

Coastal Studies Institute: A History of Science Contributions for 60 Years

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ABSTRACT

The Coastal Studies Institute (CSI), Louisiana State University, is celebrating 60 years of trend-setting research contributions to understanding coastal and deeper marine systems. The Institute was founded by the internationally respected physical geographer, Dr. R. J. Russell with funding from the Office of Naval Research (ONR), Geography Programs, under the direction of Dr. Evelyn Pruitt. Although unofficially organized in the early 1950s, the LSU Board of Supervisors formally recognized CSI in 1954 when it became an independent unit under the School of Geoscience.

Following World War II, Russell served on a National Academy of Sciences panel designed to evaluate environmental problems faced during the war years by the Department of Defense. The panel concluded that invasion forces were deployed with very little coastal environmental data or predictability of coastal conditions. This knowledge gap led Russell and Pruitt to start a research group at LSU dedicated to building a better understanding of the world's coasts. The Institute was structured as a self-contained unit so that its researchers could start with research ideas, collect and process field data, and prepare manuscripts for publication. Initial studies of trafficability and stability of various parts of the Mississippi River Delta quickly shifted to other coastal types at both domestic and foreign sites. By the late 1960s, CSI was recognized by the science community as one of the world's most productive coastal research groups. By the mid-1970s, CSI had fielded projects on every continent except Antarctica and research programs were expanding beyond the coast to deeper water environments.

Largely because of the research conducted by geologists, geomorphologists, and sedimentologists through CSI, the Mississippi River Delta became the "standard" to which other deltas were compared. Fundamental knowledge of the delta cycle that built the coastal plain, delta stratigraphy, sand body geometries, sedimentary structures, fluid mud dynamics, delta-front instabilities, and worldwide delta variability derived from the Institute's work. A long involvement with arctic deltas and tropical deltas has added to the Institute's reputation for deltaic research.

With the addition of researchers trained in coastal engineering, physical oceanography, and coastal meteorology to the Institute's research staff, multidisciplinary research quickly became an early characteristic of CSI field projects. This teamwork approach was first applied to the sandy beaches where sea-air-land interaction studies produced fundamental research project results that explained beach morphology changes, rip currents, and both eolian and subaqueous sediment transport related to their physical process environments. Later, this approach was applied to foreign deltas plus carbonate and fluid mud coasts with results that were equally productive.

With the loss of ONR institutional funding in the mid-1980s the CSI research program broadened to meet national research initiatives and available support from state

and national funding agencies. From the mid-1980s through the early 2000s large physical oceanography and marine geology projects drove much of the Institute's research. Significant contributions to our knowledge of: (1) Gulf of Mexico shelf and deep water currents, (2) the dynamics of the world's major sea straits, (3) physical processes and marine geology associated with the delta front of the Yellow River and Nile River deltas, (4) marine geology of the Mahakam Delta and eastern Java Sea shelf, and (5) surficial geology of the northern Gulf of Mexico continental slope. During this period the Earth Scan Laboratory (ESL), the first satellite receiving station in the Gulf Coast region, was founded within CSI. This facility continues to support CSI projects with data from six different satellites. Like ESL the near-shore ocean observing stations, Wave-Current Surge Information Systems (WAVCIS), established in 1998 have provided and continue to provide near-real time physical process data for support for many coastal research projects.

The Institute's research and training of students has had a far-reaching impact on academic institutions, industries and government agencies worldwide. As the CSI researchers and field support personnel hired during the early years of the Institute cycle out, a new generation of researchers is faced with a challenging set of coastal problems related to the steady disappearance of Louisiana's coastal plain forced by conditions of subsidence, an increasing rate of sea level rise, and a decreasing supply of Mississippi River sediment to help offset growing coastal plain accommodation. Many deltaic coasts of the world face similar problems. The 60 years of CSI's fundamental coastal and marine research achievements will provide a strong foundation for facing these and other coastal challenges at home and abroad.