

**THE EFFECT OF BARRIER ISLAND MORPHOLOGY ON THE ENVIRONMENT OF THE
BACK BAY**

*Daniel C. Conley
Marine Sciences Research Center
SUNY Stony Brook
Stony Brook, NY 11794-5000*

The salinity, nutrient content and degree of contamination in the back bays behind barrier islands are predominately determined by a balance between fresh water input from the main land in the form of ground water runoff and seepage, and the oceanic contribution of salt water. This salt water component, and the degree of mixing with the fresh water, is largely determined by the tidal influx through the inlets between islands. The inlets act like a filter inhibiting the exchange of water between ocean and bay so that the tidal signal in the bay is reduced relative to the ocean outside the bay. A dramatic change in the barrier island morphology, such as island breaching or inlet infilling, will result in a change of the properties of the inlet filter, thereby altering the fresh/salt water balance and the associated environment in the bay. The Dec 1992 breach at Pikes Inlet on Westhampton Beach provides a unique opportunity to observe this process in action.

Following the occurrence of the breach, tide gauges were installed in Moriches Bay and in the ocean just seaward of the breach. Salinometers were deployed at both ends of Moriches Bay as well as in a control location in Shinnecock Bay. These instruments were left in place until several months after the closing of the breach so that pre-closure and post-closure conditions could be monitored and compared. It has been observed that the tidal range in the bay for the two months prior to the initiation of breach closure was more than 25% greater than the post closure tidal range. What this represents in terms of, tidal transmittance, the correlation between breach infilling and tidal elevations, and the effects on bay salinity, will be discussed.