Tidal Creeks: Indicators of Coastal Health

Recently UNC-TV's weekly science series, NC Science Now, featured a segment covering the important role tidal creeks play in our coastal ecosystems. Tidal creeks, which rise and fall with the tide, serve as a link between estuaries and land by mixing runoff from the land with saltwater flowing in from the estuary. Like estuaries, tidal creeks provide important nursery and foraging habitat for marine life. What's more is that these creeks play an important role in determining the health of our coastal ecosystems.

Byron Toothman checks the water quality monitoring equipment

Research Biologists, Byron Toothman and Heather Wells, with the NC Coastal Reserve & National Estuarine Research Reserve measure this health by monitoring water quality. Each month, Toothman and Wells collect data from four water quality monitoring stations setup at Masonboro Island Reserve and Zeke's Island Reserve. Every 15 minutes these stations measure turbidity (how material in the water column affects the passage of light), salinity (amount of salt in the water), pH (acidity), dissolved oxygen (amount of oxygen in the water), chlorophyll *a* (an indicator of phytoplankton biomass), specific conductivity, and temperature. Shifts in these parameters notify researchers of long and short-term environmental changes. For example, data showing lower salinity measurements over a certain time period can be attributed to a storm event that caused an increase in freshwater from runoff and rainfall.

This type of data is currently being used by our research partners at the Center of Marine Science at the University of North Carolina at Wilmington, or CMS. With support from NC Sea Grant, oyster researchers at CMS are using water quality data to monitor the health of tidal creeks to determine whether oyster reefs will thrive in these areas.

Watch this video to learn more about the research on tidal creeks!

The National Estuarine Research Reserve's System-Wide Monitoring Program, or SWMP, was established to develop quantitative measurements of short-term variability and long-term changes in the water quality, biological systems, and land use/land-cover characteristics of estuaries and estuarine ecosystems for the purposes of informing effective coastal zone management. NCNERR has a total of six water quality monitoring stations, two at Rachel Carson Reserve, two at Masonboro Island Reserve, and two at Zeke's Island Reserve.