

July was Earth's hottest month on record

Scientists say climate change is worsening California drought

Paul Rogers, Bay Area News Group, 8-21-15

In a dramatic sign of climate change's growing impact, this July was the warmest month on Earth since modern temperature records were first kept in 1880, federal scientists announced Thursday.

While climate change isn't causing California's drought, it's making the disaster worse, according to a separate report released Thursday. The study by researchers at Columbia University, NASA and the University of Idaho found that rising temperatures over the four years of drought have caused more evaporation of water supplies, making California's drought about 15 to 20 percent more severe than it otherwise would be.

And there's no sign the heat is letting up.

El Niño conditions now underway in the Pacific will continue to warm the oceans and release enormous amounts of heat into the atmosphere this year, almost certainly making 2015 the hottest year ever recorded, breaking the previous record -- set in 2014 -- federal researchers said.

"The world is warming. It's continuing to warm. That's being shown time and time again in our data," said Jake Crouch, a physical scientist with the National Oceanic and Atmospheric Administration in Asheville, North Carolina.

Crouch and other researchers at NOAA, the parent agency of the National Weather Service, announced that the average global land and sea temperature in July was 61.86 degrees Fahrenheit, breaking a record set in 1998 by one-seventh of a degree, which scientists consider a large margin for year-to-year temperature changes.

That makes this July the warmest of all 1,627 months since January 1880, when Rutherford B. Hayes was president, Thomas Edison was tinkering in his lab and the U.S. had only 38 states.

Although droughts are a natural part of California and the West, the steadily warming climate is making the current drought more intense, according to the Columbia-NASA study published in *Geophysical Research Letters*, a journal of the American Geophysical Union.

The reason: Hotter weather is drying soil and plants at an unprecedented rate, pulling out moisture. And, the study found, the trend is creating a "new normal" for California.

"A lot of people think that the amount of rain that falls out of the sky is the only thing that matters," said A. Park Williams, a bioclimatologist at Columbia University's Lamont-Doherty Earth Observatory and lead author of the study. "But warming changes the baseline amount of water that's available to us because it sends water back into the sky."

At the present rate of warming and evaporation, California in 50 years will be in a semi-permanent state of drought, the study found, interrupted by intense storms.

Californians are desperately hoping the strong El Niño developing in the Pacific will bring heavy rain this

winter. After four years of below-normal rain and hot temperatures, major reservoir levels are less than half of normal for this time of year, as wildfires rage across the state.

The Sierra's spring snowpack was virtually nonexistent this year, and farmers are pumping groundwater wells so heavily that the ground in the Central Valley is sinking 2 inches a month in parts, cracking roads.

State officials and the Obama administration have passed rules in recent years requiring reductions in greenhouse gas emissions from power plants, factories and vehicles, along with mandates for more solar, wind and other renewable energy. But the new restrictions have been met with opposition from oil and coal companies and many Republican leaders.

"New scientific reports now make it crystal clear that climate change is already affecting California and the Southwest in the form of higher temperatures and a more devastating drought," Gov. Jerry Brown said in a statement Thursday. "It's time for Republicans, foot-dragging corporations and other deniers to wake up and take sensible action before it's too late."

The vast majority of the world's climate scientists -- and organizations such as NASA, NOAA, the National Academy of Sciences and the World Meteorological Organization -- say the planet is warming because the buildup of carbon dioxide and other gases in the atmosphere is trapping heat. The gases come from the burning of coal, gasoline and other fossil fuels.

Over the past 250 years, greenhouse gas concentrations have increased 40 percent in the atmosphere, and they are now at their highest rate in at least 800,000 years, according to measurements of air bubbles in ice cores from Antarctica.

Brown traveled last month to the Vatican to attend a summit on climate change held by Pope Francis, who issued an encyclical in June that said "the Earth, our home, is beginning to look more and more like an immense pile of filth." He added: "What kind of world do we want to leave to those who come after us, to children who are now growing up?"

Brown and Democratic leaders are pushing bills in the Legislature that would require 50 percent of the electricity generated in the state to come from renewable sources by 2030, up from the 33 percent now required. The legislation would also require that by 2030 petroleum use in cars and trucks be reduced 50 percent and energy efficiency in existing buildings be doubled.

The hot, dry conditions across the West this year, exacerbated by low levels of moisture in trees and shrubs, continued Thursday to play havoc with fires.

More than 383,000 acres have burned so far this year in California -- an area 13 times the size of San Francisco. That's three times the average of the previous five years, which was 125,161 acres through mid-August.

Five U.S. Forest Service firefighters have been killed in recent weeks, three in Washington state this week and two near Lake Tahoe and in Modoc County over the past three weeks.

Said Stanton Florea, a spokesman for the U.S. Forest Service: "It's been a terrible year."