Scientists unveil new seasonal hurricane forecasting model

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Scientists at The Florida State University's Center for Ocean-Atmospheric Prediction Studies (COAPS) have developed a new computer model that they hope will predict with unprecedented accuracy how many hurricanes will occur in a given season.

After about five years developing and assessing the model, Associate Scholar Scientist Tim LaRow and his COAPS colleagues are putting the system to the test this year with their first-ever hurricane forecast. The COAPS model is one of only a handful of so-called "dynamical models" in the world being used to study seasonal hurricane activity.

The COAPS model has predicted a below-average season in the Atlantic Ocean, with a mean of eight named storms and four hurricanes based partially on emerging El Nino conditions. During an El Nino, the warmer ocean temperatures in the tropical eastern Pacific tend to suppress hurricane activity in the Atlantic. The historical seasonal average is 11 tropical storms and six hurricanes.

"Making a real-time forecast for the first time is always very interesting and a very good test of the model," LaRow said. "The hard part is in the waiting to see how the model verifies."

LaRow and COAPS researchers Lydia Stefanova and Dong-Wook Shin issued their forecast on June 1, the official start of the six-month hurricane season. The tropics traditionally don't become active until the early fall months, so it's too early to tell if the forecast is on track.

However, the researchers have good reason to feel confident.

Before making this year's prediction, they used the model to perform 20 years of re-forecasts, or hindcasts, using the sea surface temperatures determined by the National Oceanic and Atmospheric Administration on June 1 of every year from 1986 to 2005. They found a very high correlation between the model's predictions of the number and intensity of tropical cyclones and what actually occurred during those years.

In addition, the model outperformed many statistical and other dynamical models, LaRow said. Statistical models use statistical relationships between oceanic and atmospheric variables to make a forecast, while dynamical models, such as the COAPS model, require major computing resources in order to make trillions of calculations using the equations of motion along with the best physical understanding of the atmosphere.

The COAPS model uses the university's high-performance computer to synthesize massive amounts of information including atmospheric, ocean and land data. A key component of the COAPS model is NOAA's forecast of sea surface temperatures. But COAPS researchers continue to study their own model in an effort to better understand the relationship between sea surface temperatures and climate predictability.

"All models are unique, and what makes them unique is the physics inside them," LaRow said. "How and why our model's collection of physical processes captures the year-to-year variability so well needs to be better understood. This research will lead to even greater seasonal forecasting skill in the future."

In 2006, COAPS received a $6.2 million, five-year grant from NOAA that has been used, in part, to support the development of this model.

Source: Florida State University (news : web)