

Researcher says climate change may be cooling California

Matt Weiser, Sacramento Bee, 6-4-11

Spring passed California by, and summer remains in hiding.

Nine tornadoes have torn up the Sacramento Valley from Oroville to Fairfield. A giant Sierra snowpack, still frozen fast, has put innumerable summer adventures on hold.

The Golden State's weather has gone haywire.

And it's not over yet: Sacramento can expect as much as another 1.4 inches of rain this weekend and temperatures 20 degrees below normal, with more mountain snow.

"It's what I call global weirding," said Bill Patzert, a climatologist at NASA's Jet Propulsion Laboratory in Pasadena. "This has been a very strange year all over the planet."

What's going on?

First of all, this spring's weather is not unprecedented, just uncommon. California has had wet, cold spring weather before, notably in 1983, a year that produced record Sierra snows.

This year, the blame falls on a complex interaction between La Niña and another phenomenon called a negative Arctic oscillation, Patzert and others said.

La Niña is marked by a cooling of equatorial waters in the Pacific – the opposite of El Niño. In the past, this pattern means an equal chance of wet or dry weather.

What made this year so wet was the negative Arctic oscillation.

Typical conditions make the Arctic colder than the mid-latitudes, which include the United States and Europe. This is a positive oscillation.

Negative conditions flip this around, making the Arctic warmer than usual and pushing cold air and a vigorous jet stream down into the United States and Europe.

The deadly blizzard that struck New York and other Northeast states in December is one consequence.

"It's a great snow producer, rain producer and tornado producer when it's in that pattern," Patzert said. "Nobody knows exactly what causes that."

One theory gaining traction is that climate change, in fact, may be to blame.

The theory was developed in several published papers by Judah Cohen, an atmospheric scientist in Massachusetts.

Cohen argues that ice melt in the Arctic has produced more snowfall across Siberia. All that snow creates a giant cold air mass that diverts the jet stream, contributing to the negative Arctic oscillation.

Cohen successfully predicted this winter's colder temperatures across the northern United States, but said the phenomenon influences weather on the East Coast more than the West.

Colder and snowier winters caused by global warming? It may be one of the counterintuitive consequences of climate change, he said.

"We don't understand everything, and we don't understand how the different feedbacks affect different parts of the climate system," said Cohen, director of seasonal forecasting at Atmospheric and Environmental Research, a private firm in Lexington, Mass. "It's very complicated. So we should expect the unexpected."

Californians have been getting plenty of practice at that.

Those nine tornadoes, for example: While far weaker than recent twisters in the Midwest, they caused significant damage to a handful of agricultural operations.

An almond farm near Ord Bend in Glenn County had half its trees in a 35-acre orchard destroyed by a tornado that touched down May 25. A roof was torn off a dairy barn at another nearby farm.

Nine tornadoes sounds like a lot, but the region actually had more in 2005. They typically occur when longer spring days warm up the land surface, then a cold storm arrives. The temperature difference creates wind shear and updrafts that can spin into a twister.

The region's farmers have been affected by more than tornadoes, said Jean Miller, assistant agricultural commissioner in Glenn County.

"The cooler weather is just not allowing the plants to grow like they should be," she said. "We have the possibility for diseases which we would not normally be having at this time of year, when it should be 80 or 90 degrees."

A lot of recreation is also on hold.

On Thursday, organizers of the storied Tevis Cup Western States Trail Ride decided to move it from July to October for the first time in its 56-year history. The 100-mile horse race uses a trail across the Sierra Nevada, from Squaw Valley to Auburn, that is completely snowed in.

The event avoided postponement in the big snow year of 1983 by using an alternate trail.

"Two months ago, we had planned on using that alternate route," said ride director Chuck Stalley. "But our alternate route is basically snowed in. It's been a rough year."

The statewide snowpack stands at 262 percent of average. Rather than shrinking, as it normally would by this date, the snowpack has held steady and even grown deeper in places with new storms.

In February, the Arctic oscillation returned to its positive phase, yet storms continue to hammer California. The likely cause is a third phenomenon: A cooling of the North Pacific Ocean called the Pacific decadal oscillation.

"I don't think we're done yet," Patzert said.

The state's reservoirs are brim-full, yet the snowpack still has to melt. This could lead to flooding problems, especially on the San Joaquin and Kings rivers, said Rob Hartman, hydrologist-in-charge at the California-Nevada River Forecast Center, a branch of the National Weather Service.

The peak of spring snowmelt, Hartman said, is probably now delayed to late June or early July – at least a full month late.

Hartman said the reservoir operators are confident they can handle the remaining snowmelt, but he remains concerned.

"This is a very unusual year," he said. "So there's a real possibility that we are underestimating everything."