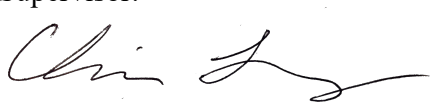
Supervisor:



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A Modern Distribution of Foraminifera to Reconstruct Environmental Change Offshore Galveston Bay, Texas

Solveig H. Schilling

Sand is an important resource for coastal engineering, but in Texas, offshore sand deposits are primarily found buried in Pleistocene fluvial sediments or in Holocene estuarine environments like tidal channels or bayhead, flood, and ebb tide deltas. Exploring for these resources requires a comprehensive understanding of the depositional system in which they are buried. Benthic foraminifera represent one tool to reconstruct the paleoenvironment of sand-bearing Holocene estuary deposits. Foraminifera assemblages have long been tied to specific environments, and the Gulf of Mexico is one of the best studied places for this. Well documented predominance facies of benthic foraminifera in Galveston Bay represent a promising technique to reconstruct paleoenvironment in Holocene cores, but to date there are no equivalent records directly offshore to compare to, leaving the inner shelf assemblage unconstrained. Additionally, no direct comparisons have been made between ancient estuary assemblages and the modern living assemblages in Galveston Bay. This project examines the environmental evolution of the Trinity river valley estuary using benthic foraminifera and core data. 32 grab samples were collected offshore Galveston Bay and were stained with rose bengal to identify the living or recently living benthic foraminifera. 300 individual foraminifera were identified to the species level, and their distribution was mapped across the inner continental shelf. The foraminifera trends offshore Galveston Bay suggest a more diverse assemblage compared to estuary samples, and this diversity is likely driven by changing salinity levels in the bay. The increased diversity of inner shelf assemblages compared to those of the bay can be used for recognizing offshore assemblages as distinct from estuarine samples. Additionally, the comparison of living and Holocene estuarine populations shows that there is a non-analogue population suggesting a recent environmental change in the bay.