

Storm Surge Scales and Storm Surge Forecasting

During the open public comment period for the draft of the Saffir-Simpson Hurricane Wind Scale, many people suggested that the National Weather Service develop a storm surge specific scale as well as improve its forecasting of storm surge. It is acknowledged that there are some researchers who advocate developing another scale for hurricanes specifically geared toward storm surge impact^{1,2} by incorporating aspects of the system's size. However, the National Hurricane Center does not believe that such scales would be helpful or effective at conveying the storm surge threat. For example, if 2008's Hurricane Ike had made landfall in Palm Beach, Florida, the resulting storm surge would have been only 8', rather than the 20' that occurred where Ike actually made landfall on the upper Texas coast. These greatly differing surge impacts arise from differences in the local bathymetry (the shallow Gulf waters off of Texas enhance storm surge while the deep ocean depths off of southeastern Florida inhibit surge). The proposed storm surge scales that consider storm size do not consider these local factors that play a crucial role in determining actual surge impacts.

The National Weather Service believes that a better approach is to focus directly on conveying the depth of inundation expected at the coast and inland. Because storm surge-induced flooding has killed more people in the United States in hurricanes than all other hurricane-related threats (freshwater flooding, winds, and tornadoes) combined since 1900³, the National Oceanic and Atmospheric Administration is working to enhance the analysis and prediction of storm surge. Direct estimates of inundation are being communicated in the NHC's Public Advisories and in the Weather Forecast Office's Hurricane Local Statements. New ways of communicating the threat have also been developed. NHC's probabilistic storm surge product, which provides the likelihood of storm surge values from 2 through 25 feet, became operational in 2009, and the NWS's Meteorological Development Laboratory is providing experimental, probabilistic storm surge exceedance products for 2010. In addition, coastal WFOs will provide experimental Tropical Cyclone Impacts Graphics in 2010; these include a qualitative graphic on the expected storm surge impacts. Finally, the NWS is exploring the possibility of issuing explicit Storm Surge Warnings, and such warnings could be implemented in the next couple of years. In all of these efforts, the NWS is working to provide specific and quantitative information to support decision-making at the local level.

¹ L. Kantha, 2006 in *EOS*.

² M. D. Powell and T. A. Reinhold, 2007 in *Bulletin American Meteorological Society*.

³ E. S. Blake and colleagues, 2007 in *NOAA Technical Memorandum NWS TPC 5*.