



LIVING MARINE RESOURCES PROJECT 28

Proposed ASA Standards on Towed Passive Acoustic Monitoring and Mitigation Systems

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 underwater detonations from explosives and explosive munitions.

Passive acoustic monitoring (PAM) methods can include fixed range hydrophones, fixed single sensor hydrophones, hydrophones deployed on mobile unmanned underwater vehicles (i.e. sea gliders, wave gliders, etc.), tags, and towed cabled hydrophone arrays. Several U.S. federal agencies and departments, including the U.S. Navy, desire consistent standards for how to implement PAM for marine mammals for monitoring and compliance purposes. Specifically, the U.S. Navy, National Marine Fisheries Service (NMFS), and the Bureau of Safety and Environmental Enforcement (BSEE), are partnering in an effort to develop a standard for towed cabled PAM.

SOLUTION

Developing a standard for towed cabled PAM by a professional society would create both greater simplicity in assigning PAM contracts and greater consistency in PAM operations across multiple organizations and contractors. It also would improve transparency in the collection and dissemination of PAM data.

This project would help to support development of an Acoustical Society of America (ASA)-sponsored

American National Standard ("ANSI standard") on towed cabled PAM systems and operations for monitoring and mitigation purposes.



One example of a dipole towed array deployed.

METHODOLOGY

The Principal Investigator will consolidate and extend the results of a recent working group to produce a draft standard for "towed PAM." Towed PAM uses hydrophones towed behind surface vessels. The hydrophones transmit data via either cable or telemetry to a central recording station. Although towed PAM comprises a relatively minor portion of Navy marine mammal PAM efforts, the technology is perceived as the most mature and thus the best candidate for starting a standards process. A successful implementation of this standard would provide a template for other PAM technology standards as various technologies mature.

The standard will address requirements and recommendations for initial planning (including guidelines for when PAM is not appropriate for a planned field operation), hardware, software, training, real-time mitigation and monitoring procedures, and performance validation. It will not cover operational shutdown

decision criteria, sound source verification or how to establish the required detection range of the system.

The draft will be circulated through the industrial, regulatory and academic communities before being submitted for Acoustical Society of America vote. Other members of the working group include individuals from academia, industry and federal regulatory agencies.



G. Pavan,
University of Pavia

Towed array hydrophone equipment on its storage reel.

SCHEDULE

In year one the working group will seek to prepare a draft working standard that can be circulated through the marine mammal and acoustic communities.

During year two, the working group will address comments and produce new draft standard. By the end of year two, the group will submit the draft for a vote by the appropriate ASA institutional consensus committee (ANSI-Accredited Standards Committee (ASC) S3/SC 1, Animal Bioacoustics).

NAVY BENEFITS

The template that a towed array PAM standard provides will benefit the Navy in future action on standards for other PAM systems (e.g., moored and drifting systems). These latter systems currently are not sufficiently developed to achieve consensus across industry, academia and regulatory agencies. However, demonstrating a successful procedure for developing a towed PAM standard clears the way for

more rapid progress in future standards. Having such standards could help to reduce costs associated with procurement and contracting of passive acoustic services in the future.

TRANSITION

The final product will be a draft standard that will be released to the wider community via mailing lists (e.g. MARMAM) and the Acoustical Society of America media (e.g. Acoustics Today). Following rounds of review by from the wider regulatory, academic and industrial communities, in order to obtain as much of a consensus as possible, the draft standard will be submitted for passage by the appropriate ASA institutional consensus committee (ANSI-Accredited Standards Committee (ASC) S3/SC 1, Animal Bioacoustics). If support from other federal agencies or industrial consortia becomes viable, then future work could include a workshop with an advisory group in order to accelerate the incorporation of community comments.

ABOUT THE PRINCIPAL INVESTIGATOR

Aaron Thode, Full Research Scientist at the Scripps Institution of Oceanography Marine Physical Laboratory, concurrently earned his bachelor of science (in physics) and master's (in electrical engineering) degrees in 1993 from Stanford University. He received his Ph.D. in oceanography from Scripps in 1999. Dr. Thode's research has included developing automated detection, classification and tracking methods of migrating bowhead whales in the Beaufort Sea, using vertical arrays to localize whale sounds in range and depth from a single deployment, and studying the relationship between visual censuses and acoustic call detection rate for gray whales in the breeding lagoons of Mexico.

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.

