Global warming's role in Calif. drought unclear, climate experts say

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Extreme drought in California is making headlines this winter, with water reservoirs across the state dipping lower than they have in decades and no rain clouds on the horizon.

But many climate change experts hesitate to attribute the state's parched conditions to global warming, saying that natural year-to-year variability in rain and snowfall is the most likely culprit.

Compared with the rest of the contiguous United States, "we have fantastic variability in our precipitation from year to year," said Michael Anderson, California's state climatologist at the Department of Water Resources in Sacramento.

"You'd be really hard-pressed to say that there's a [climate change] signature on the precipitation side of things," Anderson added. "What we're going through is more just a confluence of different earth system forcings that all seem to be wanting to put high pressure over the eastern Pacific."

This high-pressure zone, stubbornly anchoring itself along California's coast since November, has blocked the infrequent but heavy winter precipitation events that the state usually counts on between mid-December and March, said Michelle Mead, a meteorologist with the National Weather Service in Sacramento.

Above-normal temperatures last year in California could have played a role in intensifying the drought, but the magnitude of warmer weather's impact is so far difficult to parse out, said Kelly Redmond, deputy director of the Western Regional Climate Center in Reno, Nev.

"I think this is a thing where we can only understand it by looking at it in the rearview mirror. It's kind of a retrospective thing," Redmond added. "It's really hard to tell when you're in it. There's so many factors at work."

Although California has not yet officially issued a drought declaration, the latest U.S. Drought Monitor, published yesterday, showed that 97 percent of the state is now under drought.

Last year was the driest on record for Los Angeles, with the city recording a total of only 3.44 inches of precipitation in 2013. While not yet confirmed, low-precipitation records are also likely to be set in the cities of Eureka, Sacramento and Santa Cruz, as well as at the Yosemite National Park headquarters and the Shasta Dam.

No improvement in sight

Improvement is unlikely in the near term, said Brad Pugh, meteorologist with the National Weather Service's Climate Prediction Center in College Park, Md.

"For the next two weeks, the CPC is forecasting enhanced odds of below-median precipitation," Pugh said. "It seems that the drought pattern will continue at least through the first half of January."

But in an interview on Dec. 18, Martin Hoerling, meteorologist with the National Oceanic and Atmospheric Administration's Earth System Research Laboratory in Boulder, Colo., agreed with the California state climatologist's conclusion that global warming probably isn't behind current conditions.

The mechanism behind California's drought "has virtually nothing to do with climate change," Hoerling said, asserting that the underlying cause is "simply that the storm track has failed to find its way across the Pacific."

According to Richard Seager, professor at Columbia University's Lamont-Doherty Earth Observatory, the infrequent rain and snowfall events seen over the past several winters in California are "actually contrary to the latest generation of climate models."

Many of the most recent climate models predict that global warming should actually trigger an increase in midwinter precipitation in California from San Francisco northward, Seager explained, with precipitation decreases more likely to occur in the warmer seasons.

Although many climate researchers agree that global warming will make dry spells more severe by the end of the century, climate change's impact on today's droughts is still subject to intense debate.

"It is currently very difficult to separate the climate change 'signal' from the 'noise' of the natural variability in the climate system, and so we cannot say definitively what role (if any) climate change is having in the current droughts," Benjamin Cook, also of the Lamont-Doherty Earth Observatory, said in an email.

"As the climate change signal gets stronger over the coming decades, we expect it will be easier to answer this question," he added.