FITZGERALD, DUNCAN, Department of Earth Sciences, Boston University, Boston Massachusetts 02215, MARK A. KULP, and SHEA PENLAND, Department of Geology and Geophysics and Pontchartrain Institute for Environmental Sciences University of New Orleans, New Orleans, LA 70148

Tidal Prism Changes within Barataria Bay and its Effects on Sedimentation Patterns and Barrier Shoreline Stability

The Louisiana Barataria barrier system formed between the Plaquemines and the Lafourche deltaic headlands within the Mississippi River delta plain. During the past half-century rapid relative sea-level rise (1.03 cm/yr) and other erosional processes within Barataria Bay have led to substantial wetland loss, converting more than 775 km^2 of wetlands to open water. As the open water area increased, so has the bay tidal prism and tidal exchange. Between 1880 and 1980 the enlarging tidal prism produced a 44% increase in the combined cross-sectional areas of the major tidal inlets of Barataria Bay. Increase in size of the tidal inlets was at the expense of the adjacent barrier islands. During the same period of time there was concomitant progradation of the ebb-tidal deltas. For example, since the 1880's the ebb delta at Barataria Pass built seaward more than 2.0 km. Shoreline erosion and increasing bay tidal prism also facilitated formation of new inlets, including Pass Abel. Although there are ongoing programs to restore the integrity of Louisiana's barriers by dredging sediment from offshore and rebuilding their architecture, little consideration is being given to the role of backbarrier wetland loss in tidal inlet evolution and shoreline stability. If wetlands can be created in Barataria Bay, thereby reducing open water area, then tidal prisms can be reduced and the size of tidal inlets stabilized. This approach could benefit the adjacent barrier islands by lessening beach erosion and decreasing the rate of transgression along the Louisiana coast.