Sarasota Bay Listening Network

A collaborative program involving colleges, universities, industry and citizen scientists, led by the Sarasota Dolphin Research Program (SDRP), Brookfield Zoo Chicago.

INTRODUCING THE SARASOTA PALS NETWORK

In our previous issue we shared that we are collaborating with our sister network, the Sarasota Coast Acoustic Network (SCAN), to study the behavior of animals in the Sarasota Bay estuary. The two networks have complementary capabilities. The Sarasota Bay Listening Network (SBLN) records underwater sounds made by animals, weather and human activities, whereas SCAN detects animals that have been tagged with acoustic transmitters. Together, the two networks facilitate research on dolphins, manatees, sharks, rays, other fish, and invertebrates. We now have a name and matching logos for this exciting collaboration: The Sarasota PALS (Passive Acoustic Listening Stations) Network (Figure 1). You can learn more about the PALS Network at this link.

Figure 1. New logos and infographic for SBLN and SCAN, known collectively as The Sarasota PALS Network.

OUR NETWORK IS ABOUT TO GROW - A LOT!

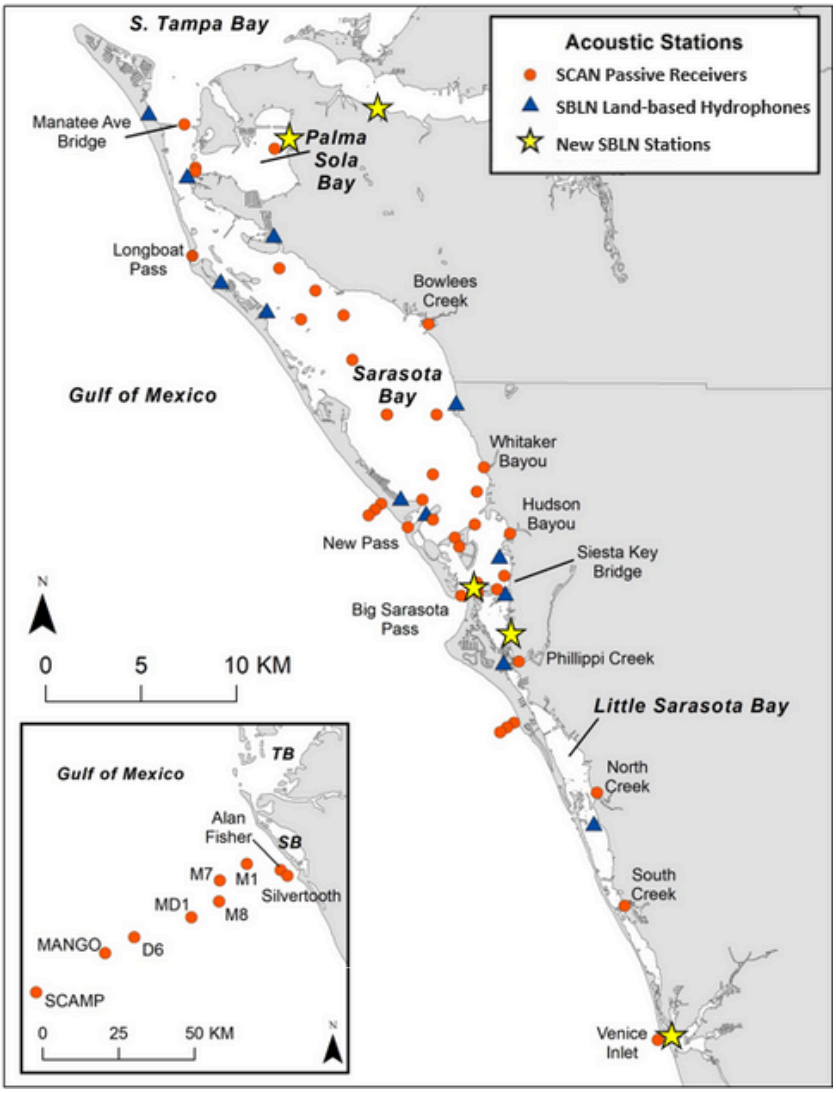

Figure 2. The five new Sarasota Bay Listening Network (SBLN) stations being installed in 2024, indicated by stars.

The Sarasota Bay Listening Network will be growing to a total of 18 stations this year. We are excited to share that we will be adding five new stations and reinstalling the station at Eckerd College (Figure 2). Generous support from our station hosts, donors and the Disney Conservation Fund has made this possible. This expansion will increase our coverage to further align with SCAN and the study area of the Sarasota Dolphin Research Program, which extends from southern Tampa Bay to Venice. There are still areas where we are seeking to pair SBLN and SCAN stations to more fully integrate the Sarasota PALS Network, but meanwhile we are thrilled to have met our initial goal of adding five new stations to important areas where there have long been gaps in the SBLN.

FUNDING UPDATE

We would like to take this opportunity to thank the Charles & Margery Barancik Foundation for their generous support of our staff time for SBLN maintenance, management and data analysis this year. We are also pleased to share that we have received a small grant from Wildlife Acoustics, Inc. for licensing of their Kaleidoscope Pro software and the Chicago Board of Trade Endangered Species Fund Grant, which will be used to finance SBLN equipment and SCAN maintenance.

We are currently seeking funding for SBLN station upgrades that will include more advanced onboard data processing, remote access to monitor station status, and onsite listening options that will benefit our station hosts including educational institutions, as well as other community members at publicly accessible stations (Marie Selby Gardens Historic Spanish Point and future stations TBD).

YOU ASKED: ARE WE USING AI IN OUR RESEARCH?

Bottlenose dolphins produce individually distinctive signature whistles that they use for interacting with conspecifics, and the SBLN was constructed in part to listen for individual animals. Identifying which whistle is from which individual requires extensive work both gathering and curating a signature whistle catalogue, and then matching whistles from each station to known signature whistles. Our collaborators at Woods Hole Oceanographic Institution, Aarhus University and University of St Andrews, along with engineers at the non-profit EarthSenseAI, have been developing AI algorithms (deep convolutional neural networks) that help to detect and identify individual signature whistles and greatly facilitate our use of signature whistles for population monitoring (Figure 3).

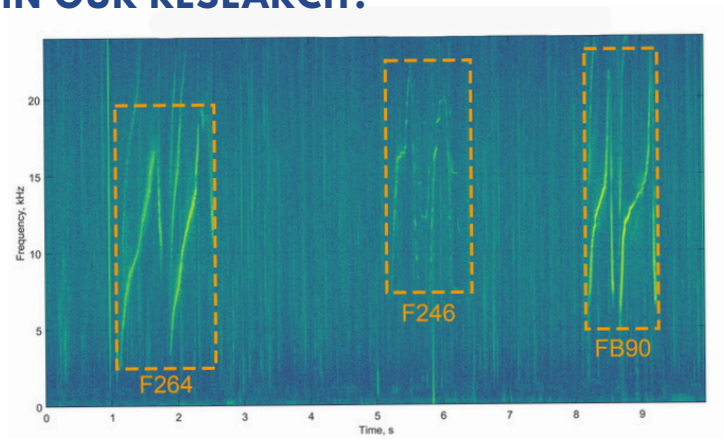

Figure 3. AI helping to identify signature whistles.

While work is still underway to modify algorithms and make them ready to be deployed in the field, they already seem to provide performance on par with what trained analysts can achieve, with >93% of signature whistles classified correctly. We hope that the natural laboratory we have in Sarasota, with the extensive listening network coupled with regular visual surveys, can allow us to develop and validate approaches for monitoring bottlenose dolphins remotely using their signature whistles.

STUDENT RESEARCH IN THE SPOTLIGHT

Congratulations to New College of Florida undergraduate (and SDRP intern) Vivian Cargille (above right), who recently completed their thesis entitled 'New College dolphins: Automated whistle extraction'! Viv used data from two Sarasota Bay Listening Network stations to design and test an automated whistle detection method based in Kaleidoscope Pro acoustic analysis software (Wildlife Acoustics, Inc.) - a more accessible alternative to AI methods. Viv then used the Kaleidoscope method to analyze daily and seasonal whistle detection patterns at the New College station. Well done Viv!

SDRP graduate student and SBLN contractor Cecilia Thompson (far left) is diving into her dissertation project for the final stage of her master's degree in marine mammal science at the University of St Andrews in Scotland. She is investigating the occurrence of Sarasota dolphins with known signature whistles at SBLN stations, using these whistles to infer an individual's presence near a station. This study will compare passive acoustic and visual detection methods and highlight how passive acoustic monitoring can be used to non-invasively track individual dolphins.

WE'VE BEEN OUT IN THE COMMUNITY

SDRP staff participated in the Science and Environment Council of Southwest Florida's 2023 EcoSummit in December. Drs. Randy Wells and Katie McHugh presented at the event, sharing what we've learned from the program's long-term dolphin and ecological research. Our SBLN and SCAN managers showcased The Sarasota PALS Network at the SDRP event table (right) and enjoyed engaging with local eco-friendly business owners, non-profits and other community members to share how we use passive acoustics technology to study marine wildlife.

SDRP staff at our EcoSummit table. Left to right: Katie McHugh (Deputy Program Director), Katy Holmes (SBLN Manager), Randy Wells (Program Director), Krystan Wilkinson and Kim Bassos Hull (SCAN Co-Managers)

Katy Holmes and Krystan Wilkinson conducted an outreach event for fifth graders on April 23rd at Anna Maria Elementary School, where we have established one of our 12 stations for the Sarasota Bay Listening Network. They gave a presentation about dolphin biology, how SDRP uses PALS and other tools in our research, and how the students can help their dolphin neighbors in the bay. The students did photo-identification and whistle matching activities to learn how we identify dolphins based on dorsal fin features and how the dolphins identify each other from their signature whistles. They also made stow-it bins (right) to collect and secure used monofilament fishing line and other trash. It was a pleasure to work with such a smart and engaged group of kids!

We greatly appreciate the support of Mote Scientific Foundation, Disney Conservation Fund, the Charles & Margery Barancik Foundation, Brookfield Zoo Chicago (formerly known as 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