Research offers new way to predict hurricane strength, destruction

September 15 2014

A new study by Florida State University researchers demonstrates a different way of projecting a hurricane's strength and intensity that could give the public a better idea of a storm's potential for destruction.

Vasu Misra, associate professor of meteorology and co-director of the Florida Climate Institute, and fourth-year doctoral student Michael Kozar introduce in the *Monthly Weather Review* of the American Meteorological Society a new statistical model that complements hurricane forecasting by showing the size of storms, not just the wind speed.

The model predicts the amount of integrated kinetic energy within Atlantic tropical cyclones. This kinetic energy metric is related to the overall size and strength of a storm, not just the maximum wind speed. Predictions of this metric complement existing forecasting tools, potentially allowing forecasters to better assess the risk of hurricanes that make landfall.

"We don't perceive this to be an alternative to how storms are explained to the public, but a complement," Misra said.

Hurricane forecasts have traditionally focused on wind speeds as measured through the Saffir-Simpson Hurricane Wind Scale. For example, a storm that has wind speeds of 74 to 95 miles per hour would be called a Category 1 storm. A hurricane with wind speeds of 157 miles per hour or higher would be listed as a Category 5.

However, some of the most destructive hurricanes to hit the United States have been labeled a Category 1 or Category 2 because of their slower wind speeds.

Hurricane Ike, for example, was a category two storm when it made landfall in 2008, meaning it had maximum sustained winds of 96 to 110 miles per hour. Despite the modest rating on the Saffir-Simpson Hurricane Wind Scale, Hurricane Ike caused widespread destruction because it was such a large storm.

"When the National Hurricane Center says Category 1, the attitude by the public is that it's fine and they can live through it," Misra said. "But, the damage by flooding is typically more widespread in larger storms."

Added Kozar: "It's the wind that gets all the attention, but it's the flooding that causes much of the damage."

Kozar and Misra's work thus far has focused on using data on storms dating back to 1990. The next step in their research is to focus on real-time weather prediction, so they can show the model in action.

Provided by Florida State University