

Study finds Sierra snowpack at 500-year low

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Not since at least the days of Christopher Columbus has there been so little snow as this past winter on California's Sierra Nevada mountains, according to a new scientific study.

On April 1, when the California snowpack generally has reached its greatest depths, the Sierra snowpack was at 5 percent of normal.

Such low amounts of snow are beyond unusual – they are unprecedented in the past 500 years, according to the study published Monday in the journal *Nature Climate Change*. The study used tree ring data to estimate the amount of snow.

“We didn't expect for it to be the lowest number in over 500 years,” said Valerie Trouet, a researcher at the University of Arizona and a co-author of the report.

Confronted with the surprising figures, Trouet said her team “ran the numbers 10 times” and each time found an extremely high likelihood that the Sierra snowpack has not been so low since about the Middle Ages.

The rivers of Northern California and the snowpack on top of the Sierra typically provide most of the surface water used throughout the state. Without the snowpack, the state's key reservoirs often run low.

The dismal snowpack prompted Gov. Jerry Brown this year to mandate a 25 percent reduction in urban water use across California. Water deliveries to farmers were slashed, causing them to rely heavily on groundwater reserves and fallow hundreds of thousands of acres. Multiple species of fish are struggling against extinction as streams become too hot for them to survive.

“It definitely set a new standard for a what a low can look like,” said Jeff Anderson, a hydrologist for the U.S. Natural Resources Conservation Service, referring to this year's snowpack. “We have data going back 100 years. It was the lowest year in that period.”

Anderson, who was not connected to the new study, noted that snow levels at Lake Lucille, a high Sierra lake in the Desolation Wilderness, were 6 inches lower this year than ever had been recorded on April 1.

Two factors contributed to record low snowpack this year, Trouet said: hot temperatures and low precipitation.

Predictive models suggest that hotter winters will become more common – as will extremely dry winters, Trouet said.

“The type of low snowpack we saw in 2015: It won't take another 500 years for this to happen again,” she said.

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