



US Army Corps
of Engineers®

Engineer Research and
Development Center

Sabine Pass to San Luis Pass, Texas, Shoreline Erosion Feasibility Study

Description

The US Army Engineer District, Galveston, has requested the technical assistance of the U.S. Army Engineer Research and Development Center's Coastal and Hydraulics Laboratory (CHL) in their major shoreline erosion study along the northeast Texas Gulf coast. This ongoing study will identify those reaches where erosion control is justifiable on economic and/or environmental grounds, and will develop effective solutions at minimum costs. Within the Coastal and Hydraulics Laboratory, the majority of this assistance is being supplied by team members from the Coastal Processes Branch (CPB).



Highway 87, Jefferson County TX, abandoned due to coastal erosion.

Issue

CPB is applying cutting-edge technologies and in-depth analysis to assist in the design effort. For example, all standard numerical models incorrectly predicted the direction of net sediment transport along Galveston Island. By using high-speed computers to model the effects of local winds, CPB developed modifications to the numerical model GENESIS that produced a net transport direction in agreement with observations.

Products

To date, CPB has produced a 10-year (1990-1999) WIS hourly hindcast of wave conditions along the Texas coast, along with storm wave, hindcasts for hurricane events dating back to 1886. Using these and other data inputs, CPB has set up and calibrated GENESIS and SBEACH models to test design alternatives. In the future, CPB will apply these and other models along with their expertise to supply input to economics models and to help formulate and test alternative erosion control designs.

Supporting Technology

The numerical models being applied in this study include the latest versions of WIS (Wave Information Study), ADCIRC (ADvanced CIRCulation model), STWAVE (Steady-state spectral WAVE model), GENESIS (GENERalized model for Simulating Shoreline change), SBEACH (Storm-induced BEACH CHange model) and EST (Empirical Simulation Technique).

Benefits The results of this study will lead directly to the construction of erosion control projects that will help protect economically valuable and environmentally sensitive property along the northeast Texas Gulf coastline.

Sponsors This project is sponsored by the US Army Engineer District, Galveston.

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Partners CPB team members involved in this project are working directly with other CPB personnel who are field-testing innovative erosion control designs along the flood-prone mud shorelines at the eastern end of the study site as part of a Section 227 demonstration project. They are also working directly with Coastal and Hydraulic Laboratory team members from other branches who have produced hurricane water level hindcasts and a sediment budget for the study area, as well as with team members from the Galveston and the Wilmington Districts of the Corps. CPB team members are also involved in data sharing and consultations with other study partners including Texas county governments, state agencies (Texas General Land Office), universities, and private contractors.