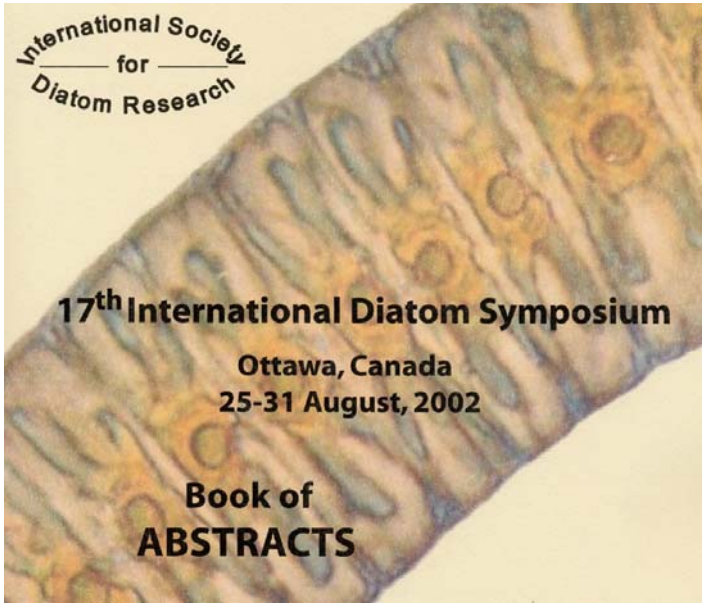

Estuarine Paleoecology: a study of Weeks Bay, Alabama

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Estuaries are dynamic environments in which unraveling the sequence of past events requires the application of many paleoecological tools. This research uses diatom, pollen and Cs analyses, as well as C dating in an attempt to establish the long-term environmental history of Weeks Bay, Alabama. Weeks Bay is a small estuary in the southeastern comer of Mobile Bay, a National Estuary. Mobile Bay and Weeks Bay are situated on the northern coast of the Gulf of Mexico and are subjected to frequent storm events, especially hurricanes.

Historical research has determined that anthropogenic influence began in the Weeks Bay watershed approximately 200 years ago. Ambrosia (ragweed) pollen percentages suggest that almost 70 cm of sediment have accumulated at the coring site at mid-bay since settlement. However, an Accelerator Mass Spectrophotometer (AMS) radiocarbon date contradicts this time- line and assigns a date of 900 years BP to the sediment at 55 cm down-core. "'Cs data indicates atmospheric fallout to a depth of almost 75 cm. The "'Cs data profile is remarkably flat down- core, suggesting mixing to a depth of 75 cm. Therefore, it would appear that frequent scouring events in the form of tropical storms have mixed at least the top 75 cm. If this mixing extends farther down-core, interpretation of diatom assemblages to determine the environmental conditions of pre- and post-settlement will be less precise.

A detailed analysis of near surface and surface diatom assemblages indicates a high diversity of fresh, brackish and marine diatoms. The most abundant of these species are small pennate diatoms, including *Desikaneis gessneri, D. howellii, Opephora sp.* and *Fallacia sp*. These species decrease or disappear down core. The increase of these small pttmate diatoms in near surface and surface sediments might signal a rapid change in the environment. *Paralia sulcata* is abundant in the middle and lower core, but exhibits a sharp decrease beginning at approximately 75 cm to the surface. This trend could be the result of an increase in runoff and siltation. It should be noted that silica is not limiting in Weeks Bay, and recent testing indicates that excess nitrogen may have the dominant impact on the environment. This excess nitrogen is probably due to agricultural runoff and effluent releases in the watershed.