination Approved Now!

By Antonio Gonzalez and Nativo Lopez

http://voiceofoc.org/2016/10/gonzalez-and-lopez-80-of-oc-latino-voters-want-hb-desalination-approved-now/

Voice of Orange County

October 30, 2016

The new online survey by Sextant Research commissioned by the William C. Velasquez Institute (WCVI) found that Latino voters in Orange County want prompt new policies from local and state government (89%) to solve the drought like the Huntington Beach Desalination plant (80%) currently before regulatory bodies like the Coastal Commission. They also favor capturing storm water and recycling.

Finally, those with no vision, and trapped in the idea of limited resources, have their say against desalination in this article from *KQED* on October 31, which presents nothing that has not been said for years. If you wish to read it, the link is here:

Desalination: Why Tapping Seawater Has Slowed to a Trickle in California

*By **David Gorn** October 31, 2016*

https://ww2.kqed.org/science/2016/10/31/desalination-why-tapping-sea-water-has-slowed-to-a-trickle-in-california/

Some Background on the Water Board's Proposal to Let the Rivers Flow to the Sea

Over the past few weeks I have given extensive coverage to the Water Boards proposed plans for letting the San Joaquin and its tributaries flow to the sea unimpaired, meaning that as much as 400,000 acre-feet of water will no longer be available for agriculture or anything else. Below is a link to a study by Paul Stanton Kibel published in the *Water Law Journal* on October 27. The term "unimpaired flow," which I noted last week was one people should become familiar with, is defined more precisely at the end of the excerpt below. If you want to dig into the technicalities, this is the one for you.

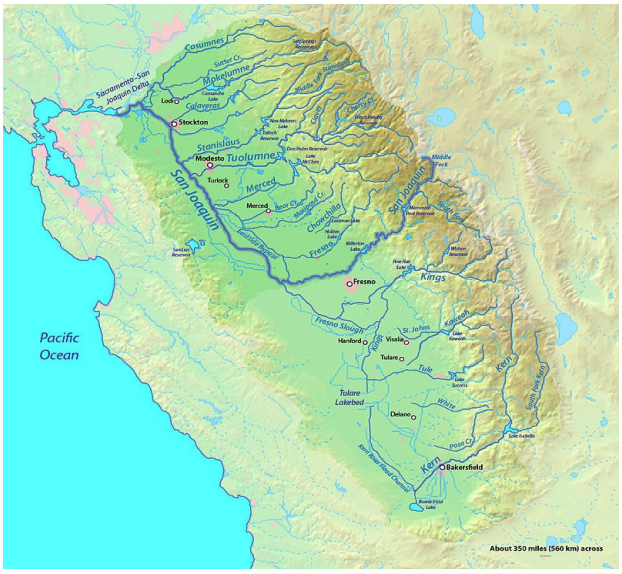
Truly a Watershed Event: California's Water Board Proposes Base Flows for the San Joaquin River Tributaries

By Paul Stanton Kibel

http://waterlawjournal.com/truly-a-watershed-event-californias-water-board-proposes-base-flows-for-the-san-joaquin-river-tributaries/

Professor Paul Stanton Kibel teaches water law at Golden Gate University School of Law and is natural resource counsel to the Water and Power Law Group. He is the author of the forthcoming book "Understanding Water Rights in California and the West."

On September 15, 2016, the State Water Board released its draft of a proposed update to the Water Quality Control Plan for the San Francisco Bay/Sacramento-San Joaquin Delta Estuary, often referred to as the Bay Delta Water Quality Plan. The update to the Bay Delta Water Quality Plan is being undertaken pursuant to requirements under the federal Clean Water Act and California's Porter-Cologne Water Quality Act. To ensure adequate water conditions for fisheries (such as salmon, steelhead trout and smelt) that are present in and migrate through the Bay Delta, the September 15, 2016 draft of the Bay Delta Water Quality Plan update recommended that a range of between 30 and 50 percent (with a starting point of 40 percent) of the "unimpaired flows" of the Stanislaus, Tuolumne and Merced Rivers be left instream until their confluence with the San Joaquin River. According the State Water Board, "Unimpaired flow is the rate and volume of water that would be produced by the rain and snow accumulating in a watershed absent any diversion, storage or use of water. An unimpaired flow approach generally mimics the natural variability of California's river flows that support native fish like salmon and steelhead and for which they have evolved."



San Joaquin River Watershed, Mainstem and Tributaries