

Source and Transport Mechanisms of Tropical Foraminifera in the Hudson River Estuary System

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River sediment cores provide a record of past environmental changes through stacked layers of sediments preserved in the core. In such a core recovered from the Hudson River, the shells of heterotrophic protists called foraminifera were recovered. These creatures live in marine and brackish waters and secrete calcium carbonate (CaCO_3) shells called tests during their lifecycle. The presence of these tests in the core was remarkable, as the tests are from open ocean marine foraminifera. To collect the tests, wet sieving was employed over the sections of the core with low impedance levels suggesting high carbonate content. To gather these shells, we took small samples of sediment from the core and washed them through different sized mesh sieves to retain certain sizes of particles.

These samples were then picked for planktic foraminifera tests. The species, size, and isotopic composition of these recovered shells provide information about the transport mechanism and source of these shells. The strongly marine signal in $\delta^{18}\text{O}$ isotopes suggests that these shells were in fact transported into the Hudson from the open ocean. Because only planktonic, tropical foraminifera assemblages are represented, storm surges may have brought these foraminifera into the Hudson River possibly with the assistance of the Gulf Stream. Plankton tow samples were collected at the Hudson Battery south of the sample site and at Piermont Pier north of the sample site and no foraminifera were found. This data, in addition to the relatively small number of tests found in the sediment suggests that the introduction of foraminifera into the Hudson River must be driven by rare events, since planktic foraminifers are not part of the typical Hudson plankton community.