

## **ERDC'S COASTAL STORM MODELING SYSTEM: SYSTEMS INTEGRATION**

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The USACE ERDC Coastal Storm Modeling System (CSTORM-MS) provides for a robust, standardized approach to characterizing the hurricane hazard that puts coastal communities at risk. It allows for multi-scale scenarios for reducing the uncertainty of storm impacts to existing and new structures and for design of new structures. Realistic coastal storm modeling requires the integration of several complex and sophisticated numerical modeling systems. In particular, the following systems are currently being used within CSTORM-MS: a tropical planetary boundary layer model, MORPHOS-PBL, to generate the cyclone wind and pressure fields, an ocean hydrodynamic model, ADCIRC, to generate the surge field, and both regional and nearshore ocean wave models, WAM and STWAVE, to generate the wave fields. In addition to these models that simulate the oceans response to a storm in the form of waves and surge, a bed morphology model, C2SHORE, is currently being included to simulate landscape changes due to the surge and wave effects. In order to gain a more complete representation of the response to the storm, many of these systems are tightly coupled to allow for timely feedback responses into each model. We will present a new work flow, see Figure 1, that is easy to configure and execute with the aid of graphical user interfaces (GUI) in the Surface Modeling System (SMS). This new work flow system with GUI's and tightly coupled models represents an enabling technology for more comprehensive studies on flood and shore protection and sediment management. These same technologies can be applied for both hindcasting and forecasting scenarios. CS TORM-MS simulations are then able to be stored, queried, and visualized inside of the CSTORM database (CSTORM-DB). Details of the coupling strategies and efficiencies will be discussed in detail.