

Title: “Statistical Models of Holland Pressure Profile Parameter and Radius to Maximum Winds of Hurricanes from Flight Level Pressure and H*Wind data” (07/23/2007)

Authors: Peter J Vickery and Dhiraj Wadhera.

Recommendation: Accept with minor changes.

Summary:

This paper makes use of flight level data and H*wind re-analyses to develop Statistical models of B and RMW. From this large data set only 2291 profiles meet the quality control criteria. The retained profiles (1977-2001) along with H*wind data (2004-2005) are seasonally and geographically representative. Using various good methods, this data set is used to estimate B and RMW. From the estimated B and RMW values (extracted at every three hours) the authors develop very useful statistical models of B and RMW.

However, in their intent to develop models of B and Rmax for all hurricanes, the author may have eliminated profiles of category one hurricanes during the filtering process. I suggest that the authors consider increasing the upper boundary on the central pressure, this will have a small increase in the sample size and may have a small impact on the developed models.

Minor comments:

1. **page 6:** “Criteria (b): results in the data associated with Category 1 or higher hurricanes only.” Based on Table 1, this criterion eliminated 1180 profiles which is significant. The eliminated profiles may have contained hurricane profiles since we can have hurricanes with central pressure in the 990mb range. The author should consider relaxing the 25mb (deltaP) condition. The following are examples of hurricanes with central pressure in the 990mb range:
Eg: 1- Hurricane Charley had a central pressure of 992 mb and winds were 70 knots at landfall near Cape Romain, SC. The report can be found at
<http://www.nhc.noaa.gov/2004charley.shtml>
2- Hurricane Humberto had a central pressure of 992mb and winds were over 70 knots before landfall. This can be verified at <http://meso.aoml.noaa.gov/AnalysisOutput.html>
3- Hurricane Lorenzo had a central pressure of 990mb and winds were over 70 knots before landfall, this can be verified at <http://meso.aoml.noaa.gov/AnalysisOutput.html>

In general this could be statistically insignificant in terms of the total number of storms but may have a small impact in terms of the number of passes through the storms. I suggest that the

authors look into this case.

Page 8: First paragraph in part 4 the following sentence; “A B value chosen so that the maximum surface level wind speed obtained from the model match the H*wind estimate of the maximum wind” needs more details on why this method of estimating B is better than matching the shape of the curve around the radius of maximum wind.

page3, and 9: The author's conclusion in the last paragraph (page 3) may need to be more specific; consider adding a table that compares the gulf hurricanes to the rest of the US land falling by SS category. In the last paragraph (page 9) of section 4, the author may add that in their conclusion, they are comparing the same kind of storms (In terms of SS scale).

Page 9, 10, and 13: The authors develop statistical models for RMAX and B with the condition that the upper boundary for central pressure is 980mb. If the authors's goal is to develop statistical models for all hurricanes (as mentioned in page 6 and in page 9 section 5.1 All hurricanes) then they should relax the 980mb condition as we have hurricanes with central pressure in the interval [980, 990] mb (based on HURDAT and H*Wind).

Miscellaneous comments:

Figure 5. The central pressure plot should be replaced by the Holland B plot for Hurricane Rita.

page 2. There is a Missing parenthesis after RMW.

page 3. After the sentence “with a major difference between”, “there” should be replaced by “their”

page 6. “Central pressure difference is less than 25mb” should mention what the two quantities are, perhaps it can be replaced by “ The difference of the peripheral pressure and the central pressure is less than 25mb”.

page 7. “Landfall’s “ should be replaced by “landfalls”

page 15. “modeling B as a function of fcRMW” should be replaced with “modeling B as a function of the product of fc and RMW” or replace it with “modeling B as a function of fc and RMW”.

page 15. “The regression model relating B to fcRMW” should be replaced with “The regression model relating B to the product of fc and RMW”.