Supporting the Blue Economy - SECOORA 2018 Annual Meeting

SECOORA Principal Investigator Abstracts

May 22-24, 2018 | Website

A Coordinated Observing and Modeling System for the West Florida Continental Shelf as part of SECOORA

Robert H. Weisberg and Yonggang Liu, College of Marine Science, University of South Florida

This award partially supports three real-time ocean-atmosphere buoys (C10, C12, C13) on the west Florida shelf (WFS), a west Florida coastal ocean circulation model (WFCOM) that downscales from the deep-ocean, across the shelf and into the estuaries, and satellite altimetry and surface geostrophic currents analyses. Two subsurface moorings are also maintained. Both real time observations and modeled nowcast/forecasts are served at http://ocgweb.marine.usf.edu and supplied to SECOORA. These are also distributed through NOAA.

All of the real-time moorings were damaged by Hurricane Irma. C10 and C12 being closest and with damage to power system and some sensors were quickly back on line. C13, more remote and more severely damaged remains to be fixed. The recent receipt of a National Academy of Science Gulf Research Program (NASEM-GRP) Irma damage award has now enabled us to accomplish this though the purchase of necessary replacements and the funding of ship time. A new C13 system is scheduled for deployment in June 2018. We have reason to believe that the internally recording and separately powered C13 ADCP continues to function as it did transmit up until the buoy telemetry power system eventually failed a few days after the storm passage.

Along with the SECOORA funded buoys, we also made significant progress on our RESTORE Act funded real-time waves/currents/met station deployed offshore of St. Pete Beach, FL. This funding was leveraged through a competitive grant from Pinellas County and will be included as part of the SECOORA and USF College of Marine Science funded Coastal Ocean Monitoring and Prediction System as long as funding remains available. The meteorological station portion of the system was deployed in January 2018. Adverse weather at that time kept us from completing the system, and ship support has been unavailable since then. As presently scheduled this C21 site will be completed at the end of May 2018.

We also completed a very high resolution model for the Tampa Bay vicinity with a competitive Pinellas County RESTORE Act award. This Tampa Bay Coastal Ocean Model (TBCOM), with resolution as fine as 20m, includes Tampa Bay, Sarasota Bay,

the Intra-Coastal Waterway, and all of the inlets connecting these with each other and with the Gulf of Mexico. TBCOM provides automated, daily nowcast/forecasts available to the public at: http://ocgweb.marine.usf.edu/~tbm/index.html. By nesting in WFCOM, TBCOM we have a seamless transition from the deep ocean across the WFS and into Tampa Bay, which allowed us to accurately model the response to Tampa Bay to Hurricane Irma.

It is only through the coordination of observations and model simulations that we can continually advance our understanding on how the WFS works, thereby providing useful information to stakeholders. Two recent accomplishments of note are a new hypothesis on the WFS control of the Loop Current penetration into the Gulf of Mexico and an explanation on the origin and transport of sediments to the south Florida reef track during Hurricane Irma. Both of these may lead to new leveraging opportunities.

Recent papers include:

Chen, J., R.H. Weisberg, Y. Liu, L. Zheng (2018), The Tampa Bay Coastal Ocean Model (TBCOM) Performance for Hurricane Irma, *Marine Technology Society Journal*, in press for Vembu special issue.

Liu, Y., R.H. Weisberg, J. Law, B. Huang (2018) Evaluation of Satellite-Derived SST Products in Identifying the Rapid Temperature Drop on the West Florida Shelf Associated with Hurricane Irma, *Marine Technology Society Journal*, in press for Vembu special issue.

Weisberg, R.H., L. Zheng, and Y. Liu (2017), On the Movement of Deepwater Horizon Oil to Northern Gulf Beaches, Ocean Modelling, 111, 81-97, doi:10.1016/j.ocemod.2017.02.002.

Weisberg, R.H. and Y. Liu (2017), On the Loop current penetration into the Gulf of Mexico, Journal of Geophysical Research: Oceans, 122, 9679-9694, doi:10.1002/2017JC013330, https://doi.org/10.1002/2017JC013330.