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Forecasters missed the wildly wet winter. We asked NOAA why.

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NOAA forecasters missed by a mile when they predicted in October that winter would be "drier than average" in California and across the South.

Cue floods, whiteout blizzards and torrential downpours.

Instead, California experienced one of the wettest winters in history. On March 14, for example, Los Angeles was drenched with 1.89 inches of rain, breaking a record set in 1930.

The effects of the wild winter weather are still being felt. The nation's most populous state has saturated soil from earlier rains, multiple rivers in flood stage and mountain areas with as much as eight feet of snow — poised to produce more flooding as spring gets warmer.

How did forecasters miss so badly?

David DeWitt, the director of NOAA's climate prediction center, said in an interview that the possibility of heavy precipitation was covered in later reports made 15 to 30 days before the winter surprise began.

He blamed the delay in accurate forecasting on two global weather patterns. One is called the El Niño-Southern Oscillation, or ENSO. The other is called the Madden-Julian Oscillation (MJO). The circulations that helped form them are so large they can sprawl over half the globe.

DeWitt explained that computerized climate models sometimes have difficulty finding and tracking the patterns' impacts. ENSO was first discovered years ago by South American fishermen, when they noticed that coastal ocean waters sometimes warmed around Christmas. They called it "El Niño," or the little boy.

In other years, though, the oceans cooled. That phenomenon became known as La Niña. Finally, there were periods when the ocean waters didn't vary from average temperatures, qualifying them as the "neutral" phase of ENSO.

As for the Madden-Julian Oscillation, it is named after two American meteorologists: Roland Madden and Paul Julian. They documented this pattern in 1971. It is formed by very warm ocean waters; when the jet stream steers it into an ENSO pattern, the result can be a "heavy precipitation event," according to one description of the MJO.

"The two phenomena then had destructive interference, and MJO won," explained DeWitt, with a shrug.

This outcome wasn't evident in October because MJO is only predictable within 30 to 50 days before it happens, he said. "This is the state of the art in seasonable predictions," he added.

As he described it, NOAA's success of predicting the arrival of an ENSO event in 1998 and 1999 encouraged the agency to start making seasonal, 90-day forecasts in advance. But by 2014, it began to realize that it had only "modest skills" in predicting seasonlong risks involving climate change.

So in 2014, NOAA started a new program to give people a better understanding of the complex nature of weather patterns and climate change.

Called the ENSO Blog, it started as a weekly column written by a team of NOAA meteorologists. It is used by journalists, high school teachers and college professors, the agency says. In recent years, its appearance dropped to twice a month.

In November 2019, NOAA took a second step.

It had spent a considerable amount of money improving computer predictions of hurricanes and where they might go. The result was that damages, which were costing over $25 billion a year, began to shrink.

So the agency appointed a working group to study how a “precipitation prediction grand challenge” strategy might improve climate change forecasts.

The plan, adopted in 2020, is aimed at doubling the predictive skill of precipitation forecasts within 10 years. DeWitt described its potential as being “very strong and robust.”

Xianan Jiang, a climate researcher at UCLA, was the lead author of a recent study in the *Bulletin of the American Meteorological Society* that asserted current computer models “show nearly no skill” in predicting the effects of complex weather patterns, beginning with MJO and the variations of ENSO.

In an interview, Jiang said, “this is a challenge for the climate community,” including researchers at NOAA and governments and universities around the world.

“We need to have many people working in this field,” he said.