UA Atmospheric Scientists Forecast Six Atlantic Hurricanes in 2015

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For the 2015 hurricane season (1 June to 30 November), the University of Arizona (UA) forecasting model developed by Kyle Davis, Xubin Zeng and Elizabeth Ritchie (Davis et al. 2015) predicts 6 hurricanes in the North Atlantic, including the Gulf of Mexico and Caribbean Sea. Six is the historical average for Atlantic hurricanes since 1950. Hurricanes are tropical cyclones with wind speeds in excess of 73 mph.

Our group's prediction is in sharp contrast to the less active hurricane season predicted by other centers or research groups. The NOAA Climate Prediction Center projects a 70% chance of between 3 and 6 hurricanes, Colorado State University forecasts 3, and Tropical Storm Risk foresees 4.

The March/April/May averaged tropical Atlantic sea surface temperature is slightly above the historical average (since 1950), favoring hurricane activities.

Our model also includes the force of the wind on the ocean. Strong winds reduce sea surface temperatures because they mix the ocean layers, thereby bringing cooler, deeper water to the surface. The May averaged zonal pseudo wind stress (i.e., zonal wind velocity times total wind speed) in the North Atlantic to the 3/2 power is also above the historical average in magnitude, hindering hurricane activities.

One of our innovations is using the state of a longer-term climate cycle called the Atlantic Multidecadal Oscillation (AMO) to judge how much influence El Niño has in a particular year. The other forecasting models rely heavily on the state of the El Niño climate cycle, a three-to-seven-year cycle that affects weather all over the globe.

The Pacific sea surface temperature (ENSO) index in April and May was positive (indicating a strengthening El Niño), which was a major reason for the less active hurricane season predicted by other groups. In contrast, because AMO was also positive in April and May, the El Niño effect was not considered in our model, leading to an average hurricane season in our prediction.

We estimate the range of hurricane numbers at 4 to 8 by adding/subtracting one standard deviation of forecast errors. Calculated this way, the range captured 84% of the actual hurricane counts from 1950-2013 (Davis et al. 2015).

While our model outperforms the other three from 2001-2013 (Davis et al. 2015), our hindcast skill does not necessarily translate to future skill. This year will be an interesting test.

Reference: Kyle Davis, Xubin Zeng, and Elizabeth A. Ritchie, 2015: A New Statistical Model for Predicting Seasonal North Atlantic Hurricane Activity. *Wea. Forecasting*, **30**, 730–741, doi: 10.1175/WAF-D-14-00156.1

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