

Where Rivers Meet the Sea...

Georgetown's Estuaries: North Inlet & Winyah Bay

Estuaries are places where marine and fresh waters mix. Bountiful marshlands and waterways have shaped this region's economy and cultural history for centuries. Georgetown's estuaries provide critical habitats for many birds, fish, shellfish, alligators, and other wildlife. These ecosystems, and the human activities they support, depend on healthy **Water Quality**.

Winyah Bay is a river-dominated estuary that receives drainage from the 3rd largest watershed (land area where rainfall will flow into a certain waterbody) on the East Coast, extending all the way to the Blue Ridge Mountains of North Carolina. Sediment from the Pee Dee River and the darkly stained waters from the forested wetlands of the Black, Waccamaw and Little Pee Dee rivers give Winyah Bay its characteristic color. Water quality in Winyah Bay is influenced by agriculture and industry within its watershed. **North Inlet estuary** is composed of shallow tidal creeks and extensive salt marshes. Most of the water in this estuary exchanges with the Atlantic Ocean, rather than Winyah Bay. Due to this ocean influence and its largely undeveloped watershed, most tidal creeks in this estuary have exceptionally clean water quality and are designated Outstanding Resource Waters by the State of South Carolina.

Continuous **water quality monitoring** is essential to tracking and understanding short- and long-term changes in the environmental conditions within these two estuaries. The data improves our fundamental understanding of estuarine ecology and is essential for sound and effective coastal zone management. These monitoring efforts are supported with funding from the National Oceanic and Atmospheric Administration (NOAA) to the University of South Carolina.



How's the Water? Check the real-time water quality monitoring data on the screen. Is the **salinity** high or low (mostly fresh or mostly marine)? Is the **dissolved oxygen** at a healthy level (at least 2 mg/L) for marine life? Explore all the water quality variables below.

Automated instruments equipped with different sensors measure a variety of water quality characteristics including:

Water temperature – measure of the heat content of water.

Salinity – concentration of salts dissolved in the water. Freshwater salinity is 0; ocean water is approximately 35.

Dissolved oxygen – amount of oxygen dissolved in the water. Oxygen is vital to marine life; most fish cannot tolerate levels below approximately 2 mg/L for any length of time.

Turbidity – measure of the cloudiness of the water caused by the amount of suspended particulate matter, mostly sediments eroded from land.

pH – measure of the acidity or alkalinity of a solution. Values less than 7 are acidic, and values greater than 7 are alkaline.

Chlorophyll - provides an estimate of the amount of algae in the water.

Aerial view of Winyah Bay and North Inlet →

Imagery was acquired between January 31 and February 8, 2010, a period of heavy rain and high river discharge as evidenced by the brown water throughout Winyah Bay and the creeks that feed into North Inlet from Winyah Bay.



Measurements at this location are only made at a single depth due to the shallow and well mixed waters in this estuary.



Measurements at this location are made at both surface and bottom since the central channel is deep and often stratified into two layers - fresher on the top, saltier on the bottom.