

# Albemarle Sound – Pilot study of the National Monitoring Network for U.S. Coastal Waters and their Tributaries

Albemarle Sound is a shallow, low-salinity, high-turbidity estuary in North Carolina. Freshwater inputs dominate this lagoonal estuary system that is separated from the ocean by a chain of barrier islands. The Albemarle Sound supports several important commercial and recreational fisheries, but current populations are well below historic levels for many species. Several portions of the sound, including the Chowan and Roanoke Rivers were recently nominated as strategic habitat areas for these fisheries. Managers are concerned about potential contaminants in the water, sediment, and biota in these strategic habitat areas. Additionally, an understanding is needed of the ecological effects that may result as the sea-level rises in this low-lying system.

A Water-Quality Monitoring Network for Albemarle Sound will be developed to examine critical water-quality management issues as a pilot study of the National Monitoring Network for U.S. Coastal Waters and their Tributaries. The goal of the National Monitoring Network for U.S. Coastal Waters and Tributaries is to provide information about the health of our oceans and coastal ecosystems and inland influences on coastal waters for improved resource management. The network is an integrated, multidisciplinary, and multi-organizational program using multiple sources of data and information to augment current monitoring programs. To learn more about the Network visit: <http://acwi.gov/monitoring/network/>.

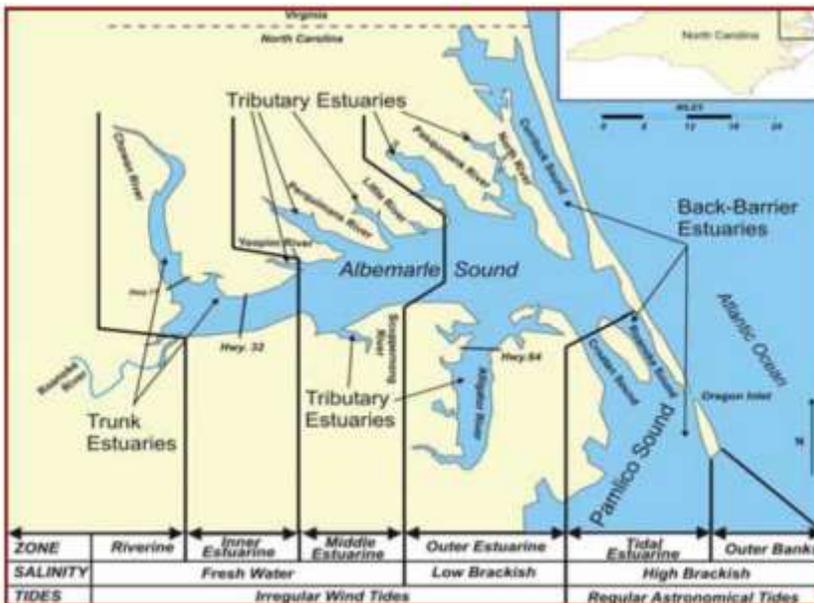
## Objective 1: Conduct a gap analysis of the current monitoring networks in the Albemarle Sound

We are working with the Albemarle-Pamlico National Estuary Program to

- Inventory current and historical monitoring programs and research studies in the Albemarle Sound
- Evaluate monitoring gaps between current monitoring programs and that indicated by the National Monitoring Network design
- Identify and resolve data-comparability and data-sharing issues
- Improve data storage and access



Managers are concerned with fish kills and shellfish closures in the Albemarle Sound and its tributaries



## Objective 2: Fill current monitoring gaps for the Albemarle Sound

This project aims to improve understanding of potential contaminants in the system by:

- Assessing the occurrence of emerging and historical contaminants in the sound
- Determining the toxicity and potential sources of algal blooms
- Evaluating changes in historical land use for the Sound
- Improving understanding of the historical and current quality of water, sediment, and biota in the Sound

Figure 1. The Albemarle Sound, showing major marine subbasins and rivers (Riggs and Ames, 2003)



**USGS monitors the Albemarle Sound and its tributaries for nutrients and contaminants**

### Major Partners:

- Albemarle-Pamlico National Estuary Program (APNEP)
- East Carolina University
- National Oceanic and Atmospheric Administration (NOAA)
- North Carolina Division of Marine Fisheries (NC DMF)
- North Carolina Division of Water Quality (NC DWQ)
- North Carolina Wildlife Resources Commission
- North Carolina State University
- U.S. Army Corps of Engineers
- U.S. Environmental Protection Agency (EPA) Region 4
- U.S. Fish and Wildlife Service
- USGS National Water-Quality Assessment (NAWQA) Program

### Objective 3: Linking monitoring to management

We have worked with our partners to identify critical management issues in the Albemarle. One of the most critical issues is the decline of important commercial and recreational fisheries including river herring, shad, Atlantic and shortnose sturgeon, and blue crab. Management efforts for these fisheries are underway, but their success depends on understanding what may be preventing or reducing recovery efforts.

While overfishing was probably the cause of diminished fish stocks in the past, moratoriums on fishing have not been able to improve recovery efforts for several species of concern. It is possible that recovery efforts are less successful due to factors such as eutrophication, noxious algal blooms, toxins in the bed sediment or water column, hypoxic and anoxic conditions, runoff from agriculture or urban areas, leaky wastewater systems, or predation or competition by exotic species.

Improved monitoring and identification of potential contaminants in the water, sediment and biota will allow us to identify factors impacting the ecology of the sound and allow managers to make appropriate decisions regarding their restoration and recovery efforts.

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*"Albemarle Sound – Pilot study of the National Monitoring Network for U.S. Coastal Waters and Their Tributaries (Network)" is available online at:*  
[ftp://ftpext.usgs.gov/pub/er/nc/raleigh/Moorman/Albemarle\\_NWQMN.pdf](ftp://ftpext.usgs.gov/pub/er/nc/raleigh/Moorman/Albemarle_NWQMN.pdf)

### Project Outcomes

- A web-based map portal and catalogue of current and historical monitoring and research efforts in the sound
- A summary of the current distribution of measured contaminants in the Sound
- An improved understanding of factors effecting the ecology of the Sound



**The USGS has been continuously monitoring water quality on the Roanoke River since 1996, a strategic habitat area**

### References Cited

Riggs, S. R. and D.V. Ames. 2003. Drowning the North Carolina coast: sea level rise and estuarine dynamics. North Carolina Sea Grant, Raleigh, NC, 152p.