

Advancing the Caribbean Coastal Ocean Observing System

Program Performance Report



Reporting Period: 6/01/2016 – 11/30/2016

Project title: Advancing the Caribbean Coastal Ocean Observing System

Award number: NA11NOS0120035

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Project Web Site: <http://www.CARICOOS.org>

I. PERFORMANCE PROGRESS REPORT

The no cost extension (yr. 6) for the Advancing CARICOOS Cooperative Agreement allows for the completion of ongoing and pending activities as the system transitions to the recently awarded CA entitled CARICOOS: Enhancing Coastal Intelligence in the Caribbean. Major outcomes include the launch of the new web platform, transferring ROMS from UTD to UPRM, deployment of an ADCP in support of shipping maneuvers in St. Thomas and the implementation of a tide forecasting and hydrodynamic model for nearshore waters (FVCOM). Also, resources allowed for the emplacement of administrative facilities and personnel in support of CARICOOS Governance activities.

1. Progress and Accomplishments

MILESTONE / TASK	Q1	Q2	Q3	Q4	Original Completion Date	Status
Refurbishment of the CARICOOS Rincón Wave Buoy					June 2016	Completed (June 2016) – Buoy
Deployment of side-looking Aquadopp at Port of Charlotte Amalie by UVI personnel					August 2016	Completed (August 2016)
Operate MAP CO2 buoy and continue discrete sampling program under NOAA's OAP					May 2017	On-Track (bi-weekly cruises)
Commence FVCOM simulations for Parguera					April 2017	On-Track
Transitioning ROMS operations from UTD to UPRM					May 2017	On-Track
Begin ROMS 4D-VAR assimilation experiments					May 2017	Delayed – Although there is significant progress with ROMS, 4D-VAR assimilation efforts are awaiting further validation of several ROMS configurations

MILESTONE / TASK	Q1	Q2	Q3	Q4	Original Completion Date	Status
Implementation of tidal modeling system using ADCIRC					May 2017	On-Track – but model was replaced by operational FVCOM – beta version already in place.
Deployment and optimization of CARICOOS new web interface.					Nov 2016	Complete (November 2016) – The final components of the CARICOOS website were completed in Nov 2016. Further improvements will respond to stakeholder needs and new product development.
Continued development of CARICOOS DMAC subsystem while meeting IOOS requirements (NetCDF updates to U. Maine buoy data files					May 2017	On Track – Ongoing effort of bringing NetCDF files to version CF1.6 and implementation of QARTOD procedures.
Teacher workshop for reassessment of effectiveness of CARICOOS data and products as teaching tools					May 2017	On-Track
Enhancement of the CARICOOS HFR network: Movement of the FURA antenna to Rincón Lighthouse if found feasible Deployment of a new HFR antenna in the north-east coast sector of the region					May 2017	On-Track <ul style="list-style-type: none"> • Movement of FURA antenna to Rincon Lighthouse cancelled for now due to logistics & permitting. • A site survey was conducted in the island of St. Thomas to identify candidate locations for the new HFR site – expected to be operational in February / March 2017.
Deployment of a thermistor chain mooring off St. Thomas					May 2017	On-Track – UVI working with final permitting issues

MILESTONE / TASK	Q1	Q2	Q3	Q4	Original Completion Date	Status
Provide logistic support for CARICOOS Inc. and preparation and submission of Application for Certification as a RICE					December 2016	On-Track – UVI working with final permitting issues

2. Scope of work

No substantive changes to the project’s SOW are anticipated at the moment.

3. Leadership Personnel and Organizational Structure

No major changes

4. Budget Analysis

A granted no cost extension authorized the expenditure of a total of \$716,619 dollars remaining from the initial five years of the project. All proposed sub-award extensions were formalized during the period reported except with U. of the Virgin Islands which was delayed pending confirmation of the implementation of a corrective action plan included with their 2015 A-133 audit report. Expenditures have progressed as proposed except for the purchase of an HFR antenna. Given the uncertainty in identifying a suitable site for a permanent deployment on the southeastern end of the existing HFR domain, instead of acquiring a long-range antenna one was leased through a subaward to Rutgers U. Remaining funds were redirected to data management and web product construction. Expenditures and encumbrances totaled \$658,233. An updated financial report was submitted by UPRM on September 30, 2016.

Major equipment acquired includes a Rigid Inflatable Boat (RIB) for field operations (\$38k) and an Aquadopp Acoustic Doppler Current Profiler (\$20k). An unforeseen emergency haul-out of the San Juan buoy for repairs had a cost totaling \$12.5k.

II. PERFORMANCE PROGRESS REPORT - ADDENDUM

1. Confirmation that O&E has been updated

The O&E addendum has been updated to include recent education and outreach materials, newsletters, CARICOOS news blogs, among others. Previous materials have been updated and links were confirmed to be working properly.

2. DMAC Progress and Challenges

The major outcome from DMAC during the reporting period was the migration to the Cloud, which has resulted in less downtime and greater stability of our webpage and data servers. This move is in response to power and network interruptions we have experienced since our inception. We have accelerated the following initiatives in order to minimize downtime:

- a. Implement Amazon Web Services (AWS S3) buckets as repositories of data and model output used in the various products and displays available through our web page
- b. Set up a test THREDDS/OPeNDAP server as an EC2 AWS instance to replace one of our two physically distant servers; test for cost effectiveness, reliability and bandwidth
- c. Achieve cloud-based computing and improve HPC infrastructure

The greatest challenge to be addressed during the 3rd and 4th Q of FY16 is the poor representation of CARICOOS datasets in the IOOS Catalog and Registry. We will strive to reach the high standards set by our sister RAs now that the Cloud migration, and the resulting hardening of our data services, is almost finished. Specifically, we note that:

- a. We are currently in the process of updating our WAF thredds crawling scripts to generate up-to-date WAF metadata records for the IOOS Catalog.
- b. Registry information for CARICOOS is being updated
- c. Our metadata records need to be greatly improved

Below we provide specific comments on the ten DMAC IOOS requirements:

2.1. Open Data Sharing

We continue serving regional data openly through our web page Data Download tab, through our webpage products and through our dual THREDDS/OPeNDAPP servers.

2.2. Data management planning and coordination

A Data Management System (DMS) Plan has been finalized as part of our RICE application process. The DMS Plan discusses all our data, data management, servers and services in great detail.

2.3. Provision of data to the Global Telecommunication System (GTS)

All our metocean data are uploaded to the GTS either directly by us or through NDBC.

2.4. Data access services

We provide a Data Access page and dual/redundant THREDDS/OPeNDAPP access as well as links to the data pages of the HFR DAC, the Glider DAC and for AOML drifter. Data may be accessed in NetCDF and/or text format depending on the data type. Data access from NetCDF source files through our THREDDS/OPeNDAPP servers is the preferred method; however, csv text files are available for near-real-time data. We try to accommodate all user requests and format preferences.

2.5. Catalog registration

We are registered in the IOOS Registry. See above.

2.6. Common data formats

The two most common data formats are NetCDF and text CSV.

2.7. Metadata standards

CariCOOS conditions all subcontracted data providers to follow current metadata and data discovery standards.

2.8. Storage and archiving

The Archival section of the DMS Plan provides details of our Request to Archive documentation at NCEI.

2.9. Ontologies, vocabularies, common identifiers

We need to increase our efforts in terms of NetCDF file compliance as assessed through the use of the IOOS and NCEI compliance checkers. This effort is ongoing.

2.10. Consideration for Long-term Operations

These details are included in the CARICOOS Data Management Plan.

3. Observing Assets

3.1. Update the RA Observing Asset Inventory

The CARICOOS asset inventory has been updated, and a spreadsheet has been uploaded as an attachment.

3.2. HFR-Asset-and-Staffing-Inventory

Staff Member	(% FTE or #person-months)
Technical Director (HFR Lead)	Miguel Canals (5%)
Technicians/Engineers	Patricia Chardon (25%), Jose Torres (10%), David Carrero (20%)
Students	Colin Evans (50%), Luis Pomales (10%)

Other: CARICOOS extends a subaward to RUCOOL for HFR technical assistance and for rental of HFR antenna.

Total # of Radars Supported: 5

Site Code	Location	City, State	Frequency	Institution
FURA	18°17.514'N,067°11.897'W	Añasco, P.R.	13.45 MHz	CariCOOS
CDDO	18°05.997'N,067°11.428'W	Cabo Rojo, P.R.	13.45 MHz	CariCOOS
FARO	17°56.002'N,067°11.520'W	Cabo Rojo, P.R.	4.35 MHz	CariCOOS
PYFC	17°57.766'N,066°37.100'W	Ponce, P.R.	4.35 MHz	CariCOOS
MABO	17°59.288'N,065°53.100'W	Maunabo, P.R.	4.35 MHz	CariCOOS

3.3. Annual glider days

The glider days inventory for calendar year 2016 has been completed and uploaded as an attachment. There were a total of 498 CARICOOS glider days in 2016.

III. ENVIRONMENTAL COMPLIANCE

No activities outside those considered in the final U.S. IOOS PROGRAMMATIC ENVIRONMENTAL ASSESSMENT and found as posing no significant impact (FONSI 6/29/2016) were undertaken during the period here reported.