Investigating the Utility of Multi-Lead-time Probabilistic Rapid Intensification Models

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The SHIPS rapid intensification index (SHIPS-RII) has provided operational estimates of the probability of tropical cyclone rapid intensification (RI) in the Atlantic and eastern North Pacific basins since being adopted as an operational forecasting tool by the National Hurricane Center prior to the 2004 and 2006 Hurricane Seasons, respectively. Although the original version of the SHIPS-RII utilized only a few large-scale atmospheric and oceanic variables and information related to the current storm intensity to estimate the probability of RI, improved versions that employed more storm structurally-based predictors and more sophisticated statistical methods have subsequently been developed.

Since the original version of the SHIPS-RII provided probability of RI estimates for only the 24-h lead-time, new versions were developed for the added lead times of 12-h, 36-h, and 48-h. Recently, these new SHIPS-RII models have been combined with newly developed logistic regression and Bayesian probabilistic RI models to derive new consensus-based multi-lead-time RI models. The above new suite of RI models was successfully transitioned to operations for use in both the Atlantic and eastern North Pacific basins at the beginning of the 2016 Hurricane Season.

During our presentation, a verification of the new multi-lead-time RI model guidance suite's performance as well as ongoing efforts to extend the forecasting capability of those models out to 72 h will be provided.