

Quantifying the Impact of 0600 UTC and 1800 UTC Assimilated Upper Air Observations and COCONet Measurements in the Western Atlantic and Caribbean during the Hurricane seasons of 2011 and 2012

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In this study, we propose to incorporate the COCONet GPS precipitable water (PW) and radiosondes measurements at 0600 and 1800 UTC to assess the impacts of this additional data on global and high resolution Weather Research and Forecasting (WRF) model 0-72 hour forecast over the Caribbean and Western Atlantic tropical ocean. These additional measurements will focus on two special observing periods: 25 August- 15 September, 2011 and 15 August-30 September 2012. A limited number of radiosonde measurements at 0600 and 1800 UTC will be deployed in Barbados (13.1°N, 59.4°W) during these time periods. This research will be aimed on improvements in: (a) the forecasted large-scale environment with an emphasis on wind shear, humidity and potential vorticity; (b) forecasted TC genesis and TC intensity forecasts; and (c) African Easterly Wave/850 hPa relative vorticity position and amplitude.

The data from COCONet may be transmitted to the Global Telecommunications System (GTS) in real-time for assimilation in the global model forecasts. It is anticipated that this research will be utilized in collaboration with the Joint Hurricane Testbed (JHT) staff to produce Global Forecast System (GFS) model forecasts with/without the additional GPS PW measurements from those 50 COCONet stations for the 0600 and 1800 UTC forecasts. These global model forecasts will serve as initial and boundary conditions for the Hurricane WRF (HWRF) and WRF forecasts. The proposed set of observations provides the basis for providing robust statistics to determine the value of the additional COCONet data.