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Engineer Research and
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New Orleans 17th Street Canal Physical Model Study

Description

To understand the performance of levees and floodwalls during Hurricane Katrina, investigators must obtain detailed estimates of the hydrodynamic forces and overtopping rates throughout the storm. These measurements do not exist in the vicinity of the levees and floodwalls. The Interagency Performance Evaluation Task (IPET) Force is developing time histories of local wave and water level forces acting on flood protection structures, including flow over the levee or floodwall, wave overtopping, and static and dynamic pressure forces on the structures. Researchers are modeling all areas in the primary New Orleans drainage/navigation canals and along the hurricane protection levees surrounding parishes. The IPET has tasked the U.S.

Army Engineer Research and Development Center (ERDC), Coastal and Hydraulics Laboratory (CHL) to develop both numerical and physical models of flood control structures in the New Orleans area. ERDC-CHL has been working with coastal and river models since 1929 and is the nation's expert in this field.



Overview of 17th St Canal physical model with Directional Spectral Wave Generator (DSWG) shown at top of photo.

Objective

The objective of this study is to (a) acquire information that will be used to estimate wave transmission under the Old Hammond Highway Bridge near the canal's mouth at Lake Pontchartrain, (b) calibrate and validate information that will be fed into various numerical models, and (c) quantify the potential for wave groups to create surging currents within the canals (resonant and non-resonant).

Issue

The 14,500 sq ft physical hydraulic model of the 17th Street Outfall Canal has been constructed to a 1:50 undistorted scale. The model replicates 0.5-mi of the canal from the Old Hammond Highway Bridge to 1,200-ft beyond the breach site, and more than a mile of the lake front. Data collection began the first week in March, 2006 with testing consisting of 30-40 unique alternative model runs. Waves will be generated by both unidirectional and multi-spectral computer-controlled wave generators that can produce waves of varying heights, periods and directions similar to the storm conditions occurring during Hurricane Katrina. Surge water variation time history will also be reproduced in order to examine flow fields through the canal. Data collected from the physical model study will be incorporated into a suite of numerical models being used by the IPET. All available information will be used to ensure that results are consistent with high water marks and other physical evidence in the study area.

Sponsors

Interagency Performance Evaluation Task (IPET) Force

Point of Contact

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