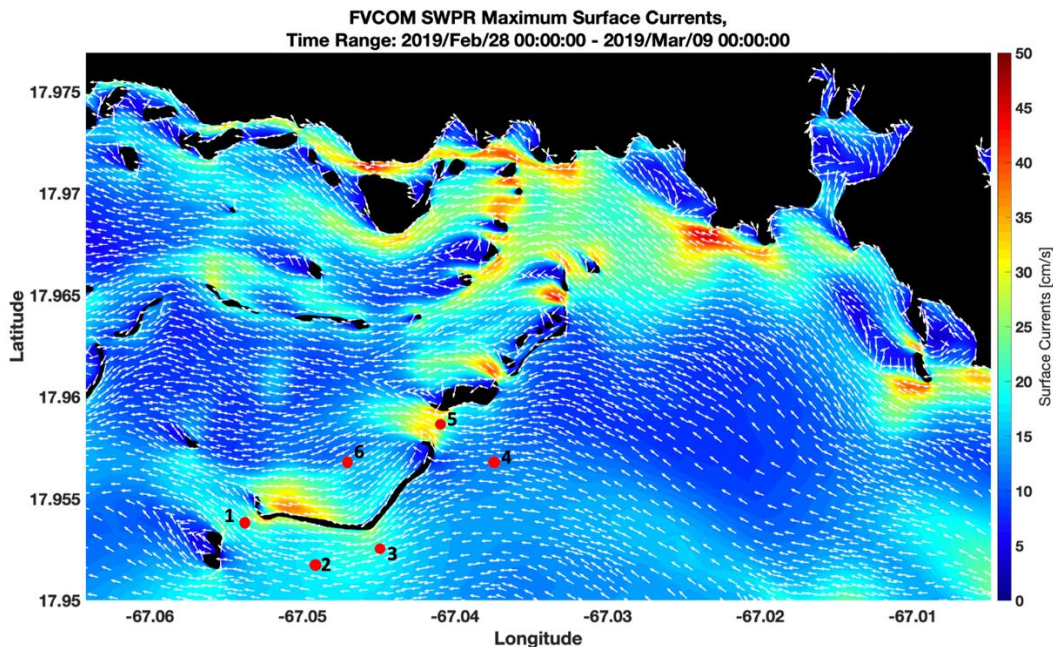# CARICOOS
CARIBBEAN COASTAL OCEAN OBSERVING SYSTEM

An 3D Hydrodynamic Model of
La Parguera, Puerto Rico (FVCOM-SWPR)

Patricia Chardón-Maldonado, Julio Morell, Fabián García-Moreno
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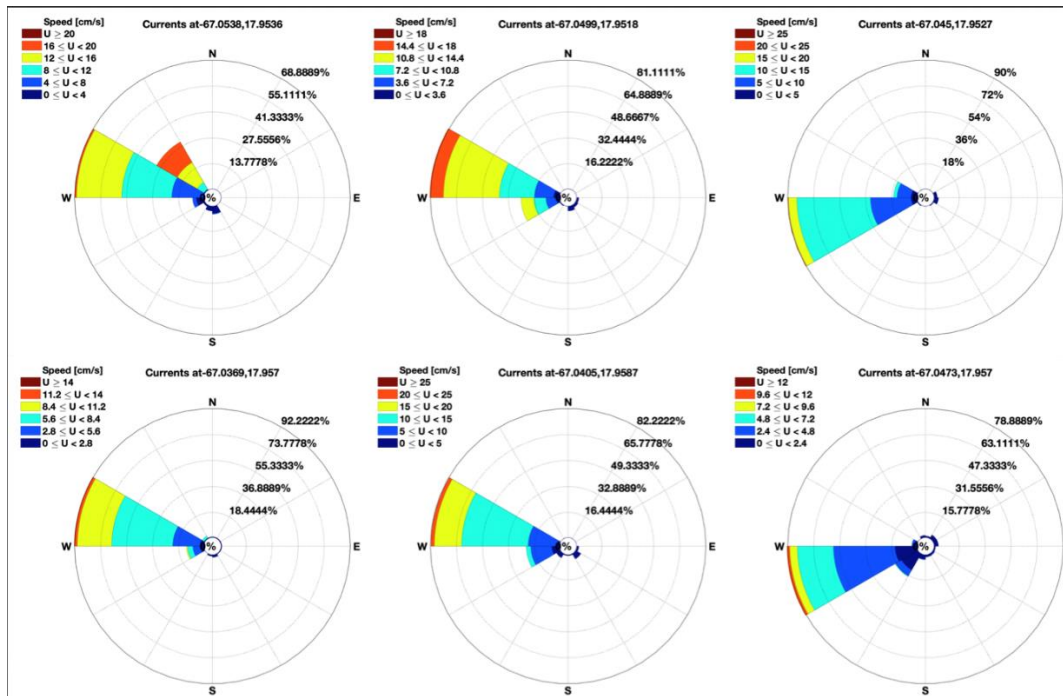*Performance Period: December 1, 2018 – May 31, 2019*

LONG-TERM GOALS

The main goal of the CARICOOS coastal modeling group is to develop a reliable hindcast tool that will provide high resolution predictions of water levels, currents, temperature, and salinity. Due to the successful implementation of the Finite Volume Community Ocean Model (FVCOM) at Puerto Rico & Virgin Islands the same model was selected to be implemented at La Parguera, Lajas. Initial efforts in modeling the region have proven to be successful but still under development. The development of this hindcast tool will provide useful information to better understand circulation/transport patterns at La Parguera and help improve efforts in ocean acidification monitoring. The images below showcase current patterns near Cayo Enrique which could be used to estimate water residence time and coral health impact.

FVCOM SWPR Maximum Surface Currents, Time Range: 2019/Feb/28 00:00:00 - 2019/Mar/09 00:00:00

MILESTONES / OBJECTIVES

Milestone/Task	Completion Date	Status
Implement CARICOOS FVCOM to understand the hydrodynamics in La Parguera Marine Reserve (NOAA sponsored Ocean Acidification studies)	December 2019	In progress

WORK COMPLETED

- Implemented a new high resolution mesh for the SWPR domain. Computational domain now counts with a variable spatial resolution of 10-750 m and extends offshore ~12 km to include the shelf drop.

- Wrote automatized matlab routines for pre-processing and post processing visualization.

- Processed CFMC benthic habitat mapping shapefiles to be included into FVCOM-SWPR in the form of variable bottom roughness

MAJOR OUTCOMES

NONE

RELATED PROJECTS

NONE

WORK PLAN FOR UPCOMING PERFORMANCE PERIOD (June 1, 2019 – November 30, 2019)

- Assign corresponding n-manning coefficients to benthic habitad polygons.

- Perform 3D baroclinic 2 month hindcast simulation

- Validate model output (water surface elevation and surface currents) with available sensors deployed in the region.