LIVING MARINE RESOURCES PROJECT 21

Extended Duration Acoustic Tagging of Right Whales

NEED

The Navy is responsible for compliance with a suite of Federal environmental laws and regulations that apply to marine mammals and other marine protected species, including the Endangered Species Act (ESA) and the Marine Mammal Protection Act (MMPA). As part of the regulatory compliance process associated with these acts, the Navy is responsible for implementing a marine species monitoring program to assess potential impacts from Fleet and Systems Command military readiness activities involving active sonar and the use of explosives and explosive munitions.

To improve understanding of marine mammal behavior, researchers employ a variety of passive acoustic monitoring and recording techniques. Acoustic recording tags that can be non-invasively attached to an animal have provided baseline data on sound production for a wide range of critical marine mammal species. Earlier versions of these tags had limited recording capacity, ranging from 12 to 20 hours. An additional limitation has been their attachment mechanism, which typically limited data collection to less than one day. To improve its compliance assessment effort, the Navy needs finer-scale data of acoustics and marine mammal behavior that have been collected over longer time periods.

SOLUTION

Expanding data collection from tags over longer durations requires both tags that can record desired data points for longer periods and attachment mechanisms that will keep the tag attached for as long as possible. The latest generation of Digital acoustic recording TAGs (DTAG), the DTAG-3, offers significant data collection advancements with the potential to collect acoustic data for up to 72 hours from baleen whales. New micro-texture and glue attachment methods to be used with the new tags offer promising results.

Attaching a monitoring tag to a whale.

METHODOLOGY

This study will be the first to apply a newly developed attachment system to a free ranging baleen whale. Researchers will test the attachment of the DTAG-3s using micro-texture and biocompatible glues during monitoring studies of North Atlantic right whales off the Southeastern United States. The monitoring studies, supported by U.S. Fleet Forces, are focused on right whales due to their endangered status and proximity to the undersea warfare training range (USWTR) off of Jacksonville, Florida. This training range is one of the identified priority regions for the LMR program and the Navy.

DTAGs have been used extensively for baleen whale research for over 15 years. The newer, version 3, tags are smaller, lighter, more hydrodynamic and

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capable of longer-term data collection. With the development and preliminary testing of micro-textures and glues for attaching tags, it is expected that the tag attachment can be extended from hours to multiple days. Thus, this project will demonstrate attaching a tested tag technology with a developed but unimplemented attachment technology to collect data on endangered baleen whale species in a critical habitat area. This will support collecting fine-scale acoustic and movement data needed to provide baseline data on whale detectability and movement patterns for future longer-term movement studies.

SCHEDULE

The team will deploy DTAG-3s with a micro-texture and glue attachment system during two January/February field seasons in 2017 and 2018. Recovered data sets will be analyzed and reported following each field season.

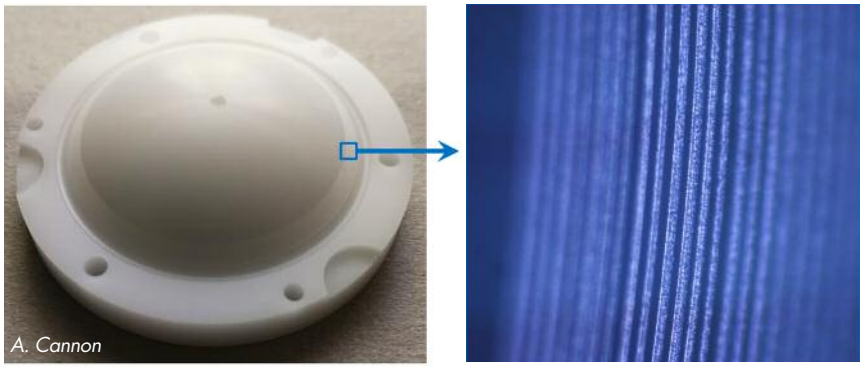
NAVY BENEFITS

Successful use of the new attachment method and longer-term recording tags will open the potential for attaching these tags to a broad range of endangered coastal species in multiple Navy areas of interest, significantly extending acoustic data collection timeframes.

The data collected during this project also will start to fill in important behavioral data gaps for endangered baleen whale species that calf off of Florida and Georgia, in the coastal waters near USWTR off the coast of Florida.

TRANSITION

The products from this research will include micro-textured machined suction cups in the final form as determined from results of field testing. A publication summarizing results will be completed.



Mold (left) used to produce micro texture (right) into the edge of the suctions cups.

ABOUT THE PRINCIPAL INVESTIGATOR

Susan Parks is an Assistant Professor in the Department of Biology at Syracuse University in Syracuse, NY. She specializes in bioacoustics, focusing on the use of sound for communication and the impacts of noise on development, behavior, sound production and reception. Dr. Parks holds a Ph.D. in Biological Oceanography from the Massachusetts Institute of Technology & Woods Hole Oceanographic Institution.

The co-principal investigator for this project is Doug Nowacek from the Duke University Marine Lab.

About the LMR Program

The Living Marine Resources (LMR) program seeks to develop, demonstrate, and assess data and technology solutions to protect living marine resources by minimizing the environmental risks of Navy at-sea training and testing activities while preserving core Navy readiness capabilities. For more information, contact the LMR program manager at exwc_lmr_program@navy.mil or visit www.lmr.navy.mil.