

# **Advancing the Caribbean Coastal Ocean Observing System**

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<http://caricoos.org>

## **LONG-TERM GOALS**

Past NOAA funding has provided for the development of the Caribbean Regional Association for Coastal Ocean Observing, CaRA, which has guided the development of the Caribbean Coastal Ocean Observing System. As designed, CariCOOS has strived to identify and meet prioritized stakeholder needs for coastal information with an efficient design minimizing observing assets while developing complementary modeling tools. This initial system has proved effective in providing wind, wave and current data products as well as simulations supporting forecasting for the Atlantic and Caribbean insular shelves. Through the present proposal, we intend to complete the initial CariCOOS phase and develop the required observing, modeling and skill assessment assets and tools needed before proceeding on a shoreward extension of the CariCOOS product domains. Informational access to the near coastal and nearshore regions will allow us to bring our services to specific shore dependent activities/sectors such as port and harbors operations, recreational activities and coastal resource management.

## **OBJECTIVES**

We focus on support to navigation and recreational safety and rapid response recovery in the most important regional ports, minimizing hazards to beachgoers and other recreational users, long term observing of climate change and ocean acidification, remediation, mitigation and adaptation to coastal hazards, data support for marine spatial planning and marine protected areas, and outreach and education to develop an “ocean literate” society.

## **APPROACH AND WORK PLAN**

- 1) Proposed scientific and/or technical approach:
  - a. Maintain existing data streams and product distribution/availability, web interfaces
  - b. Convene and host CariCOOS DMAC subsystem review design and training meeting.
  - c. Commence enhancement of DMAC subsystem
  - d. Operate and maintain and refurbish CariCOOS Data Buoy network

- e. Contract the continued operation and maintenance of 12 coastal weather MESONET stations and add 1 station.
- f. Validate SWAN and ADCIRC forecasting skill for north and south shelves
- g. Maintain WRF, ADCIRC, SWAN model output
- h. Commence ADCIRC enhancement with winds and HYCOM boundary conditions
- i. Purchase and install sidescan for bathymetric data system aboard existing PWC platform.
- j. Implement inshore high resolution SWAN and ADCIRC for San Juan & Charlotte Amalie
- k. Implement water quality measurements including pH and optical properties
- l. Implement Caribbean Time Series occupations in support of WQ, Ocean acidification and Caribbean climate monitoring
- m. Commence implementation of high resolution wave nowcast & forecast for beaches
- n. Co-host Sandwatch, Cajaya, PR weather camp, in-service teacher training
- o. Convene Stakeholders Council and General Assembly
- p. Convene CI-FLOW Workshop

2) identify the key individuals participating in this work at your own or other organizations and the roles they play:

Six senior personnel receive partial support and eight technical assistants are fully supported by the project. The Executive Director Morell is responsible for overall direction and coordination of the project. Two Associate Directors, Corredor and Canals assist with general project implementation and personnel supervision in the general areas of oceanography and coastal engineering respectively. Co-PI Detrés coordinates outreach and education. Co-PIs in the various thrust areas are: Mercado in coastal inundation and Aponte in Mesonet management, WRF validation and MCSP.

## **WORK COMPLETED**

As U.S. IOOS regional awards were finalized by NOAA in late August 2011, work supported by this award is just beginning. Nevertheless, below we itemize outstanding program accomplishments to date.

## **RESULTS**

Programmatic accomplishments include the recruitment of technical personnel, including student interns, drafting and signature of contracts/ subawards including WeatherFlow Inc for mesonet operation and maintenance and U Maine for coastal buoy maintenance and U Virgin Islands as sub regional liaison. All observing and modeling assets as well as data and product streams have been kept in operation.

## **IMPACT AND APPLICATIONS**

### **National Security**

CariCOOS coastal waves, winds, and currents data and forecasts products support regional operation of security related agencies including US Coast Guard, CBP, and local police force. Moreover, a sidescan sonar unit has been acquired by CariCOOS and installed aboard a PWC with the specific

mission of updating bathymetric data in beaches, ports and harbors including port recovery and reopening by USCG.

### **Economic Development**

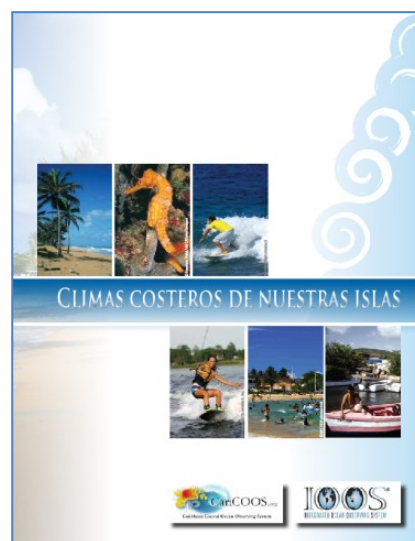
CariCOOS coastal waves, winds, and currents data and forecasts products support regional commercial and recreational maritime operations thus contributing to economic development of the PR and USVI region.

### **Quality of Life**

Water quality parameters are being developed to calibrate remote sensing imagery in order to identify and characterize critical watersheds in the region.

### **Science Education and Communication**

The CariCOOS educational module **Climas Costeros de Nuestras Islas (Coastal climates of our Islands)**, targeted to middle and high school (7-12 grades), was presented to the approximately 600 teachers attending the “5th Generation Mathematics and Science Teachers Congress”. **Climas Costeros de Nuestras Islas** integrates the most important concepts to understand how waves, currents and wind impact the coastal zone and the activities carried out there. The main objectives of this module are to promote understanding of the basic concepts of coastal climate, to learn about the web based tools and products provided by **CarICOOS**, to develop skills for interpretation of maps, models and coastal weather products, and to make informed decisions to prevent accidents in the coastal zone. The experience of developing this document was shared by a team of science teachers (education standards specialists), publishers, researchers and CariCOOS experts on the different topics. The module should be ready for distribution early next year. CariCOOS will offer professional development training on the topic of coastal weather to supplement this material.



### **TRANSITIONS:**

See transitions as per above discussions.

### **RELATED PROJECTS**

CSR, the Center for Secure and Resilient Maritime Commerce, is a Center of Excellence supported by the Department of Homeland Security. CariCOOS provides technical and administrative support to CSR in the maintenance and operation of a suite of HF Radars for the dual applications of vessel identification and tracking and surface current monitoring.

<http://www.stevens.edu/csr/news/index.php>.