BOEM ENVIRONMENTAL STUDIES PROGRAM: ONGOING STUDIES

BOEM OCS Region: Gulf of Mexico

Title: New Wave Current Information System (WAVCIS) Ocean Observing Station on Ship Shoal (GM-92-42-119)

Planning Area Central

Total Cost: $500,000 **Period of Performance:** FY 2005-2012

Conducting Organization: Coastal Marine Institute, Louisiana State University

BOEM Contact: Geoffrey Wikel

Description:

Background: Numerous geological and geophysical studies offshore the central coast of Louisiana have determined that Ship Shoal is an ideal source of beach-compatible sand to place on the rapidly eroding Louisiana barrier islands. BOEM continues to negotiate agreements with the State of Louisiana and other Federal agencies for planned barrier island and marsh restoration projects. Many large-scale coast projects are in the planning stages, some of which will require substantial volumes of nourishment material. For example, the Louisiana Coastal Area Plan by the U. S. Army Corps of Engineers estimates that as much as 61 million cubic yards of sand may be required from the Outer Continental Shelf (OCS) for barrier island restoration. The Corps of Engineers is currently preparing Environmental Impact Statements for potential barrier island restorations projects in Barataria Basin and Terrebonne Basin.

Long-term data on sea state directly offshore the Louisiana coast, particularly in the Ship Shoal area, are virtually non-existent. Obtaining more accurate information is integral to improved numerical and hydrodynamic modeling that is used to evaluate impacts associated with the site-specific extraction of sand from the shoal, as well as providing invaluable wind, wave, and current information to support dredging operations.

The Louisiana State University Coastal Studies Institute's (CSI) WAVCIS (WAVe–Current-surge Information System) is addressing that void, providing real-time and archive met-ocean information including wave height, wave period, wave direction, directional wave spectra, water level, surge, water column velocity profiles, conductivity, turbidity, surge, sea temperature, and meteorological conditions. Using MMS funding, CSI is maintaining one of six operational stations. Station CSI-15, located on Ship Shoal lease block 114A, became fully operational in May 2007.

Objectives: The purpose of the study is to install a WAVCIS station in the vicinity of Ship Shoal, to provide near real-time wave information to support numerical wave modeling efforts and dredging operations associated with the large-scale barrier island and coastal restoration efforts planned using sand from Ship Shoal and elsewhere off the Louisiana coast.

Methods: Install a WAVCIS station consisting of an acoustic doppler current profiler, sea-surface temperature and pressure gauge, meteorological instruments, data logging, telemetry system, and power supply/controller. Transmit and process raw data and incorporate data real-time into an automated computer modeling system that provides wave nowcasts and forecasts.

Products: All data collected by the WAVCIS station are available on a near real-time basis over the internet at: http://wavcis.csi.lsu.edu/.

Importance to BOEM: Data acquired from WAVCIS can be used for direct input and skill assessment in numerical modeling (wave, circulation, and wind) used to examine the long-term physical impacts of dredging on Ship Shoal and support engineering design associated with barrier island restoration. Given the complex interaction of swell and locally wind-generated seas in coastal waters, this data may provide for a better understanding of sea state at any given time. The distribution of wave energy is also important for extracting information about storm events and seasonal fluctuation along the Louisiana coast. Observational data are also coupled to DHI MIKE21 SW sixty hour wave forecasts for the Gulf of Mexico. The model skill is assessed using observed data.

Current Status: WAVCIS station is operational, and data are published to the internet.

Final Report Due:	None (Contract ended February 29, 2012)
Publications:	WAVCIS Ocean Observing Station off Ship Shoal – Annual Report (October 2007)
Affiliated WWW Sites:	http://wavcis.csi.lsu.edu/
Revised date:	March 2012
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