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Sentinel Site Quarterly

North Carolina
Sentinel Site Cooperative

Happy Spring from the N.C. Sentinel Site Cooperative!

Signs of Spring are finally here! The North Carolina Sentinel Site Cooperative (NCSSC) Coordinator and Core Management Team have been busy this Quarter. Check out the Quarterly Newsletter to learn about research and education events, upcoming meetings, and partner activities.

For more information about the NCSSC or to submit ideas for inclusion in the Quarterly, contact Jennifer Dorton.

Previous Quarterly Newsletters can be found on the NCDENR Coastal Training Program website.

In This Issue

The Defense Coastal/Estuarine Research Program

The Defense Coastal/Estuarine Research Program (DCERP) is a 10-year, integrative research and monitoring program designed to promote adaptive natural resource management in support of the military mission of training and readiness. This program is funded by the Strategic Research and Development Program, the Department of Defenses' (DoD) environmental

science and technology program, and supported by discipline experts from various universities, government agencies, and small businesses. The DCERP team includes RTI International, Duke University, NC State University, University of Connecticut, UNC Chapel Hill, Virginia Institute of Marine Sciences, and Virginia Tech, staff from NOAA and the US Army Corps of Engineers and the small businesses Aquatic Analysis and Consulting, Geodynamics, and Seahorse Coastal Consulting.

The team is working at Marine Corps Base Camp Lejeune (MCBCL), NC and the focus of our work is the New River estuary and its tributaries, the coastal wetlands, barrier island and into the fire adapted terrestrial uplands. The overarching goal of DCERP is to look forward and anticipate future natural resource constraints that may impede the DoD's ability to satisfy mission requirements. The first cycle of DCERP, referred to as DCERP1, was conducted from 2007-2013, and identified significant ecosystem stressors, their sources (on and off MCBCL), and their level of impact on MCBCL's ecological systems. The research team incorporated stressor and other ecological indicator information into models, such as the Estuarine Simulation Model, Marsh Equilibrium Model, and Short-Term Barrier Island Overwash Model, with the aim of developing effective management guidelines for sustainable ecosystems. MCBCL managers received results as well as recommendations from the research team to improve sustainability of the ecosystems and natural resources into the future.

Dr. Mike Piehler, with the UNC-CH Institute of Marine Science, working at a tributary creek of the New River Estuary. Mike is studying land-use activities and climate impacts on carbon, sediments and nutrients from coastal subwatersheds.

The second phase of DCERP (DCERP2) is authorized from 2013-2017. The team is taking their understanding of ecosystem

processes and stressors developed in DCERP1, and looking at them in the context of four climatic drivers: rising temperatures, change in precipitation patterns, increasing storm intensity, and rising sea level. We are focusing our research on understanding the carbon cycle, nutrient utilization, and sediment transport within the context of climate change impacts and the potential impacts of these drivers on ecosystem processes and the training mission. The ultimate goal of the research is to develop a carbon budget for the New River Estuary, NC and associated coastal marshes and barrier island - early findings suggest that some common assumptions regarding carbon cycling in tidal estuaries do not fit with the New River estuary system. Stay tuned as DCERP2 moves forward!

For more information, access to DCERP documents, results from DCERP1 and 2, and to learn more about our research team, please visit the DCERP website: https://dcerp.rti.org/

Enhancing Stem Education in North Carolina

Scientists prepare lesson plans based on their research and then showcase them at SciREN events. Here, Justin Baumann (UNC), displays a lesson on coral reef ecology at the 2015 SciREN Coast event.

Over 100 teachers and 60 scientists from around eastern North Carolina came together on February 12, 2015 at the Pine Knoll Shores Aquarium for the 3rd Annual SciREN Coast networking event. The Scientific Research and Education Network (SciREN) is a graduate student led initiative originating from the UNC Chapel Hill Institute of Marine Sciences and now also encompasses students from Duke University, North Carolina State University, and East Carolina University. As part of its mission to bring current, local science to the classroom, SciREN helps prepare scientists to make their own research-based lesson plans to present to K-12 teachers at networking events. A majority of the materials presented are from research occurring within the NCSSC boundary. The NCSSC hosted a booth at the February networking event in order to introduce educators to the Cooperative and establish contacts for future education and outreach activities.

SciREN networking events take place each year on the coast and in the Triangle. This year's event also marked the unveiling of SciREN's new online networking portal which provides teachers and scientists better access to classroom materials as well as a place to request classroom visits or new lesson plans. The ultimate goal of the SciREN portal is to connect teachers with scientists who are conducting research locally. It is SciREN's hope that this tool will help provide STEM resources to rural areas and underserved audiences.

The Fall 2014 SciREN networking event was hosted at the NC Museum of Natural Sciences. 200 educators were able to interact with approximately 100 researchers from the museum and area Universities.

For more information on SciREN or to become a member of the network check out our website at www.thesciren.org.

NCCOS Supports Natural Infrastructure Approaches for Shoreline Management

Carolyn Currin, NCSSC Core Management Team member, received NOAA National Centers for Coastal Ocean Science (NCCOS) funding for her project "Developing Guidance for Incorporating Natural Infrastructure into Management Efforts to Increase Coastal Resiliency". The value of incorporating a 'natural infrastructure' approach to coastal community resilience has become increasingly evident after the disasters of Sandy and Katrina. Intertidal estuarine habitats, including salt marshes and oyster reefs, have the ability to attenuate waves, stabilize shorelines, and decrease storm surge, and are thus a key part of the natural infrastructure approach. However, these habitats are limited in their distribution by physical forces and geomorphological setting, and their resilience to SLR and wave erosion is site-specific. Understanding the factors that drive the distribution and resilience of these habitats is crucial to successfully incorporating natural infrastructure into coastal resiliency efforts. The project team will use the data-rich NCSSC area to develop and test a model that will provide site-specific guidance on the type of natural infrastructure approach (e.g. Living Shoreline, marsh restoration) that is appropriate for a given range of physical

conditions. Results will be distributed to coastal resource managers, marine contractors, and other stakeholders. The overall project will provide a framework and proof-of-concept example for national use.

Storm Surge High Water Level Observations

As part of a Sea Grant funded effort, the NOAA Southeast and Caribbean Regional Team (SECART) has been working to improve the collection of reliable storm surge water level observations. A team from offices within NOAA and affiliated partners has developed a plan and methodology for gathering this information by establishing a network of collaborators and volunteers. The Newport/Morehead City National Weather Service (NWS) office hosted a workshop at the NOAA Beaufort Lab, March 17-18, 2015 to share this methodology and build collaboration among groups in NC that may be able to assist with storm surge, high water mark data collection after a storm. Workshop participants included representatives from the NCSSC, four NWS offices, NCCOS, CO-OPS, NOS, National Geodetic Survey, NC Geodetic Survey, US Fish and Wildlife Service, US Geological Survey, Department of Defense, NC Sea Grant, NC NERRs, State and County Emergency Management officials, East Carolina University, and UNC Institute for Marine Sciences.

Day 1 included a review of the methodology that was developed to find, mark, and measure high water marks following a storm. This included demonstrating the use of GPS survey equipment (X90-OPUS) that will be available from NC Sea Grant for use by project partners.

Day 2 focused on engaging partners across the area who could assist with the collection of water level, inundation, and wave data after a storm event. Additionally, USGS described the SWATH program and their efforts to identify locations suitable for the deployment of permanent and temporary sensors to collect storm surge and wave data. Meeting participants were able to provide information on gaps in current coverage maps and identify collaborative opportunities for NOAA and USGS efforts. This coordination will help USGS site their gauges in the most beneficial locations and help prioritize which sites should receive a sensor if only a limited numbers are available for deployment.

For more information, contact Rich Bandy, NOAA NWS.

Funding Opportunities

Below are funding opportunities which may be of interest to NCSSC partners.

- NC Sea Grant announces the opening of the Core Funding Cycle. Pre-proposals are due **April 10**.
- Sea Grant Marine Aquaculture Grant Program - Full proposals are due **April 27**. The RFP is available on the NOAA website or by clicking on the following link: http://www.grants.gov/web/grants/view-opportunity.html?oppId=274777

The NOAA Sentinel Site Program leverages existing research and monitoring resources to ensure resilient coastal communities and ecosystems in the face of changing conditions. The program's place-based approach focuses on issues of local, regional, and national significance that impact habitats and species managed by NOAA as well as surrounding coastal communities.