NOAA/AOML Sea Gliders Collaboration

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LONG-TERM GOALS

Our long-term goal is to continue the collaborative efforts with NOAA/AOML, by assisting and doing sea glider deployments, recoveries and refurbishments on CARICOOS facilities. Our work in this operational aspect aids sustatially the main goal of the sea glider proyect which is to better our understanding of the air-sea interactions during hurricane force winds. This adds sea gliders to CARICOOS network of assets and it's a highly valuable open ocean data provider for a wide range of oceanographic applications. In our interest lies the use of sea glider data for the skill assessment and validation of numerical models in the CARICOOS region.

MILESTONES / OBJECTIVES

First quarter (July 1st – September 30th):

Pre-deployment preparation of SG609, SG610, SG630 and SG547.

Deployment of SG609 and SG630 off La Parguera, Lajas, P.R., and SG610 and SG547 off San Juan, P.R.

Second quarter (October 1st –December 31st):

Recover said deployed sea gliders.

During the sea glider recoveries take measurements of temperature, pressure and salinity with a CTD cast up to 300 meters; surface dissolved oxygen samples, and full-depth current measurement with a dropsonde, these measurements will be later compared with the sea glider data.

Start to refurbish them and have them ready for the next mission.

Train at least 3 people on sea glider refurbishment.

WORK COMPLETED

2016-07-20: Pre-deployment preparation procedures and tests completed for SG609 and SG630.

2016-07-21: Deployment of NOAA/AOML SG609 and SG630 ~8 nautical miles south of La Parguera, Lajas, P.R.

2016-08-03: Pre-deployment preparation procedures and tests completed for SG610 and SG547.

2016-08-04: Deployment of NOAA/AOML SG610 and SG547 ~8 nautical miles north of San Juan, P.R.

2016-11-01: Emergency recovery of NOAA/AOML SG610 ~20 nautical miles north of Aguadilla, P.R.

2016-11-02: Recovery of NOAA/AOML SG547 ~8 nautical miles north of San Juan, P.R.

2016-11-07: Started the refurbishment on SG610, did data backup, overall cleanup and disassembly of parts that need to be shipped back to Kongsberg (Manufacturer of the Sea Gliders) for replacement. Did data backup on SG547.

2016-11-10: Recovery of NOAA/AOML SG609 and SG630 ~8 nautical miles south of La Parguera, Lajas, P.R. CTD cast performed up to 300 meters, surface water dissolved oxygen samples were taken and a dropsonde cast for full-depth current measurement was also done.

2016-11-16: Shipped 1 cradle, 1 communication cable – 1 powered and 1 unpowered, and a wand to Grant Rawson for the use of the New sea glider adquired by AOML.

2016-12-05: Started the refurbishment on SG609 and SG630, did data backup, overall cleanup and disassembly of parts that need to be shipped back to Kongsberg (Manufacturer of the Sea Gliders) for replacement.

2016-12-08: Shipped the following parts to Kongsberg for refurbishment: Roll motor of SG609, fluorometer and VBD system of SG630.

MAJOR OUTCOMES

At-sea operations such as deployments and recoveries have been highly successful with the new way of handling the sea glider while in the water close to the boat. This new way is very easy to learn and simple enough to remember. Also the Sea Glider HQ room has been completely revamped with the correct conditions for complete sea glider refurbishment, sensor additions and replacement of any parts.

RELATED PROJECTS

Following the "*CARICOOS-NOAA AOML GLIDER SURVEYS WARM WATER "BLOB" IN THE CARICOOS REGION*" letter of intent CARICOOS-NOAA/AOML Sea Glider data has been used to survey warm water "blobs" within the CARICOOS region, with the objective of giving the NOAA Coral Reef Watch (CRW) Sea Surface Temperature Anomaly (SSTA) 5 km near-real time global satellite product, globally used to monitor coral bleaching thermal stress, a three dimensional context by measuring temperature with sea gliders and then estimating the temperature anomalies from the climatological values (World Ocean Atlas 2013, version 2) within the upper-layer open ocean. The objective is to explore the vertical extent of the temperature anomalies shown on the sea surface temperature anomaly satellite data by the NOAA Coral Reef Watch in order to use it as a warning system identifying the vertical reach of possible coral bleaching. To access the developed product click the following link: http://www.caricoos.org/gliders/sg609.

WORK PLAN FOR UPCOMING PERFORMANCE PERIOD (Dec. 1 – May 31 2016)

Third quarter (January 1st - March 31st):

Upgrades:

- SG609 – Software Update, change from CT Sail to GPCTD (conversion of the temperature and salinity sensors handle to a flow-through pumped system).
- SG610 – Modem and Compass replacement.

Do a complete refurbishment of the following NOAA/AOML sea gliders: SG609, SG610 and SG630.

Deploy 2 or possibly 4 sea gliders (SG609, SG610, SG630 and SGXXX [New]) by early 2017.

Fourth quarter (April 1st –June 30th):

Recover said deployed sea gliders, refurbish them and have them ready for the hurricane season.

PUBLICATIONS & PRODUCTS

Publication (under review): Dong et al., Impact of underwater glider on Hurricane Gonzalo (2014) forecast. Manuscript currently under review at Weather Forecasting.

Poster: NOAA's First Emerging Technologies Workshop, Silver Spring, MD, July 2016. Link here:
https://nosc.noaa.gov/2016_NOAA_ETW/5_Posters/Oceans_Goni_NOAA_Emerging_Tec_Jul2016_poster.pdf

Product on CARICOOS webpage (currently off because there are no sea gliders on the water) illustrates the anomalous temperature along the sea glider dive track by computing the

difference in temperature measured by the sea gliders against the monthly climatological World Ocean Atlas 2013 2nd revision temperature data. On this product CARICOOS is exploring the vertical extent of the temperature anomalies shown on the sea surface temperature anomaly satellite data by the NOAA Coral Reef Watch. Here is the link to the product: http://www.caricoos.org/gliders/sg609

The CARICOOS gliders page will be available once the sea gliders are on the water again early 2017.