

CariCOOS Field Operations

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LONG-TERM GOALS

The Field Operations Division is responsible for the planning, development, and execution of CariCOOS field experiments (i.e., acquire data to validate CariCOOS numerical models) and the monitoring, troubleshooting, reporting, and evaluation of the following CariCOOS assets:

- network of five ocean data buoys and one directional wave buoy
- one ocean acidification monitoring buoy
- Operational High-Frequency Radar (HFR) Network (five HFR antennas)
- Mesonet and Windnet, (network of sixteen coastal weather stations)
- Lagrangian Drifter Program
- Seaglider Program (operated in collaboration with NOAA AOML)

This report covers activities conducted during the last six 6-month performance period of 2016.

MILESTONES / OBJECTIVES

Field Operations Division will:

- a. Assist CariCOOS/UMaine in the yearly maintenance and operation of existing data buoys.
- b. Assist UPRM/CariCOOS/Rutgers the maintenance and operation of existing and planned (St. Thomas, USVI) CODAR sites.
- c. Assist UPRM/CariCOOS/Rutgers with the identification and preparation of a site suitable for the long-range CODAR system being rented from Rutgers.
- d. Assist UPRM/CariCOOS in the maintenance and operation of Mesonet & Windnet
- e. Assist in the supervision of students supported by CariCOOS and assist them with their CariCOOS-related research and development activities.
- f. Lead and/or assist observational campaigns including programming and deployment of oceanographic instrumentation (e.g. drifters, Acoustic Doppler Current Profilers – ADCPs, etc.), and the analysis of the resulting data.

WORK COMPLETED

Field operations performed during the last six 6-month period (June-November) were successfully completed (Fig. 1). The completed milestones have enhanced the efficiency of the growth and maintenance of the existing CariCOOS assets so as to better serve the needs and desires of the CariCOOS stakeholders.

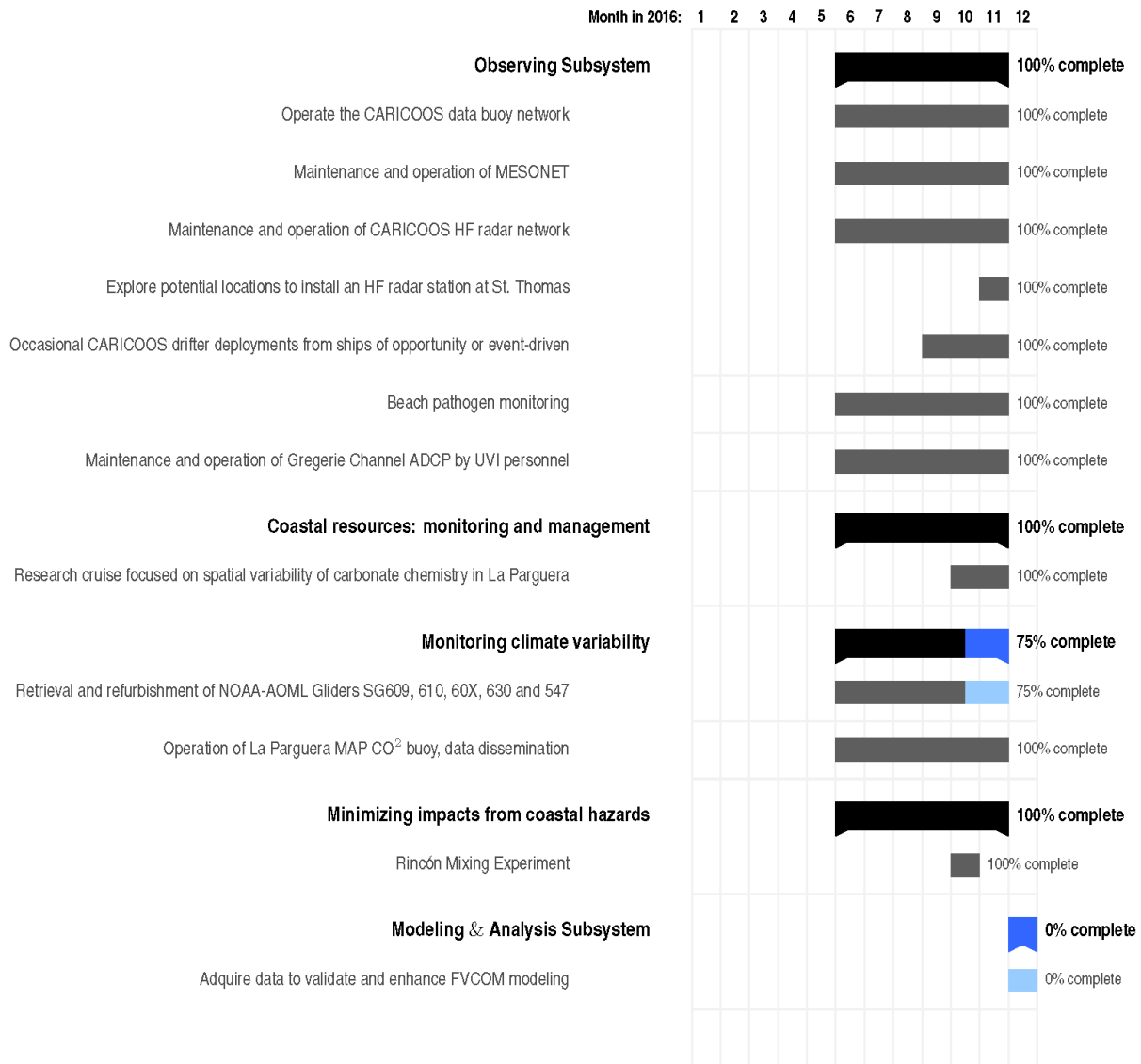


Fig. 1 Milestones completed from June to November 2016.

HF-Radars Coverage

Range data coverage and availability in the Caribbean Sea (Fig. 4) surpassed the 80% coverage for more that 80% of the time, providing reliable estimates of surface currents magnitude and direction.

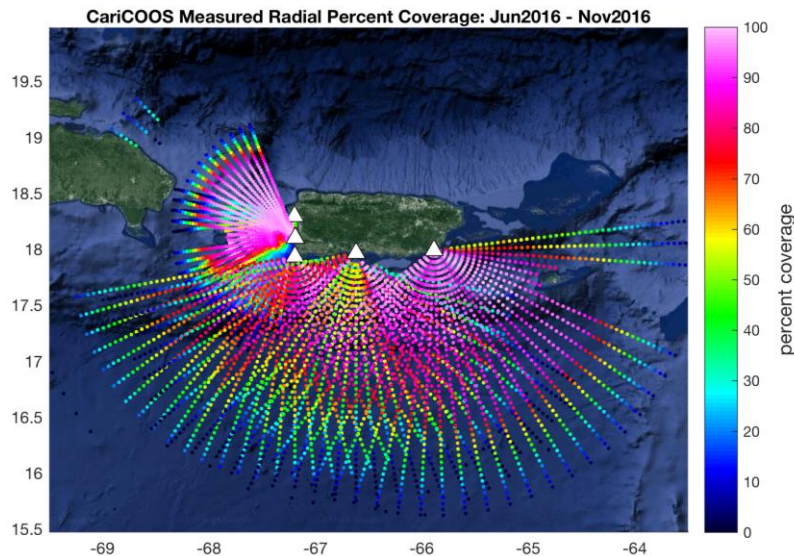


Fig. 4 Data coverage maps for the total surface currents in the Caribbean Sea from June 2016 to November 2016. The colorbar indicates data coverage between 100% (pink) and 0% (blue).

New HF-Radar Station at St. Thomas

A search for potential locations to install a new HF-Radar station in St. Thomas was performed on December 6, 2016. The new installation will provide estimates of surface current velocity and direction. The velocity and direction estimates will also enhance the measurements acquired from the existing station at Maunabo, PR. This installation is of interested because will help understand more in detail the highly-complex currents generated between Puerto Rico and St. Thomas.

Ocean Acidification

CARICOOS, Sea Grant, UPRM and University of New Hampshire (UNH) conducted a field-based study to assess the potential vulnerability of natural coastal barriers in La Parguera, Lajas, and PR to ocean acidification. A flow-through system, developed and tested at UNH, was used to map in real time the chemical parameters (i.e., salinity, CO_2) of the area. Several current meters and Lagrangian drifters were also deployed to investigate the dominant current patterns.



Fig. 5 Flow-through system to measure several chemical parameters (photo credit: Chris Hunt)

San Juan Buoy Refurbishment

San Juan Buoy was down during September and October due to batteries problems. University of Maine visited Puerto Rico to refurbish such buoy. All batteries were replaced and the buoy was re-deployed on October 29, 2016.



Fig. 6 CARICOOS San Juan buoy.

Beach water quality

A 48-hr sampling campaign was conducted at eight different beach and fresh water stations in Rincón's Public Beach, in an effort to improving CariCOOS beach water quality nowcast. Two laboratories were set up nearby for microbiological analysis, while several sensors were deployed in and out of the water to investigate the dominant wave, wind and current patterns.



Fig. 7 Left side: Aerial image of study site at Rincón Public Beach. Right side: David Carrero (CariCOOS Technician) deploying drifters to assess nearshore surface currents (photo credit: Jim Crotty).

gliders

CariCOOS glider operators deployed 4 gliders in the north and south of Puerto Rico (Fig. 8) during June to October, 2016 to collect over 5,400 temperature, salinity, dissolved oxygen and chlorophyll profiles during the Hurricane season. Gliders are going to be send for routine checks before being re-deploy in 2017.

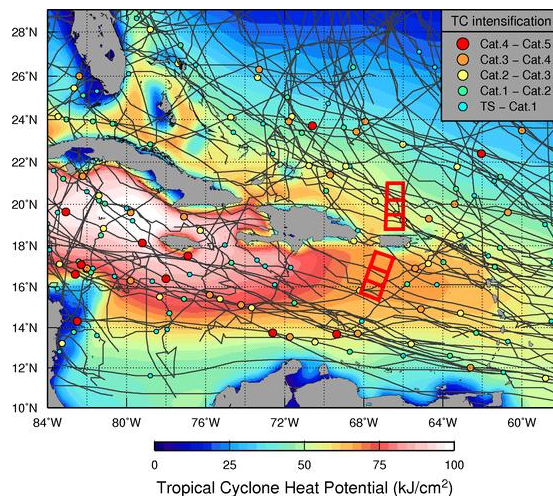


Fig. 8 The red lines indicate the location where CariCOOS gliders were deployed.

WORK PLAN FOR UPCOMING PERFORMANCE PERIOD

Dec. 1 to Dec. 31, 2016 (Fig. 1): Deploy three oceanographic instrumentation in an effort to measure currents in and near San Juan Bay to validate FVCOM model.

Fig. 9 presents the milestones for the upcoming performance period (January-May, 2016)

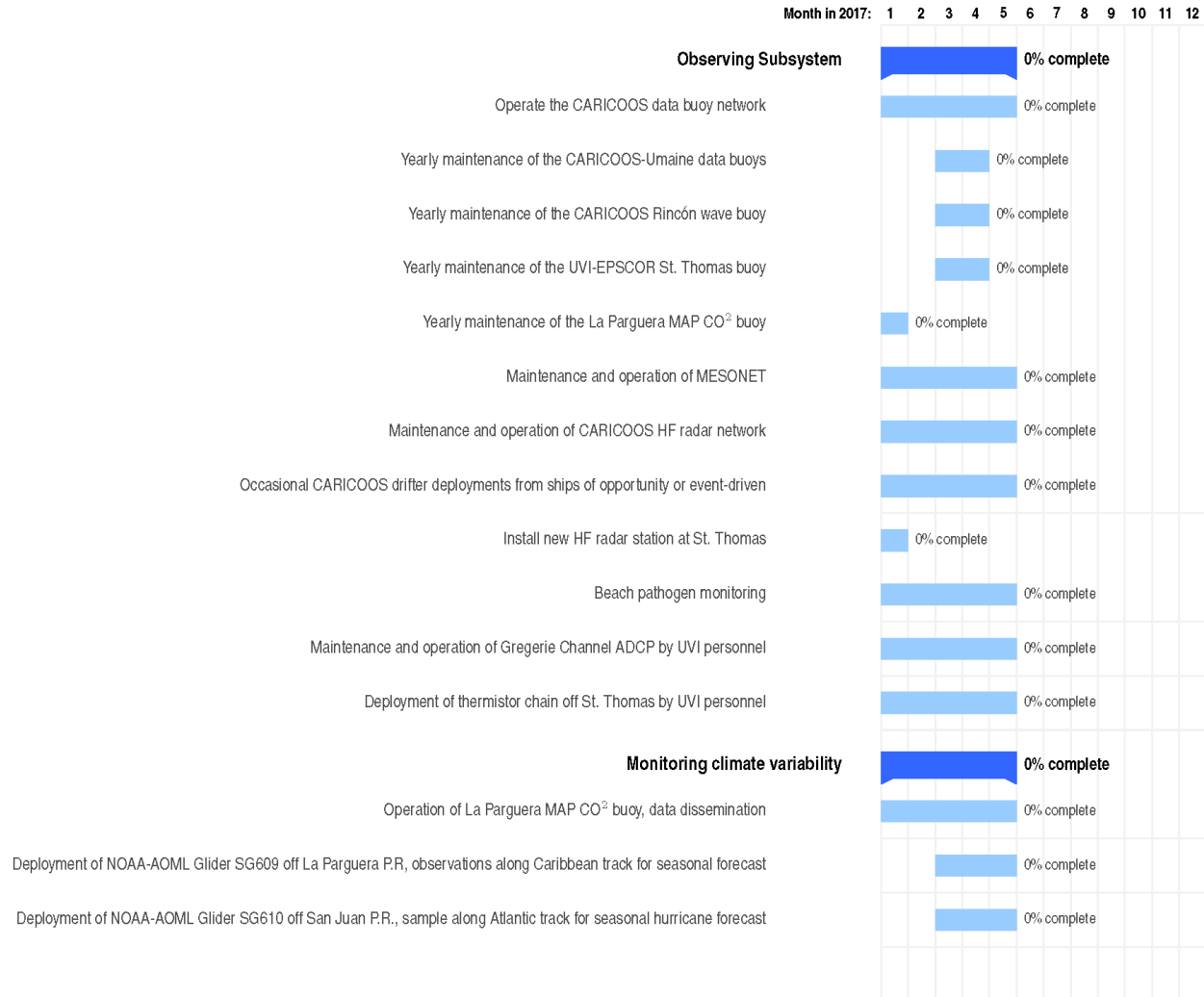


Fig. 9 Milestone for upcoming performance period (January-May, 2016)

REFERENCES

NONE

PUBLICATIONS & PRODUCTS

NONE