US IOOS Coastal and Ocean Modeling Testbed Summary

Becky Baltes
becky.baltes@noaa.gov

Abstract

The mission of the Coastal and Ocean Modeling Testbed (COMT) is to use targeted research and development to accelerate the transition of scientific and technical advances from the coastal and ocean modeling research community to improve identified operational ocean products and services (i.e., via research to operations and also operations to research). The vision of the program is to enhance the accuracy, reliability, and scope of the federal suite of operational ocean modeling products, while ensuring its diverse user community is better equipped to solve challenging coastal problems and recognize the COMT to be where the best coastal science is operationalized. Since its initiation in June, 2010, non-federal partner, the Southeast University Research Association (SURA) has led the development of the COMT to include a flexible and extensible community research framework to test and evaluate predictive models to address key coastal environmental issues. This framework supports integration, comparison, scientific analyses and archiving of data and model output. The COMT has developed a cyber infrastructure to allow more effective collaborations among Federal research labs, the academic community and Federal operational centers to accelerate improvements of predictive models. Several models, tools and techniques are now being incorporated into NOAA's operational framework. The National Center for Environmental Prediction (NCEP) is an operational "anchor" for the COMT, which addresses major NCEP modeling challenges in coastal, predictions by enabling the transition of research improvements into NCEP's operational forecast capability. In addition to numerous academic partners, Federal participants include agency representation from NOAA, Navy, EPA and the U.S. Army Corp of Engineers (USACE). So far, the COMT has addressed three research challenges of high socioeconomic relevance: estuarine hypoxia, shelf hypoxia, and coastal inundation. Successes include:

- Advancing multi-model capabilities for forecasting the location and timing of the "dead zone" in Chesapeake Bay to support Chesapeake Bay Program managers.
- Transitioning a simple model for predicting the location and timing of hypoxia to NOAA's operational Chesapeake Bay Operational Forecast System (CBOFS).
- Forecasting the timing, duration, spatial extent, and severity of the Gulf of Mexico "dead zone" and reducing uncertainties about the role of nutrient loads to aid NOAA CSDL.
- Improving predictions of coastal flooding by nor'easters in the Gulf of Maine by incorporating wave effects in the models.
- Five models that predict coastal flooding by hurricane storm surge in the Gulf of Mexico and include wave effects, were evaluated and refined.
- A storm surge model, with a coupled waves model, is now being transitioned to the National Hurricane Center for testing prior to consideration in operational use.
- The model archive and tools developed by the COMT are being used by operational groups (NRL, National Hurricane Center) and researchers to improve model prediction