LMR news

SPRING 2014

Welcome!

Welcome to the second issue of *LMR News*—the 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.

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

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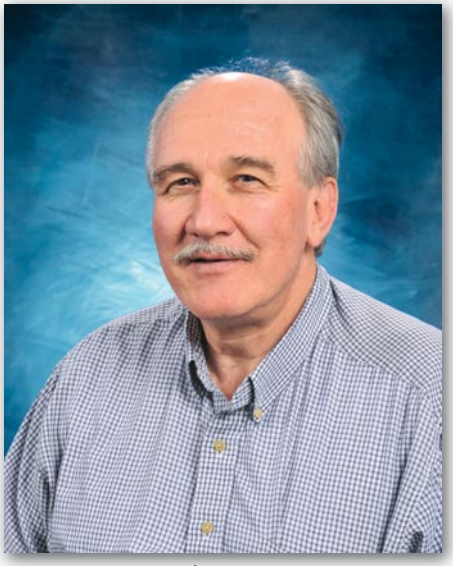
WHO WE ARE

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 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 OFFICE INSIGHTS

It has been another busy time in the LMR program, with personnel additions, the second programmatic In-Progress Review (IPR) in January, and getting our eight (!) new 2013–2014 contracts in place, placing about a third of program funds into new directions for LMR.



Bob Gisiner

The program is happy to announce the arrival of Anurag (Anu) Kumar as Deputy Program Manager. Anu brings significant technical and management skills to the position. His background is in bioacoustics, impacts assessments, marine species density estimation, and marine mammal biology. As the Marine Resource Branch Head at Naval Facilities Engineering Command Atlantic (NAVFAC LANT), he oversaw a talented group of scientists that supported the analysis and completion of the Atlantic Fleet Training and Testing Environmental Impact Statement and Marine Mammal Protection Act and Endangered Species Act permit applications. The team also developed the U.S. Fleet Forces marine species monitoring program. Prior to joining LMR program management, Anu represented NAVFAC LANT on the LMR Advisory Committee (LMRAC).

Anu Kumar

Joel Bell, NAVFAC LANT's new LMRAC representative, is LANT's Senior Marine Resource Biologist and manages the U.S. Fleet Forces marine species monitoring program. His responsibilities also include overseeing much of the program development coordination across both Fleets. He came to the Navy in 2001 after experience in field survey work with the National Marine Fisheries Service's Beaufort, North Carolina lab.

The program resource sponsor, the Chief of Naval Operations (OPNAV) Energy and Environmental Readiness Division (N45), has also seen staff changes. Frank Stone is now head of N45's Afloat/Ashore Environmental Compliance Branch. Danielle Buonantony has assumed Frank's previous staff responsibilities

as N45 liaison to the LMR program office. Danielle currently is the Marine Resources and Ocean Acoustics Specialist with N45. She has worked with the Navy for over five years, including a position as Marine Resources Specialist with NAVFAC LANT. Her expertise is in marine biology with a focus on marine mammal and sea turtle biology and behavior, complemented by an emphasis in acoustics.


Sperm whale.
istockphoto.com

Discussed in greater detail below, the program's second IPR, held in January, brought the LMRAC members together with the Principal Investigators (PIs) of our LMR-funded projects. This meeting saw increased focus on the role of the LMRAC and research project PIs during the process of transitioning the successful demonstration of new capabilities (such as the Marine Mammal Monitoring on Ranges project [M3R]). Transitioning research to products and tools that can be used by the Fleets and System Commands (SYSCOMs) is a critical part of the LMR program. The M3R project transition will help us to work out the transition process.

IN-PROGRESS REVIEW

The program's second IPR was held 14–16 January 2014 at EXWC in Port Hueneme, California. Several PIs on LMR-funded projects briefed the LMRAC on the plans, status, and results of projects. The sessions included productive discussions between the LMRAC and PIs on how their project results can best meet Navy needs.

The PIs presented briefs on several ongoing projects, six new-start projects, and three projects that are wrapping up. LMRAC member Mike Weise presented informational briefs on related work supported by his program at the Office of Naval Research on developing physiological measures of stress and the MOCHA statistical project. These projects are focused on tools and standard ways of presenting data on the behavioral response of marine mammals to Navy sound sources, including sonars.

TABLE 1 IPR PRESENTATIONS

Title	Status	Presenter
Transitioning M3R to the Fleet	Ongoing	*Dave Moretti* NUWC
Monitoring Whale Responses to Sonar Tests at the Atlantic Undersea Test and Evaluation Center	Ongoing	*Diane Claridge* Bahamas Marine Mammal Research Organisation
SCORE Tagging and Monitoring	Ongoing	*Erin Falcone* *Gregg Schorr* Cascadia Research
Odontocetes on the Pacific Missile Range Facility: Movements and Residency Patterns	Ongoing	*Robin Baird* Cascadia Research
ONR Research in Stress & Population Consequences of Disturbance	Informational	*Mike Weise* ONR
Demonstration of Commercially Available High-Performance PAM Glider and Profiler Float	New start	*Haru Matsumoto* Oregon State University
Technology Demonstration for Fleet PAM	New start	*John Hildebrand* Scripps Institution of Oceanography
Simple Performance-Characterized Automatic Detection of Marine Mammal Sounds	New start	*Dave Mellinger* Oregon State University
Development of Automated Whistle and Click Detectors and Classifiers for Odontocete Species in the Pacific and Atlantic Oceans	New start	*Julie Oswald* BioWaves, Inc.
Database and Metrics for Testing Automated Signal Processing for PAM in Naval Training Ranges	New start	*John Hildebrand* Scripps Institution of Oceanography
Improving the Navy's Automated Methods for Passive Underwater Acoustic Monitoring of Marine Mammals	New start	*Tyler Helble* Scripps Institution of Oceanography
Constructing Hearing Threshold Diagrams for Marine Mammals: Computational Methods	Close out	*Ted Cranford* San Diego State University *Peter Krysl* UC, San Diego
Measuring Low Frequency Hearing Shifts in Bottlenose Dolphins	Close out	*Paul Nachtigall* University of Hawaii
Assessing a Low Frequency Weighting Function For Marine Mammal Hearing; Electrophysical Correlates of Loudness Growth	Ongoing	*James Finneran* U.S. Navy Marine Mammal Program
Extending Our Capability to Determine Distribution and Abundance of Marine Mammals from Line Transect Data	Close out	*Len Thomas* University of St. Andrews
Behavioral Response Study: Status & Publication Plan	Ongoing	*Brandon Southall* Southall Environmental Associates *John Calambokidis* Cascadia Research
Behavioral Response Study: MOCHA (Multi-study OCean acoustics Human effects Analysis)	Informational	*Mike Weise* ONR

Of particular interest were discussions on projects nearing transition to Navy implementation for legally required environmental monitoring and risk mitigation applications. Applying the results of these projects to Navy use is a primary goal of LMR projects. The M3R project and other passive acoustic monitoring methods are providing tools to detect, classify and determine the location of many marine mammal species by their signature sounds. Additional signal processing and analysis tools are providing new ways to estimate the abundance of species. These acoustical tools provide insights into marine mammal behavior when visual observations are unavailable, as well as supporting survey teams for field studies. For example, M3R can detect beaked whales during their deep foraging dives, which cannot be visually observed.

Transitioning M3R to undersea ranges will provide several benefits, including larger continuous datasets that will provide a more complete record of animal abundance and behavior over time, seasons, and events. It also offers improved hardware/software systems and user interfaces that enable Navy range operating staff to take on the day-to-day environmental monitoring functions as part of their normal range operating duties.

North Pacific right whale.
Amy S. Kennedy, NMML Permit #782-1719

The timeline for full transition is not yet established, but is expected to begin this year (in 2014) and be completed by late 2015/early 2016. Continued LMR support for M3R refinements and added species detectors is expected to continue after transition of core monitoring capabilities to range operations.

Similar success has been achieved by the towed array passive acoustic monitoring (PAM) methods developed by Dr. Sofie van Parijs of the NOAA Northeast Fisheries Science Center (NEFSC). Towed PAM conducted with standard visual line transect surveys by expert NOAA staff demonstrated that the addition of PAM can double the detections of deep diving species like sperm whales and beaked whales, as well as improve the detection and statistical confidence in estimates of Risso's dolphins and other species. Based on the demonstrated added value of towed PAM to standard vessel-based surveys, OPNAV N45 has assumed responsibility in 2014 for continuing towed PAM as part of the Atlantic Marine Assessment Program for Protected Species (AMAPPS). AMAPPS is jointly sponsored by the Navy, NOAA, U.S. Fish & Wildlife Service and the Bureau of Ocean Energy Management and supports vital Navy data needs for the Atlantic Fleet Training and Testing (AFTT) environmental compliance program. The data provided by AMAPPS will be greatly improved by the addition of towed PAM methods as developed, demonstrated and evaluated under LMR funding.

SONOBUOYS ALLOCATED

We are pleased to note that we were able to fill requests for 480 sonobuoys in FY14. The normal annual allocation is 400 sonobuoys, but thanks to the enthusiastic and generous support of Teresa Yost with the Naval Supply Center and Kathy Edwards at the Naval Research Laboratory (NRL) we were provided with an additional 80 sonobuoys that enabled us to fill all requests. A special note of thanks also goes to the hard-working staff at Applied Logistics Services (Jeff Leonhard, Ed Rainey, Edward Brown, Todd Mequet and their colleagues) who have been unflagging in their support of the program and worked tirelessly to get the sonobuoys to the users as quickly and smoothly as possible.

Sonobuoys ready to be loaded for deployment. *Jeff Foster*

For more information regarding how sonobuoys are helping marine mammal research and monitoring, as well as the role that the LMR program plays in reviewing requests, watch for the article "Sonobuoys Play Valuable Role in Marine Mammal Research & Monitoring: LMR Program Now Manages Allocations to Support New & Ongoing Data Collection Efforts" in the spring 2014 issue of *Currents* magazine.

TABLE 2 2014 SONOBUOY ALLOCATIONS

Requesting Activity	Contact	Application/Navy Relevance	Quantity
NOAA Northwest Fisheries Center	Hansen, Brad	Monitor Southern Resident killer whales in Puget Sound	48
NOAA Southwest Fisheries Science Center	Rankin, Shannon	Acoustic monitoring on ORCAWALE cruise: data useful for Navy at-sea compliance needs	48
BioWaves, Inc.	Norris, Tom	Support Navy marine mammal surveys in Guam and Mariana Islands	48
Naval Undersea Warfare Center Newport	Moretti, David	Support Navy Behavioral Response Study (BRS) on the Southern California Offshore Range (SCORE), to provide data on marine mammal reactions to SQS-53C ASW sonar operations.	48
NOAA National Marine Mammal Lab	Berchok, Catherine	Arctic NOAA surveys	48
Scripps Institution of Oceanography	Hildebrand, John	California Cooperative Oceanic Fisheries Investigations (CalCOFI) survey cruises of the SOCAL ranges, to provide Navy with data on marine mammals on the ranges	192

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.

Spinner dolphins.
Morgan Richie

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.

COLLECTING PROPOSALS TO ADDRESS PRIORITY NEEDS

The LMR recently issued a Broad Agency Announcement (BAA) to seek pre-proposals in three topic areas related to underwater sound produced by human activities and its effect on marine life. Topics include hearing measurements in a broad range of marine mammal species, population density estimation from passive acoustic monitoring, and marine species monitoring data collection toolkit development.

The BAA (Solicitation Number N39430-14-R-1464) can be viewed at the LMR web site, www.lmr.navy.mil, or at www.neco.navy.mil or www.fbo.gov. Please note that all submissions must be made via the LMR web site. The solicitation period will close on 16 June 2014 (see web site or BAA for official dates and other guidance). Potential applicants are encouraged to visit the LMR web site to learn more about both the LMR program and the solicitation.

Bottlenose dolphins.
istockphoto.com

LMR PROGRAM PARTICIPANT UPDATES

Congratulations to Darlene Ketten for her Excellence in Science Communication Award from the Society for Marine Mammalogy. Dr. Ketten is a PI on an LMR project to better understand and model whale hearing.

Journal articles published during the first quarter of 2014 on which LMR PIs were authors include:

Au, W. W. L.; Giorli, G.; Chen, J.; Copeland, A.; Lammers, M.O.; Richlen, M.; Jarvis, S.M.; Morrissey, R.; Moretti, D. (2014) **Presence and seasonal variation of deep diving foraging odontocetes around Kauai, Hawaii using remote autonomous acoustic recorders.** The Journal of the Acoustical Society of America, 2014 Jan;135(1):521-30.

Jarvis, Susan M.; Morrissey, Ronald P.; Moretti, David J.; DiMarzio, Nancy A.; Shaffer, Jessica A.. (2014) **Marine Mammal Monitoring on Navy Ranges (M3R): A Toolset for Automated Detection, Localization, and Monitoring of Marine Mammals in Open Ocean Environments.** Marine Technology Society Journal, Volume 48, Number 1, January/February 2014, pp. 5-20(16).

Moretti, D.; Thomas, L.; Marques, T.; Harwood, J.; Dilley, A.; et al. (2014) **A Risk Function for Behavioral Disruption of Blainville's Beaked Whales (*Mesoplodon densirostris*) from Mid-Frequency Active Sonar.** PLoS ONE 9(1): e85064. doi:10.1371/journal.pone.0085064.

Schorr, G.S.; Falcone, E.A.; Moretti, D.J.; Andrews, R.D. (2014) **First Long-Term Behavioral Records from Cuvier's Beaked Whales (*Ziphius cavirostris*) Reveal Record-Breaking Dives.** PLoS ONE 9(3): e92633. doi:10.1371/journal.pone.0092633.

An article detailing the ongoing efforts by personnel—including LMRAC member Julie Rivers—from Commander, U.S. Pacific Fleet in the Navy's Hawaii Range Complex to research and monitor marine species is the cover story of *Currents* magazine winter 2014 issue. You can find the article online at http://greenfleet.dodlive.mil/currents-magazine.

USING OUR WEB SITE

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

www.lmr.navy.mil

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 web site (www.lmr.navy.mil) for the most current information.

TABLE 3 LMR SCHEDULE

No.	What	When
1.0	**Proposal Solicitation, Review & Contract Process**	27 April 2014 to 15 January 2015
1.1	Issue Broad Agency Announcement (BAA), Solicit Pre-proposals	27 April 2014
1.2	Pre-proposals Due	16 June 2014
1.3	Technical Review Committee (TRC) Members Review Pre-proposals	14 July 2014
1.4	Collect LMRAC Comments on Pre-proposals	11 August 2014
1.5	Request Full Proposals	25 August 2014
1.6	Full Proposals Due	6 October 2014
1.7	Collect Comments on Full Proposals (LMRAC & TRC members); Rank Full Proposals	10 November 2014
1.8	Obtain Sponsor Review & Approval of Full Proposals	24 November 2014
1.9	Announce New Starts; Award Contracts	1 December 2014
1.10	Complete Project Management Plans	15 December 2014
1.11	Complete Project Transition Plan	15 January 2015
2.0	**Sonobuoy Requests**	1 October 2014 to 15 January 2015
2.1	Solicit Sonobuoy Requests	1 October 2014
2.2	Approve Sonobuoy Requests	15 January 2015
3.0	**Needs Solicitation**	31 August 2014 to 15 October 2014
3.1	Close Needs Solicitation	31 August 2014
3.2	LMRAC Completes Needs Ranking	15 October 2014

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

CALL FOR LMR-RELATED PHOTOS

We know that many of you have wonderful high resolution photographs of marine mammals taken during your survey work, as well as photos of personnel who were involved and the equipment that you used. We'd like to include some of those images in a future issue of the LMR newsletter and give you credit—right there with your photo.

So please, go through those photos and send us a few that you're particularly proud of. Include a caption, photo credit and permit number (as applicable) and be sure that they are in high resolution format. And who knows, you may see one of those photos in a future issue of the LMR newsletter.

Humpback whale.
istockphoto.com

HELP WITH OUR MAILING 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 THE LMR PROGRAM

For more information about the LMR program and its operations, contact Program Personnel, Bob Gisiner or Anu Kumar, at the phone numbers and email addresses listed below.

Name	Organization	Phone	Email
Gisiner, Bob (Program Manager)	NAVFAC	805-982-4853	exwc_lmr_program@navy.mil
Kumar, Anu (Deputy Program Manager)	NAVFAC	805-982-5872	exwc_lmr_program@navy.mil

IN THE NEXT ISSUE OF LMR NEWS

Our next issue will provide updates on pre-proposals received and project status highlights as they are available.

Until then, 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.