ABSTRACT

Communicating the Threat of a Tropical Cyclone to the Eastern Range

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The 45th Weather Squadron (45 WS) has developed a tool to help visualize the Wind Speed Probability product from the National Hurricane Center (NHC) and to help communicate that information to space launch customers and decision makers at the 45th Space Wing (45 SW) and Kennedy Space Center (KSC) located in east central Florida. This paper reviews previous work and presents the new visualization tool, including initial feedback as well as the pros and cons.

The NHC began issuing their Wind Speed Probability product for tropical cyclones publicly in 2006. The 45 WS uses this product to provide a threat assessment to 45 SW and KSC leadership for risk evaluations with an approaching tropical cyclone. Although the wind speed probabilities convey the uncertainty of a tropical cyclone well, communicating this information to customers is a challenge. The 45 WS continually strives to provide the wind speed probability information to customers in a context which clearly communicates the threat of a tropical cyclone. First, an intern from the Florida Institute of Technology (FIT) Atmospheric Sciences department, sponsored by Scitor Corporation, independently evaluated the NHC wind speed probability product. This work was later extended into a M.S. thesis at FIT, partially funded by Scitor Corporation and KSC. A second thesis at FIT further extended the evaluation partially funded by KSC. Using this analysis, the 45 WS categorized the probabilities into five probability interpretation categories: Very Low, Low, Moderate, High, and Very High. These probability interpretation categories convert the forecast probability and forecast interval into easily understood categories that are consistent across all ranges of probabilities and forecast intervals. As a follow-on project, KSC funded a summer intern to evaluate the human factors of the probability interpretation categories, which ultimately refined some of the thresholds. The 45 WS created a visualization tool to express the timing and risk for multiple locations in a single graphic.

Preliminary results on an on-going project by FIT will be included in this paper. This project is developing a new method of assigning the probability interpretation categories and updating the evaluation of the performance of the NHC wind speed probability analysis.