Recent Advances of An Integrated Modeling System for Coastal and Estuarine Environments

Y. Peter Sheng, Vladimir A. Paramygin, Tianyi Liu, Andrew Lapetina, and Justin R. Davis

Department of Civil and Coastal Engineering
University of Florida
Gainesville, FL 32611-6580
pete@coastal.ufl.edu

This presentation describes the recent advances of an integrated modeling system for coastal and estuarine environments, CH3D-SSMS (Sheng et al. 2010), which is based on the boundary-fitted curvilinear grid hydrodynamic model CH3D (Sheng 1987, 1990) coupled to the SWAN model in the coastal region and basin-scale hydrodynamic model (HYCOM, NCOM, and ADCIRC, etc.) and wave model (WW3).

Recent advances of the modeling system include (1) combination of 3D baroclinic feature with flooding-drying capability; (2) enhancement of current-wave interaction with depth-dependent radiation stress; (3) incorporation of a vegetation canopy model; and (4) coupling of an oyster population model.

Results of the integrated modeling system obtained with the new model features will be highlighted during the presentation.

References

Y.P. Sheng, V. Alymov, and V. Paramygin, "Simulation of Storm Surge, Wave, Currents, and Inundation in the Outer Banks and Chesapeake Bay during Hurricane Isabel in 2003: The Importance of Waves", *Journal of Geophysical Research – Oceans*, April 2010, pp.1-35.