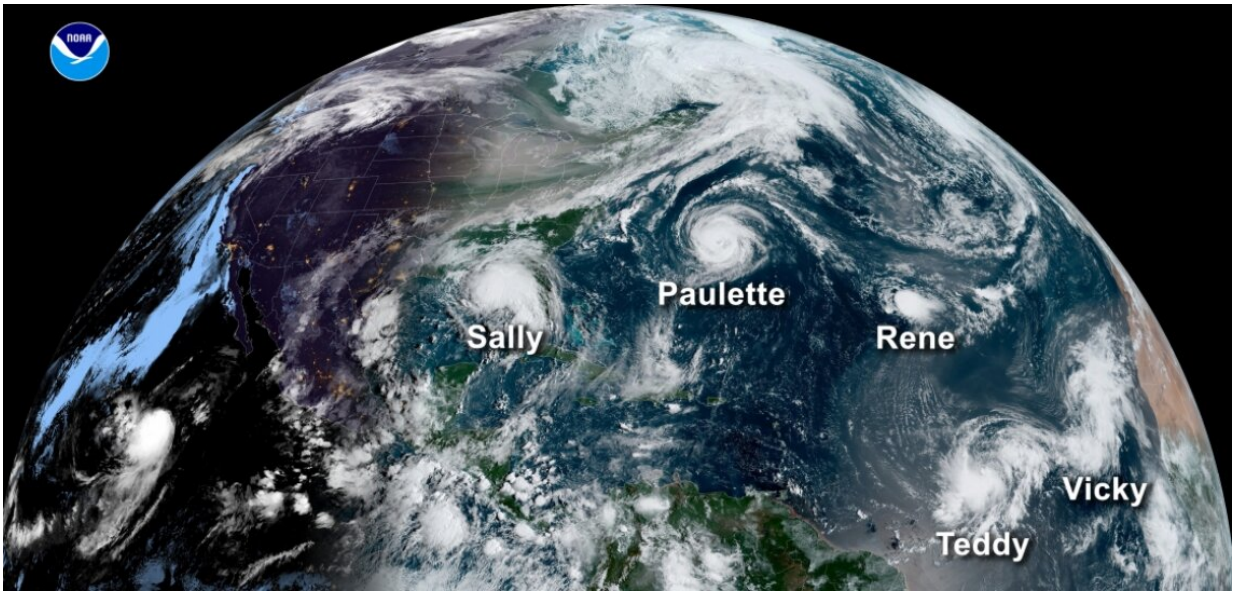
Above-average Atlantic hurricane activity again expected in 2021

April 22 2021, by Mikayla MacE Kelley



The 2020 Atlantic hurricane season produced 30 named storms and 13 hurricanes – six of which were major hurricanes. In April 2020, University of Arizona forecasters predicted 19 named storms and 10 hurricanes – including five major hurricanes. Credit: University of Arizona

The year 2020 saw the most active hurricane season on record and marked the fifth consecutive year for above-average activity. A University of Arizona-led hurricane forecasting team predicts another year of above-average hurricane activity over the Atlantic Ocean in 2021.

The team predicts 18 named storms, including eight hurricanes, throughout the 2021 North Atlantic hurricane season, which runs from June 1 to Nov. 30. In comparison, the 30-year average is 13 named storms and seven hurricanes annually.

Four storms are expected to produce major hurricanes, which are defined as category 3, 4 or 5.

If the predictions are realized, 2021 will be the sixth-consecutive year for above-average activity.

"The past decade has been very active for hurricanes," said forecast creator Xubin Zeng, director of the university's Climate Dynamics and Hydrometeorology Center and a professor of atmospheric sciences.

"We need to ask ourselves if this is part of the natural variability of the system, or if we are already seeing impacts of global warming," said Zeng, who is also the Agnes N. Haury Endowed Chair in Environment in the Department of Hydrology and Atmospheric Sciences. "If this is part of the natural variability, then after some overactive seasons, we'd expect activity to quiet down, but every year is kind of crazy in the past few years."

While Zeng expects that a warming world is translating to warmer ocean waters that fuel hurricane development, that can't yet be confirmed through modeling.

"In climate modeling, every model resolution (similar to a single pixel or grid box on the Earth's surface) is about 50 miles by 50 miles. In contrast, for global weather forecasting models, the resolution is more like five miles by five miles," Zeng said. "If we really want to simulate the impact of global warming on hurricanes, it's preferable we have the smaller model grid box, and we just don't have the computing power for

that yet for decade-long simulations."

Zeng predicts, however, that in another 10 years, he will have the data and confidence to say for sure that the increase in hurricane activity was outside of the natural variability of the climate.

While this season is expected to bring above-average activity, it isn't expected to be as dramatic as last year, partly due to average climate patterns in the Pacific Ocean driven by sea surface temperatures.

When eastern tropical Pacific sea surface temperatures are below average—a weather phenomenon known as La Niña—it drives up easterly wind speeds over the Atlantic that exacerbate hurricanes. When Pacific sea surface temperatures are above average—a weather pattern referred to as El Niño—it weakens easterly winds and weakens hurricane activity over the Atlantic.

Zeng and former graduate student Kyle Davis developed the hurricane model, which combines seasonal forecasts of sea surface temperature, wind, pressure, humidity and precipitation from the European Centre for Medium-Range Weather Forecasts with machine learning and the researchers' own understanding of hurricanes. The team made forecasts 51 times to constrain uncertainty in their predictions.

The team began making its annual predictions in 2014, and the UArizona model is now one of the most accurate in the country for hurricane forecasting.

The team will update predictions again in June.

Provided by University of Arizona

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