CARICOOS

The CARICOOS Operational Wave Modeling System

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LONG-TERM GOALS

Develop and maintain accurate, high-resolution operational wave models and wave-prediction products with the goal of enhancing available information that supports decision-making by stakeholders in the maritime sector.

MILESTONES / OBJECTIVES

The following table includes the wave modeling milestones / tasks as included in the FY18 scope of work, and their current status.

MILESTONE / TASK	Original Completion Date	Status
Operation & maintenance of CARICOOS Nearshore Wave Model	continuous	Ongoing
Migrate the CARICOOS Nearshore Wave Model to Amazon EC2 HPC instance	March 2019	In progress
Continue operation of the Yabucoa Port Metocean observation and prediction system	continuous	Completed
Numerical modeling in support of the CARICOOS Beach App	continuous	Ongoing
Maintain and enhance the operational CARICOOS - Sea Grant Nearshore Breaker Model	continuous	Ongoing
Modeling and product development in support of the CARICOOS Boating App	May 2019	Ongoing

WORK COMPLETED

1. Operation & maintenance of CARICOOS Nearshore Wave Model

All wave models have run without issues except for a 5-day period in October 2018 when issues with NWS' NDFD wind model affected operational runs.

2. Migrate the CARICOOS Nearshore Wave Model to Amazon EC2 HPC instance

Model is already installed in AMAZON EC2. Operational runs will resume once funds become available to restart the HPC instance. This is expected to happen in January 2019.

3. Continue operation of the Yabucoa Port Metocean observation and prediction system

Model is operational, running once per day.

4. Numerical modeling in support of the CARICOOS Beach App

Breaking wave height forecast modeling is ongoing in support of the beach app. Breaking wave height forecast output were reformatted for ingestion by the app developers in September 2018.

5. Maintain and enhance the operational CARICOOS - Sea Grant Nearshore Breaker Model

The Nearshore Breaker Model has been fully operational during the performance period. In addition, we have begun experimental work to include 1D SWASH (phase resolving) wave modeling for selected sites to compare the performance of SWASH with the breaking wave heights estimated by SWAN using spectral partitioning.

6. Modeling and product development in support of the CARICOOS Boating App

This task is ongoing. Product development will commence once stakeholder surveys are completed. Data preparation and coding has begun to prepare model output for data ingestion by app developers.

MAJOR OUTCOMES

- Breaking wave height forecasts for 5 days in advance are now available for ingestion by the CARICOOS Beach App – implementation by app developer is pending

- All wave models operational during the performance period

RELATED PUBLICATIONS & PRODUCTS

Canals, M. and C. García. *On the spatial distribution of the wave energy resource in Puerto Rico and the United States Virgin Islands*, Journal of Renewable Energy, *In Press*, 2018

Loeffler, C. R., A. Robertson, H. A. Flores Quintana, M. Canals, T. B. Smith, and D. Olsen. *Ciguatoxin prevalence in four commercial fish species along an oceanic exposure gradient in the U.S. Virgin Islands.* Environmental Toxicology and Chemistry, Vol 37(7):1852-1863. doi: 10.1002/etc.4137, 2018