STRUCTURE OF THE ICOAST COASTAL HAZARD FORECAST SYSTEM

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Within the UF iCoast initiative, we are developing a coastal hazard prediction system, which is aimed at providing real-time numerical forecast of different coastal hazards, such as erosion, flooding and water quality reduction. This poster presentation reviews the present status and recent updates of the system.

The icoast-forecast system is a platform based on Matlab and Python currently running on the Hipergator supercomputer from the UF Research Computing Center. Every day, the icoast-forecast system pre-processes the initial, boundary and atmospheric forces needed to run a 3-dimensional hydrodynamic and wave generation and propagation models. The current version of the forecast system is based on the Coupled-Ocean-Atmosphere-Wave-Sediment Transport (COAWST) model, which is composed of the Regional Ocean Modeling System (ROMS) hydrodynamic model and the Simulating WAves Nearshore (SWAN) for wave generation and propagation. Atmospheric forces forecasted by the High-Resolution Rapid Refresh HRRR model are used to force both ROMS and SWAN. Initial and boundary conditions for ROMS are extracted from HYCOM (HYbrid Coordinate Ocean Model). Initial and boundary conditions for SWAN are derived from the WW3 (WaveWatch3) forecast run by NOAA. Although in the current system specific boundary and forcing sources are considered, in the future we plan to include different forcing sources. The goal is to include in our predictions. the uncertainty derived from the atmospheric forecast uncertainty. The prediction system is being tested in the area of Guana-Tolomato-Matanzas (GTM) estuary and provides up to 36 hours forecast on a daily base. The forecast variables include water level oscillations, 3-dimensional structure of currents, water temperature, salinity and wave conditions. After we verify this forecast system in the Guana-Tolomato-Matanzas estuary, we will apply it to other coastal areas along Florida.

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