

Fine-scale Spatial Mapping of Biological Sounds in the May River Estuary

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Abstract: The study of soundscapes is a fairly new scientific field that uses sound to characterize ecosystems. This can be a helpful tool for tracking species, population sizes, behavior of these species, and studying the overall quality of habitats. In estuaries, this tool is especially helpful since the underwater environment and behavior of species inhabiting this environment cannot be studied easily by sight due to the lack of visibility of this highly productive ecosystem. Estuarine soundscapes are acoustically rich, and sound patterns have been an understudied element in these ecosystems. Therefore, the goal of this project was to map the soundscape of the May River. A passive acoustic recorder (DSG-Ocean) was towed by boat and recorded sound continuously along a specific course. From the acoustic data collected, sound pressure levels (SPLs) of high frequency (7000 Hz-39000 Hz) and low frequency (50 Hz-1200 Hz) bandwidths were determined every 1 sec and mapped to a specific GPS location. The data was then used to create heat maps using ArcGIS. The acoustic data collected and the heat maps that were produced revealed that the soundscape of the May River was complex and exhibited great spatial heterogeneity. Distinct spatial hotspots of low frequency sound (i.e., indicative of spotted seatrout chorusing) and high frequency sound (i.e., indicative of snapping shrimp acoustic activity) were observed. In the future, the goal is to collaborate with SCDNR to map the shoreline habitat of the May River. The purpose of this is to determine if there is a correlation between shoreline structure (e.g., oyster reefs and soft bottom) and higher SPLs of high and low frequency. The soundscape data collected could potentially provide new tools to help understand the health of estuaries by tracking biological sounds over time and space.