

LMR Program Announces FY14 New Projects

Projects Include New Data to Support Navy Risk Guidelines & Advancements to Automated Acoustic Signal Processing

THE NAVY'S LIVING Marine Resources (LMR) program has announced its new start projects for Fiscal Year (FY) 2014 which include an effort to derive large whale hearing data from anatomical information as well as a project to develop testing data sets for new signal processing tools used to analyze Navy passive acoustic monitoring (PAM) data.

For the past several months, the program's executive board—the Living Marine Resources Advisory Committee (LMRAC)—has been busy reviewing pre- and full proposals. Proposals were submitted by Navy

personnel, other federal agencies, academic institutions and private industry in response to the following six priority needs identified by the program earlier in the year:

1. Demonstration of PAM Technology (need no. N-0006-13)
2. Behavioral Responses of Marine Mammals to Navy Sound Sources (need no. N-0011-13)
3. Hearing and Auditory System Information for Hearing-Based Risk Criteria (need no. N-0012-13)
4. Demonstration and Evaluation of Platform-Independent Improve-

ments to Automated Signal Processing of PAM Data (need no. N-0020-13)

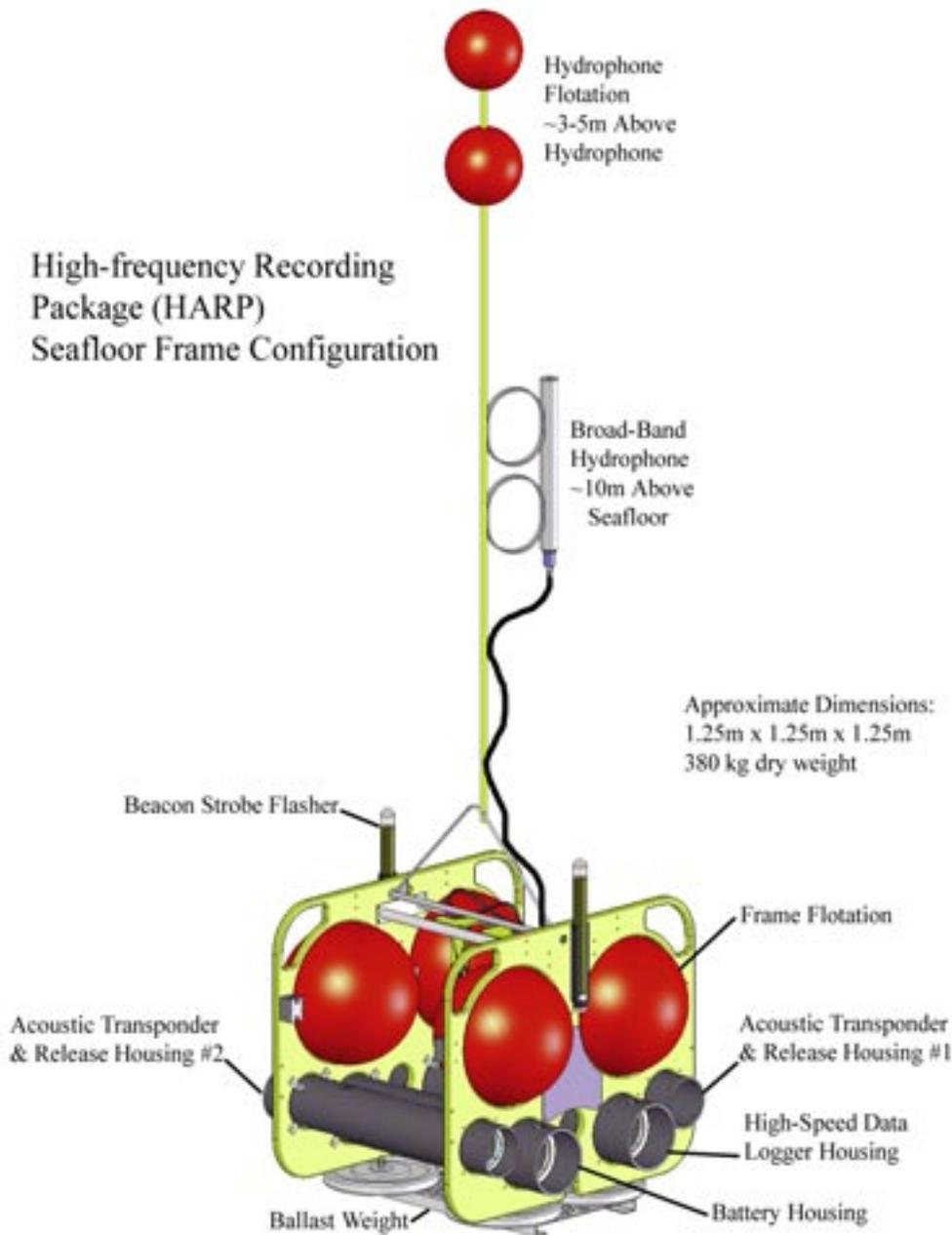
5. Capability Development for Hearing Measurements (need no. N-0029-13)
6. Assessing and Mitigating the Effects of Construction Noise on Living Marine Resources (need no. N-0001-13)

The six selected needs were incorporated into a Broad Agency Announcement that was released on March 7, 2013. The LMR website (www.lmr.navy.mil) received 105



Using high resolution anatomical imagery of specimen materials from stranded whales and computerized Finite Element Modeling of ear mechanics, Dr. Darlene Ketten of Woods Hole Oceanographic Institution and her colleague Dr. David Mountain of Boston University are able to predict the likely hearing abilities of large whales that currently cannot be tested directly.

The 2014 IPR will be held January 14–16, 2014 at the Naval Facilities Engineering and Expeditionary Warfare Center in Port Hueneme, California.



John Hildebrand and his colleagues at the Scripps Institution of Oceanography have developed the HARP for required Navy range acoustic monitoring. Under LMR support a new longer-lived, higher storage capacity HARP will be developed and demonstrated. New designs must stand up to challenging deep-sea conditions and not generate system noise that can interfere with recordings of animal sounds.

pre-proposals, of which 30 were selected for development into full proposals after extensive review by a team of independent expert reviewers (the program's Technical Review Committee (TRC)) and the LMRAC. After further TRC and LMRAC review, the LMRAC selected 12 proposals for new starts in FY14, contingent on the availability of funds.

Next on the LMR program schedule will be the review of submitted needs for FY15 proposal solicitation and an annual In-Progress Review (IPR). Each year, the LMR program holds an IPR to assess the progress made by its Principal Investigators on their respective projects.

The IPR will also help to acquaint Navy stakeholders with advances in scientific capability supported by the LMR program, prepare the Principal Investigators and appropriate Navy commands for work product transition to Navy application, and acquaint the research community more directly with the Navy's needs.

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NO.	PROPOSAL NO.	TITLE	PRINCIPAL INVESTIGATOR & ORGANIZATION	OBJECTIVE
1.	3	Integrated Real-Time Autonomous Passive Acoustic Monitoring System for US Navy Operational Use	<i>Abbott</i> OASIS, Inc.	The objective of this project is to demonstrate the potential for a powered autonomous underwater vehicle to provide reduced-cost acoustic monitoring and survey capabilities for Navy at-sea activities, improving coverage and reducing cost of at-sea data collection.
2.	11	The Effects of Noise on Marine Mammals—A Book	<i>Erbe</i> Curtin University	The objective of this project is to provide an updated review of scientific information relevant to the effects of underwater sound.
3.	13	Simple Performance-Characterized Automatic Detection of Marine Mammal Sounds	<i>Mellinger</i> Oregon State University	The objective of this project is to develop user interfaces and training courses to facilitate usage of the Ishmael signal processing toolkit by Navy staff and contractors, reducing the need for expensive external expert staffing.
4.	14	Demonstration of Commercially Available High-Performance PAM Glider and Profiler Float	<i>Matsumoto</i> Oregon State University	The objective of this project is to compare two new alternative PAM technologies, gliders and drifting floating systems to assess cost and performance relative to existing Navy PAM systems (moored, towed, other).
5.	19	Development of Automated Whistle and Click Detectors and Classifiers for Odontocete Species in the Pacific and Atlantic Oceans	<i>Oswald</i> BioWaves, Inc.	The objective of this project is to follow up a successful demonstration of an improved Real-time Odontocete Call Classification Algorithm (ROCCA) dolphin acoustic classifier with tailored regional applications at Navy sites of interest (including the Southern California Range Complex (SOCAL), Atlantic Fleet Training and Testing area, Pacific Missile Range Facility, and the Mariana Islands Range Complex).
6.	21	Database and Metrics for Testing Automated Signal Processing for Passive Acoustic Monitoring in Naval Training Ranges	<i>Hildebrand</i> Scripps Institution of Oceanography	The objective of this project is to develop and maintain a test data set for assessing new PAM signal processing systems to generate cost and performance metrics for new signal processing tools under consideration by LMR and the Navy.

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7.	22	Improving the Navy's Automated Methods for Passive Underwater Acoustic Monitoring of Marine Mammals	<i>Helble</i> Scripps Institution of Oceanography	The objective of this project is to develop a suite of automated signal conditioning tools that can be used to normalize data sets from different ambient acoustic regimes prior to submitting the normalized data to standardized automated signal processing systems in a process similar to that applied in tactical acoustic system signal processing.
8.	27	Atomic Force Microscopy to Finite Element Modeling (FEM): Comprehensive Models of Hearing in Critical Species for Mitigating Sound Impacts	<i>Ketten</i> Woods Hole Oceanographic Institution	The objective of this project is to use anatomical data and sophisticated computer models of auditory function to derive hearing data for species that otherwise cannot be tested directly, such as large whales.
9.	28	Analysis and Modeling for SOCAL Behavioral Response Study (BRS)	<i>Joseph</i> Naval Postgraduate School	The objective of this project is to provide key services to the multi-partner SOCAL BRS (2010-2015). Services include sound field modeling for the SOCAL study area and post-doctoral data analyses for species.
10.	29	Proposed Acoustical Society of America Standards on Towed Passive Acoustic Monitoring and Mitigation Systems	<i>Thode</i> Scripps Institute of Oceanography	The objective of this project is to provide community standards for hardware and software requirements for PAM systems, starting with towed PAM. Community standards are an important part of establishing acceptance of Navy data by the regulator and public.
11.	32	Electrophysiological Correlates of Subjective Loudness in Marine Mammals	<i>Finneran</i> Space and Naval Warfare Systems Command—Systems Center Pacific	The objective of this project is to calibrate a new means of establishing subjective loudness for regulatory hearing weighting functions, using evoked potential methods instead of trained animal behavior, thus reducing the cost of obtaining data and enabling data to be obtained rapidly from more species and more individuals of each species.
12.	33	Technology Demonstration for Fleet Passive Acoustic Monitoring	<i>Hildebrand</i> Scripps Institution of Oceanography	The objective of this project is to develop, demonstrate and evaluate improvements to the High-frequency Acoustic Recording Package (HARP) moored PAM systems widely used by Navy for monitoring compliance, and then compare the updated HARP system with other comparable PAM systems for cost and performance.

LMRAC Membership

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Sponsored by the Chief of Naval Operations Energy and Environmental Readiness Division (CNO N45), the LMR program achieves its mission by:

- Providing science-based information to support Navy environmental effects assessments for its at-sea activities.
- Improving knowledge of the ecology and population dynamics of marine species of concern.
- Developing the scientific basis for the criteria and thresholds to measure the biological effects of Navy generated sound.
- Improving understanding of underwater sound and sound field characterization unique to assessing the biological consequences of underwater sound (as opposed to tactical applications of underwater sound or propagation loss modeling for military communications or tactical applications).
- Developing technologies and methods to mitigate and monitor environmental consequences to living marine resources resulting from naval activities at sea. 

For More Insights

FOR MORE INSIGHTS into the LMR program, visit www.lmr.navy.mil.



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