MARINE SENSORY & NEUROBIOLOGY LAB

University of South Carolina Beaufort

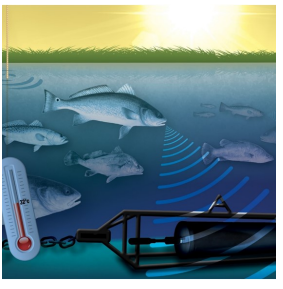
MAY, 2022

Caroline Tribble collecting data on a dolphin survey.

Dolphin sighted in Colleton River.

Dr. Eric Montie driving the boat on a dolphin survey in the May River.

About our lab



Design by Tim Devine, USCB Graphics Manager

Our research utilizes passive acoustic recorders that allow continuous and long-term sampling of underwater soundscapes. These recordings provide information on the behavior of snapping shrimp, spawning patterns of fish, foraging and communication patterns of bottlenose dolphins, and noise levels association with human activity. We also, conduct visual surveys of bottlenose dolphins to determine abundance and distribution patterns. Using photo-ID we can document the number of sightings of each dolphin per year and distinguish between residents and migrants. We can also determine when migrants arrive in our estuary and how these groups interact and use the estuary and how this may help explain the acoustic behavior of these animals. This can provide critical data about the ecology and health of the estuary.

Long-term goal of studying our estuaries

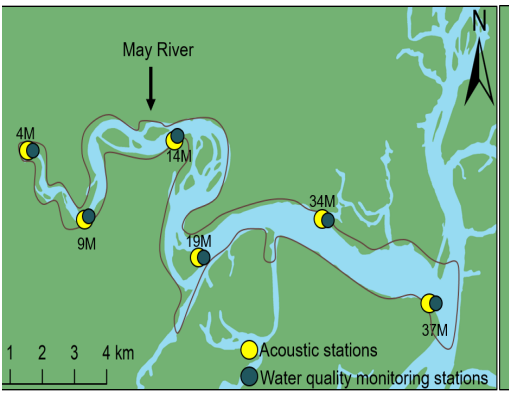
The long-term goal is to 'eavesdrop' on key behaviors of marine animals that can change rapidly or gradually in response to environmental changes and human impacts, thus providing a measure of resilience of shifting baselines in a globally changing environment. We can use this information to understand animal responses or resilience to various stressors including vessels, underwater construction, overfishing, chemical pollution, harmful algal blooms, climate change, and extreme weather events like hurricanes and floods.

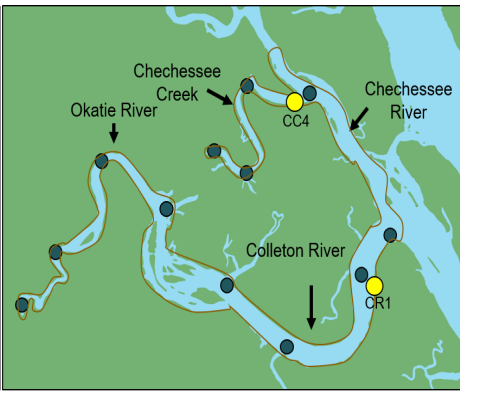
Dolphins strand feeding in Chechessee Creek.

Where are we listening?

Lindsey Transue helping deploy acoustic recorder in Chechessee Creek.

Currently, we have 9 recorders deployed in 4 estuaries in South Carolina, which includes the May River (3 stations), Chechessee Creek and Colleton River (2 stations), Charleston Harbor (3 stations), and the North Inlet-Winyah Bay National Estuarine Research Reserve System (NI-WB NERRS) (1 station). Our lab has been collecting data in the May River since 2013 – this dataset comprises our longest time series (9 years of sound data!). In 2017, we initially expanded deployments to 6 stations in Charleston Harbor but later, in 2019, we dropped to 3 stations. Also in 2019, we expanded soundscape monitoring to Chechessee Creek (1 station), Colleton River (1 station), and the NI-WB NERRS (1 station).





Sources

Marian A.D., Monczak A., Balmer B.C., Hart L.B., Soueidan J. & Montie E.W. Long-term passive acoustics to assess spatial and temporal vocalization patterns of Atlantic common bottlenose dolphins (Tursiops truncatus) in the May River estuary, South Carolina. Mar Mam Sci. 2021;1–25. https://doi.org/10.1111/mms.12800

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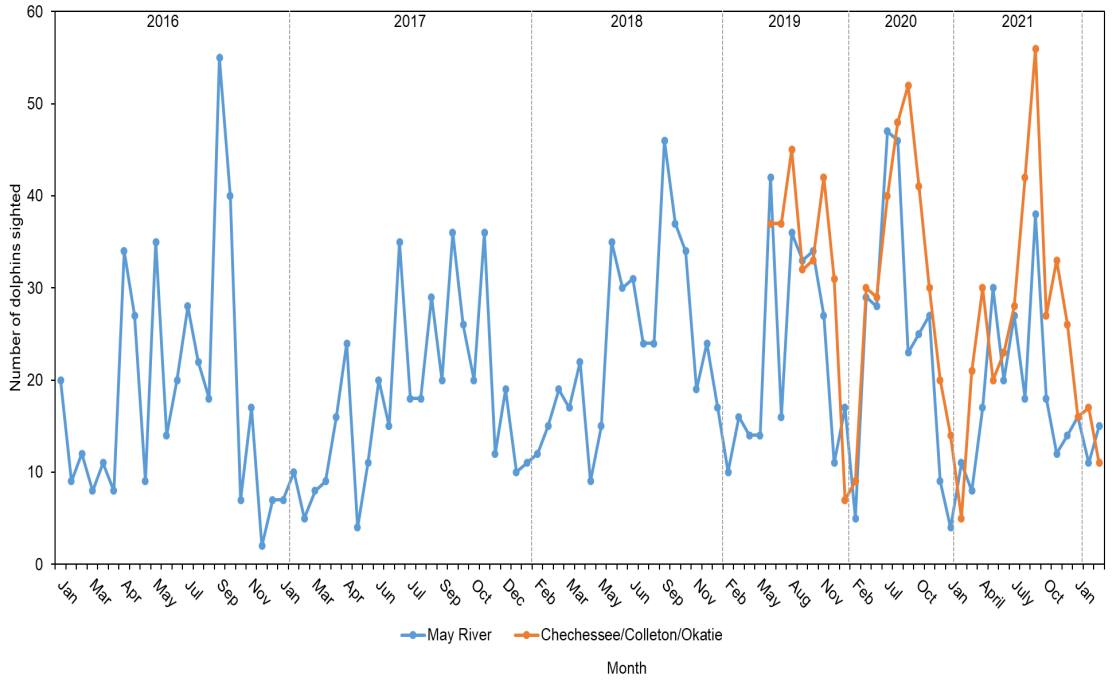
Meet our dolphins

Ralph, a resident dolphin seen frequently in Chechessee Creek.

Meet Ralph! Ralph is a resident dolphin of the Port Royal Sound area. We have only sighted Ralph in Chechessee Creek. This dolphin is always sighted with another dolphin, Coral. It is possible that Coral and Ralph are a male "pair bond". This is the longest association for bottlenose dolphins, sometimes lasting the duration of their lives. These bonds are thought to help with hunting, protection, and mating success. These dolphins may also be mother and calf as calves can stay with their mother until they are 6 years old.

Bottlenose dolphin visual data

We have been conducting monthly visual surveys in the May River since 2016. In June 2019 we began conducting surveys in the Port Royal Sound area (Chechessee River, Chechessee Creak, Colleton River, and Okatie River). On each survey we monitor the number of animals including adults, calves, and neonates. We also record GPS locations of all sighted animals and record any observed behaviors (e.g., mating, breaching, feeding). This will help up understand the number of dolphins in our estuary throughout the year, the arrival of migratory animals each year, and how these groups utilize the estuary. We have found that there are approximately 156 dolphins in the Chechessee/Colleton/Okatie area as compared to 196 in the May River. We see more dolphins in the late summer and early fall due to an influx of migratory animals. We also see more dolphins at the mouth of estuaries in the winter, which is most likely linked to their prey. These animals have extensive home ranges as we see some of the same individuals in both of our survey areas. Overall, we have a healthy population of dolphins in our estuary. We have also learned a lot about the acoustic behavior of these animals. They produce echolocation (foraging), burst pulses (social interactions), and whistles (identification). Echolocation is the most common vocalization and understanding echolocation patterns can help us learn about the foraging behavior of these animals. Vocalization patterns follow both spatial and seasonal patterns. At the mouth of the May River, vocalizations are greater in the fall and winter and lower in the spring and summer. This is likely in response to prey abundance. In the winter, when prey is scarce dolphins may need to echolocation more frequently to find food. We continue to combine both visual surveys and acoustic data to understand our local dolphins.



This figure shows the abundance of dolphins sighted on each survey in both the May River (blue) and the Port Royal Sound area (orange). Surveys in the Port Royal Sound area began in June, 2019.

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