

Abstract

Title: Implementation of a Flexible ADCIRC-WAVEWATCH III Coupling System

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This research effort advances modeling capabilities of the real-time ADCIRC Prediction System (APS) for predicting hazards and potential impacts from tropical and extratropical cyclones on critical infrastructure and communities in the U.S. The APS is currently based on the coupled ADCIRC-SWAN framework. Recent improvements in WAVEWATCH III (WW3) wave model numerics and shallow water physics make WW3 a strong candidate to replace the traditional SWAN model in APS. A flexible coupling application for ADCIRC and WW3 (ADC-WW3-NWM-NEMS) developed at NOAA has been installed and implemented successfully on RENCi high performance computers. With the unstructured WW3 configuration, we found that in coastal waters (<30 m) the magnitude of the enhanced drag coefficient on the left tropical cyclone quadrant is very sensitive to the model time step. This sea-state dependent coupling parameters between the WW3 model and the atmospheric cap has been established and are ready to be used to couple WW3 with an atmospheric model such as the URI hurricane boundary layer model.