

An Improved Ocean Observing System for Coastal Louisiana: WAVE-CURRENT-SURGE Information System

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Abstract

WAVE-CURRENT-SURGE Information System (WAVCIS) is a regional ocean observing and forecasting system. It was designed to automatically measure, process, forecast, and distribute oceanographic and meteorological information. WAVCIS was developed and is maintained by the Coastal Studies Institute at Louisiana State University. The in-situ observing stations are distributed along the central Louisiana and Mississippi coast. The forecast region covers the entire Gulf of Mexico with emphasis on offshore Louisiana. By using state-of-the-art instrumentation, WAVCIS provides data on waves, currents, temperature, water level, visibility, humidity, turbidity, and salinity. Through satellite communication links, measured data are transmitted to the WAVCIS laboratory. After processing, they are available to the public via the internet on a near real-time basis. WAVCIS also includes a forecasting capability. Waves, currents, and winds are forecast every day for up to 84 hours in advance.

There are a number of numerical wave and surge models that can be used for forecasts. Two third generation wave models, WAM (Wave Model) and SWAN (Simulating Waves Near-shore), have been selected for operational purposes to forecast waves. The final choice of operational surge models will be decided by comprehensive spatial testing. Interpolated winds from the ETA wind model operated by NOAA's National Center of Environmental Prediction (NCEP) are used as input forcing for waves. Both in-situ and forecast information are available online to the users through World Wide Web. Interactive GIS web mapping is implemented on the WAVCIS webpage to visualize the model output and in-situ observing data. WAVCIS data can be queried, retrieved, downloaded, and analyzed through the web page. Near real-time numerical model skill assessment can also be performed by using the data from in-situ observing stations.