

Sarasota Bay Listening Network

A collaborative program involving colleges, universities, industry and citizen scientists, led by the Chicago Zoological Society's Sarasota Dolphin Research Program (SDRP).

WELCOME TO OUR NEW TEAM MEMBERS

We are pleased to welcome long-time SDRP collaborators Dr. Laela Sayigh of Woods Hole Oceanographic Institution and Dr. Frants Jensen of Aarhus University to the SBLN Board. Dr. Sayigh is an expert in cetacean communication and social behavior. She curates the Sarasota Dolphin Whistle Database: a unique dataset that allows individual dolphins to be monitored acoustically using SBLN stations. Dr. Jensen is a behavioral ecologist with expertise in bioacoustics, acoustic communication and effects of noise. He is developing algorithms for detecting and classifying cetacean acoustic signals, and for understanding structure, function and information content within and across species.

We are also excited to introduce Dr. Kathryn Holmes, a former SDRP intern who joined the team in January as the SBLN Manager. Dr. Holmes recently completed her PhD at the University of Western Australia, where she studied the development of alliance behaviors in juvenile male Indo-Pacific bottlenose dolphins. She has expertise in dolphin social behavior and vocal communication.

OUR NETWORK OF LISTENING STATIONS IS GROWING

We have been busy making our passive acoustic listening stations (PALS) more resilient to biofouling and severe weather, and reinstalling two stations (Figure 1). For the first time, the entire network is operating simultaneously, and it is growing! Stations were added at Anna Maria Elementary School and New College of Florida (NCF) in 2022. NCF students of SBLN Board member Dr. Athena Rycyk are using data from their station for undergraduate coursework and senior honors theses. We are seeking funding for five more stations as part of a collaboration with the Sarasota Coast Acoustic Network (SCAN), which detects acoustically tagged fish and invertebrates in the Sarasota Bay estuary. With this expansion (Figure 2), the SBLN and SCAN will become better integrated, providing critical insights into the movements, behavior and responses to natural and human disturbances of animals in the Sarasota Bay estuary.



Figure 1. F213 (Maddie) and her calf echolocate as CZS SDRP staff remove a hydrophone (underwater microphone) for site maintenance near Palma Sola Bay.

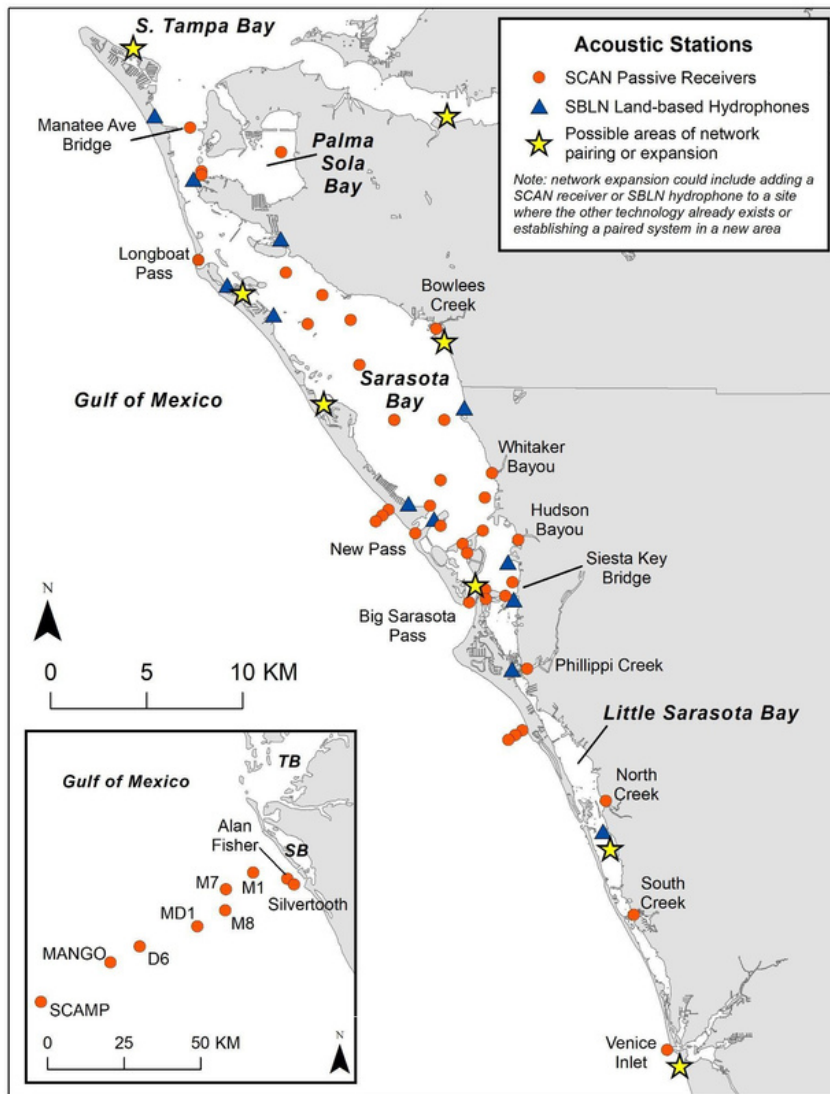


Figure 2. Proposed joint expansion of the Sarasota Bay Listening Network (SBLN) and Sarasota Coast Acoustic Network (SCAN). SBLN records underwater sound to detect sound-producing species such as dolphins, manatees, fish that are dolphin prey and invertebrates such as snapping shrimp, and vessels. SCAN tags sharks, rays and other fish, as well as invertebrates such as whelks, with acoustic transmitters and detects them with acoustic receivers. The proposed expansion will extend the range of both networks and increase the area that both networks cover to achieve a more comprehensive understanding of the interactions between species and their environment (for example, shark and dolphin predator-prey interactions; multi-species responses to red tides), including for some threatened or endangered species.

WE'VE BEEN PUBLISHING WITH OUR PALS

Vessel noise is a major part of many marine soundscapes, including Sarasota Bay, and can negatively affect species such as dolphins, manatees, and fish that rely on sound to communicate, find food, or navigate. In some places, the global slowdown in human activity due to COVID-19 restrictions reduced vessel traffic and noise from commercial operations such as shipping. Using SBLN data, University of St Andrews master's student Emma Longden and coauthors investigated how vessel traffic and dolphin whistle detections, which indicate the presence of dolphins in an area, may have changed at two PALS sites during COVID-19 restrictions. Contrary to expectations, vessel traffic did not decrease at either site. It even significantly increased at one site. Over the same period, dolphin presence remained the same at the noisier site and decreased at the site where vessel traffic remained the same. These unexpected local patterns led the authors to caution that the pandemic should not be assumed to have lessened human noise at other urban sites, and highlight the usefulness of long-term SBLN recordings to examine the impacts of human activity on dolphins. The study was published in the *Journal of the Acoustical Society of America*. You can read the study at this [link](#).

Manatees are also susceptible to negative impacts from vessel traffic, including collisions, which account for a high percentage of deaths of this threatened species. SBLN Board Member Dr. Athena Rycyk led a study published in 2022 in PLOS ONE that used SBLN data from four sites with different levels of background noise to investigate how noise may affect manatees' ability to hear and move away from approaching vessels in a timely manner. Rycyk and coauthors found that high levels of background noise strongly reduce a manatee's estimated ability to hear approaching vessels, as well as the distance over which they can communicate with each other. Manatees are expected to hear slow-moving vessels earlier, giving them more time to move out of the vessel's path. This finding highlights the importance of slow speed zones and research on how noise varies over time and space in areas used by vulnerable species that rely on sound. You can read the study at this [link](#).

ADVENTURES OF A LISTENING NETWORK CONTRACTOR



Figure 3. Cecilia Thompson at the Marie Selby Botanical Gardens Historic Spanish Point campus listening station.

In 2022, CZS SDRP hired former SDRP intern and volunteer Cecilia Thompson as an Independent Contractor to assist with the SBLN and other SDRP projects. Cecilia is a graduate of Eckerd College in St. Petersburg, FL. During her time with

SDRP, she has assisted Drs. Laela Sayigh and Athena Rycyk with SBLN data processing for a project that aims to refine SIGID, the method for identifying dolphin signature whistles ("names"), for use with listening station recordings. Cecilia also conducted a preliminary overview of the underwater soundscape in Sarasota Bay, and found that it is dominated by snapping shrimp, bottlenose dolphins, and fish (e.g., Gulf toadfish), as well as geophysical (e.g., rain, wind) and human noise sources (e.g., vessels). She presented this work at the 2023 Southeast and Mid-Atlantic Marine Mammal Symposium. As this SBLN project continues, we aim to assess the relative diversity and abundance of dolphin prey fish to supplement the SDRP's long-term catch-and-release purse-seining fish surveys, and track ecosystem health and noise from human activity over time. Cecilia recently began a master's degree in marine mammal science at the University of St Andrews in Scotland. We wish her the best!



We greatly appreciate the support of Mote Scientific Foundation, Disney Conservation Fund, the Chicago Zoological Society, and several donors and citizen scientists towards establishing, maintaining, and enhancing this network. Sarasota Bay Listening Network Board Members: Drs. Katie McHugh, David Mann, Athena Rycyk, Laela Sayigh, Frants Jensen, Peter Simard, and Randy Wells