



California Water and Infrastructure Report

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

For January 17, 2019

by Patrick Ruckert

Published weekly since July, 2014

An archive of all these weekly reports can be found at both links below:

<http://www.californiadroughtupdate.org>

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

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*"It may appear easier for Board members to file for Chapter 11 – shifting the burden of dealing with the myriad issues that will face the Board and placing it squarely on the shoulders of the Bankruptcy Court and the companies' advisors – but **it will destroy value for the Company and in particular its shareholders – the only groups to which you owe a duty.**" (Emphasis added).*

Part of a statement by Blue Mountain Hedge Fund, a major shareholder of PG&E stock. Of course, for them it is all about their money, not the 86 people dead in the Camp Fire or the 14,000 who lost their homes.

A Note To Readers

The California Department of Water Resources is the largest consumer of electricity in the state. It is also the fourth largest producer of electricity, with its five hydroelectric generating plants and four hybrid pumping/generating plants. The State Water Project moves millions of acre feet of water hundreds of miles in a system of dams, aqueducts, pipelines and canals, powered by 20 pumping plants.

Thus, the water infrastructure system of the state, which integrates three river systems (the Sacramento, the San Joaquin, and the Colorado), is really a water/electricity system.

Now, with both the Colorado River reaching record low flows-- threatening both the water supply for

millions in California and generating of electricity from Hoover Dam-- , the shutting down of the San Onofre nuclear power plant scheduled in just a few years, and now the coming bankruptcy of PG&E, the state is heading for serious crisis, whether anyone wants to recognize it or not.

Especially since the criminal enterprise Enron bankrupted PG&E in 2001 and facilitated the entry of Arnold Schwarzenegger into the governor's office, the state is now the number one state in the country for poverty (with 45% of the children in the state below or near the poverty line), and ranks near the bottom in educational outcomes. Housing costs has driven tens of thousands to sleeping in the streets (53,000 in Los Angeles alone), and the cities in the country with the worst kept streets are San Francisco, Oakland and Los Angeles.

The new governor, Gavin Newsom, likes to cite the fact that the state has more than a \$20 billion surplus now, without really explaining how, after Arnold had left the state \$27 billion in debt, we went from negative to positive. Well, just like the European Union has imposed vicious austerity on the countries of that organization, the state's citizens have been given the same treatment. Maybe that has something to do with the state being at or near the bottom in educational performance of its students.

And a positive budget surplus in California depends on billionaires and their stock portfolios, and the top one percent of tax payers in the state pay almost half of the income taxes collected. A state report from last March said, "A moderate recession, like the dot-com bust, could lead to a \$40 billion budget problem. A more mild recession might result in a \$20 billion budget problem." A crash like 2007-2008 is not even considered in that report, despite the reality that the present financial bubble is much larger and more volatile than the housing bubble of the crash.

In this week's report

We have gotten a lot of rain and snow this week, so the first section below reports on that.

This week two topics dominate: First the announcement by PG&E that it will be filing bankruptcy. And second, the developing crisis on the Colorado River. My introduction to those two sections suffice and I need not say more here.

Finally, I include the link for the second class in the LaRouche PAC series now ongoing. The second class title is: "*Science — not Mathematics! — is Key to the Economy.*"

Rain and Snow Galore This Week

California snowpack surges after slow start. Will it be enough to combat years of drought?

Joshua Yeager, Visalia Times-Delta
Jan. 13, 2019

<https://www.visaliatimesdelta.com/story/news/2019/01/14/california-snowpack-surges-after-slow-start-enough-combat-years-drought/2539399002/>

California's snowpack is surging after a series of storms hit the Sierras last week.

More snow could hit California's mountain ranges this week.

"Last week's storms have been nice and cold, coming from the Gulf of Alaska and putting some nice snow across the Sierra Nevadas," said Chris Orrock, California Department of Water Resources

spokesman.

California began 2019 with lower-than-average snowpack measurements — just 67 percent of the year-to-date average.

Recent storms pushed that total to 90 percent as of Friday.

With more precipitation on the horizon, forecasters predict snowpack measurements will "meet or exceed" the year-to-date average by the end of the week.

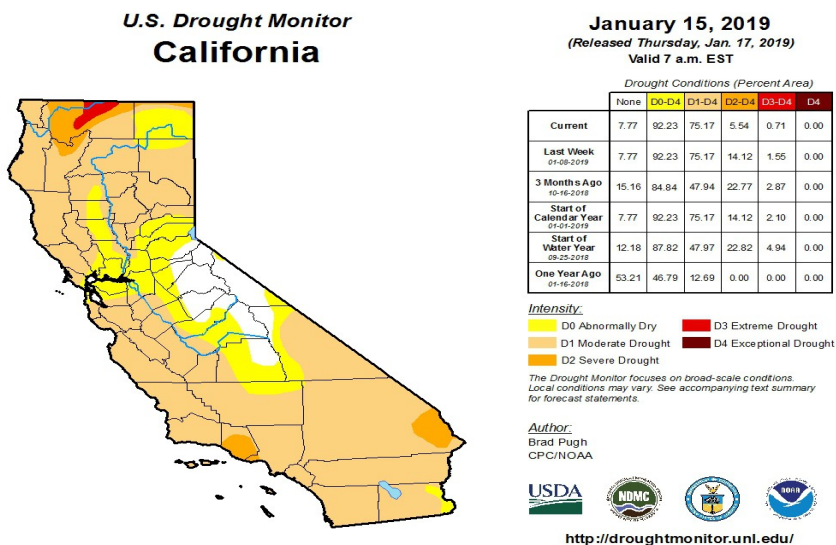
"On average, the snowpack supplies about 30 percent of California's water needs as it melts in the spring and early summer," said Michael Anderson, a climatologist with Water Resources. "The greater the snowpack water content, the greater the likelihood California's reservoirs will receive ample runoff as the snowpack melts to meet the state's water demand in the summer and fall."

Though many consider the worst of California's drought to be in the past, forecasters warn that the Central Valley will need several average-to-wet years to fully recover.

In fact, 75 percent of California, including much of the Central Valley and parts of Tulare County, remain designated as official drought zones, according to Borgioli.

"We have not fully recovered from the drought in terms of groundwater recharge," Borgioli said. "Some areas of the Valley have experienced 5 to 6 feet of subsidence."

U.S. Drought Monitor



As can be seen from the U.S. Drought Monitor, 75% of the state remains in Moderate, Severe, or Extreme Drought. Though, this past week the percentage in Severe and Extreme Drought has declined significantly.

One Of The World's Largest Rivers Is Floating Above California. It's Bringing Rain, Possible Flooding And A Blizzard Warning

By Ezra David Romero

January 15, 2019 | Sacramento, CA

http://www.capradio.org/129092?utm_source=feedburner&utm_medium=feed&utm_campaign=Feed

California is about to get hammered by a storm that could drop three inches of rain at low elevations and up to five feet of snow in the Sierra.

"It definitely is looking like the biggest storm that we've seen so far this winter ... with heavy rain, strong winds and heavy mountain snow," said Sacramento National Weather Service Meteorologist Corey Miller.

The storm is the result of what's known as an atmospheric river, sometimes called a Pineapple Express, and is usually a warmer and wetter weather pattern that acts like a hose dumping rain on California.

"If you look at the models it sort of looks like a river headed right into California," Miller said.

Warmer rain will push snow levels above 7,000 feet. "It'll likely add to the snowpack, but typically you want to see a lower snow level system to really make a difference," Miller adds.

PG&E Bankruptcy

On Monday, PG&E announced that it would file bankruptcy before the end of January. Facing as much as \$30 billion in costs due to its responsibility for some of the devastating fires, especially those in 2017 and 2018, including the Camp Fire, which killed 86 people, PG&E will face bankruptcy for the second time since 2001.

The 2001 bankruptcy of the company was caused by the Enron criminal manipulation of energy supplies and prices after California deregulated the electricity sector, throwing out the window the system of regulation established in the 1930s by President Franklin D. Roosevelt. That foolish and criminal action not only bankrupted PG&E, but cost the state \$30 billion and the rate payers of California an estimated \$80 billion. The criminals of Enron did go to jail, but PG&E and the state of California are still paying for it. The Enron disaster resulted in Arnold Schwarzenegger becoming Governor, which dramatically accelerated the destruction of the state. (See the next section below in this report)

PG&E serves 16 million customers in northern California, and that covers more than 70,000 square miles. It is the largest utility in the state, and is privately owned.

Last year the California legislature created a process that allows PG&E to pass along costs of its responsibility for fire damage to its customers. The legislation, passed and signed by the governor in August of 2018, allows utilities to "securitize" billions of dollars for damage from fires they are responsible for. The state also has mandated an "inverse condemnation" rule, that holds utilities responsible for damages when officials deem power lines and other infrastructure caused the fire, even if the companies followed all required safety practices.

Under the law, now, PG&E must pay all it can pay first, then it may issue bonds that its customers can pay off over a period of years. A caveat here is that the bill, SB901, only applies to fires PG&E was responsible for in 2017. With the announcement of the bankruptcy filing the legislature is unlikely to extend the law to the 2018 fires.

Complicating this already very messy situation is that PG&E has been found guilty of felony crimes in the 2010 San Bruno explosion of its gas lines which killed 10 people, and is most likely to be found in violation of its probation. With 86 dead in Paradise from the Camp Fire, it is possible that PG&E could be charged with murder.

While PG&E has been acting to clear trees away from its lines and hardening its equipment, it has not been as aggressive in doing so as has been San Diego Gas and Electric.

Governor Newsom has responded to the already rumored bankruptcy filing as he was inaugurated the week before and had established a group to monitor, study, and propose what action the state will take. Speculation abounds, with talk of breaking up the company, or the state bailing it out and taking it over, or cities like San Francisco buying out chunks of the company.

As PG&E stock has fallen through the floor and the investors have lost billions over the past two months since the Camp Fire, one major stock holder, the hedge fund Blue Mountain, expressed its “don't give a damn about anything but our money” mentality, whining that, “the decision to file for bankruptcy is not in the best interests of all stakeholders....,” and, “it will destroy value for the Company and in particular its shareholders – the only groups to which you owe a duty.” (The quotes are from an article below).

The CEO and other top executives of the company have resigned over the past few days, and some legislators are calling for a complete clean-out of the entire board of directors.

What follows are a few excerpted articles highlighting some of the points I have just discussed. A final point, while the company has been delinquent and rightfully convicted in court, and may be even found guilty of murder in the future, before breaking it up, if that is what the court and the state determine to do, serious questions must be answered on the consequences for the entire energy grid of northern California.



The Camp Fire

Lawsuit: Poorly maintained PG&E transmission tower started Camp Fire

J.D. Morris Dec. 7, 2018 Updated: Dec. 7, 2018 6:27 p.m.

<https://www.sfchronicle.com/california-wildfires/article/Lawsuit-Poorly-maintained-PG-E-transmission-13450713.php>

A group of Camp Fire survivors claim in a new lawsuit against Pacific Gas and Electric Co. to have pinned down how the deadly fire started, blaming the ignition of the blaze on a specific part of one of the utility's transmission towers in Butte County.

“PG&E's entire system is old and decrepit, and instead of inspecting and maintaining it in a prudent fashion, they simply let it run until it fails and then fix it,” said Mike Danko, one of the attorneys involved in the suit. “Most of the time, you get away with that. ... But you don't get away with it in the situation that we have with the drought and the dry conditions.”

PG&E spikes after a hedge fund challenges its 'damaging, avoidable, and unnecessary bankruptcy'

Ethel Jiang

Jan. 17, 2019, 09:03 AM

<https://markets.businessinsider.com/news/stocks/pge-stock-price-bluemountain-capital-challenges-bankruptcy-2019-1-1027876485>

Facing pressure from [people who lost their homes in the fire](#) and [regulators](#), PG&E shares have lost more than half their value since the end of 2018, prompting the utility to seek [bankruptcy protection](#) as it feared a massive charge related to billions in costs associated with the wildfire, Reuters reported on January 4 — 10 days before PG&E announced its bankruptcy plan.

But BlueMountain says the decision to file for bankruptcy is not in the best interests of all stakeholders.

"A Chapter 11 filing while PG&E is solvent is an utter abdication of this duty," the letter reads.

"It may appear easier for Board members to file for Chapter 11 – shifting the burden of dealing with the myriad issues that will face the Board and placing it squarely on the shoulders of the Bankruptcy Court and the companies' advisors – but **it will destroy value for the Company and in particular its shareholders – the only groups to which you owe a duty.**" (Emphasis added).

PG&E was down 85% since the California wildfire, and are trading near \$7.40 a share early Thursday.

It's time to talk about radical changes to California's utilities

By The Times Editorial Board

Jan 16, 2019 | 1:10 AM

<https://www.latimes.com/opinion/editorials/la-ed-pge-bankruptcy-20190116-story.html>

It's high time we had a frank discussion about whether our current reliance on gigantic profit-making companies makes sense for the state's future.

Most Californians get their electricity from the three big investor-owned utility companies. (Not Angelenos, though, who have Los Angeles Department of Water and Power, a city-owned utility). Though they are private companies, the IOUs (as they are called for short) are treated like quasi-governmental agencies in some respects. Their rates and profits are regulated by the California Public Utilities Commission. They can't refuse to serve customers based on fire risk. And they must pay for the losses caused when their equipment destroys property or kills people, even if there was no negligence on their part. With climate change fueling larger and deadlier fires — and ever larger damage claims — this formula has shown itself to be unsustainable.

The Future of a Bankrupt PG&E May Be a Breakup

David R. Baker and Mark Chediak

[Bloomberg](#)

January 16, 2019

<https://finance.yahoo.com/news/future-bankrupt-pg-e-may-100002847.html>

(Bloomberg) -- PG&E Corp.'s looming bankruptcy could lead to an unprecedented spectacle -- a major American power company being taken over by the state or broken up for city governments to run.

More often, it works the other way. Local governments have a long history of selling off municipal utilities, switching them from the public sector to the private. Witness the ongoing efforts to privatize

Puerto Rico's troubled power authority.

But with PG&E planning to file for bankruptcy this month -- the result of mounting wildfire liabilities that could reach \$30 billion -- a government takeover has become a real possibility. In fact, the future of the power giant that has long reigned over a broad swath of California could very well involve a complete dismantling of its system and a takeover by multiple municipalities.

PG&E's own hometown of San Francisco has signaled interest in buying some of the company's assets. The city's utilities commission said Tuesday that Mayor London Breed asked it to study the possibility.

The California Public Utilities Commission has opened a proceeding to look at the structure of PG&E, including carving the utility owner into smaller, regional subsidiaries or converting it into a government-owned company, while Governor Gavin Newsom has said all options are on the table. Any effort to break up the company, or sell off pieces of it, would have to be hashed out in bankruptcy court and approved by the judge overseeing the proceedings.

PG&E bankruptcy plan leads SF to reconsider public power system

[Dominic Fracassa](#) and [J.D. Morris](#)

Jan. 16, 2019

<https://www.sfchronicle.com/business/article/PG-E-bankruptcy-leads-San-Francisco-to-reconsider-13536619.php>

The planned bankruptcy of Pacific Gas and Electric Co. has opened the possibility of San Francisco taking over some or all of the utility's local operations and infrastructure, reinvigorating an enduring debate over whether the city should take on a greater role as a power provider.

Mayor London Breed has asked the San Francisco Public Utilities Commission to analyze the impacts of PG&E's likely insolvency and what the city needs to do to ensure electricity services continue uninterrupted. The report is due in three months.

"The analysis should evaluate all options," the mayor said in a letter to SFPUC General Manager Harlan Kelly, "including the possibility of acquiring and building electrical infrastructure assets."

The idea of creating a fully independent municipal electricity program while decreasing the reliance on PG&E has been batted around in San Francisco — the utility's hometown — for generations. But arguments about the costs and complexity of such a move — along with stiff opposition from PG&E — have long sapped the political will to turn the city into a full-scale retail power provider.

But now an unprecedented collision of factors have prompted city officials to consider a takeover of some of the utility company's assets.

But state Sen. Scott Wiener, D-San Francisco, said the utility's bankruptcy provides an opportunity to explore creation of an independent electric utility. San Francisco could take a page from the Los Angeles Department of Water and Power, which provides electricity to residents of California's largest city.

"We have plenty of examples in California of publicly owned utilities that are doing a great job delivering energy," Wiener said. "(But) we don't know how the bankruptcy is going to play out. Maybe it plays in a way where there is not an opportunity for us."

What does PG&E filing for bankruptcy mean for Diablo Canyon?

[By Kaytlyn Leslie](#)

January 14, 2019

<https://www.sanluisobispo.com/news/local/environment/article224498645.html>

News that San Luis Obispo County's largest private employer plans to declare bankruptcy in the coming days had some officials worrying Monday, with many noting PG&E's plans could put the decommissioning of Diablo Canyon nuclear power plant in jeopardy.

"I am very concerned about layoffs that could affect employees who live in our community, and I remain concerned that the plant operate to the end of its licenses," county Supervisor Adam Hill said in an email to The Tribune on Monday. "There are no (greenhouse gas)-free replacements that could make up for the power the state's grid needs. It would be very bad for the state to allow it to go offline sooner than its licensed end."

The company employs more than 1,600 people in San Luis Obispo and northern Santa Barbara counties, Jones said.

Just a month ago, PG&E officials announced they would be asking for \$1.6 billion from ratepayers to pay for the safe shutdown of the plant. Those plans are pending a decision by the California Public Utilities Commission, and it's unclear whether bankruptcy proceedings could in some way impact them.

Jones said the company is still committed to that plan.



Diablo Canyon Nuclear Power Plant

The Colorado River: The Crisis Will Arrive, Whether This Year or a Couple More

January 31 is the deadline for Arizona, California, and Nevada to come to an agreement on a Drought Contingency Plan to "keep water in Lake Mead below levels that would trigger a crisis and lead to mandatory cuts in water. And if the states do not agree on a plan by the end of this month, U.S. Bureau of Reclamation Commissioner [Brenda Burman](#) says she will step in and force hard decisions."

Now California, or rather the Metropolitan Water District of Southern California is taking water it has stored in Lake Mead out. Complicating and perhaps driving the entire Colorado River system into a crisis now.

The seven states and Mexico which rely upon the river, and the 40 million people who live in areas

dependent on the river, are increasingly at risk of rationing. In addition, once the water level in Lake Mead goes below a certain level, electrical power generation from the Hoover Dam is threatened.

The following reports provide background and a picture of the present developments underway in perhaps a futile attempt to prevent the Colorado system from becoming not disfunctional, but at least partially crippled.

There is a real solution, and that solution has been on the table for 60 years. It is time for the North American Water and Power Alliance (NAWAPA). I have presented NAWAPA in these pages a few times over the past four years, but real solutions can never be repeated too often. So, here is just a couple of links to the greatest water infrastructure project ever designed:

NAWAPA 1964 -- Feature Film

<https://www.youtube.com/watch?v=c0QS9AaMfvY>

LaRouchePAC - The true story of the fight for NAWAPA, the North American Water and Power Alliance, spanning the 60s and early 70s, as told through the words of Utah's Senator Frank Moss.

Drought: The Time for NAWAPA has Come

<https://www.youtube.com/watch?v=QC-tQKUAoTA&fbclid=IwAR2Pt5LVEVCnfzHdHL37YxDHs4PmUa0xTWslsryVgb8CmKaHQBRpxvUaYeU>

The drought that now plagues huge sections of the United States is the worst in recent history. Michael Steger of the LaRouchePAC Policy committee narrates this discussion of the causes of the current crisis, and the immediate and long term remedies.



Things Are Getting Crazy on the Colorado River

The Colorado River, the source of much of the American West's economic productivity, essentially functions like a bank. This month, the nation's largest water agency, the Metropolitan Water District, began what amounts to a run on the bank.

[Ry Rivard](#)

January 14, 2019

<https://www.voiceofsandiego.org/topics/science-environment/things-are-getting-crazy-on-the-colorado-river/>

The Colorado River may not look like it, but it's one of the world's largest banks.

The river is not only the source of much of the American West's economic productivity – San Diego, Phoenix and Denver would hardly exist without it – but its water is now the central commodity in a complex accounting system used by major farmers and entire states.

This month, the nation's largest water agency, the Metropolitan Water District, began what amounts to a run on the bank.

The district – which delivers water across Southern California, including to San Diego – started rapidly withdrawing water from the river, which is stored behind Hoover Dam in Lake Mead.

Metropolitan officials are worried that the federal government is about to step in to ration the river, which 40 million people depend on as it flows some 1,300 miles from its headwaters in Wyoming and Colorado to the Sea of Cortez in Mexico.

All this is happening because an ongoing drought along the river has collided with years of overuse by the states, primarily California and Arizona.



In recent years, states realized their problem and began trying to create “surplus” water in Lake Mead and bank it for use in future years. But those bank accounts get frozen if the lake's elevation is below 1,075 feet at the start of a year. Water agencies would still be entitled to annual flows from the river fed by snow melting in the Rocky Mountains, but that's like living paycheck to paycheck while working for a fickle boss or nearly bankrupt company.

Metropolitan's immediate concern is that it will lose the ability to withdraw 600,000 acre feet of banked water from Lake Mead – enough water for roughly 7 million people. The district can only get half of that out this year, meaning it is in danger of losing lots of water.

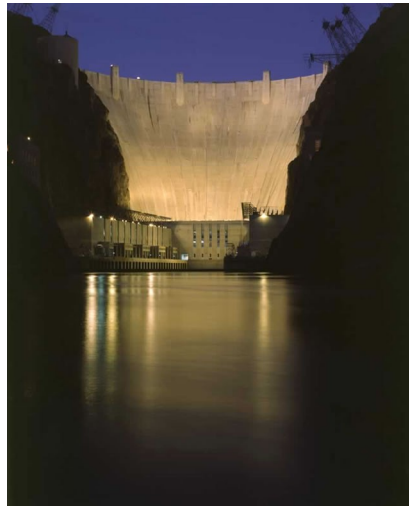
How that happened is the result of a complex, arcane and absurd accounting system. The system – used now by seven states and two countries – tries to correct a historic mistake. Starting in 1922, officials gave cities and farms rights to more water from the river than the river usually holds.

At last count, Lake Mead stood just six feet away from falling into shortage, the first step toward

rationing water. There was already about a 50-50 chance the river would fall that far this year. The chances are even higher now, because Metropolitan's plan to withdraw as much water as it can may cause the lake to drop four or five feet – though the lake will rise again as snow melts this spring.

Once there's a shortage, Arizona is supposed to be in trouble. At least on paper, California's rights to the river's water are so secure that Arizona's water supply would have to run dry before California loses a single drop.

That's politically impossible since 7 million people live in Arizona and need water. So for several years, Metropolitan and a clutch of power-players across seven states have been trying to reach a different, more realistic deal. Their efforts have repeatedly stalled, mostly because of squabbling within Arizona, which is ironic because the state stands to lose so much unless something changes.



Hoover Dam

Shutdown, additional requests for water could disrupt Arizona drought plan

By Bret Jaspers

KJZZ

January 10,

<https://cronkitenews.azpbs.org/2019/01/10/government-shutdown-could-disrupt-arizona-water-plan/>

PHOENIX – The partial federal government shutdown is affecting Arizona's painstaking work on an internal drought plan, although not enough to delay a federal deadline set for the end of this month.

Interior department lawyers have been working with Arizona's two biggest water agencies, the Central Arizona Project and the Arizona Department of Water Resources, to hammer out the various agreements required to finalize the state's plan to deal with expected drought in the Colorado River Basin, which supplies millions of people Arizona and six other Western states. Arizona is the only basin state that requires legislative approval for the drought contingency plan, known as the DPC, to be implemented.

The Steering Committee for the Arizona Lower Basin Drought Contingency Plan, made of key water stakeholders in the state, met Tuesday for the first time since Reclamation Commissioner Brenda Burman set a Jan. 31 deadline for parties to have passed the DPC.

The broad DCP covers the entire Colorado River Basin and is an effort to prop up Lakes Mead and Powell, the major reservoirs for the river system. Arizona and a few California water agencies are the last holdouts amid intrastate negotiations.

The West's Great River Hits Its Limits: Will the Colorado Run Dry?

Crisis on the Colorado: Part I

As the Southwest faces rapid growth and unrelenting drought, the Colorado River is in crisis, with too many demands on its diminishing flow. Now those who depend on the river must confront the hard reality that their supply of Colorado water may be cut off. [First in a series.](#)

By [Jim Robbins](#) / [Photography by Ted Wood](#) • January 14, 2019

<https://e360.yale.edu/features/the-west-s-great-river-hits-its-limits-will-the-colorado-run-dry>

Nature, in fact, has been given short shrift all along the 1,450-mile-long Colorado. In order to support human life in the desert and near-desert through which it runs, the river is one of the most heavily engineered waterways in the world. Along its route, water is stored and siphoned, routed and piped, with a multi-billion dollar plumbing system — a “Cadillac Desert,” as Marc Reisner [put it](#) in the title of his landmark 1986 book. There are [15 large dams](#) on the main stem of the river, and hundreds more on the tributaries.

The era of tapping the Colorado River, though, is coming to a close. This muddy river is one of the most contentious in the country — and growing more so by the day. It serves some 40 million people, and far more of its water is promised to users than flows between its banks — even in the best water years. And millions more people are projected to be added to the population served by the Colorado by 2050.

The hard lesson being learned is that even with the Colorado's elaborate plumbing system, nature cannot be defied. If the over-allocation of the river weren't problem enough, its best flow years appear to be behind it. The Colorado River Basin has been locked in the grip of [a nearly unrelenting drought](#) since 2000, and the two great water savings accounts on the river — Lake Mead and Lake Powell — are at all-time lows. An officially announced crisis could be at hand in the coming months.



The Colorado flows 1,450 from its source in Colorado to the southwest, ending just short of the Gulf of California. Map by David Lindroth

Meanwhile the Lower Basin states — Arizona, California, and Nevada — have, despite much debate,

been unable to come up with a Drought Contingency Plan to keep water in Lake Mead below levels that would trigger a crisis and lead to mandatory cuts in water. And if the states do not agree on a plan by the end of this month, U.S. Bureau of Reclamation Commissioner [Brenda Burman](#) says she will step in and force hard decisions.

There are large, existential questions facing the 40 million people who depend on the river — there simply is not enough water for all who depend on it, and there will likely soon be even less.

Most of the water in the Colorado [comes from snow](#) that falls in the Rockies and is slowly released, a natural reservoir that disperses its bounty gradually, over months. But since 2000, the Colorado River Basin has been locked in what experts say is a long-term drought exacerbated by climate change, the most severe drought in the last 1,250 years, tree ring data shows. Snowfall since 2000 has been sketchy — last year it was just two-thirds of normal, tied for its record low. With warmer temperatures, more of the precipitation arrives as rain, which quickly runs off rather than being stored as mountain snow. Many water experts are deeply worried about the growing shortage of water from this combination of over-allocation and diminishing supply.

There is [tree ring data](#) to show that multi-decadal mega-droughts have occurred before, one that lasted, during Roman Empire times, for more than half a century. The term drought, though, implies that someday the water shortage will be over. Some scientists believe a long-term, climate change-driven aridification [may be taking place](#), a permanent drying of the West. That renders the uncertainty of water flow in the Colorado off the charts. While not ruling out all hope, experts have abandoned terms like “concerned” and “worrisome” and routinely use words like “dire” and “scary.”

“These conditions could mean a hell of a lot less water in the river,” said [Jonathan Overpeck](#), an interdisciplinary climate scientist at the University of Michigan who has extensively studied the impacts of climate on the flow of the Colorado. “We’ve seen declines in flow of 20 percent, but it could get up to 50 percent or worse later in this century.”

This winter is make or break for the short term. A crisis is underway — record low flows [were seen](#) throughout last summer and fall. Another low- snow winter could light the fuse of a major crisis — an escalating crescendo of emergencies ending in a “compact call” when the lower basin states call on the upper basin states to send them their legally mandated allotment of water — whether they have it to spare or not. All of the players along the river are jockeying for “water security,” an oft-heard term in the region these days.

Another friction point is the fact that the Upper Basin States — Wyoming, Colorado, New Mexico, and Utah — still have “paper water,” meaning water [owed to them](#) by the 1922 compact, which they have not yet taken out of the river. And while many experts say no new straws should be dipped into the river to suck more water out, even if a state is entitled, there are plans afoot to do just that, setting up even more contention and wranglings.

Speculators are quietly buying up farms with water rights and holding them for the day that the price of water soars.

The future of farms and ranches that depend on Colorado River water is most uncertain. Agriculture uses about 80 percent of the Colorado’s flow to [irrigate 6 million acres](#) of crops, the largest share of which is alfalfa grown to feed cattle; cities use just 10 percent. While agriculture’s rights are senior — it staked the first claims and so, by law, is the last to lose its water in a crunch — if the going gets tough and cities start running out of water, political and economic clout would favor the millions of people who live there. In that case, agriculture would start losing some of its allotment, either willingly or unwillingly.

Feature

New 5-part Class Series on Saturdays on larouchepac.com

The Creative Powers of the Human Mind Reflect a Principle of the Universe as a Whole

Class #1: How You Think the Universe Works is How You Behave

January 5, 2019

[https://www.youtube.com/watch?](https://www.youtube.com/watch?v=ljdhX7d0anI&fbclid=IwAR0azdwZuKokR2ttwKGWkOdsRYH7YPH4V2jbW9qgdV58w2cWyf8XBFN3i3o)

[v=ljdhX7d0anI&fbclid=IwAR0azdwZuKokR2ttwKGWkOdsRYH7YPH4V2jbW9qgdV58w2cWyf8XBFN3i3o](https://www.youtube.com/watch?v=ljdhX7d0anI&fbclid=IwAR0azdwZuKokR2ttwKGWkOdsRYH7YPH4V2jbW9qgdV58w2cWyf8XBFN3i3o)

NEW LAROCHEPAC CLASS SERIES How you behave is largely shaped by how you think the Universe works, and it's likely wrong. Join LaRouchePAC's latest class series and learn to think about how you think, and why that's relevant to political economy. <https://discover.larouchepac.com/> Watch Bruce Director's entire class here, https://youtu.be/cvyQfD_ma6s

Class #2: Science — not Mathematics! — is Key to the Economy

January 12, 2019

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SPEAKERS: Jason Ross and Megan Beets, collaborators with Lyndon LaRouche in his “Basement” project, to draw out the connection of the history of science to economics

LaRouche holds that, in order to understand the anti-entropic nature of the human mind, and its ability to develop new concepts granting us increased power to shape and understand nature, we should look to the central role of Johannes Kepler, the first modern scientist. Kepler created science by ending Aristotle's centuries-long suppression of knowledge, and by venturing beyond mathematics into the domain causes.

Similarly, LaRouche maintains, Kepler's discoveries are key to understanding economic cycles as the result of dynamics, the result of physical causes. This is in opposition to the failed and unfortunately widespread approach that looks at financial numbers and tries to build up a model based on them.

Observed trends do not create themselves — their causes do. Join us in our encounter with the creativity of the human mind, and learn how it provides us crucial insights into economics!