

Classification of Holocene Foraminifera Bio-Facies within the Transgressive Lower Lafourche Headland, Louisiana

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ABSTRACT

The focus of this study was to enhance and extend existing research by incorporating improved preparation techniques and modern taxonomy, and to sample environmental variables that could control foraminiferal distributions within a transgressive marsh environment.

The coastal Louisiana location for this study is a transgressive, saline marsh within the lower Lafourche headland of the south-central delta plain. Marsh surface samples were taken along transects from highest high water, marsh interior, lowest low water marsh, marsh edge, intertidal mud flat, and tidal creek. Precise elevation surveys were conducted and sediment samples were obtained for analysis of foraminifera. Environmental variables include: sediment grain size, organic carbon and pore-water salinity. Results indicate that environmental variables apparently strongly influence the distribution of agglutinated marsh foraminifera. For example, *Trochammina inflata*, and *Siphotrochammina lobata* dominate the foraminiferal assemblage at the higher elevations (~0.6 m) and pore water salinities exceed 50 psu. By contrast, *Miliammina fusca* dominates the marsh interior (0.4 m) where pore water salinity is near marine (24 psu). *Arenoparella mexicana* and coarsely agglutinated *Ammotium crassus* dominate the barren mudflat (0.1 m) and pore water salinity is 35 psu. Assemblages change distinctly with elevation from the upper to the lower intertidal zones along with vegetation and pore water salinity.

This approach provides the opportunity to develop a surficial model of foraminifera biofacies within saline influenced marsh of the Louisiana coastal zone. Biofacies models can provide comparative tools used to evaluate foraminiferal occupation and propagation, and measure the health of coastal marshes or restoration success.