

Drought-stricken states prepare for landmark year in fires

By Ben Baeder, Whittier Daily News
Saturday, February 15, 2014

PressTelegram.com

Long Beach Press Telegram (<http://www.presstelegram.com>)

History shows California subject to extreme droughts

Subhed jkl;f dafjkl;sda jkl; jkf kldsda

If you are reading this from anywhere in California, stop, look in the mirror and say, "I'm a champion."

It's an indisputable claim, because experts say Californians are the worldwide leaders at capturing water.

Our state has its own man-made circulation system — concrete canals and pipes that bring water from faraway mountains to farms and population centers. We're the only place in the world with anything like it.

But, like a lot of champions, we might be getting complacent, cruising to victories over a bunch of easy-to-beat weather patterns.

Because as scientists slowly piece together clues unlocking the region's ancient climate history, they are learning that California's past is marked by stifling, soul-crushing droughts that lasted 30 years or longer and brought complex societies to their knees.

We may already be in what climatologists call a megadrought.

On average, Los Angeles gets about 15 inches of rain each year, according to the Western Regional Climate Center.

In 2011, we got 12 inches.

In 2012, we got 8.

In 2013, we got 2.

And halfway into the current rainy season, we've had less than 1 inch.

The weather has been so dry that state officials announced this month that they won't send any water into the canals of the State Water Project unless rain comes soon.

No one can say for sure if we are in a megadrought. We only know that, at this rate, we'll eventually run out of water.

"You crawl into these things, and you crawl out of them," said Bill Patzert, a mathematician and oceanographer at Jet Propulsion Laboratories who is considered the foremost expert on the interaction

between the ocean and weather patterns. "But I can guarantee that we're eventually going to find ourselves in a bad one."

And this is probably not due to human-created climate change, Patzert said. It's just garden variety variation in a climate that is much more erratic than most of us realize, he said.

Just how bad can it get?

By aging old tree stumps in Lake Tahoe, climate researcher Susan Lindstrom found a dry period that lasted an estimated 1,300 years until it finally started getting wetter around 4000 B.C.

And, more recently, an extended dry period that began about 1,050 years ago likely helped cause the absolute collapse of intricate Southwest American-Indian societies.

What's more, a flood in 1605 was so severe it turned the Central Valley into a lake.

The last 150 years of weather represent some of the most peaceful, reliable periods of rainfall in the region's history, concluded paleoclimatologists B. Lynn Ingram and Frances Malamud-Roam, in their recent book "The West Without Water."

Put succinctly, Ingram and Malamud-Roam concluded that we have drastically underestimated the severity of the West's weather.

Using their own research and cross-referencing with other scientists and scientific disciplines, they say California's water supply can turn seemingly on a dime, and then stay changed for long stretches of time.

Those turns are primarily determined by the Pacific Ocean.

Patzert has been trying for years to sound the alarm about the volatility of the West's weather. From time to time, the ocean gets a little colder and then stays that way for decades.

Scientists call it the Pacific Decadal Oscillation. And when the ocean is cold, the jet stream change tends to move north, making for a much drier California.

Any surfer can remember the 1997-1998 rainy season, a time when a warm PDO crossed with warm temporary El Niño conditions. Our part of the Pacific got warm, and huge storms produced some truly legendary swells.

That season, Los Angeles got 16 inches more rain than normal.

"I'm a surfer," Patzert said. "Believe me, that was an extraordinarily warm period."

Around 2000, the PDO flipped, and the weather has since been significantly drier, Patzert said.

In essence, our state depends on five or six big storms, and if we miss a few, things get bad fast, Patzert said.

This year is the absolute nadir. The jet stream has taken a route that completely pushes the weather around California while freezing the East Coast.

For residents of the Central Valley and Sacramento areas, the dry, brown peaks circling the valley are downright foreboding.

“This year, it really feels scary,” said Sue McClurg, a spokeswoman for the Water Education Foundation, which is based in Sacramento. “Unless we have an incredible February or a miracle March, this looks bad.”

Most of the state’s water eventually runs out of the mountains and passes through McClurg’s region before it’s pumped into the canals of the State Water Project. That water eventually ends up going to farmers or to population centers in the Bay Area and Southern California.

Other communities, especially in the Imperial Valley and San Diego areas, get water from the Colorado River.

Los Angeles gets much of its water from the Owens Valley in the eastern Sierra Nevada.

The fourth source of water is groundwater supplies, which are usually replenished by melted snow from local mountains, which is the case in the San Gabriel Valley and much of the Inland Empire.

With no Sierra Nevada water available, it looks like most communities are going to have to survive the year with supplies from reservoirs and aquifers.

“People are getting really nervous up here,” McClurg said.

Unpredictable supply

To one economist, the takeaway from all of this is easy — the water supply is unpredictable, and therefore water prices will rise.

Economist David Zetland has dedicated much of his career — and a lot of his free time — to studying the way California pays for water. He runs a blog, aquanomics.com, and he argues that the price of water should be related to its availability.

“The water we use now is subsidized,” he said. “It’s subsidized by the future, by the ecosystem, and by other things.”

He’s writing a book on the subject, “Living With Water Scarcity,” which is scheduled to be published this year.

California will have to use less water, and the easiest way to cause that is to raise the price, which would immediately cut usage and force society to become more efficient, Zetland argues.

When more precipitation comes and builds up a healthy snowpack, the price should go back down, he said.

Instead, water agencies will propose what Zetland considers to be inefficient solutions, such as desalination plants and hiring public employees to police water use.

“Every big city in Australia has a desalination plant, and all of them are sitting there, unused,” he said.

Zetland and Patzert both agree that Californians could easily cut water use.

“We could reduce our water use by 30 percent without breaking a sweat,” Patzert said. “We’ve got communities up here near Pasadena that look like a rain forest. There’s a lot of fat to cut.”

Experts guess that our local water districts this summer will likely carry out some emergency measures, such as limiting outdoor watering and banning the washing of cars. That’s what happened from 1987 to 1992, during the longest sustained drought in modern California history.

At some point, farmers will end up selling their water because it will net them a higher profit than selling crops, Zetland said.

Food prices could increase, or California could end up exporting much less produce to other parts of the country and world.

All experts agree on one thing: We will probably never run out of drinking water. Farms, factories and ecosystems will all be allowed to fail. But the taps in our homes won’t be allowed to run dry.

The effects of a long drought will likely be much more subtle than a Mad Max-esque apocalypse.

Human response

The same group of scientists who dug up information about ancient droughts often work in concert with anthropologists and archaeologists who have also studied how people responded to extremely dry periods.

Researchers think regimes fell as warfare and starvation emaciated ancient cities. Skeletons in the Southwestern United States from periods of drought are marked with higher incidences of injuries from arrow tips and spears, according to anthropologist Pat Lambert of Utah State University.

“Droughts create two things,” said Douglas Kennett, an archaeologist who has studied how California’s early people responded to climate changes. “An increase in interpersonal violence and an increase in social hierarchy.”

Those who can innovate and respond to the change gain an advantage, which can cause a culture to stratify along economic lines, he said.

For instance, groups that made beads used for currency seemed to fare better than other cultures. So did groups near the coast, who depended on ocean fish for food.

Some societies formed more permanent settlements along the most reliable springs and streams.

“Certain communities dominate others,” Kennett said.

Other cultures simply disappeared.

So Californians will, with absolute certainty, eventually be forced to make a choice about water.

Zetland said California needs to make sure it can respond to droughts in a way that keeps our state efficient and competitive.

About 20 percent of the state’s energy is used to pump water.

If a drought causes a knee-jerk response that couples increased utility prices with increased taxes, businesses will leave to greener pastures in states or countries where water and power are cheap and plentiful, Zetland said.

And California, a champion of water use, will be dethroned.

“Detroit’s hope is California’s incompetence,” he said.

URL:

<http://www.presstelegram.com/general-news/20140215/history-shows-california-subject-to-extreme-droughts>

© 2014 Long Beach Press Telegram (<http://www.presstelegram.com>)