

# Biological & Behavioral Response Studies of Marine Mammals in Southern California, 2012 ("SOCAL-12")

[www.SOCAL-BRS.org](http://www.SOCAL-BRS.org)



## SOCAL-12 OVERVIEW

SOCAL-12 is the third field season of a multi-year effort (2010-2015), more generally referred to as “SOCAL-BRS” (Southern California Behavioral Response Study), designed to better understand marine mammal behavior and reactions to sound. The overall objective is to provide a better scientific basis for estimating risk and minimizing effects of sonar for the U.S. Navy and regulatory agencies. SOCAL-12 includes collaborations among the National Oceanic and Atmospheric Administration (NOAA), private sector and academic scientists, and U.S. Navy researchers. It is jointly funded by the U. S. Navy, Chief of Naval Operations, Environmental Readiness Division (OPNAV N45) and the Office of Naval Research (ONR). SOCAL-BRS is part of an international collaboration to measure the impacts of noise on marine mammals.

Two successful field seasons of SOCAL-BRS have been completed (see Southall *et al.*, 2011; 2012<sup>1</sup>) using an adaptive approach that optimizes the probability of good weather and finding and tagging different focal species. Over 100 tags were deployed on individuals of eight different species and 46 complete experimental BRS sequences conducted. Analyses of the SOCAL-10 and SOCAL-11 data are ongoing, but some of the results have already been presented at scientific meetings<sup>2</sup>. Additionally, a paper focusing on the development of the smaller sound source and adaptation of previous CEE methods will be published later this year<sup>3</sup>.

SOCAL-12 will use similar configurations, protocols, focal species, equipment, and areas, with a few modifications. Notable among these is the development of an even lighter sound source on the second primary phase enabling a pilot effort (phase III) based off San Clemente Island using smaller vessel configurations. SOCAL-12 will also include preparation and transition for the use of realistic Navy sonar systems in experimental applications in 2013.

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<sup>1</sup> Project reports available at: [www.SOCAL-BRS.org](http://www.SOCAL-BRS.org)

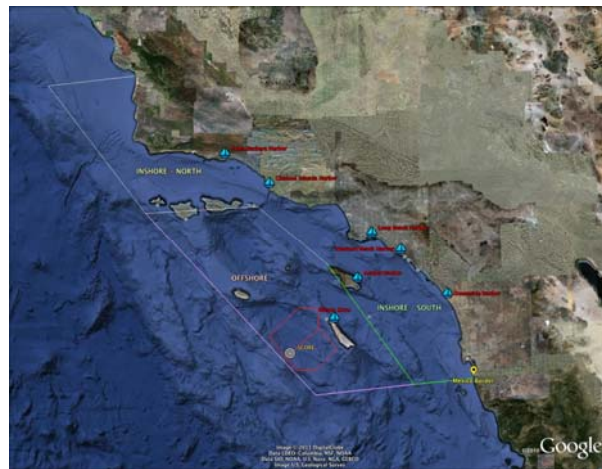
<sup>2</sup> Goldbogen, J.A., Calambokidis, J., DeRuiter, S.L., Douglas, A.B., Falcone, E., Friedlaender, A.S., Schorr, G., Southall, B.L., Tyack, P.L. 2011. Dynamics of blue and fin whale maneuverability: three-dimensional kinematic analyses for assessing the effects of sound on behavior. The 4<sup>th</sup> international science symposium on Biologging (Hobart, Tasmania, 14-18 March).; DeRuiter, S. L., Calambokidis, J., Douglass, A., Falcone, E., Friedlaender, A., Goldbogen, J., Hildebrand, J., Moretti, D., Pusser, T., Schorr, G., Southall, B., and Tyack, P. 2011. Effects of simulated military sonar on sound production by blue whales, fin whales, sperm whales, Risso's dolphin, and Cuvier's beaked whale. The 4<sup>th</sup> international science symposium on Biologging (Hobart, Tasmania, 14-18 March).

<sup>3</sup> Southall, B. L., D. Moretti, B. Abraham, J. Calambokidis, S. DeRuiter, P.L. Tyack. (in press). Marine Mammal Behavioral Response Studies in Southern California: Advances in Technology and Experimental Methods. Marine Technology Society Journal.

## SOCAL-12 OVERALL CONFIGURATION

**WHAT:** SOCAL-12 is a study of basic behavior and responses to controlled sound exposures in a variety of marine mammal species. It consists of a multi-disciplinary research team with specialists in marine mammal field methods, active and passive acoustics, and the use of controlled sound exposures in studying behavioral response.

**WHERE:** SOCAL-12 operational area includes both “inshore” areas along southern California from Morro Bay to San Diego and an offshore area that includes the U.S. Navy’s SCORE range near San Clemente Island. SOCAL-12 sound transmissions will occur more than 1nm from any land mass and more than 3nm from any land mass within the Channel Islands National Marine Sanctuary (CINMS)



**WHEN:** SOCAL-12 will occur in three phases during the second half of 2012:

**SOCAL-12 PHASE I: 26 July – 8 August (14 days)**

**SOCAL-12 PHASE II: 12 – 25 October (14 days)**

**SOCAL-12 PILOT PHASE III: First two weeks December**

**Specialized teams** perform different operational functions:

- The **source vessel** is the logistical hub of operations, has visual monitoring capabilities, and conducts CEEs, monitoring/mitigation, and tag retrieval;
- **Two tagging RHIBs** operate independently of source vessel. They locate and tag focal animals with suction cup acoustic and positional tags; conduct behavioral focal follows during CEEs; will assist in tag recovery.



- **Passive acoustic monitoring** guides field operations by listening to marine mammals. These include monitoring from the Navy's SCORE range, towed acoustics from a dedicated sailboat, dipping hydrophones, and remote-deployed sonobuoys in some areas;



- **Fisheries acoustics** will be used to measure prey field data (*e.g.*, krill) to better understand behavioral responses.

**Experimental protocols** involve the measurement of diving, vocal, and other behaviors before, during, and after CEEs with several sound stimuli under the following conditions:

- Tags must be successfully deployed for long enough to reduce attachment disturbance effects obtain sufficient baseline behavioral data
- No calves in focal/nearby group(s) may be neonates;
- No marine mammals come within 200m of source vessel during transmissions.
- No unusual and abnormal surface/subsurface behavior involving apparent disorientation or risk of ship strike or stranding; and
- No clear separation of dependent calves from mothers is observed.

## **SOCAL-12 STRANDING RESPONSE AND TRANSPARENCY**

- While these precautions are intended to reduce the risk of harm from studies intended to better understand and manage marine mammals, a **stranding response plan** in coordination with the Southwest Regional Stranding Network in place in the event of any stranding (not uncommon in California during this period).
- SOCAL-12 is committed to an **open and transparent process** regarding how and why these experiments are conducted, the results and their implications for better understanding and managing marine mammals. A daily blog describing research activities will be available from the field.



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