



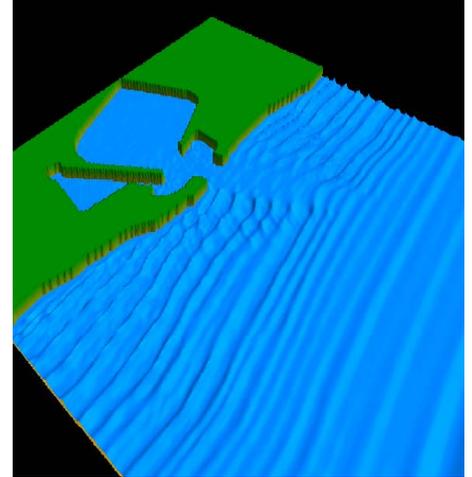
**US Army Corps
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Engineer Research and
Development Center

Waves in Entrance Channels

Description Develop a numerical model to improve wave predictions in the Corps-critical area of entrance channels.

Issue The prediction of wave conditions in channels is complicated by the abruptness of the channel geometry, wave nonlinearities, and by the presence of structures and currents. Present Corps numerical wave and harbor model technology is based on approximations that are not accurate in channels and incorporate structures in a rudimentary way. Physical models are used in many channel designs, but they are costly to build. Numerical wave simulation technology will allow evaluation of Corps channel designs, structure designs, and dredging alternatives, and will improve sediment management simulation allowing the Corps to choose the most cost-effective alternatives.



Users Corps Districts Offices.

Products A Boussinesq model was targeted as the technology leader for integrated wave modeling in entrance channels. The model BOUSS-2D has been enhanced to include the interaction between waves and structures (reflection, transmission, dissipation, runup, and overtopping), which is critical to accurate wave predictions in channels. The model has been verified to reproduce the generation of long waves in harbors that cause disruptive harbor oscillations. The model has also been applied to the combined problem of shallow-water wave breaking and generation of surf zone currents. BOUSS-2D has been documented in a user's guide, and the model has been implemented in the Surface-water Modeling System user interface. The interface simplifies user input and visualization of results. Present efforts focus on a long-wave toolbox, improved user interface, and additional documentation. A user workshop has been held to put the model in the hands of users. Another workshop is scheduled for August 2005 in San Francisco, California.

Benefits The numerical wave simulation technology offers evaluation of Corps channel designs, structure designs, dredging alternatives, and improve sediment management simulation allowing the Corps to choose the most cost-effective alternatives.

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