June 14, 2016

AOML-CariCOOS Hurricane Underwater Gliders

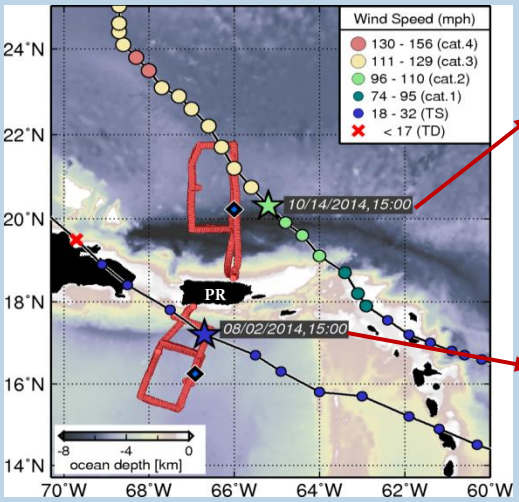
A NOAA cross Line Office and multi-institutional effort geared towards helping to improve hurricane forecasts

http://www.aoml.noaa.gov/phod/gliders

Goal: Enhance our knowledge on the role that the ocean plays in the intensification of tropical cyclones, and help to improve Atlantic hurricane intensification forecasts.

Strategy: Deployment of a network of hurricane gliders in the Caribbean Sea and Tropical North Atlantic Ocean, which provide thousands of ocean profile observations, even during hurricane wind conditions.

Mission 01



Hurricane Gonzalo

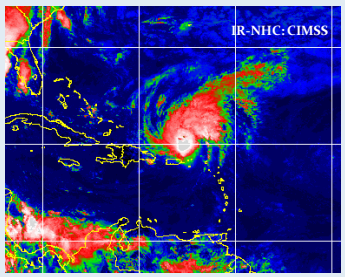
Period: October 2014

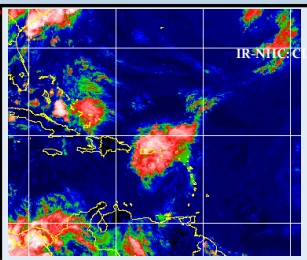
N obs.: 228 profiles

Domingues et al. (2015)

Goni et al. (2015)

Dong et al. (in preparation)



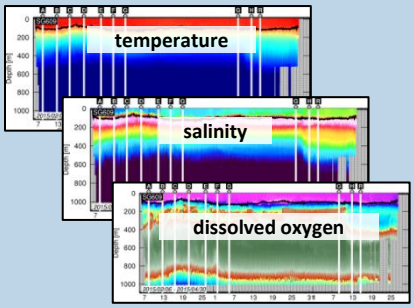


Tropical Storm Bertha

Period: August 2014

N obs.: 82 profiles

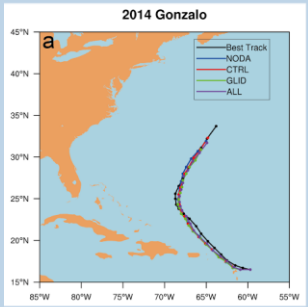
Data & Highlights

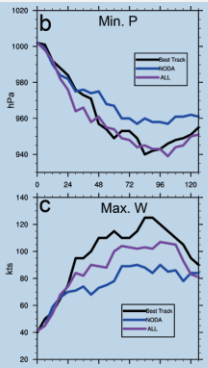


Data distribution: All data collected by this project is transmitted in real-time to the GTS, and made freely available through project webpages.

Highlights:

- ✓ During Hurricane Gonzalo, ocean cooling was partially suppressed by near-surface stratification due to low salinity conditions.
- ✓ Assimilation of glider and other ocean observations had a positive impact on Gonzalo's forecast using ocean-atmosphere coupled model.
- ✓ Approx. 10,000 profile observations collected during first four missions.





Minimum pressure and maximum wind speed forecasts during Hurricane Gonzalo
HYCOM-HWRF forecast with no data assimilated
HYCOM-HWRF forecast with all observational data assimilated

Domingues et al. (2015), Upper ocean response to Hurricane Gonzalo (2014): Salinity effects revealed by targeted and sustained underwater glider observations, Geophys. Res. Lett., 42, doi:10.1002/2015GL065378.

Goni, et al. (2015), State of the climate in 2014, Bull. Am. Meteorol. Soc., 96(7), S121–S122.

Dong et al. (in preparation), Impact of underwater glider data on Hurricane Gonzalo (2014) forecast

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