Caribbean Coastal Ocean Observing System (CariCOOS): executive progress report:

CaRA General Assembly, March 12, 2012
Palmas del Mar Yacht Club and Marina, Humacao, P.R.
CaRA CariCOOS tasks

Completion of CariCOOS phase 1: “Implementing CariCOOS”
goals
• Addressing stakeholder needs for wind, wave and current data
  and products at critical and regionally representative sites as
  well as modeling storm surge inundation and assessing water
  quality issues i.e. suspended sediments

Implementation of phase 2 “Advancing CariCOOS”
• “moving inshore”: developing assets, tools and products
  required by shore dependent sectors such as harbor operations
  and beach hazards

Buildout plan: mid and long term goals
• Focused on detection and mitigation of climate change
  impact on marine resources and natural hazards
Completion and continued operation of CariCOOS initial phase:

- maintain and enhance observing and data m&d capabilities
  - buoy and weather mesonet uptime of over 80%
  - addition of 2 wind stations: Rincon P.R., WICO cruise ship pier VI
  - deployment of GOMOOS type data buoy for Vieques Sound
  - hardening data mgmt., archival and serving systems
Completion and continued operation of CariCOOS initial phase:

- enhancement of modeling products (inundation, waves, currents, winds & W Quality)
- Regional Currents:

AMSEAS (NMCOM /NAVO) : HYCOM /ROMS (L. Cherubin, U. Miami)
http://www.caricoos.org/zplayer/am_seas
Completion and continued operation of CariCOOS initial phase:

- enhancement of modeling (inundation, waves, currents, winds) and WQ products
  - Storm surge inundation maps for USVI and PR (Exhibit)
  - A. Mercado & N. Benitez
Completion and continued operation of CariCOOS initial phase:

- enhancement of modeling (inundation, waves, currents, winds) and WQ products
  - Water quality product for watershed management: MERIS (ESA) total suspended sediment product @ 300m resolution: Processing and access via web-based ESRI-ArcGIS interface

- Exhibit by B. Brocco: A RS/GIS Based Assessment of Coral Reef Exposure to Suspended Sediments
Phase 2: “Advancing CariCOOS”

Activities focused on meeting data needs from shore dependent sectors:

- support to navigation safety in harbors and approaches
- search and rescue
- response / management of spills and plumes
- rapid response port recovery
- minimizing hazards in recreational activities
- characterizing beach erosion

Presentation: CariCOOS Advances: Operational modeling of waves and currents at beach and harbor scales, Dr. Miguel Canals
Development of tools required for Phase 2 “Advancing CariCOOS”

- enhancement of modeling (inundation, waves, currents, winds) and WQ products
  - Waves: upgrade to SWAN multigrid Canals
  
Development of tools required for Phase 2 “Advancing CariCOOS”

NEARSHORE CURRENTS

- Forecasting Currents in the Virgin Islands Using ROMS
  M. Solano, S. Leonardi, M. Canals, J. Capella et al.

- Forecasting currents in San Juan Bay using ROMS
  Edgardo Garcia, S. Leonardi, M. Canals, J. Capella et al.
Development of tools required for Phase 2 “Advancing CariCOOS”

Particle tracking application for current models:

- spill response
- search and rescue
- larvae dispersal

Edgardo Garcia, Stefano Leonardi & C. modeling team
Development of tools required for Phase 2 “Advancing CariCOOS”

- Poster: Development of the Puerto Rico Beach and Surfzone Currents Warning System - Miguel Canals and CariCOOS Numerical Modeling Team.

CariCOOS partnerships

- Ocean Acidification Project; collaboration with coral reef monitoring NOAA-OA Program
  POSTER: - Melissa Meléndez, et. al.

- Cooperative agreement with NWS SJ-WFO
  - model implementation and validation
  - shadow model runs for WRF & SWAN

POSTER: The CariCOOS Wind Mesonet and Wind Modeling Initiative – Luis D. Aponte et. al.
CariCOOS partnerships

- **DHS Center for Secure and Resilient Maritime Commerce**

- **PR Sea Grant. Development of the Puerto Rico beach and surfzone currents warning system:** M. Canals

- **DNER- Storm Surge Modeling in Puerto Rico**
  - A. Mercado: Storm surge for two sea level rise scenarios

- **Puerto Rico Climate Change Council**
  - Working Group 1: Geophysical and Chemical Scientific Knowledge

- **DHS Coastal Hazards Center of Excellence**
  - J. Gonzalez, et. al. U. Notre Dame. Wave and Surge Modeling and Operational Forecasting in Puerto Rico
Posters by CariCOOS partners and stakeholders


- Oceanographic and meteorological observations of the United States Virgin Islands: a climatological history from weather station and data buoy measurements - Vanessa Wright, LeAnn Conlon, Joanna Gyory, Nasseer Idrisi. University of the Virgin Islands, Center for Marine and Environmental Science, St. Thomas, USVI.

- Proyecto Seguridad Acuatica (UPRM Sea Grant) – Berliz Morales

- The San Juan Bay Estuary Long-Term Monitoring Platforms - Jorge Bauza . San Juan Bay Estuary.
<table>
<thead>
<tr>
<th>Project Description</th>
<th>Funding Amount</th>
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<tbody>
<tr>
<td>IOOS - “Advancing CariCOOS”</td>
<td>$1,374,000</td>
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<td>NOAA Ocean Acidification program</td>
<td>$27,000</td>
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<td>NOAA OCRM “NE Corridor Reserve Hydrodynamics”</td>
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<tr>
<td>PR-Sea Grant “Development of the Puerto Rico Beach Surfzone Currents Warning System”</td>
<td>$42,293</td>
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<td>DHS Center for Secure and Resilient Maritime Commerce</td>
<td>$60,000</td>
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<tr>
<td>IOOS- A Puerto Rico/U.S. Virgin Islands surge and wave inundation model testbed (Southeastern URA)</td>
<td>$37,264*</td>
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<tr>
<td>DNER- Storm Surge Modelling in Puerto Rico</td>
<td>$44,000</td>
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</table>
Metrics: anybody out there? CariCOOS.org

HURRICANE ISAAC

HURRICANE SANDY

Visitadas
1200

abril 2012  julio 2012  octubre 2012
Metrics: anybody out there?

access to data and products via CariCOOS.org and NDBC web interfaces

circa 50,000 stakeholders (>50 visits/yr.)
Deliverables for March 2014

Operational status for:

• Observing subsystems: Mesonet and data buoy
• Nearshore wave model (SWAN multigrid)
• ROMS/AMSEAS current forecasts for harbors and approaches
• CariCOOS Harbor Operations Support System for major ports
• Puerto Rico Beach and Surfzone Currents Warning System
• WQ imagery and inundation map serving via CariCOOS GIS server
• Data management and communication subsystem (DMAC)
• Delivery of CariCOOS.org data and products
# The CariCOOS team

## Investigators
- Julio Morell
- Jorge Corredor
- Roy Watlington
- Miguel Canals
- Yasmin Detres
- Jorge Capella
- Stefano Leonardi
- Luis Aponte
- Aurelio Mercado

## Co-awardees
- Neil Pettigrew, U. Maine Ph. Oce. Group
- Jay Titlow, WeatherFlow Inc.
- Laurent Cherubin, U. Miami
- University of the Virgin Islands

## Technical Personnel
- Vanessa Gutierrez
- Belitza Brocco
- Adolfo Gonzalez
- David Carrero
- Jose Rodriguez
- Edda Larracuente
- Carlos Ortiz
- Roberto Castro
- Jorge Sabater
- Efrain Figueroa

## Student interns
- Andres Amador
- Melissa Melendez
- Patricia Chardon
- Edgardo Garcia
- Miguel Solano
- Jose Benitez
- Jose Mesa
- Christian Rojas
- Christian Velez
- Alexander Padin