

**JHT Mid-term Report**  
**April 1, 2006 – October 31, 2006**

**Estimating tropical cyclone wind radii utilizing an empirical inland wind decay model**

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**Mid-term progress report:**

**Accomplishments:**

Numerous modifications were made to the decay model code in preparation for real-time testing during the 2006 hurricane season. These modifications were required to implement an updated version of the decay model that is better designed to handle landfalling tropical cyclones that traverse islands and peninsulas (DeMaria et al. 2006). Specifically, a wind field on a cylindrical grid with 5 km radial and 15 deg. azimuthal spacing was generated every hour along the NHC forecast track. The shape of the wind field was determined every hour by fitting the NHC OFCI forecasted storm structure, intensity, and storm speed along the forecast track using a modified Rankine vortex. The wind field on the cylindrical grid was then decayed for time periods when the storm was overland using the updated version of the decay model (DeMaria et al. 2006). The updated version of the decay model uses the fractional area of the storm that is over land to modify the decay rate that was determined in the original version of the model (Kaplan and DeMaria 1995, 2001). For time periods when a storm moved back over water after having made landfall, the trend in the OFCI intensity forecast was then employed to adjust the decayed wind field. The resultant decayed wind field was then sampled every hour and the maximum wind and radius of 34,50 and 64 kt wind were then estimated and written to a file.

After the decay model was fully tested, scripts were written to run the decay model in real-time on the JHT computer for all Atlantic and E. Pacific systems. After consultation with the NHC hurricane specialists, the decision was made to only print out estimates of the maximum wind, and 34,50, and 64 kt wind radii when a system crossed land during a given forecast period. Commencing in the middle of September, these estimates were provided to the NHC for all landfalling Atlantic and E. Pacific systems.

**Future Work:**

The maximum wind and wind radii estimates generated using the updated version of the decay model will be compared to best track estimates of these same parameters and the results will be presented at the upcoming 2007 Interdepartmental Hurricane Conference (IHC).

**References:**

DeMaria, M, J.A. Knaff, and J. Kaplan, 2006: On the decay of tropical winds crossing narrow landmasses. *J. Appl. Meteor.*, **45**, 491-499.

Kaplan, J., and M. DeMaria, 1995: A simple empirical model for predicting the decay of tropical cyclone winds after landfall. *J. Appl. Meteor.*, **34**, 2499-2512.

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