



SOIL AND PLANT SCIENCE DIVISION

Technical Soil Services

Special Projects Region

Soil and Plant Science Division Provides Coastal Zone Soil Survey Demonstration for North Carolina Onsite Water Protection Conference

Purpose

On October 16, 2024, Austin Price and Reuben Wilson, Soil and Plant Science Division (SPSD) soil scientists with the Special Projects Region, completed technical soil services (TSS) at the Estuarium in Washington, NC. The TSS request was made by Erik Severson, a North Carolina State (NC State) Extension Associate for the Wastewater Management Training Program (fig. 1).

Background

In the summer of 2024, Erik Severson requested that SPSP Special Projects Region staff provide 3 hours of instruction on the history of coastal zone soil survey (CZSS); why CZSS is important and what decisions it informs; and the intricacies of how CZSS is conducted and the tools used to the North Carolina Onsite Water Protection Conference in Washington, NC.

The North Carolina Onsite Water Protection Conference is a gathering of Onsite Water Protection experts, regulators, and installers focused on safe drinking water and safe wastewater disposal for North Carolina residents with private wells and septic systems. According to an article published in the [Journal of the American Water Resources](#), one in four North Carolinians (2.4 million residents) relies on private wells for drinking water, which is the highest number of households with wells in the country (Murray et al., 2021). Furthermore, the [Environmental Protection Agency](#) (2024) reports that one in five U.S. households uses a septic system, but this ratio changes significantly in North Carolina. According to [NC State](#), one in two households in North Carolina uses a septic system, and in coastal areas of the state, close to 80 percent of households rely on septic systems (Howard, 2023).

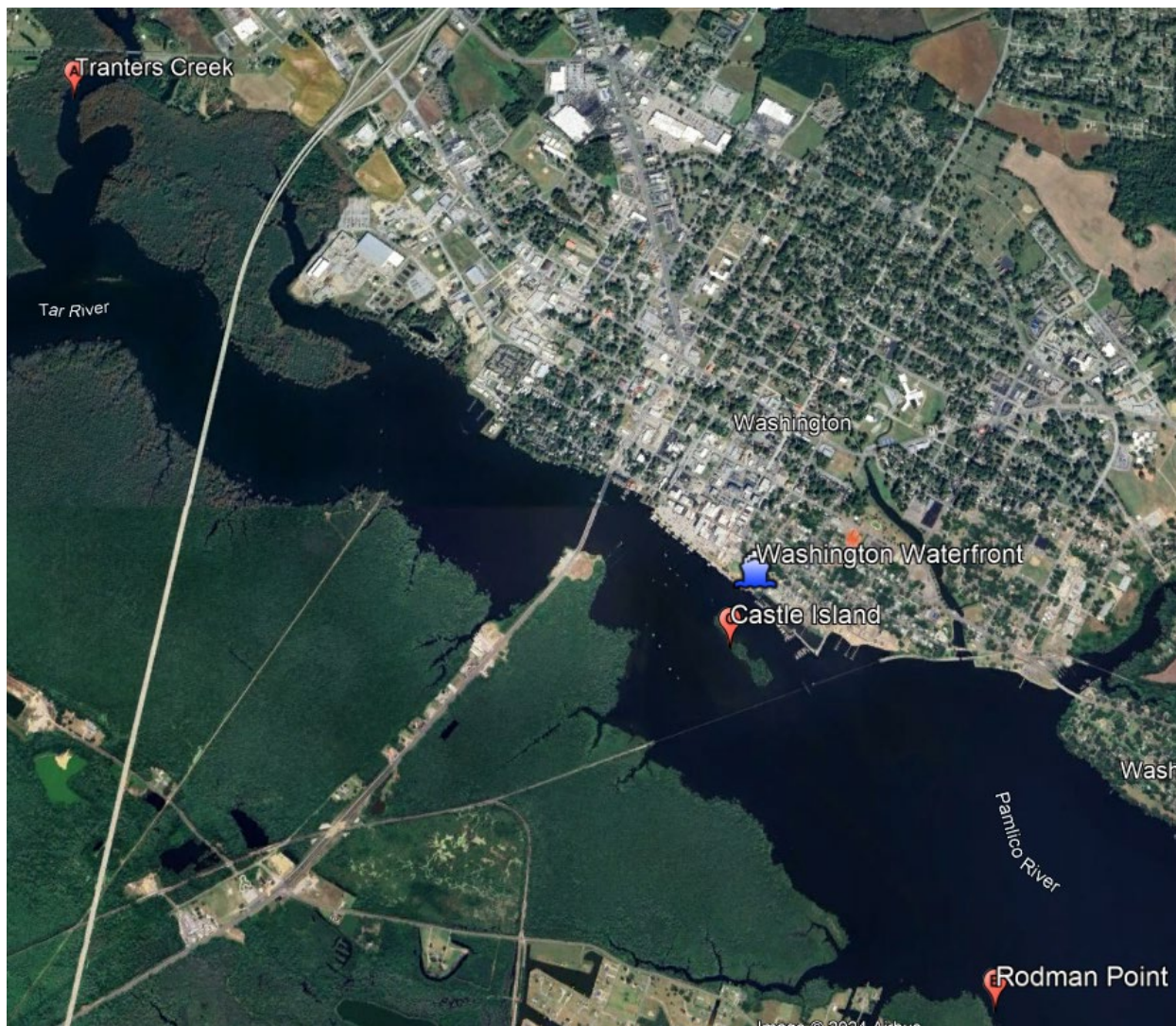


Figure 1.—A Google Earth image of Washington, NC, showing a blue boat where the demonstration was held. Three red-colored tag markers indicate the site of the soil cores: (A) The northwestern most at Tranters Creek, (B) the southeastern most at Rodman Point, and (C) the final point next to the waterfront at Castle Island in the center.

Key Outcomes

The SPSP Special Projects Region staff selected three sites in the Washington, NC, area to sample and showcase subaquatic soils. The soil scientists began by providing an hour of background information on the importance of CZSS and how it is being implemented in North Carolina. They highlighted recently published CZSS projects, such as Lake Mattamuskeet National Wildlife Reserve and the Lower Cape Fear River Estuary, and there was also discussion about ongoing projects in the state at Currituck Sound. Next, the soil scientists spent an hour exhibiting a soil core pulled from Tranters Creek, a tidal

freshwater forest, and Rodman Point, a degraded oligohaline forest commonly referred to as a ghost forest (fig. 2). During the final hour, the soil scientist demonstrated the core collection process across from the waterfront. Attendees watched the process in real-time as a core was collected from historic Castle Island, which has been the location of a quicklime factory, sawmill, and a Revolutionary War armory (fig. 3). Overall, 30 onsite water professionals were provided with a three-hour overview of coastal zone soil survey and received hands-on interaction with subaquatic soils. Several attendees expressed interest in volunteering and were highly engaged with the demonstration. The TSS provided an opportunity to showcase CZSS to other professionals in soil science and expand their knowledge of the services SPSP provides and how they can be involved.



Figure 2.—An SPSP Special Projects Regions soil scientist talks participants through the soil and the forming factors.



Figure 3.—SPSD Special Projects Region soil scientist explains the layout of the research vessel.

References

Environmental Protection Agency. (2024). *Septic System Care and Maintenance*.
<https://www.epa.gov/septic/septic-system-care-and-maintenance>

Howard, J. (2023). Septic Systems: The Underground Cost of North Carolina's Growth. *Crop and Soil Sciences News*. North Carolina University. <https://cals.ncsu.edu/crop-and-soil-sciences/news/>

Murray, A., Hall, A., Weaver, J., and Kremer, K. (2021). Methods for Estimating Locations of Housing Units Served by Private Domestic Wells in the United States Applied to 2010. *Journal of the American Water Resources Association*, 57 (5), 828–843.
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