The use of foraminifera and thecamoebians as freshwater/marine transition zones in mangrove environments of southern Florida

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The mangrove environment of southern Florida is expansive, dominating much of the southern coastline, including that of the southwestern Everglades. As such, it is a dynamic environment that is constantly readjusting the balance between fresh and marine waters. A major question about this region is what has happened in the past; it is difficult to reliably distinguish between past marine and freshwater deposits. Since 1995, the United States Geological Survey (USGS) has been engaged in a large-scale project to acquire high-quality, relevant information on the southern Florida ecosystem as part of the USGS's Placed-Based Studies Program. In conjunction with this project, various cores of unconsolidated sediment were collected, the portion of one, Core 15-5, is analyzed in this study.

This study was designed to examine whether or not marine and freshwater Rhizopodia can be used as reliable indicators of freshwater/marine transition zones in the mangrove environment of southern Florida to help reconstruct past freshwater/marine histories. A portion of two cores, Core 15-5 from Little Maderia Bay in Everglade National Park and Core L1011/Hwy 1 from Key Largo, were sampled, processed and analyzed under a stereomicroscope for freshwater thecamoebian and marine foraminifera faunal assemblages.

The results to date demonstrate a marked change in faunal assemblages between the younger calcareous mud and the underlying peat. Thecamoebians are the rhizopods present in the upper calcareous mud layers. Calcareous foraminifera occur in this region, but at much lower percentages than the thecamoebians. Progression through to the underlying peat reflects a transition to dominantly agglutinated marsh foraminifera species and much lower percentages of thecamoebians. Species diversity increased significantly from the upper mud to the underlying peat layers. These results demonstrate that the peat underlying the calcareous mud of the mangrove regions considered here are marine in origin. This demonstrates the utility of rhizopods as indicators of freshwater/marine transition zones, as this result was not obvious through other means of analysis.