



# Laguna San Ignacio Ecosystem Science Program

A Project of the Ocean Foundation in Baja California Sur, Mexico

## Advances in Gray Whale Research to Begin in 2018

The Laguna San Ignacio Ecosystem Science Program and the Universidad Autónoma de Baja California Sur (LSIESP-UABCS) gray whale research team is preparing for what will be a very interesting and busy field season in 2018. This winter we will collaborate with several of our university research partners to apply new technologies and methods to research gray whales, and to begin a new chapter in gray whale investigations in Laguna San Ignacio. These



collaborative projects will expand research methods for detecting and evaluating changes in behavior, body condition, growth, and health that may be evidence of stress and disturbance for gray whales resulting from environmental conditions, human activities, or some combination of factors. This much needed information will help marine scientists and wildlife managers to understand gray whale behavior, and to conserve the whales and their winter habitat in Laguna San Ignacio.

### Understanding Gray Whale Sounds:

Dr. Aaron Thode and his graduate students from Scripps Institution of Oceanography have documented underwater sounds and gray whale vocalizations in Laguna San Ignacio since 2005. In 2018 Aaron and his graduate student Ludovic

Tenorio will continue to measure and document the ambient noise properties and levels of whale vocal activity in the lagoon, and they will initiate new research to compare gray whale vocalizations and behavior in “real time.” Working from a 5-m tall observation tower, provided by Kuyimá Eco-Turismo, they will document the surface behavior of gray whale groups and their interactions, particularly those of mothers and calves, while simultaneously recoding the whales’ calls underwater. The goal will be to correlate specific gray whale behavior with calls of the whales, and develop an understanding the whales use of various vocalizations to communicate. They will also explore the unique acoustic structure of gray whale “blows” to determine if the sound of an individual whale’s blow has unique acoustic features, and could contain signatures of the animal’s health and condition.

### **Estimating Gray Whale Condition, Growth, and Energetic Cost of Reproduction:**

Dr. Fredrik Christiansen and his students from Murdoch University, Murdoch, Western Australia will use drones equipped with digital video cameras to obtain high resolution photographs of gray whale females and their calves. These photos will be used to estimate calf growth rates and the decrease in girth of lactating females over the winter.

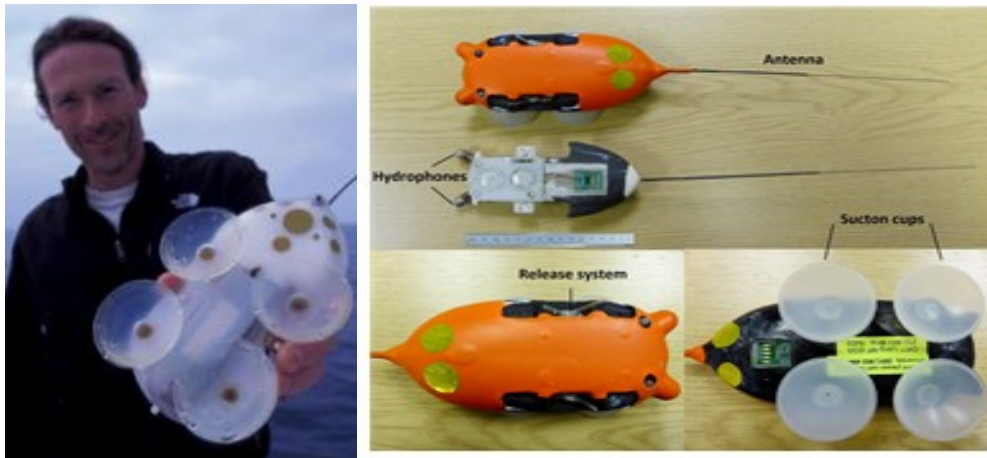


This high resolution photogrammetric data provides the baseline data to establish values of growth of gray whale calves and the loss of weight of lactating female gray whales during the winter reproductive season in Laguna San Ignacio. If gathered over time, this information could detect changes in “normal” trends that might be indications of stress, disturbance, and poor health of the whales.



### **Fine-Scale Movements and Bioenergetics of Gray Whales:**

Dr. Lars Bejder and his research associates from the University of Hawaii will work with LSIESP-UABCS researchers to attach with suction cups “digital acoustic recording tags” or “D-Tags” to gray whales to monitor fine-scale movement in three dimensions, vocal behaviour and calf suckling rates. This information will provide estimates of resting, traveling, and nursing times for gray whales, and contribute to our understanding of the bioenergetics of the whales, and their use of the Laguna San Ignacio habitat. With this baseline information it will be possible to detect changes in the suckling rates of gray whale calves, and to evaluate how calf suckling and growth might be affected by human activities.



### **Analysis of Hormones to Assess Reproductive Fitness and Stress in Gray Whales:**

Dr. Celine Godard-Coding and her students from Texas Tech University, Lubbock, Texas, with assistance from LSIESP researchers will collect samples of exhaled respirations from whale “blows” to obtain samples of organic steroid hormones from the whales. The goal is to assess whether the fitness information provided by the analysis of stress hormones and reproductive hormones correspond to predictions regarding pregnancy and health obtained from the photogrammetric “Drone” data and the “D-tag” data. This innovative research will provide an additional comparative method for evaluating gray whale health, reproductive condition, and for identifying biochemical indicators of stress (e.g., cortisol).



Augmenting our traditional boat based surveys for gray whale abundance, distribution and photo-identification with these new state-of-the-art methods for gathering information on gray whale body condition, reproductive health, and indicators of stress will over time provide a scientific basis for evaluating observed changes in the whales and their lagoon habitat, and support the conservation and the protection of the gray whales in their winter aggregation areas in Baja California Sur, Mexico.

We are very excited about beginning this winter's research with our collaborators in Laguna San Ignacio. While we have only limited internet service in the field, we will be posting research reports and research updates on our website beginning in the spring of 2018 following the winter field season.

Please remember that our non-profit academic research program is supported entirely by generous donations from our sponsors and supporting organizations. We are hopeful that this holiday season you will consider becoming a supporter of our gray whale research program in Laguna San Ignacio. You can make a safe and secure tax-deductible donation on our website: [www.sanignaciograywhales.org](http://www.sanignaciograywhales.org) through our fiscal sponsor The Ocean Foundation.

Or you may send your check directly to:

The Ocean Foundation – Laguna San Ignacio Ecosystem Science Program  
1320 19<sup>th</sup> Street, N.W., 5<sup>th</sup> Floor  
Washington, D.C. 20036

We wish everyone the most enjoyable holiday season, and thank you for your interest in gray whale conservation at Laguna San Ignacio, and conservation of all of our Oceans and the marine wildlife that call the sea their home.

Steven Swartz and Jorge Urban R.  
Co-Directors LSIESP

