

NOAA SENTINEL SITE PROGRAM

North Carolina Sentinel Site Cooperative Website:

<http://oceanservice.noaa.gov/sentinelsites/welcome.html>

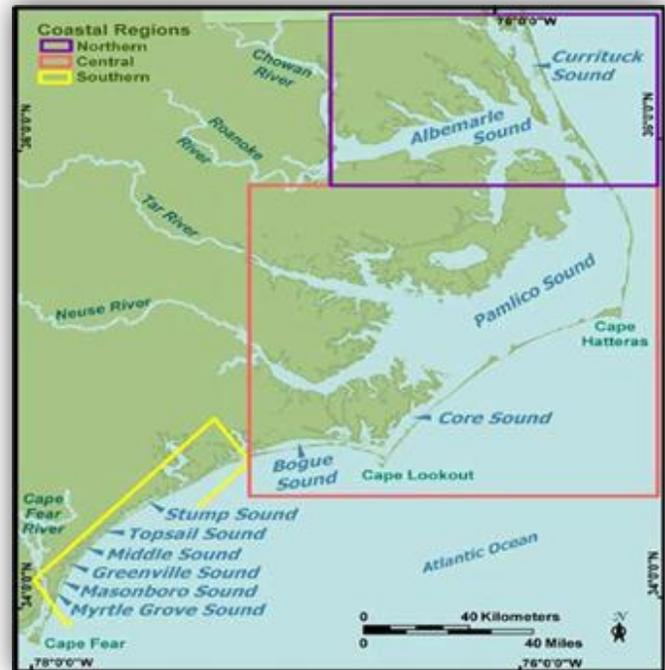
NOAA Sentinel Site Program: The NOAA Sentinel Site Program (SSP) utilizes existing assets, programs, and resources in a place-based, issue-driven approach to ask and answer questions of local, regional, and national significance that affect both NOAA Trust Resources and the surrounding communities.

Abstract

The North Carolina (NC) Sentinel Site Cooperative is located on the central NC coast, near the multi-partner NOAA laboratory in Beaufort, NC (National Estuarine Research Reserve System, National Marine Fisheries Service, and the National Ocean Service). This location is well instrumented due to the high concentration of marine science facilities in the area, and represents median conditions for the NC coast. Future expansion of this Cooperative will include the entire NC coast, which offers a gradient in sea level change (SLC) vulnerability from low-lying, lagoonal, microtidal estuaries to small, highly-flushed, mesotidal estuaries. The coast of North Carolina has one of the highest vulnerabilities to SLC on the Atlantic coast due to its high wave exposure, low-relief coastal slope, and abundance of barrier islands. The high concentration of marine science facilities, existing water level and shoreline monitoring stations, updated seamless bathymetry, and layers of coastal and marine protected areas ensures that sea level changes and their consequences, occurring in NC, will be documented with unparalleled accuracy and will inform coastal management decisions. Biogeographic provinces overlap on the NC coast, a geographic frontier, where signals of response to climate change will be first detected and most significant. Furthermore, the extensive marsh and seagrass systems, sweeping beaches, and sheltered harbors support a high concentration of coastal commerce including shipping, commercial and recreational fishing, and tourism. These industries and associated populations are highly vulnerable to SLC nationwide. Thus, the lessons learned at the NC Sentinel Site Cooperative will be transferable to regions with similar economies.

Available Assets

- NOAA National Water Level Observation Network (NWLON) station in Beaufort, NC
- 28 Surface Elevation Tables (SETs) established 2004-2007 in salt marsh habitats
- High-resolution LIDAR imagery for the entire coastal zone
- Continuous, in-situ, water monitoring for temperature, pH, turbidity, salinity, and dissolved oxygen
- Aerial imagery and photo-interpreted GIS layers of seagrass distribution from 2006-2008





- Geodetic infrastructure, including National Geodetic Survey (NGS) benchmarks and Continuously Operating Reference Station (CORS)
- NOAA National Centers for Coastal Ocean Science (NCCOS) partnership with NC Geodetic Survey on Height Modernization Program
- Marsh vegetation surveys conducted semi-annually, 2004-present, through NC National Estuarine Research Reserve (NERR) - NCCOS collaboration and funded by the NOAA Restoration Center and the Cooperative Institute for Coastal and Estuarine Environmental Technology (CICEET)
- NOAA Center for Sponsored Coastal Ocean Research (CSCOR) regionalized forecasts on geomorphologic, ecological and saltmarsh response to SLR
- Bathymographic GIS providing elevations from the continental shelf to the fall line to facilitate inundation forecasting
- NOAA Center for Coastal Fisheries and Habitat Research (CCFHR) research in progress including, “Response of coastal marshes to sea level rise” and “Forecast influence of natural and anthropogenic factors estuarine shoreline erosion rates”.
- NCCOS partnership with the U.S. Army Corps of Engineers on erosion and SLR issues related to the Atlantic Coastal Waterway
- NC NERR’s Coastal Training Program provides capacity to translate scientific findings for management applications

Internal and External Partners Currently Involved

Albemarle-Pamlico National Estuary Program; Croatan National Forest; Department of Defense; Duke Marine Lab; NOAA National Climatic Data Center (NCDC); North Carolina Aquarium; North Carolina Department of Environment and Natural Resources; North Carolina Division of Coastal Management; North Carolina Maritime Museum; North Carolina National Estuarine Research Reserve (NERR); NOAA Center for Operational Oceanographic Products and Services (CO-OPS); NOAA National Centers for Coastal Ocean Science (NCCOS); NOAA National Geodetic Survey (NGS); NOAA National Marine Fisheries Service (NMFS); National Park Service; U.S. Army Corps of Engineers; and U.S. Fish and Wildlife Service

Management Goals Addressed

The North Carolina Coastal Resource Commission’s Science Panel on Coastal Hazards (NCCRC 2010) recommended that for policy, development and planning purposes, 1 meter (39 inches) be adopted as the amount of anticipated sea level rise (SLR) by 2100. The state and federal management community in NC, including DENR, NMFS Habitat Conservation Division, and the U.S. Army Corps of Engineers has demonstrated clear intent to develop policies which reduce the adverse impacts of SLR on coastal ecosystems and communities. These agencies engage the local scientific community, and make science-based recommendations. Ongoing, the state will rely on NOAA Sentinel Site Program products and information to provide incremental support and rationale for adaptation decisions at the state and local levels. The efforts of the North Carolina Sentinel Site Cooperative will also be directed toward improving coastal communities’ and decision makers’ awareness and scientific understanding of SLR and its impacts.

Point of Contact

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