WSI LIVECAT FORECAST™ CASE STUDY

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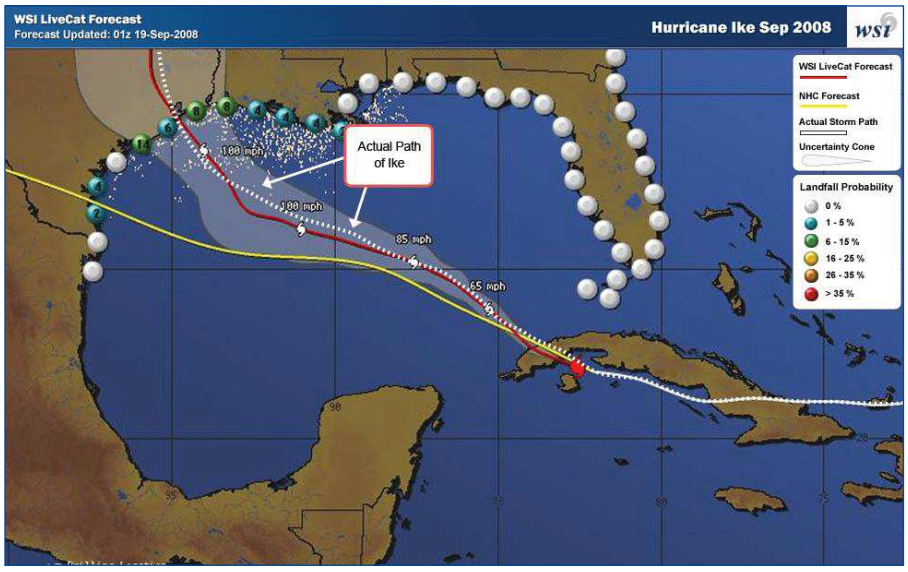
HURRICANE IKE

September 2008

Introduction

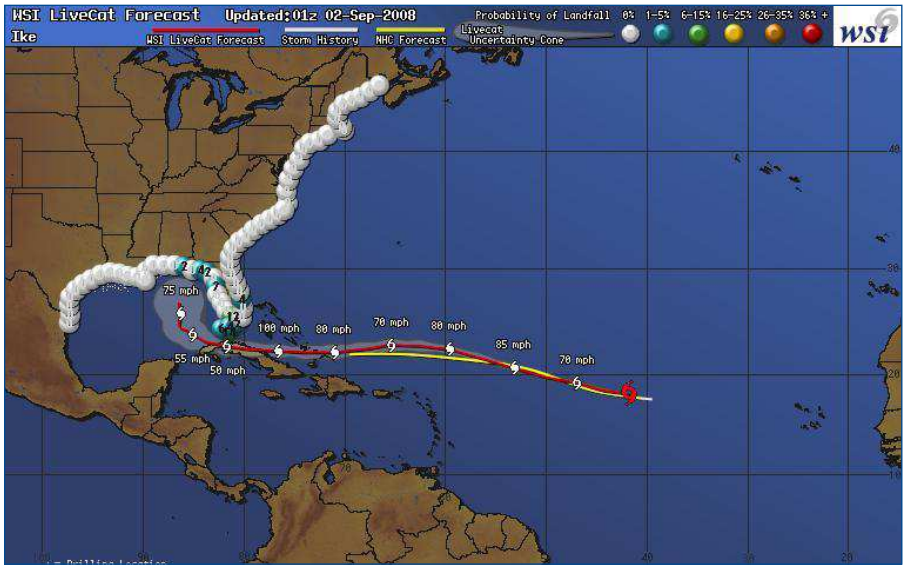
This case study details the superior performance of WSI LiveCat Forecast™ during Hurricane Ike, a long-lived intense hurricane that eventually made landfall near Galveston, TX. Damage associated with Ike totaled approximately 10-20 billion dollars, making the storm the fourth costliest in US history, behind only Katrina, Andrew and Wilma. The WSI LiveCat Forecast track forecasts clearly outperformed both the National Hurricane Center (NHC) and publicly-available medium-range model forecasts as Ike tracked through the tropical Atlantic, Caribbean, and Gulf.



WSI LiveCat Forecast (red) and NHC forecast (yellow) tracks from Tuesday morning, September 9, 2008 and the eventual observed track of Ike.

Monday, September 1, 2008

Ike was first named by the National Hurricane Center (NHC) on the afternoon of Monday, September 1, 2008, when it was still in the central tropical Atlantic. That evening, the first WSI LiveCat Forecast correctly predicted that the storm would track westward over Cuba before entering the Gulf of Mexico (below). The NHC forecast was not too dissimilar to the WSI LiveCat Forecast, but lacked any forecast information beyond the 5-day period. In this case, the 10-day WSI LiveCat Forecast was able to provide useful forecast information for risk managers beyond the more commonly-available 5-day forecast period, in this case correctly warning about a potential event in the Gulf of Mexico.



WSI LiveCat Forecast (red) and NHC forecast (yellow) tracks from Monday evening, September 1, 2008

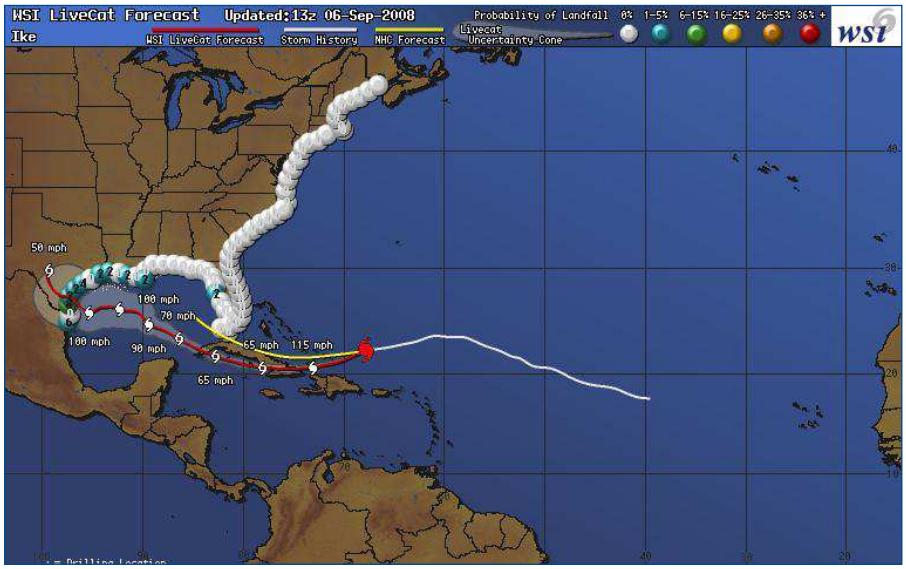
Thursday, September 4, 2008

On Thursday evening, September 4, 2008, WSI LiveCat Forecast correctly depicted a continuation of the recent northwestward track followed by a turn to the southwest towards Cuba and then into the Gulf of Mexico (below). This forecast compares rather favorably to the NHC forecast, which incorrectly depicted an initial jog to the southwest followed by a gradual rightward turn into the east coast of Florida. (See Image Below).

WSI LiveCat Forecast (red) and NHC forecast (yellow) tracks from Thursday evening, September 4, 2008

Saturday, September 6, 2008

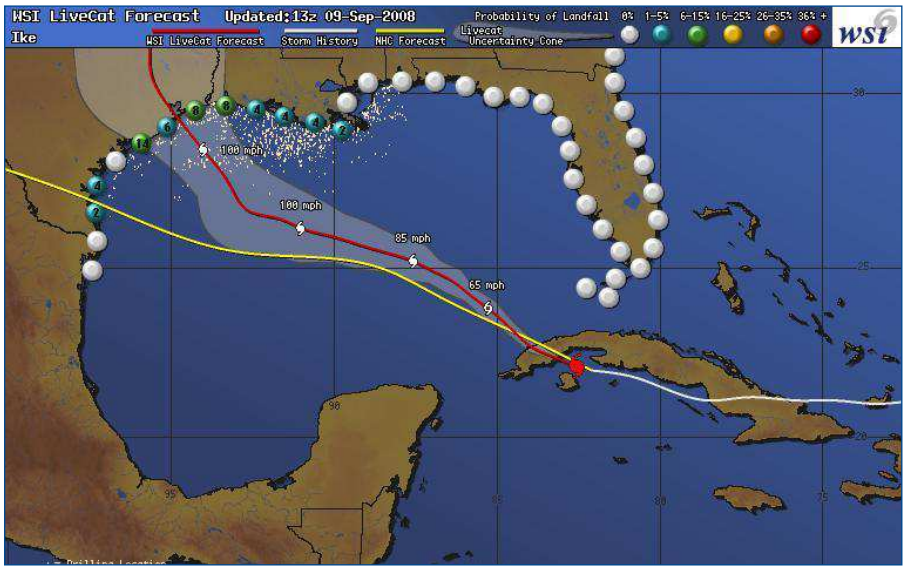
WSI LiveCat Forecast first targeted the Texas coast on Saturday morning, September 6, 2008, a full week before landfall (below). The 5-day NHC forecast track stopped in the southeastern Gulf, but a reasonable extrapolation of the track was much more suggestive of an eastern Gulf landfall.



WSI LiveCat Forecast (red) and NHC forecast (yellow) tracks from Saturday morning, September 6, 2008.

Tuesday, September 9, 2008

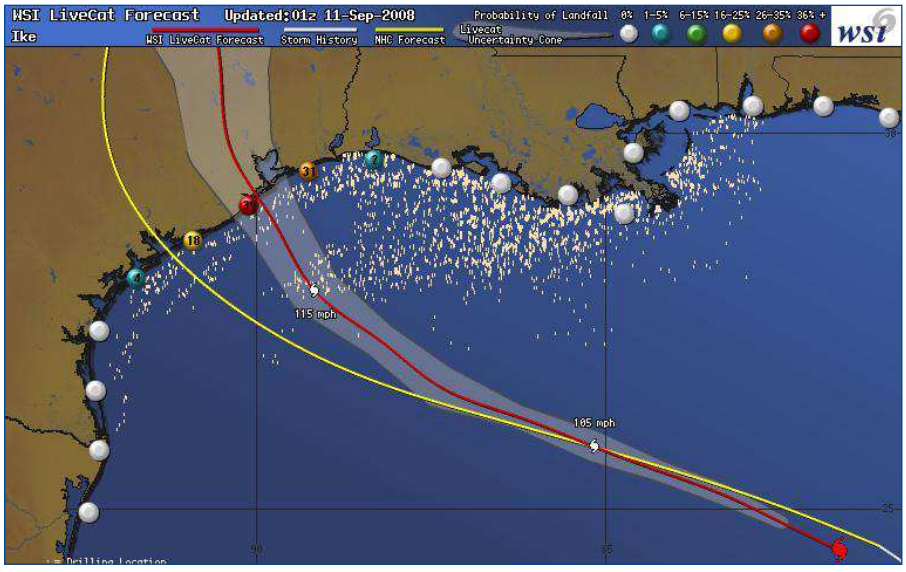
As Ike emerged into the Gulf of Mexico, the WSI LiveCat Forecast from Tuesday morning, September 9 was almost perfect in its depiction of a category two hurricane making landfall near Galveston four days hence. Meanwhile, the NHC forecast was significantly different in its inaccurate depiction of a south Texas landfall.



WSI LiveCat Forecast (red) and NHC forecast (yellow) tracks from Tuesday morning, September 9, 2008.

Wednesday, September 10, 2008

Finally, by Wednesday evening (September 10, 2008), the NHC forecast was still too far south (below), while the WSI LiveCat Forecast continued to correctly predict a landfall near Galveston Bay.



WSI LiveCat Forecast (red) and NHC forecast (yellow) tracks from Wednesday evening, September 10, 2008.

Summary

As the graphics above depict, WSI LiveCat Forecast was a clear success during Hurricane Ike, correctly predicting the various twists and turns of the track and predicting a Texas landfall a full week in advance. The figure below details the final performance (in terms of mean absolute track error; smaller numbers represent better forecasts) of Ike relative to the NHC and to the two most well-known medium-range weather prediction models, the Global Forecast System (GFS) and the European Centre for Medium-Range Weather Forecasting (ECMWF) models. Note that the performance of WSI LiveCat Forecast and the NHC was similar out to forecast hour 84 (3.5 days), but that WSI LiveCat Forecast was clearly better on days 4 and 5. Further, WSI LiveCat Forecast outperformed the ECMWF and especially the GFS throughout the 10-day forecast period.

About the Author

Todd M. Crawford, Ph.D. Principal Scientist and Product Manager in WSI's Energy and Risk group. He is responsible for scientific oversight of the research and development of new products within the group. Dr. Crawford is also the leader of WSI's long-range forecasting group, and has developed various automated statistical forecasting techniques for use on seasonal, subseasonal, and medium-range time scales. He received a bachelor's degree in atmospheric science from the University of Wisconsin, and master's and doctorate degrees in meteorology from the University of Oklahoma. Before joining WSI, Dr. Crawford was a post-doctoral scientist at the National Severce Storms Laboratory where he pursued research interests in the fields of mesoscale weather forecasting, mesoscale dynamics, diagnostic modeling, and thunderstorm initiation.

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