

SAN LUIS PASS FLOOD TIDAL DELTA: ESTABLISHING DUNES GEOMETRY, GRAIN SIZE AND WATER DEPTH RELATIONSHIPS

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ABSTRACT

San Luis Pass is a tidal inlet located on the Texas Gulf Coast, approximately 80 km south of Houston, Texas, and 32 km southwest of the city of Galveston. San Luis Pass separates Galveston and Follets islands. It is in general shallow, with water depths varying from 0.5 m to 4 m. The Texas coast is characterized by diurnal tides ranging from 45 to 60 cm, which are classified as microtidal, with relatively low amplitude waves that have periods ranging between 4 to 6 seconds. Dune geometry in tidal environments is controlled by grain size, water depth, and water velocity. The study of these relationships in the rock record has been difficult to analyze because parameters like grain size and water velocity can vary independently. While previous studies have attempted to estimate paleo-water depths using data from modern and ancient fluvial environments, this study aims to use seismic and core data to study microtidal environments. Two high-resolution seismic surveys will be completed using the University of Houston shallow water seismic survey vessel, R/V Mishipeshu, to characterize the flood tidal delta, recognize sedimentary structures, and measure dune geometry. Sea floor core samples will be also taken to provide control in dunes grain size variations. The acquired seismic will be processed and interpreted to measure water depths and dune geometries.

The goal of this project is to understand the modern processes controlling dune height in tidal environments with small tidal ranges, and correlate these relations to other tidal ranges around the world. Ultimately, this study will establish a quantitative model to analyze ancient deposits, allowing for a more complete paleo-environment characterization of outcrops and down core samples.

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