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.

Caribbean Regional Association
CaRA

CARIBBEAN COASTAL OCEAN OBSERVING SYSTEM
CariCOOS.org
CARIBBEAN IOOS

INTEGRATED OCEAN OBSERVING SYSTEM
IOOS®

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

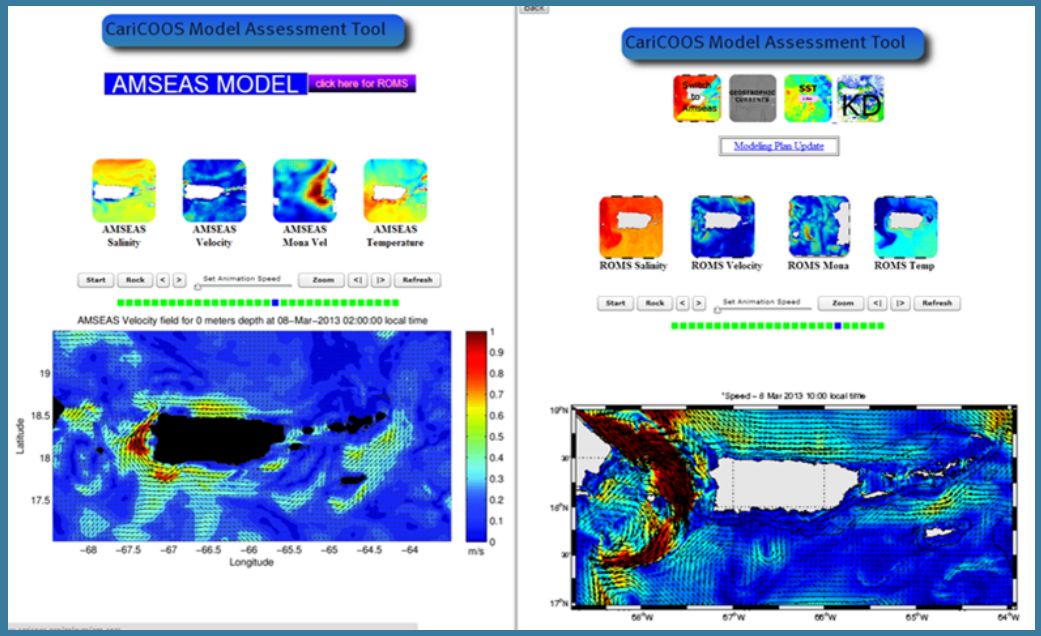
- *Focused on detection and mitigation of climate change impact on marine resources and natural hazards*

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**:



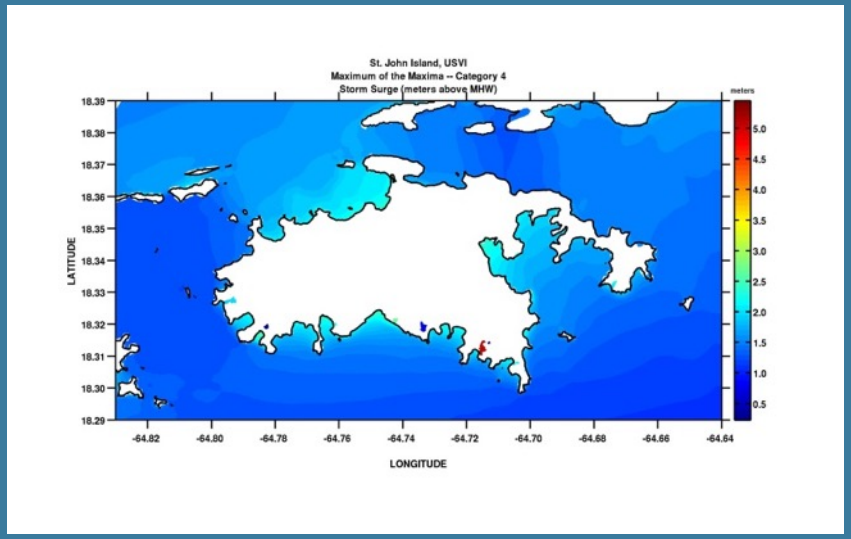
AMSEAS (NMCOM /NAVO) : HYCOM /ROMS (L. Cherubin, U. Miami)

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)**

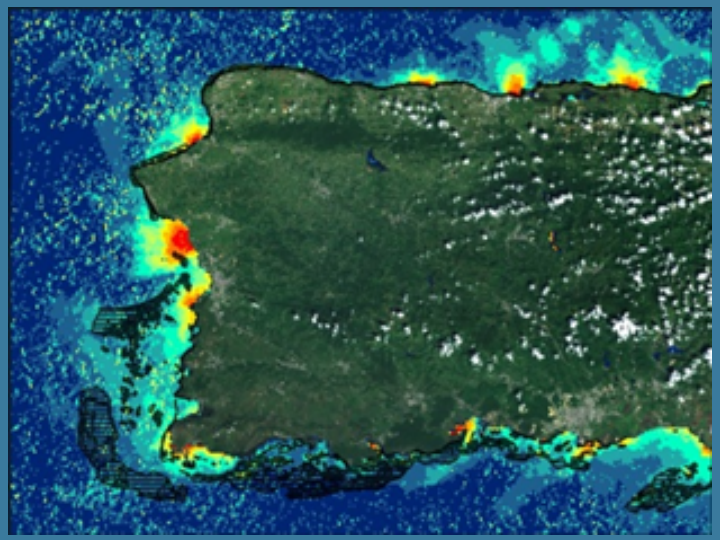
    A. Mercado & N. Benitez



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:

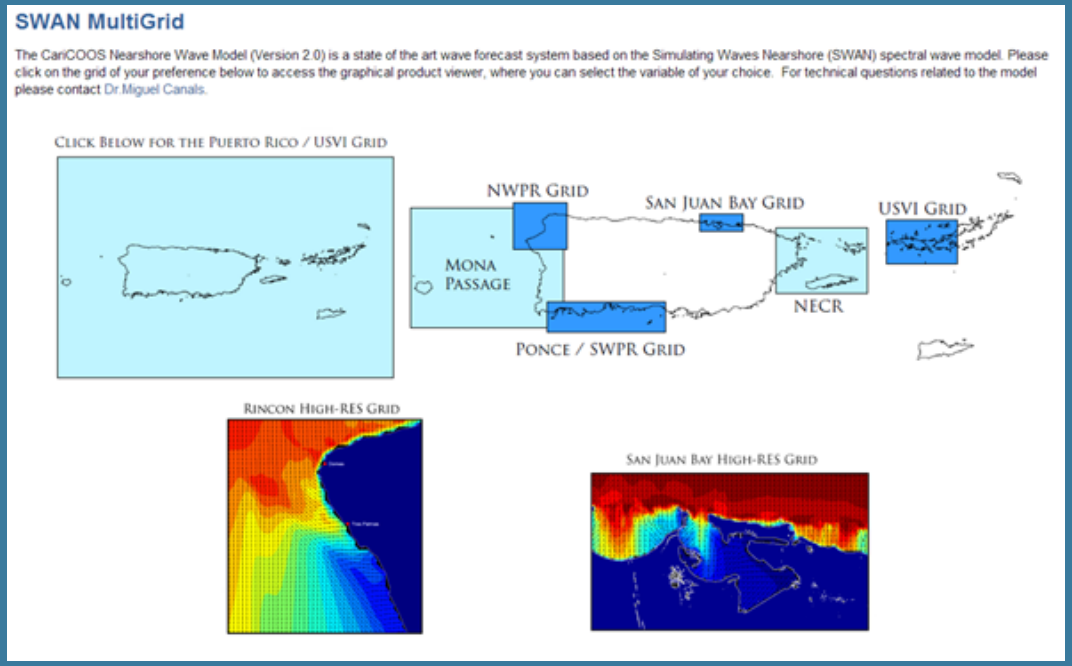
- support to navigation safety in harbors and approaches
- search and rescue
- response / management of spills and plumes
- rapid response port recovery
- minimizing hazards in recreational activities
- characterizing beach erosion

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

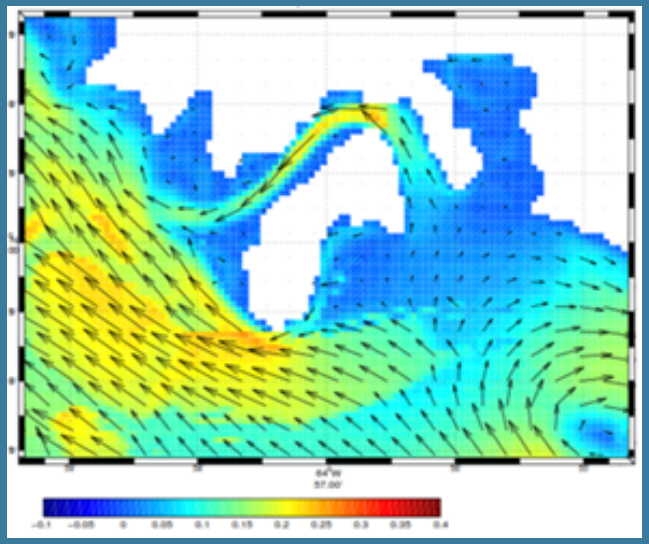
  Poster: The CariCOOS Nearshore Wave Model - Miguel Canals and CariCOOS Numerical Modeling Team.



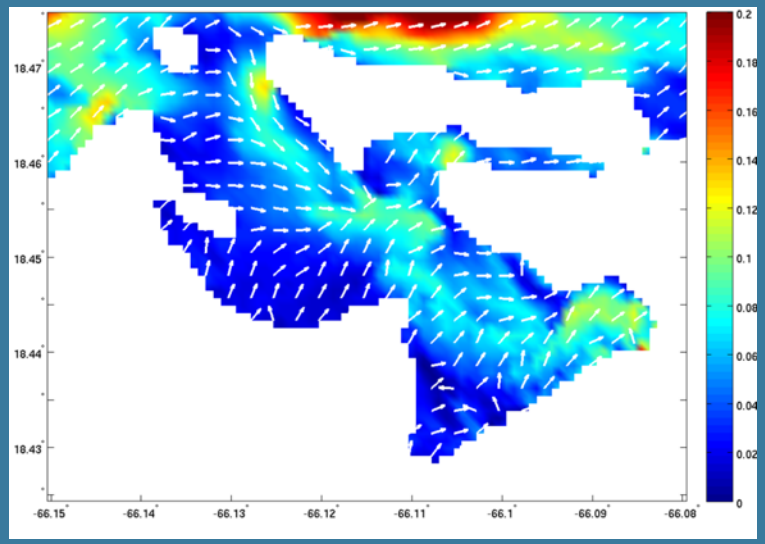
Development of tools required for Phase 2 "Advancing CariCOOS"

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.



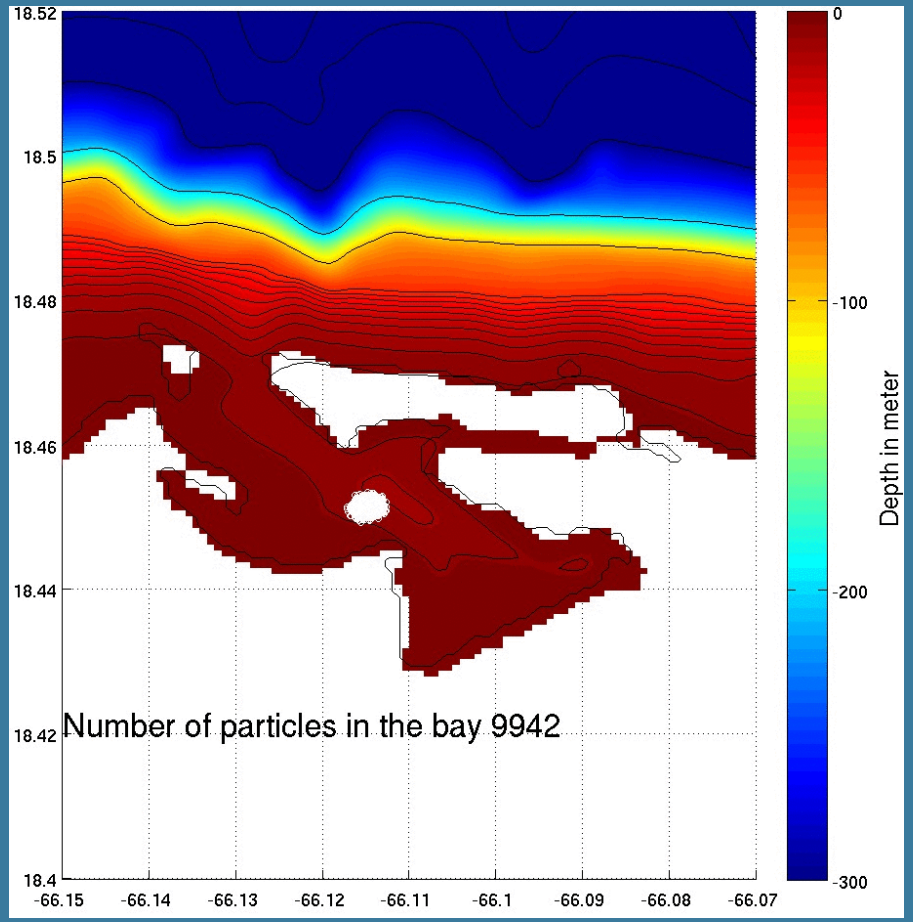
Development of tools required for Phase 2 "Advancing CariCOOS"

Particle tracking application for current models:

spill response

search and rescue

larvae dispersal

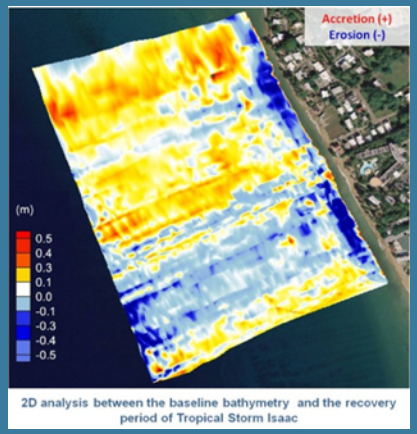


Edgardo Garcia,
Stefano Leonardi &
C. modeling team

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.

- Poster: Monitoring Morphodynamic Changes in Rincon, Puerto Rico Using a Jetski - Based Bathymetric Surveying System. Patricia Chardón and Miguel Canals.

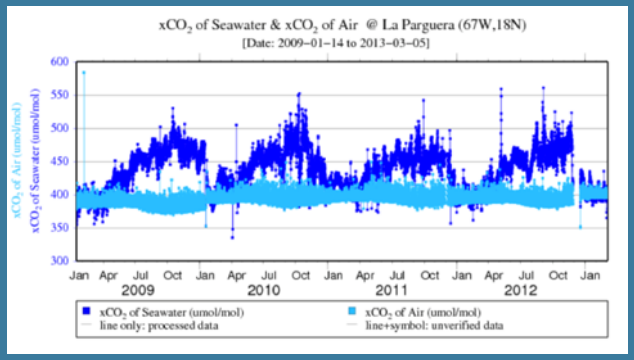


2D analysis between the baseline bathymetry and the recovery period of Tropical Storm Isaac

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**
  - J. Corredor: Co-operation of HF radar stations monitoring Mona Pass.
- **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

- Studying beach profile and sediment grain size distribution at Tombolo beach, Manatí, Puerto Rico (2011-2012) - Maritza Barreto and Jose Nevarez. University of Puerto Rico, Rio Piedras Campus.

- 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.

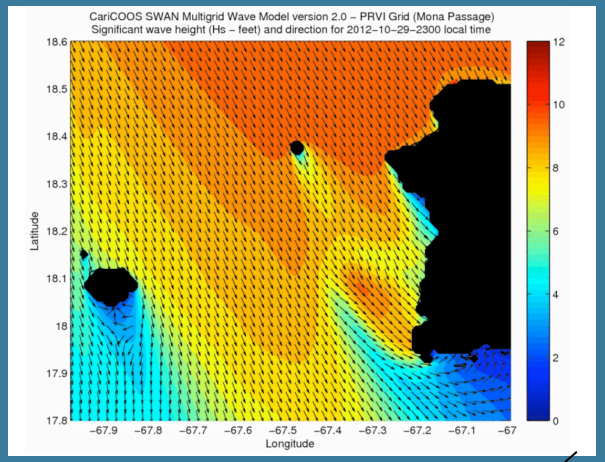
Funding 2013-2014

- IOOS - "Advancing CariCOOS" $1,374,000
- NOAA Ocean Acidification program $27,000
- NOAA OCRM "NE Corridor Reserve Hydrodynamics $35, 730*
- PR-Sea Grant "Development of the Puerto Rico Beach Surfzone Currents Warning System" $42,293
- DHS Center for Secure and Resilient Maritime Commerce $60,000
- IOOS- A Puerto Rico/U.S. Virgin Islands surge and wave inundation model testbed (Southeastern URA) $37,264*
- DNER- Storm Surge Modelling in Puerto Rico $44,000

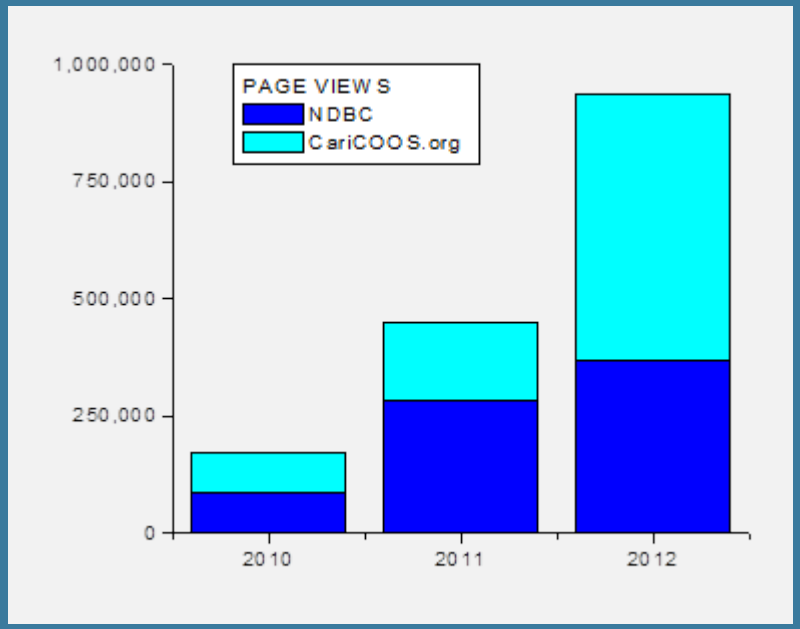
Metrics: anybody out there? CariCOOS.org

HURRICANE ISAAC

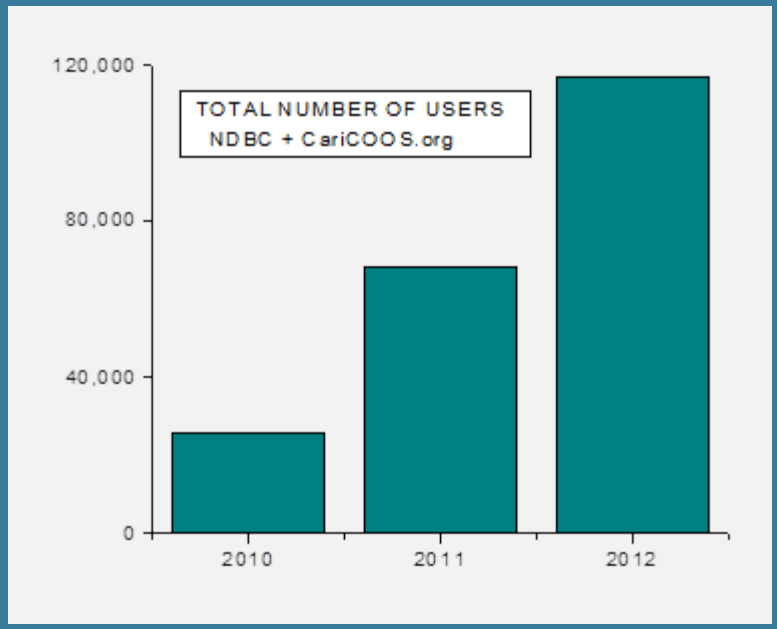
HURRICANE SANDY



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
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Yasmin Detres
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Melissa Melendez
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Edgardo Garcia
Miguel Solano
Jose Benitez
Jose Mesa
Christian Rojas
Christian Velez
Alexander Padin

Co-awardees

Neil Pettigrew, U. Maine Ph. Oce. Group
Jay Titlow, WeatherFlow Inc.
Laurent Cherubin, U. Miami
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Adolfo Gonzalez
David Carrero
Jose Rodriguez
Edda Larracuente
Carlos Ortiz
Roberto Castro
Jorge Sabater
Efrain Figueroa

THANK YOU !