

## **Investigating Dredging Options at John's Pass and Blind Pass Using the Coastal Modeling System (CMS)**

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The channels and part of the ebb shoals of John's Pass and Blind Pass have been used as borrow areas for several beach nourishment projects. An investigation for a maintenance dredging project in 2009 along the channel and over a small portion of the ebb tidal delta is conducted using the state-of-the-art Coastal Modeling System (CMS). CMS was developed by the Coastal Inlet Research Program at the US Army Engineer Research and Development Center, and has been used to study the hydrodynamics, sediment transport, and morphodynamics at numerous inlets. The objectives of this study are to examine 1) influences of the dredging to flow patterns through the tidal inlets; 2) impact of the dredging to local and regional wave fields, sediment transport, and morphology change; 3) rate and pattern of sedimentation in the dredge pits. A 1-year simulation of various dredging options was conducted. The calculated water level and flow velocity compared well with the measured values. The overall trends of morphology change also compared well with the trends elucidated from extensive field data.

The modeled flow field, sediment transport pattern, and morphology change were used to evaluate various dredging options. An optimal option is recommended based on a comprehensive analysis of existing field data and the modeling results. The design considerations of this dredging project and associated beach nourishment projects focus on minimal disturbance to coastal processes. Sediment removed from the inlets should not result in significant modification of flow field and sediment transport patterns. Thus, the majority of sediment is designed to be removed from the inlet throat, rather than from the ebb shoal. When material is proposed to be removed from the ebb shoal, the dredging location is selected on the seaward and downdrift edge. It is proposed to remove sediment from the seaward edge of the ebb shoal of John's Pass. Fortunately, the downdrift beach is over 1,000 ft wide and has been benefiting from natural inlet bypassing for many years; thus, a slight reduction in sediment bypassing will not be as significant as it might be in the case of an eroding downdrift beach.

### Biography of the Presenter

Ping Wang is the director of the Coastal Research Laboratory and an Associate Professor at the Department of Geology at the University of South Florida. Wang obtained his Ph.D. in Coastal Geology from the University of South Florida in 1995. Wang's research interest includes: coastal sedimentary processes, nearshore sediment transport, nearshore wave and current dynamics, coastal morphodynamics, coastal engineering and management, numerical modeling of coastal environments. Wang and Dr. Nicole Elko will co-lead the field trip for the 2009 ASBPA national conference.