New Tools for Hurricane Forecasting

During the 2015 hurricane season, forecasters at the National Hurricane Center (NHC) have access to new tools to assist with the analysis and prediction of tropical storms and hurricanes. Some of the new techniques have been funded and tested through the Joint Hurricane Testbed (JHT). The mission of the JHT is to transfer more rapidly and smoothly new technology, research results, and observational advances of the United States Weather Research Program within the National Oceanic and Atmospheric Administration (NOAA), its sponsoring agencies, the academic community and other groups into improved tropical cyclone analysis and prediction at operational centers.

This year there were six projects accepted and are being implemented into operations at either NHC or the Environmental Modeling Center (EMC):

1. "Improving the operational TC models at NOAA/National Centers for Environmental Prediction and Navy/Fleet Numerical Meteorology and Oceanography Center" by Prof. Isaac Ginis at the University of Rhode Island and Mr. Morris Bender at NOAA's Geophysical Fluid Dynamics Laboratory (GFDL). This project involved improving physics, resolution, and initialization of the GFDL hurricane model.
2. "Development of a Probabilistic Tropical Cyclone Genesis Prediction Scheme" by Mr. Jason Dunion at NOAA's Hurricane Research Division. This project is providing the first ever disturbance-based quantitative guidance for predicting tropical cyclone formation.
3. "Improvements in Statistical Tropical Cyclone Forecast Models" by Dr. Mark DeMaria (previously with NOAA's National Environmental Satellite, Data, and Information Service, now at NHC). This project developed a new seven day baseline scheme to determine skill levels of both official NHC and model forecasts for track and intensity (maximum sustained surface winds).
4. "Improvement to the SHIPS Rapid Intensification Index" by Mr. John Kaplan (NOAA's Hurricane Research Division). This project provides improved statistical forecast guidance for rapidly intensifying tropical storms and hurricanes.
5. "Updating the secondary eyewall formation probabilistic model, completing new climatologies of intensity and structure changes associated with eyewall replacement cycles, and construction of new forecast guidance tools based on the new climatologies" by Dr. Jim Kossin (NOAA's National Centers for Environmental Information). This project

provides improved guidance on when an eyewall replacement cycle may begin in a hurricane and how much the intensity would be reduced as a result.

6. "Improved Stepped Frequency Microwave Radiometer (SFMR) surface wind measurements in intense rain conditions" by Dr. Eric Uhlhorn of NOAA's Hurricane Research Division. This project improves the accuracy of retrieved surface winds in tropical cyclones from the SFMR, which is aboard the NOAA and Air Force "Hurricane Hunter" aircraft.

Seven on-going JHT projects are being tested during the 2015 hurricane season. Operational implementation decisions will be made for these projects this coming spring.

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