

**Mid-Year Report to the National Oceanic and Atmospheric Administration Joint
Hurricane Testbed Program**
for the
Atlantic Oceanographic and Meteorological Laboratory
4301 Rickenbacker Causeway
Miami, Fl. 33149

Title: The Assimilation of non-NOAA and non-AF GPS dropwindsonde data in NOAA numerical models

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Performance Period through March 1, 2012

The proposed work plan entails the running of a parallel cycle of the NCEP GFS in order to test the assimilation of dropwindsonde data from NASA and NSF aircraft using data collected during the 2010 Genesis and Rapid Intensification Program (GRIP) and PRE-Depression Investigation of Cloud systems in the Tropics (PREDICT) field experiments. Since these data are not currently assimilated, it was necessary to add them to the BUFR data files used by the model. Yangrong Ling and Kate Howard at NCEP/EMC kindly wrote and provided the computer codes needed to include these data for assimilation on February 8, 2012 and, after some minor refinements, it has been successfully implemented. The first of two parallel cycles has been initiated for the time period beginning at 0Z UTC August 15, 2010 ending August 25, 2010. The experimental dropwindsonde data to be assimilated are detailed in Table 1.

Table 1:

DATE	EXPERIMENT	# of DROPS	CYCLES
20100815	PREDICT	9	0Z
20100817	PREDICT	20	12Z
20100818	PREDICT + GRIP	25 + 9	12Z, 18Z
20100821	PREDICT	17	12Z
20100823	PREDICT	12	12Z
20100824	GRIP	23	12Z, 18Z
20100829	GRIP	13	18Z, 0Z
20100830	PREDICT + GRIP	29 + 13	12Z, 18Z
20100831	PREDICT + GRIP	26 + 5	0Z, 12Z, 18Z
20100901	PREDICT	16	12Z, 18Z
20100902	PREDICT + GRIP	20 + 9	18Z
20100903	PREDICT + GRIP	16 + 4	0Z, 18Z
20100905	PREDICT	22	12Z, 18Z
20100906	PREDICT + GRIP	18 + 3	12Z, 18Z
20100907	PREDICT + GRIP	19 + 7	12Z, 18Z
20100908	GRIP	12	0Z
20100910	PREDICT	34	12Z, 18Z
20100911	PREDICT	22	18Z
20100912	PREDICT + GRIP	21 + 3	12Z, 18Z
20100913	PREDICT + GRIP	13 + 23	0Z, 12Z, 18Z
20100914	PREDICT + GRIP	18 + 18	0Z, 12Z, 18Z
20100915	GRIP	10	0Z
20100916	GRIP	12	28Z
20100917	GRIP	18	0Z, 18Z
20100920	PREDICT	18	12Z, 18Z
20100921	PREDICT + GRIP	21 + 10	12Z, 18Z
20100922	PREDICT + GRIP	15 + 22	0Z, 12Z, 18Z
20100924	PREDICT	15	12Z, 18Z
20100927	PREDICT	19	12Z, 18Z
20100928	PREDICT	16	12Z, 18Z
20100930	PREDICT	25	12Z, 18Z

Due to disk failure on the Vapor high-performance computing system on which the forecasts are run, this cycle was not initialized until February 15 and is expected to be completed within the period of 1

week. At that time a second cycle will be initialized for the time period between August 29 and October 1, 2010. It was decided that two separate cycles would be preferable to one long cycle since there is a five day gap between experiments. Both forecast cycles are expected to be completed by mid March prior to the retirement of the Vapor computing system. Diagnostics of the data impact will be produced and evaluated at that time. An example of the types of diagnostics to be prepared is given in figure 1. This graphic shows the impact of PREDICT dropwindsonde data that were assimilated into the August 15, 2010 12Z GFS cycle on the forecast track for Atlantic Tropical depression #5. This preliminary result illustrates the potential value of assimilating dropwindsonde data from non-operational platforms. The proposed work plan is progressing on schedule and should be successfully completed within the one year time frame.

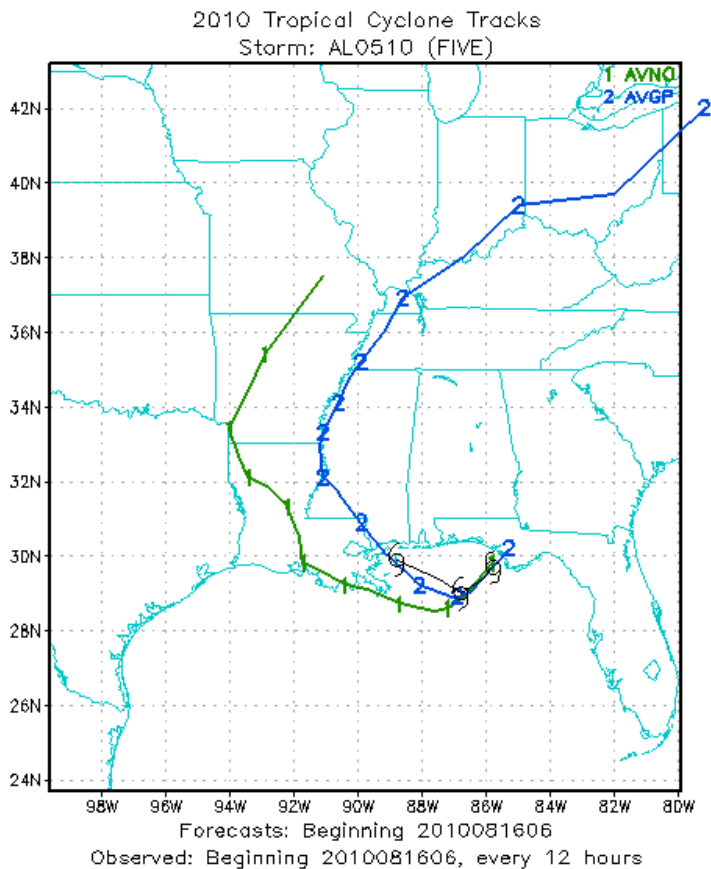


Figure 1: GFS track forecast for TD5 initialized at 6Z August 16, 2010. The black curve gives the NHC best track position, green (1) the GFS forecast track without assimilating the PREDICT dropwindsondes and blue(2) with the PREDICT data

References:

Montgomery, M. T., *etal*, 2012: The Pre-Depression Investigation of Cloud Systems in the Tropics (PREDICT) Experiment: Scientific Basis, New Analysis Tools and some First Results, *Bull. Amer. Met. Soc.*, in print