

## **Minor Modification to Saffir-Simpson Hurricane Wind Scale For the 2012 Hurricane Season**

The Saffir-Simpson Hurricane Wind Scale (SSHWS) is undergoing a minor modification for 2012 in order to resolve awkwardness associated with conversions among the various units used for wind speed in advisory products. The change broadens the Category 4 wind speed range by one mile per hour (mph) at each end of the range, yielding a new range of 130-156 mph. *This change does not alter the category assignments of any storms in the historical record, nor will it change the category assignments for future storms.* The reasoning behind this change and a tabulation of the old and new scales is given below.

Because of the inherent uncertainty in estimating the strength of tropical cyclones, the National Hurricane Center and the Central Pacific Hurricane Center assign tropical cyclone intensities in 5-knot (kt) increments (e.g., 100, 105, 110, 115 kt, etc.). Some advisory products, however, require intensity to be given in units of mph and kilometers per hour (km/h). For these products, the intensity in knots is converted into mph and km/h and then rounded to 5-mph and 5-km/h increments, so as not to suggest that the intensity of the storm can be known to unrealistic precision (e.g., 127 mph!).

Unfortunately, this conversion and rounding process doesn't work well at the Category 4 boundaries. Category 4 has historically been defined to be 131-155 mph (with corresponding ranges in other units given as 114-135 kt, and 210-249 km/h). A hurricane with an assigned intensity of 115 kt, therefore, is a Category 4 hurricane. However, when 115 kt is converted to mph (132.3 mph) and then rounded to the nearest 5 mph (130 mph), the result falls in the Category 3 mph range. In order for the hurricane to appear as Category 4 in both kt and mph, NHC is forced to incorrectly convert 115 kt to 135 mph in its advisory products. A similar problem occurs when the Category 4 intensity of 135 kt is converted to km/h.

To solve these rounding issues, the new SSHWS broadens the Category 4 wind speed range by one mph at each end of the range, yielding a new range of 130-156 mph (113-136 kt, 209-251 km/h). With this change, a 115-kt Category 4 hurricane can have its intensity properly converted to mph and rounded to the nearest 5 mph (130 mph) – and remain within the Category 4 mph range.

It's important to reiterate that because NHC assigns intensity using 5-kt increments (and will be doing so for the foreseeable future), neither storms in the historical record nor any future storms would have their SSHWS category changed as a result of this adjustment. Changing the Category 4 range to 130-156 mph, 113-136 kt, and 209-251 km/h simply allows all unit conversions from knots to be done correctly and keep storms in the correct category, regardless of the units used.

Summary of the SSHWS change (highlighted in yellow):

Category	Previous range	New range
1	74-95 mph 64-82 kt 119-153 km/h	74-95 mph 64-82 kt 119-153 km/h
2	96-110 mph 83-95 kt 154-177 km/h	96-110 mph 83-95 kt 154-177 km/h
3	111-130 mph 96-113 kt 178-209 km/h	111-129 mph 96-112 kt 178-208 km/h
4	131-155 mph 114-135 kt 210-249 km/h	130-156 mph 113-136 kt 209-251 km/h
5	156 mph or higher 136 kt or higher 250 km/h or higher	157 mph or higher 137 kt or higher 252 km/h or higher