



Monitoring environmental controls on salt-marsh foraminifera in Tuckerton, NJ: implications for sea-level research

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Salt-marsh foraminifera have been widely used as proxies to reconstruct sea-level trends because their modern distribution is strongly linked with tidal elevation, and they are relatively abundant and have a high preservation potential in intertidal sediments. To determine former sea levels, the relation between contemporary foraminifera and their controlling environmental variables must be determined and the influence of post-depositional changes elucidated. Duration and frequency of tidal exposure, while the dominant control, is not the only environmental variable controlling the distribution of foraminifera. Complex interactions between organisms and their environment factor into foraminifera species distributions and these factors will vary over space and time.

Here we present preliminary results of a spatial and temporal ecological study to monitor short-term, seasonal, and interannual variations in salt-marsh foraminifera assemblages along a salinity gradient of an intertidal zone of New Jersey, USA. The temporal nature is beneficial in recording potential lags in response to changes in environmental conditions compared with one-time sampling. Live foraminifera assemblage samples are compared with measured environmental parameters (porewater chemistry, porewater nutrients, tidal inundation, grain size) and experiments (bioturbation, overwash deposit, and infaunal) to determine the controlling environmental variables on foraminifera and how these variables and the foraminifera assemblages change through time.

Ultimately, this multi-year monitoring experiment provides a more comprehensive understanding of environmental controls on salt-marsh foraminifera and will provide a background data set of salt-marsh foraminifera to compare with future studies and with sampling after large events such as storms. A greater understanding of salt-marsh foraminifera in their environment will contribute to sea-level reconstructions. Since sea-level records use the distribution of modern foraminifera assemblages in relation to tidal elevation as a basis for assemblages in sediment cores, it is important to understand all of the environmental factors controlling salt-marsh foraminifera distributions.