

Patuxent Wildlife Research Center

Integrating Estuarine Water-Quality Data in Northeastern National Parks



The Challenge: Estuaries in northeastern states are severely threatened by the adverse impacts of nutrient over-enrichment. USGS led the development of a vital-signs protocol to monitor estuarine nutrient status in northeastern National Parks, and monitoring has been operational in coastal parks from Massachusetts to Virginia since 2006. Monitoring results must be synthesized and interpreted in a spatial and temporal context to determine if nutrient inputs are nearing thresholds that would result in shifts in ecosystem structure and function.



The Science: Biennial water-quality monitoring is conducted in park estuaries during a summer index period at a hierarchy of temporal and spatial scales. We are analyzing monitoring data to derive statistically-valid estimates of estuarine condition within six coastal parks. We are also integrating park data over time, across parks, and with complementary data from other federal monitoring programs to improve the ability to interpret vital-signs monitoring data. In particular, we will evaluate the condition of NPS estuaries within the broader context of northeastern coastal condition, watershed characteristics, and riverine inputs.



The Future: USGS continues to assist NPS with consistent implementation of monitoring standards, synthesis, and interpretation of estuarine monitoring data. User-friendly tools for data export and synthesis produced by this project enable NPS to report on the condition of estuaries in coastal parks. Integration of NPS monitoring data with information on watershed characteristics and nutrient load will help identify potential causes of estuarine degradation and suggest management strategies to improve and maintain the quality of estuarine resources.