

**SEDIMENT AND ORGANIC CARBON FLUXES IN AN IMPACTED ESTUARY,
WINYAH BAY, SC: II. CHEMICAL INTERACTIONS**

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In order to understand fluxes of organic matter, and ultimately contaminants in estuaries, it is necessary to quantify the coupling between the physical and geochemical processes. For that reason, we intensively sampled four stations located around the estuarine turbidity maximum (ETM) in Winyah Bay (SC) during October 2001, a period of low discharge. Water samples were filtered to measure the concentrations of total suspended sediments (TSS), particulate and dissolved organic carbon (POC and DOC), and particular nitrogen (PN), as well as stable carbon isotopes, and polycyclic aromatic hydrocarbons (PAHs). These measurements were carried concurrently with detailed hydrographic studies of the water column (e.g., salinity, temperature, currents; see abstract by Kim et al., this volume).

Our observations of the ETM over repeated tidal cycles show that POC concentrations were significantly lower (1-4 mg/L) than DOC (5-9 mg/L) during this period. At all four stations, POC concentrations increase with depth. TSS and POC also show a strong positive relationship with current magnitude and direction, with the highest concentrations measured during peak flood. In contrast, the highest DOC concentrations precede peak flood by several hours. The trends in the POC/PN and stable carbon isotope ratios measured in POC indicate differential transport of organic materials during distinct periods of the tide. Overall, we measured net landward fluxes of TSS and POC over a tidal cycle, indicating that Winyah Bay is flood dominated during low discharge. The overall consequence of this behavior is a significant input of organic material from the lower reaches of the bay towards the ETM.

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