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The sedimentology of muddy coastal systems: the research legacy and new perspectives from the Coastal Studies Institute

During the past decade, studies of fine-grained sediment dispersal and accumulation on continental shelves have shown that high-concentration sediment suspensions entrained near the bed play a more widespread role in sediment transport than was previously thought. Many of the pioneering studies were conducted between 1953 and 1977 by researchers at the Louisiana State University Coastal Studies Institute (CSI), which was founded in 1952. Studies of muddy coastal systems began with descriptive geomorphological work conducted by James P. Morgan and colleagues that documented open-coast deposition of fluid muds in association with high-energy sediment-transport events. This observation ran counter to existing concepts of mud deposition, and has led to five decades of worldwide study on the dynamics and stratigraphic impact of shallow-water, fine-sediment transport and accumulation. Field projects have been undertaken on the coasts of Surinam, Korea, and elsewhere, but the primary field laboratory was originally, and still is, the Chenier Plain coast of southwest Louisiana, where these complex depositional processes were first observed by Morgan. As answers for existing questions have slowly come to light, such as the shear-stress distribution responsible for development of graded beds, new problems have arisen, such as the mechanisms responsible for frequency-dependent wave attenuation by fluid muds. Ongoing studies at CSI and elsewhere are using new techniques, technologies, and theories to gain further insight into these geologically important processes.