# Muck Accumulation and Nutrient Cycling Within Salt Wedge Zones in the Indian River Lagoon: A Second Year Study

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In recent years the Indian River Lagoon has suffered from increasingly high accumulation of muck, which settles along the bottom of the estuary. The addition of artificial inlets has been proposed as a method for improving circulation within the water column, however previous data indicates the formation of salt wedges where inlets are constructed could potentially foster greater muck accumulation at the foot of the salt wedge, and greater turbidity within the wedge. This study determined how distribution of muck accumulation in the presence and absence of a salt wedge impacted phosphorus cycling within the water column. A control (no salt wedge) and treatment (salt wedge) were tested for a period of 60 minutes. A dual flume system was used to simulate an estuarine environment. Phosphate (low range) was measured in parts per million at two zones within the water column: At the peak (outflow) and the foot of the salt wedge (inflow). Salinity (in parts per thousand) was also monitored during the testing period. At the foot of the wedge (estuarine waters), top and bottom phosphate was found to be similar in concentration in the control and treatment. Within the control, bottom phosphate was significantly lower compared to top phosphate at the inflow. Within the treatment, top and bottom phosphate was found to be similar in concentration at the salt wedge peak. The addition of a salt wedge adversely decreased muck absorption rates as a result of increased salinity within the wedge, and it is possible that more phosphate remained suspended within the top and bottom sections of the water column. This may suggest that increased contact time may lead to greater absorption of phosphate at the outflow, which may be inhibited by greater salinity content found in the salt wedge.

**Awards Won:**