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Evaluation of Experimental Models for Tropical Cyclone Forecasting in Support of the NOAA Hurricane Forecast Improvement Project (HFIP)

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In 2009, the National Center for Atmospheric Science (NCAR)/Research Applications Laboratory's (RALs) Joint Numerical Testbed (JNT) Program formed a new entity called the Tropical Cyclone Modeling Team (TCMT). The focus of this team is testing and evaluation of experimental models with the goal of improving tropical cyclone forecasts in the Atlantic and Eastern Pacific Basins. Much of this effort is sponsored by NOAA's Hurricane Forecast Improvement Project (HFIP). For HFIP, the TCMT designs model evaluation experiments and provides general testing and evaluation of the various forecast models included in the HFIP annual forecasting demonstrations and retrospective experiments. The TCMT is developing statistical approaches that are appropriate for evaluating a variety of tropical cyclone forecast attributes. These methods include new diagnostic tools to aid, for example, in the evaluation of track and intensity errors, precipitation and tropical cyclone structure forecasts.

Recently, the TCMT conducted an evaluation of a set of experimental models that were candidates for future inclusion into the operational forecasting system at the National Hurricane Center (NHC). This 2010 retrospective analysis was conducted using storms observed during the 2008 and 2009 hurricane seasons in the Eastern Pacific and Atlantic basins. The goals of the 2010 retrospective testing are to (1) provide adequate statistics for assessing the skill of the model candidates, (2) help identify modeling systems to could be included in future operational forecast guidance, and (3) provide information that may help to calibrate the multi-model ensemble forecasts. The retrospective testing focused on a representative sample of 27 storms from the 2008 and 2009 hurricane seasons. Four modeling groups participated in the retrospective testing. The models included two configurations of the Weather Research and Forecasting (WRF) model, a new version of the NOAA Geophysical Fluid Dynamic Laboratory's (GFDL) model, and the Navy's tropical cyclone model. This presentation will provide an overview of the 2010 retrospective testing, a summary results from the track and intensity errors comparisons of the individual participating models, and an evaluation of the impact of including the experimental model in the NHC conventional consensus forecast. The presentation will also provide an overview of future plans for the evaluation of tropical cyclone forecasts for the upcoming hurricane season.