



Micropaleontological Evidence of a former tidal Inlet: Old Currituck Inlet, VA/NC, USA

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Examination of benthic foraminifera from six vibracores collected from a relict flood tidal delta near the Virginia/North Carolina border documents the assemblages associated with a former inlet and provides geologic evidence of this former inlet that once defined the boundary between Virginia and North Carolina along the Outer Banks. Three distinct foraminiferal assemblages were identified. The oldest assemblage contained abundant and diverse forms, dominated by *Elphidium excavatum* and several other calcareous species typical of shallow nearshore areas. Sediment immediately below and above this diverse calcareous assemblage was barren or nearly barren of foraminifera. A medium-salinity agglutinated marsh assemblage characterized mainly by *Trochammina inflata* with fewer *Tiphotrecha comprimata* overlies the uppermost barren unit. The core top assemblage was dominated by low-salinity marsh species *Jadammina macrescens*, *Miliammina petila* and *Miliammina fusca*.

A comparison of these vertically-stacked assemblages with the modern geographic distribution of assemblages in the Outer Banks estuarine system and on the nearby continental shelf reveals a succession of depositional environments proceeding from estuarine and flood tidal delta to medium salinity marsh to lower salinity marsh. These changes in depositional environments reflect a rapid and dramatic increase in salinity caused by the opening of an inlet followed by a gradual decrease in salinity due to inlet shoaling and eventual marsh colonization of the flood tidal delta. These changes cannot be determined through sedimentological studies alone; micropaleontological analysis is required.

We conclude this distinctive trend of changing depositional environments constitutes paleontological evidence of the origin and evolution of Old Currituck Inlet that

breached the barrier spit prior to 1585AD, actively built a flood tidal delta for more than 145 years, and then closed in 1731AD allowing the flood tidal delta to become colonized by marsh species.