



LMRnews

WINTER 2014

Welcome!

Welcome to the first issue of *LMR News*—
the new quarterly newsletter from the
Living Marine Resources (LMR) program.
Our goal is to provide you with the latest
information about program operations,
significant accomplishments, and future
focus areas for the LMR program.
We hope you will find the content useful
and that it provides insights into our
efforts to better understand and protect
living marine resources and support
U.S. Navy readiness training.

Minke whale, istockphoto.com

WHO WE ARE

The LMR program is one of the Navy's applied research (6.4) programs, sponsored by the Chief of Naval Operations Energy and Environmental Readiness Division (CNO N45) and managed by the Naval Facilities Command Engineering and Expeditionary Warfare Center (NAVFAC EXWC) in Port Hueneme, CA. The mission of the LMR program is to develop, demonstrate, and assess information and technology solutions to protect living marine resources while preserving core Navy readiness capabilities.

PROGRAM MANAGER'S VIEW

Fiscal Year (FY) 2013 has been a big year for the LMR program. We focused on getting the new program business plan “up and running” while keeping ongoing scientific studies moving toward transition to fleet applications.

Important first steps in establishing the new LMR business plan included establishing standard operating procedures, setting up a program office, convening our advisory and technical committees (LMRAC and TRC, respectively), and holding our first program review. We also set up the LMR website and used it to conduct the first formal and thorough solicitation of Navy needs (for more information see “N45's Living Marine Resources Program Launches First Solicitation for Needs” in the Summer 2012 issue of *Currents* magazine). We have now completed two rounds of need submissions and review (for FY13–14 and FY15), established a Broad Agency Announcement (BAA) vehicle to solicit proposals to meet those needs, and reviewed proposals leading to new projects in FY13 and 14. The web-based submittal and review process enabled us to field more than 100 pre-proposals from both Navy and external applicants, conduct proposal reviews by both the LMRAC and independent outside experts, and, finally, select proposals for funding; all in one seamless and fully documented web-based process. The support and guidance from our sister research organization—the Navy Environmental Sustainability Development to Integration (NESDI) program—were invaluable in completing these program steps. NESDI's support and example helped us to keep our research on track while we established a new administrative structure.



Bob Gisiner

The program's approach is focused on three primary objectives that enable us to accomplish our mission:

1. Collect, Validate & Rank R&D Needs

The goal of this objective is to expand awareness of applied research program opportunities within the Navy marine resource community and to encourage and facilitate the submittal of well-defined and appropriate needs statements.

2. Address High Priority Needs

Our goal under this objective is to ensure that program investments and the resulting projects maintain a direct and consistent link to the defined Navy user needs.

3. Transition Solutions & Validate Benefits

Our goal under this objective is to maximize the number of program-derived solutions that are successfully transitioned to the Fleet and System Commands (SYSCOM) for reduced environmental risk from Navy activities, reduced cost to Navy for environmental compliance, and reduced impacts of environmental compliance on warfighter training realism and effectiveness.

Another key program activity is the annual In-Progress Review (IPR), during which the ongoing projects are assessed. The IPR also acquaints Navy stakeholders with advances in scientific capability supported by the LMR program, prepares the Principal Investigators and appropriate Navy commands for work product transition to Navy application, and acquaints the research community more directly with the Navy's needs.

This issue of *LMR News* focuses on our web-based process of evaluating needs, soliciting proposals and selecting new starts.



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.

COLLECT, VALIDATE & RANK R&D NEEDS

The LMR program has completed two needs solicitations. The first round established the process for the Fleets and SYSCOMs needs to be submitted for the FY14 evaluation cycle. As the program's first needs solicitation, it also served to provide information back to the Fleets and SYSCOM about the LMR program mission, access and procedures.

The solicitation yielded a total of 65 submittals from across the Navy. After a thorough review, six consolidated statements of need were forwarded to the program's resource sponsor, CNO N45, for concurrence and approval (see Table 1). Successful proposals (see Table 2) that address those priority needs are being initiated as FY13 and 14 funds allow.

All LMR program decisions and investments are based on environmental needs that meet the following conditions:

- Identifies an existing gap in knowledge, technology, and/or capability
- Is associated with an environmental constraint or regulatory driver
- Can be categorized under one of the program's investment areas.

Submitted needs receive a thorough review by the LMRAC, which includes representatives of all the major Navy fleet and SYSCOM activities affected by at-sea environmental issues. Each statement of need is assigned to an appropriate LMRAC member, typically within his or her claimant command (e.g. needs from Naval Facilities Engineering Command (NAVFAC) personnel would be assigned to the NAVFAC representative(s) on the LMRAC). The assigned LMRAC member is responsible for coordinating priorities among the needs submitted within the command, and is responsible for providing a liaison for questions and requests for clarification from the LMRAC to the need submitter. Once the LMRAC has down-selected to a number of priority needs appropriate to the anticipated available funds, the LMR Program Manager conveys the LMRAC's selections to the resource sponsor, CNO N45, for approval and concurrence.



Blainville's beaked whale.
Mark Deakos, NMFS permit #14451

PROGRAM INVESTMENT AREAS

The LMR program's Standard Operating Procedures lay out the following five key investment areas.

1. Data to Support Risk Threshold Criteria

Conduct applied research to establish risks to marine mammals, birds, fish, turtles and invertebrates from effects of naval training, exercise and R&D activities on Navy maritime ranges and operating areas, primarily risks from sound, vessel collisions and habitat degradation.

2. Improved Data Collection on Protected Species and Critical Habitat within Navy Ranges

Develop means to improve the quality, quantity and cost-effectiveness of protected species information and habitat monitoring capabilities on Navy at-sea ranges. Work should not include operational data collection that is part of required mitigation monitoring, but should offer proof-of-concept demonstrations of improved means for obtaining such data.

3. New Monitoring and Mitigation Technology Demonstrations

Demonstrate new technologies that offer to improve the effectiveness or endurance of monitoring and mitigation or reduce costs of required mitigation. Demonstrations should be undertaken with the cooperation and coordination of the Fleet or SYSCOM sponsor that would be accepting the technology if successfully demonstrated.

4. Database and Model Development

Address issues pertaining to data needs of Navy environmental documents and ongoing adaptive management evaluations of Navy activities on range marine life.

5. Education and Outreach, Emergent Opportunities

Provide information and capabilities developed under this or other programs both to potential users and experts in the field to facilitate application of new information and capabilities and to the concerned public and regulatory community to facilitate acceptance of new Navy science and technology applications. This investment area also covers emergent needs or opportunities that present a requirement for quick response on a topic of high Navy interest with a relatively quick and straightforward solution, but which is not covered by the preceding four Priority Areas of Investment.



The following table contains a brief description of the six priority needs that resulted from the LMR program's FY 2013–14 needs collection and evaluation process.

TABLE 1 PRIORITY NEEDS

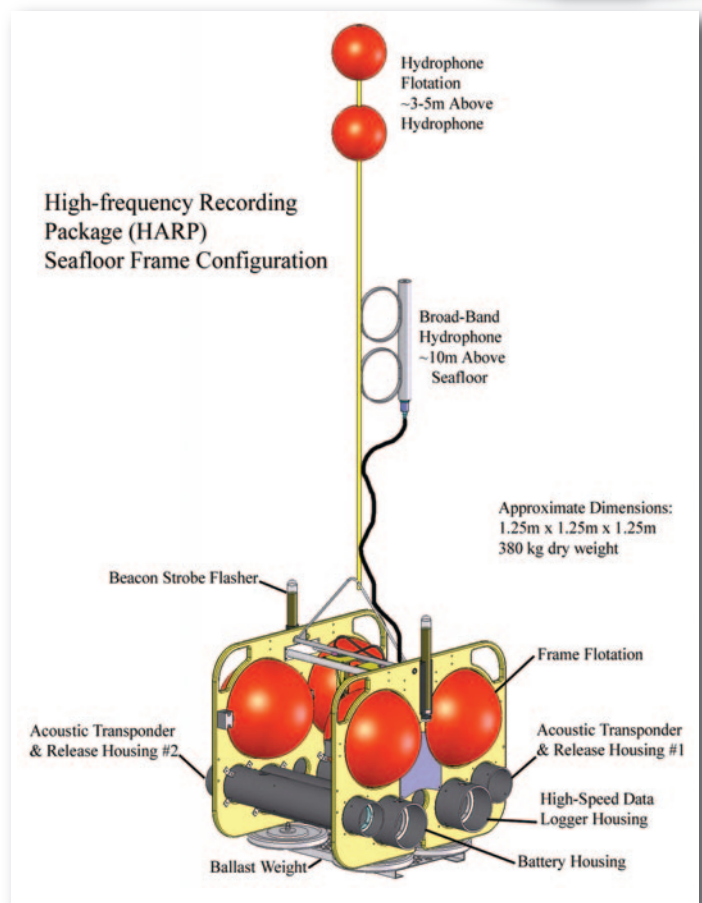
No.	Need ID	Name	Description
1.	N-0006-13	Demonstration of Passive Acoustic Monitoring (PAM) Technology	The Navy needs persistent automated monitoring of test and evaluation sites of interest, such as those covered by the National Environmental Policy Act Phase II process. PAM is a proven means of detecting, classifying, and localizing vocally active marine mammals, as well as a number of fish species.
2.	N-0011-13	Behavioral Responses of Marine Mammals to Navy Sound Sources	Potential behavioral effects from Navy activities on marine life, in particular marine mammals, make up the largest and most poorly defined category of environmental risk to marine life from Navy activities. Data are needed to strengthen the quantitative, statistical foundations of current risk thresholds developed jointly by Navy and the regulatory agencies, the National Marine Fisheries Service, Office of Protected Resources, and the U.S. Fish and Wildlife Service.
3.	N-0012-13	Hearing and Auditory System Information for Hearing-Based Risk Criteria	Three kinds of information generation have been or are currently in use. They are listed in approximate order of statistical and scientific impact, and cost (in both funds and time). <ol style="list-style-type: none"> 1. Behavioral psychophysical testing of trained captive animals. Methodologies and facilities requirements are well documented. 2. Auditory Evoked Potentials (AEP) obtained by direct measurement of electrical activity by the auditory nerve and auditory brainstem as obtained by surface or subcutaneous electrodes. 3. Anatomical models that rely on obtaining direct anatomical measurements of physiological structures and their properties by direct observation, CT (computed x-ray tomography), electron microscopy, atomic force microscopy and other methods, as appropriate.
4.	N-0020-13	Demonstration and Evaluation of Platform-Independent Improvements to Automated Signal Processing of PAM Data	A process is needed by which new and emerging signal processing systems are evaluated against common, shared benchmarks. In particular, there is a need to develop, test, and evaluate existing or new PAM signal processing systems designed for users with relatively little or no subject matter expertise.
5.	N-0029-13	Capability Development for Hearing Measurements	This statement of need focuses on technology and methodology developments to expand the sample size and range of species that can be tested, along with reducing cost and time to obtain data.
6.	N-0001-13	Assessing and Mitigating the Effects of Construction Noise on Living Marine Resources	Better methods to assess the potential effects of underwater sound in inland waterways and cost-effective methods to mitigate the impacts of underwater sound during in-water construction, maintenance, operation and training operations in inland waters are needed to support cost-effective planning and execution of projects.

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.

The LMR's second needs solicitation closed 30 September 2013 and the program is following the same review process to define priority needs for potential FY15 funding.

COLLECTING PROPOSALS TO ADDRESS PRIORITY NEEDS

After collecting, reviewing and defining the priority needs for FY14 funding, the LMR program issued its first Broad Agency Announcement (BAA) on 7 March 2013 to request pre-proposals to address the needs. Pre-proposals were submitted at the LMR website (www.lmr.navy.mil). Of the 105 pre-proposals submitted, 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.



105 pre-proposals

30 full proposals

12 selected for new starts

TABLE 2 SUCCESSFUL PROPOSALS FOR FY13 & FY14 FUNDING

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.	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	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	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	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.	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	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.
7.	22	Improving the Navy's Automated Methods for Passive Underwater Acoustic Monitoring of Marine Mammals	<i>Helble</i> Scripps Institution of Oceanography	Develop a suite of automated signal conditioning tools for normalizing data sets from different ambient acoustic regimes prior to submitting such data to standardized automated signal processing systems. This is similar to processes applied in tactical acoustic system signal processing.

SUCCESSFUL PROPOSALS FOR FY13 & FY14 FUNDING

No.	Proposal No.	Title	Principal Investigator & Organization	Objective
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	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	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 Institution of Oceanography	Provide community standards for hardware and software requirements for PAM systems, starting with towed PAM. Such standards contribute to acceptance of Navy data by the regulator and public.
11.	32	Electrophysiological Correlates of Subjective Loudness in Marine Mammals	<i>Finneran</i> Naval Space and Warfare Command—Systems Center Pacific	Calibrate a new means of establishing subjective loudness for regulatory hearing weighting functions, using evoked potential methods instead of trained animal behavior. This could reduce the cost of obtaining data and enable 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	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.

The BAA for FY15 funding will be issued soon, contingent on the anticipated availability of FY15 funds. Check the LMR website at www.lmr.navy.mil for more information.

www.lmr.navy.mil

IN-PROGRESS REVIEWS

To gain insights into the program's current research portfolio, the LMR Program Manager convened the program's first official IPR in Port Hueneme, California on 16–18 October 2012. Participants included researchers and the LMR management team—the LMRAC—at NAVFAC's Engineering and Expeditionary Warfare Command (EXWC) (formerly the Naval Facilities Engineering Service Center). Among the major projects reviewed during the course of this IPR were the following:

- Marine Mammal Monitoring on Ranges (M3R)
- Southern California Behavioral Response Study (SOCAL BRS)
- Survey Methods Development & Testing
- Anatomical & Modeling Studies of Cetacean Hearing

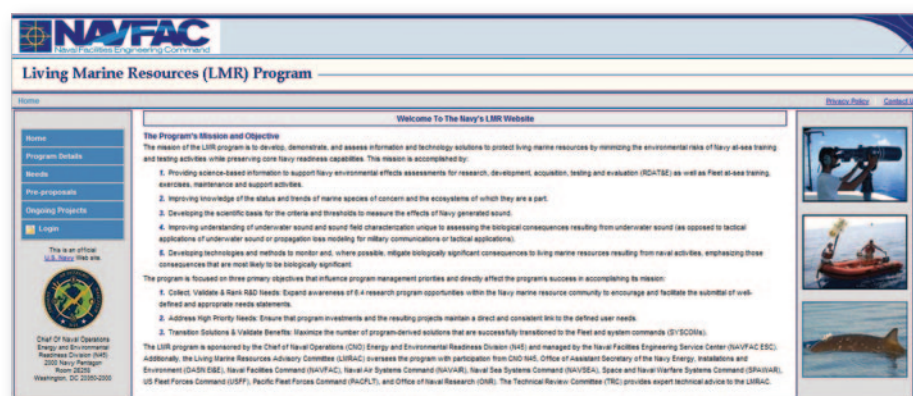
The next IPR will be held 14–16 January 2014 at EXWC in Port Hueneme, California.



Pilot whale.
istockphoto.com

USING OUR WEBSITE

Our website (www.lmr.navy.mil) provides information on submitting needs, pre-proposals and proposals. For questions on these or any other function of our website, contact our webmaster Eric Rasmussen at 732-323-7481 or eric.rasmussen@navy.mil.



Check out our website at www.lmr.navy.mil
for the latest version of our program schedule.

PROGRAM SCHEDULE

For the next several months, the program will concentrate its efforts on the collection and evaluation of pre- and full proposals to address the priority needs that were collected, screened, evaluated and ranked as part of the program's FY15 needs solicitation process. A tentative program schedule for the entire year is provided below. Schedule changes are not uncommon, so please check the LMR website (www.lmr.navy.mil) for the most current information.

No.	What	When
1.	Announce FY15 Needs Solicitation	1 August 2013
2.	Close FY15 Needs Solicitation	30 September 2013
3.	LMRAC Review of Needs	1–31 October 2013
4.	Post Need Evaluations to Web Site (LMRAC)	1 November 2013
5.	Rank Needs	7 November 2013
6.	Obtain Sponsor Review & Approval of Needs	7–15 November 2013
7.	Conduct In-Progress Review	14–16 January 2014
8.	Publish BAA to Request Pre-proposals	15 January 2014
9.	Pre-proposals Due	1 March 2014
10.	Assign TRC Representatives to Pre-proposals	March 2014
11.	Collect LMRAC Comments on Pre-proposals	April 2014
12.	Request Full Proposals	May 2014
13.	Full Proposals Due	July 2014
14.	Assign TRC Representatives to Full Proposals	Early August 2014
15.	Collect Comments on Full Proposals (LMRAC and TRC members)	August 2014
16.	Complete Final Evaluation of Full Proposals	15 September 2014
17.	Obtain Sponsor Review & Approval of Full Proposals	30 September 2014
18.	Announce New Starts	1 October 2014
19.	Quarterly Status Reports Due (all Fridays)	mid-January 2014 mid-April 2014 mid-July 2014 mid-October 2014
20.	Conduct N45 Programmatic Review	late September to early October 2014

HELP WITH OUR MAILING LIST

If you know anyone who might benefit from increased knowledge about the LMR program—what it's all about, the research that it is sponsoring, and how that research supports the ongoing operation of our testing and training ranges—please forward this document to them. We welcome your help in expanding the newsletter distribution list.

If you want to subscribe to or unsubscribe from *LMR News*, please send your email address to Lorraine Wass at 207-384-5249 or ljwass@surfbest.net.

CONTACT YOUR LMRAC MEMBER

For more information about the LMR program and its operations, contact the Program Manager, Bob Gisiner, or a member of the LMRAC at the phone numbers and email addresses listed below.

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IN THE NEXT ISSUE OF LMR NEWS

Our next issue will provide updates on the status of ongoing LMR projects and highlights from the January 2014 IPR.

Until then, look for the upcoming *Currents* article entitled “Sonobuoys Play Valuable Role in Marine Mammal Research and Monitoring: LMR Program Reviews Requests & Recommends Allocations to Support Ongoing Monitoring and Research Efforts.” The article discusses how a portion of the Navy sonobuoy allocation plays an important role in marine mammal research and conservation monitoring every year. It also summarizes why the LMRAC was the natural choice for identifying top priority requests and helping the Sonobuoy Liaison Working Group and its staff effect the transfer of sonobuoys to selected users, both within and outside Navy. Look for other articles about the LMR program’s accomplishments in upcoming issues of *Currents*, the Navy’s energy and environmental magazine. You can read *Currents* on-line and subscribe to the magazine at <http://greenfleet.dodlive.mil/currents-magazine>.



False killer whale.
istockphoto.com