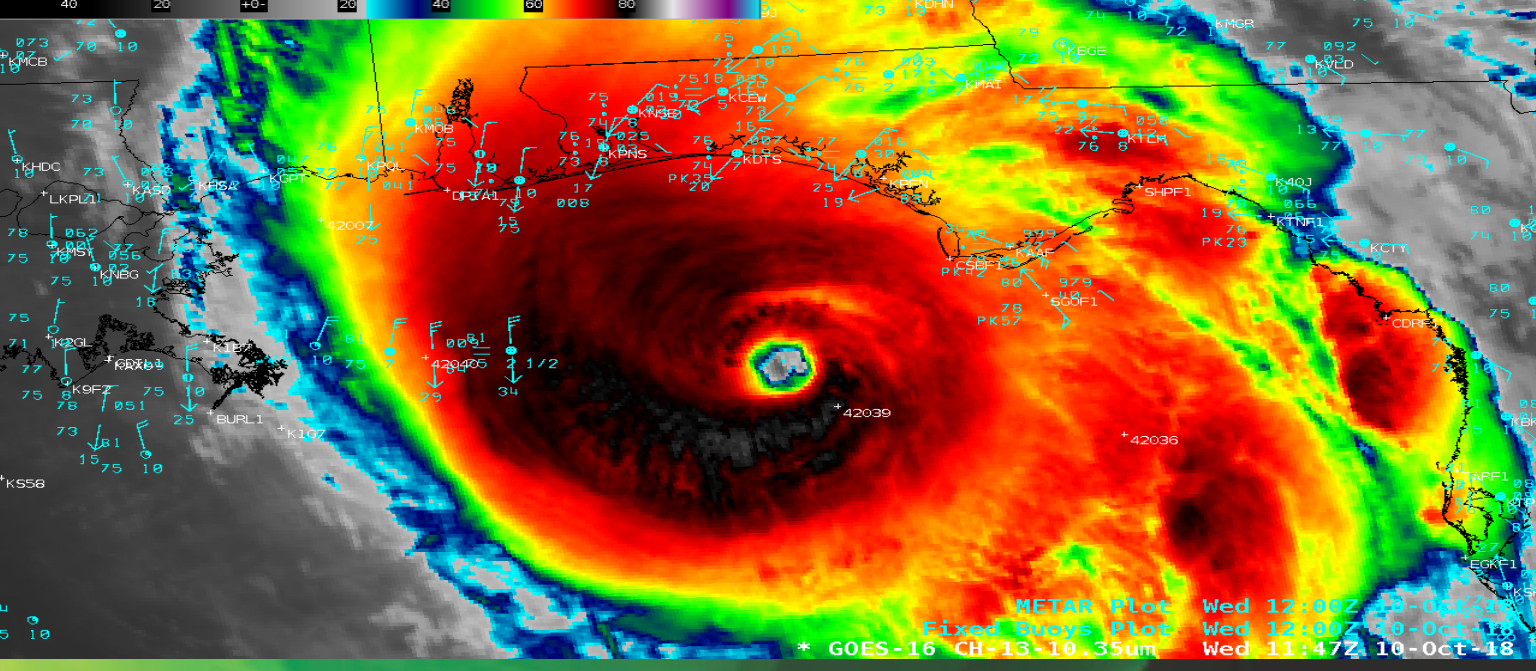

Tropical cyclone applications: Recent effort to predict rapid intensity changes and to estimate the radius of maximum winds

Abstract: Rapid intensity change, because it is a multi-scale process is often difficult to anticipate and under forecasting of such events leads to a broader forecast error distribution and negative biases. In addition, the occurrence of unanticipated rapid intensity increases can dramatically impact the messages to the public and mitigation errors. As a result, improving forecasts of rapid intensity changes or Rapid Intensification (RI) is one of the highest research priorities of both the National Oceanic and Atmospheric Administration and US Department of Defense. Until recently most of the efforts to improve RI forecasts have been concentrated in two tropical cyclone basins, the North Atlantic and the eastern North Pacific, but RI is a global problem. Here, recent efforts that to build on the experience gained in the Atlantic and East Pacific and extend RI forecast capabilities to all global tropical cyclone basins are discussed. In the process creating these methods, new methods and information have been explored including treatment of traditional predictors and the addition of new information available from satellite inputs. These details will be presented along with preliminary verification of these methods in basins routinely forecasted by the National Hurricane Center (Atlantic and East Pacific) and by the Joint Typhoon Warning Center (West Pacific, North Indian Ocean and Southern Hemisphere).

Over the past 15 years, great strives have been made to improve the routine estimation of the extent of the gale force winds in tropical cyclones. These efforts have led to much improved real-time capabilities needed for tropical cyclone advisories. Models, both statistical and numerical, have also dramatically improved the forecasts of the extent of gale force winds in tropical cyclones. At the same time, the structure of the winds near the tropical cyclone center remain best forecasts using climatological relationships. The distribution of the inner core winds, however, is much better correlated with damages and other risks associated with tropical cyclones. A key ingredient to improving the estimation and ultimately the forecast of the distribution of the strongest winds, relies on the estimation of the location of the radius of maximum winds, which can be highly variable from case to case and over the lifecycle of the storm. The radius of maximum wind is also both hard to observe without aircraft reconnaissance or synthetic aperture radar based estimates and very difficult to estimate in current observations. The details of recent efforts to estimate the radius of maximum winds in all tropical cyclones will be discussed and some recent validation is presented.

Featuring

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NOAA's Center for Satellite Research and Applications

3:00 p.m. Friday, October 30th, 2020

Remote Session via Zoom
https://fiu.zoom.us/j/95135104846

This event is free and open to the public

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