The Caribbean Regional Association (CaRA)

**Pi’s:** J. Morell (UPRM), J. Corredor (UPRM), R. Watlington (UVI)

**Steering Committee & Associated Experts:** J. Capella (CaRA), A. Mercado (CRC-PR), D. Wilson (NOAA), N. Idrisi (UVI), C. Von Hillebrandt (PRSN-UPRM) Scott Strippling (NOAA-NWS), R. Chaparro (PR Sea Grant)

**CaRA Interns**

J. Gonzalez, C. Anselmi, C. Sueiras, D. Ruiz, A. Amador
CarICOOS: A Coastal Ocean Observing System for the N.E. Caribbean

**PI's:** J. Morell, J. Corredor, J. Capella, R. Watlington (UVI), A. Mercado, L. Aponte

**Collaborators:**

N. Pettigrew (U. Maine), J. Titlow (WeatherFlow Inc.), B. Blanton (Renaissance I), D. Hill (Penn State), C. Von Hildebrandt (PSN), L. Cherubin (U. Miami), S. Strippling (NWS), (PR Sea Grant Program), DRNA,
INFORM STAKEHOLDERS OF THE RCOOS OPPORTUNITY (http://cara.uprm.edu)

IDENTIFY USERS AND NEEDS FOR COASTAL OCEAN DATA AND PRODUCTS

- Meeting with state and federal agencies, academics, maritime industry etc.
- Interviews and polls (CIEL and Sea Grant recreational and tourism sectors)
- Documentation (Harbor Assessments USCG)

CaRA’s governance structure & stakeholder council were formalized during CaRA’s first general assembly, December 4, 2007
CaRA Structure

- **Organizational structure**
  - Memorandum Of Agreement
    (signed on Dec 4, 2007)

- **Membership**
  - 57 signatories

- **Affiliations**
  - Academics 18%
  - Government agencies 12%
  - Private Sector 40%
  - Federal Agencies 9%
  - Self Signatories 21%
CaRA Governance

Stakeholders Council

- 12 Council Members
  - 1 Council Chairman
  - 1 Council Secretary
  - Executive Committee (4 council members)
  - Membership and Nominations Committee
  - 4 additional committees to be empanelled:
    » Education & outreach
    » DMAC
    » Observing systems
    » Products and Services
Identified High-Priority Observational and Forecast Needs

- Coastal winds
- Coastal waves
- Coastal currents
- Coastal inundation
- Water quality (pathogens, visibility, sediments & pollutant plumes)
- Bathymetry (navigation, inundation and wave models)
- Temperature & salinity (climate change, riverine input)
- Benthic habitats
Initial phase of CarICOOS implementation: optimal deployment of observational assets, regional “coverage” will be achieved using through nowcast and forecast modeling for:

OBSERVATIONAL ASSETS (coordination by J. Corredor):

**OCEAN:**
- 2 COASTAL BUOYS (coll. with GOMOOS)
- OFF NORTH AND SOUTH COASTS
- METEO, CURRENTS, WAVES, WATER QUALITY

WATER QUALITY (remote sensing)
- J. Trinanes-NOAA CoastWatch

**COASTS:**
- 5 HURRICANE HARDENED METEO STATIONS IN PR,
- 4 IN USVI, Collaboration with WeatherFlow Inc.
CarICOOS Data Buoys

The GOMOOS (Gulf of Maine Ocean Observing System) Data Buoy

MOORING B
Central Maine Shelf

ODAS

1 m
2 m
2.5 m
4 m
20 m
50 m

SBE 37 SM
SBE 10C

Wind, Air Temperature, Visibility, Tides and Currents, Water Level, Weather Station, GPS, TDR, ADCP, CTD, Arduino, and a solar panel.

B01 U. Maine
Small CTD Package (CTD, CCR, DLFS, battery pack)

ODAS (Optical Data Acquisition System)
CarICOOS High Frequency Radio Network

Proposed Puerto Rico HFR arrays
MODELING ASSETS (NOWCASTS AND FORECAST),

- CaRA and UPRM have jointly established the Alliance for Numerical Modeling and Coastal Forecast. The DENR has contracted the Alliance to perform Coastal Zone inundation modeling using ADCIRC, SWAN and COULWAVE.

- Coastal winds, WRF J. Gonzales-CaRA/UPRM, S. Strippling NWS-SJ)

- Coastal waves, SWAN (C. Anselmi, CaRA-UPRM, J. C. Ortiz - UniNorte)
MODELING ASSETS (cont.)

- storm surge-inundation ADCIRC (J. Gonzalez, CaRA-UPRM, A. Mercado-UPRM, B. Blanton-Renaissance Institute), collaboration DRNA

- coastal currents, ADCIRC (J. Capella-CaRA, Dave Hill, Penn State)

- offshore currents (HYCOM/ROMS) L. Cherubin-RSMAS, N. Idrissi-UVI), IAS/NCOM (D. Ko-NRL)
Products:

• Tailored to our clientele
  • From scientist to common citizens

• Easy to access
  • Accessible interfaces to be installed as part of a pilot project

• Easy to understand
  • Avoid (as much as possible) the need for training
  • Outreach component
50 year projection for CaTS SST

\[ \text{SST}_{\text{projected}} = \text{climatological T} + 0.0233 \times 50 \]

50 year projection (+1.17 °C)

Coral bleaching threshold

"Deep convection" (hurricane) threshold

CaTS climatology

Julian day
Sea level change: a driver for future conflicts?
Questions?