Study says GHGs contributed to West Coast drought

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A new study teasing out the causes of the West Coast's historic drought finds that anthropogenic climate change may have been more of a culprit than in previous dry spells.

The study, published yesterday in *Geophysical Research Letters*, examined the reasons why 81 percent of Western snow-survey sites last year had the lowest recorded snowpack in 40 years of records. That occurred even though precipitation levels were nearly normal in Oregon and Washington and unusually, but not exceptionally, low in California.

Researchers at Oregon State University and the University of California, Los Angeles, modeled simulations of last year's conditions, then varied the levels of greenhouse gases and sea surface temperatures. They found that in all three states, higher temperatures played more of a role than they did in the previous worst drought on record, from 1976 to 1977, when dry weather was the primary driver.

"Historically, droughts in the West have mostly been associated with dry winters, and only secondarily with warmth," said UCLA geography professor and study co-author Dennis Lettenmaier. "But 2015 was different, especially in California, but in Oregon and Washington, as well — the primary driver of the record low snowpacks was the warm winter."

In California, greenhouse gases added about 1 degree Celsius to 2014-15 temperatures, while sea surface temperatures had little effect. In Oregon and Washington, by contrast, modeling showed that high sea surface temperatures — which are associated with a ridge of high-pressure air over the Pacific Northwest that kept storms away — had more of an effect on snow accumulation than general warming trends associated with man-made greenhouse gases.

While earlier studies have hypothesized that the high-pressure ridge created the warm-water patch, known colloquially as "the blob," yesterday's study finds that the blob itself accounted for about twice the warming effect of greenhouse gases in Oregon and Washington.

"Some recent studies suggest that a high pressure ridge that caused warmer temperatures over land also created the blob, but our results suggest that the blob itself may also have contributed to the warm winter here," said the study's lead author, Philip Mote, director of OSU's Oregon Climate Change Research Institute.