17th SESSION IOCARIBE

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Intergovernmental Oceanographic Commission

Sub-Commission for the Caribbean and Adjacent Regions

Subcomisión para el Caribe y Regiones Adyacentes

Bogotá, Colombia
May 08 - 11, 2023

CARIBBEAN OCEAN OBSERVING NEEDS AND POTENTIAL APPROACHES TO MEET NEEDS

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GOBIERNO DE COLOMBIA

COMISIÓN COLOMBIANA DEL OCÉANO

SECTOR-FOCUSED DATA AND INFORMATION NEEDS

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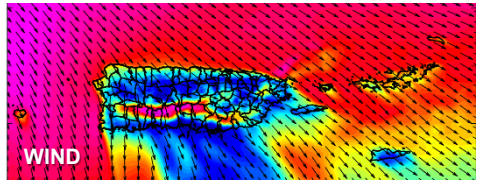
NEED ASSESSMENT AND PRIORITIZATION (CARICOOS)

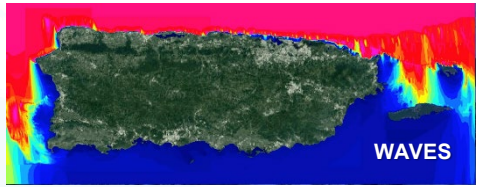
- **COASTAL HAZARDS**
  - Beach pathogens, rip currents, storm surge, compound inundation, and tsunami
- **MARITIME OPERATIONS (TRANSPORTATION, FISHERIES & OFFSHORE ENERGY)**
  - Sea state (wind and waves), currents, bathymetry, buoy data, temperature, and salinity
- **ECOSYSTEM MANAGEMENT**
  - Ocean acidification, water quality, Sargassum loading, coral disease, eutrophication, and ecosystem status
- **CLIMATE CHANGE/PLANNING SPECIALISTS**
  - Sea level rise, ocean warming, T&S anomaly, and erosion

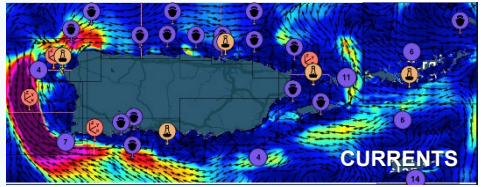
THE CARICOOS-IOOS MODEL

- **NEED ASSESSMENT AND PRIORITIZATION**
- **SYSTEM DESIGN**
  - Observations (buoys, gliders, HF radars, meteo stations) at **strategic locations** and for **model validation**.
  - Fill observational gaps with **numerical models** (global, regional, and nested high resolution)

GLOBAL	REGIONAL & NESTED HIGH RESOLUTION
Copernicus	WRF (wind)
RTOFS	SWAN (waves)
AMSEAS	FVCOM (ocean circulation)
GFS (waves & Wind)	



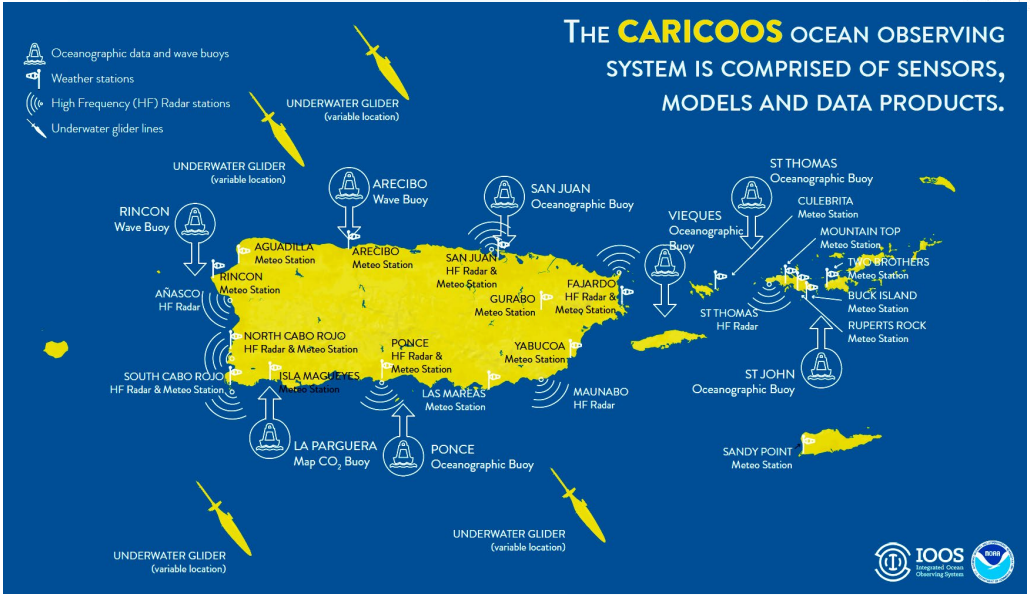




THE CARICOOS-IOOS MODEL

- **SYSTEM DESIGN**
  - Existing and essential observations (buoys, gliders, HF radars, meteo stations) at **strategic locations** and for **model validation**.

THE CARICOOS-IOOS MODEL



THE CARICOOS-IOOS MODEL

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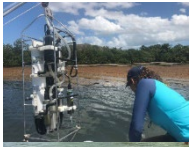
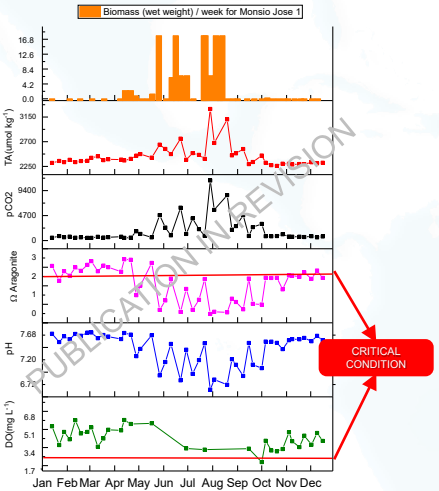
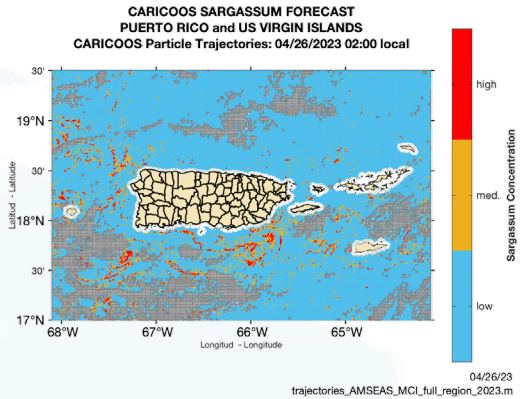
Sargasso Forecast and Biogeochemical Impact Assessment (hipoxia & ocean acidification)







THE CARICOOS-IOOS MODEL

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REQUIRED INVESTMENT

- **PHASE 1: Need and resource (expertise and data) assessment at national and regional scale**
- **PHASE 2: Development of decision-support data tools analogous to the CARICOOS platform** (~$50k US dollars)
    - Using existing observations and models
- **PHASE 3: Deployment and operation of observing and high-resolution modeling assets at high-priority sites (identified in the need assessment)** (to be determined based on need assessment)
    - Consider deploying observational assets (i.e. gliders) in the outer boundaries of the model domains.

AVAILABLE DATA RESOURCES

- **GLOBAL FORECAST MODELS AVAILABLE ACROSS TEMPORAL/SPATIAL SCALES**
  - Event-driven forecast (tsunamis)
  - Climate change
  - Global models (ocean, weather, etc.)
  - Some regional models (nesting or unstructured model implementation)
- **OBSERVATIONS: FORECAST MODEL VALIDATION, OPTIMIZATION, AND INITIALIZATION**
  - Operational (buoys, drifters, HF radars, DART moorings, AUV's)
  - Short-term efforts (seasonal)
  - Remote sensors (SST, salinity, altimetry, ocean color, etc.)
- **EXPERTISE**

AVAILABLE DATA RESOURCES

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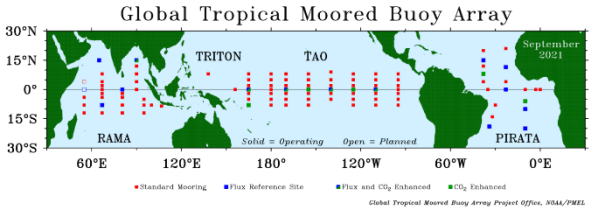
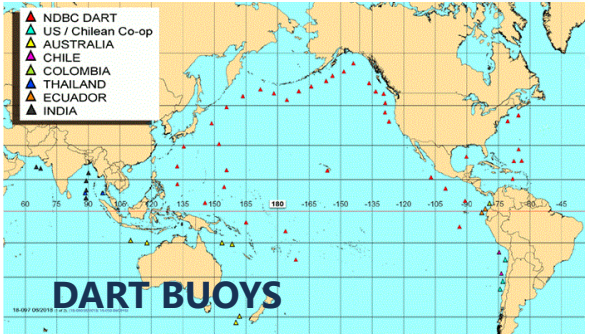
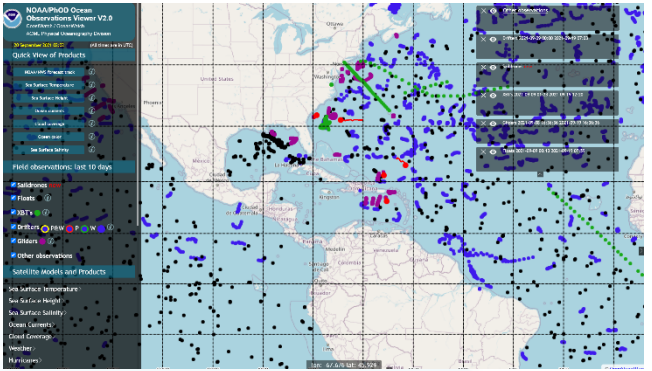


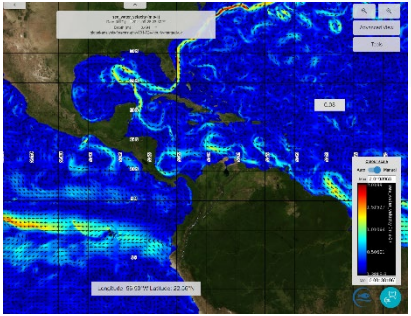




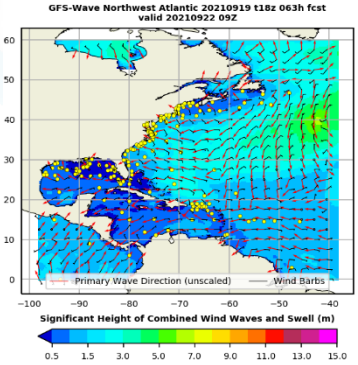
NOAA/PhOD Ocean Observations Viewer

AVAILABLE DATA RESOURCES

COPERNICUS

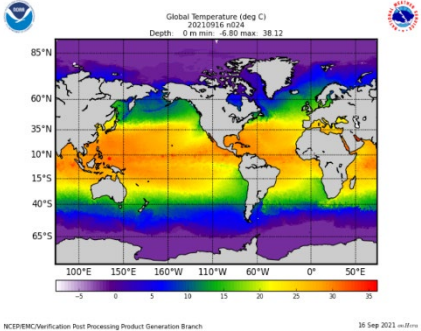


GFS Wave



Global Real-Time Ocean Forecast System (RTOFS)

(NOAA EMC)



THANK YOU

MUCHAS GRACIAS

MERCI BEAUCOUP