



## Supporting the Blue Economy - SECOORA 2018 Annual Meeting

*SECOORA Principal Investigator Abstracts*

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### **Operate and Maintain University of North Carolina – Chapel Hill IOOS Priority High Frequency Radars in SECOORA**

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The three high frequency radar installations along the North Carolina coast have operated well over the last year, providing observations over 93% of the time, over ranges of, on average, 175 km or more. Maintenance on the installations during Year 1 replaced failing components and cabling at several sites; and, working with the National Park Service, removal of sand from the access road to the HATY site at Buxton, necessary to replace the fuel tank for the backup generator. Each site faces challenges – the CORE site is remote and accessible only by boat; the HATY site has seen severe coastal erosion and overwash; and the DUCK site has also experienced significant erosion. In Year 2, HATY and CORE experienced outages related to Hurricane Maria. The HATY site suffered significant erosion as a result of the storm and the receive antenna fell into the surf. The receive antenna was repaired, but significant fluctuations in loop 1 and 2 phases and increasing noise floor levels lead us to replace the antenna board in the receive antenna. Since then, the system has been operating well. Duck sustained a lightning strike in early May that damaged receiver, transmit, and transmit antenna units operated there in collaboration with Johns Hopkins University. The strike led to a weeklong outage. The radar was returned to operation after the UNC transmit and receive units were re-installed at the site.

The installations also support a National Science Foundation study of Processes driving Exchange At Cape Hatteras (PEACH). The NC radars provide surface current information over a large fraction of the PEACH domain. The PEACH project has deployed a large array of in-water equipment and added 4 WERA higher-resolution/high frequency radar systems within the NC codar network. Gliders are also being operated on the shelf, along the shelf slope, and in the Gulf Stream. The nested radars provide combined radial vectors from both types of systems and fill in coverage in Raleigh Bay that was previously unavailable from the codar systems. The surface currents provide the PEACH project with essential information about the convergence of shelf waters off Hatteras, and the influence of the Gulf Stream on the cross shelf transport that results. The radar network also informs PEACH glider operations. Ten in-water current sensors will provide a rich source of validation data for the radar network when they are recovered in November, 2018.

