



LAGUNA SAN IGNACIO ECOSYSTEM SCIENCE PROGRAM (LSIESP) 2010 FIELD REPORT

The 2010 winter research at Laguna San Ignacio began in mid-January and continued until early-April 2010. This year's projects and researchers contributed significantly to our goals and objectives for the Laguna San Ignacio Ecosystem Science Program (LSIESP). We want to express our thanks to our sponsors, the residents of Laguna San Ignacio, and the eco-tourism operators for their support of LSIESP researchers and students.

New Website Available in August 2010: Our major project this summer is to re-design and launch a new internet website for LSIESP. The new web-site will take advantage of all the current interactive features that are now available on the internet. The new "user friendly" format will allow us to better reach out and inform our fellow researchers and the public about the findings of the program and that status of the Laguna San Ignacio ecosystem. The website will have several interactive features including: subject search, e-mail, Facebook and Twitter. The new site will also host the LSIESP gray whale photo-identification database and provide researchers with the ability to compare photographs on-line. The new web-site up will arrive in August 2010 at www.lsiesp.org.

Research Activities

Gray Whale Monitoring and Assessment: The 2010 gray whale Team was led by Steven Swartz (CRA), Jorge Urbán (UABCS), and Alejandro Gómez Guallardo U. (UABCS), and included six researchers and graduate students from universities in Mexico and the United States: Sergio Martínez (UABCS), Hiram Nanduca (UNAM), Anaíd Lopez Urbán (UNAM), Jessica Isadora R. (UABCS), Tabata Olavarrieta (UABCS), and John Symons (Lewis & Clark University). The Acoustic Research Team included Aaron Thode and Melania Guerra (SCRIPPS Institution of Oceanography) with several UCSD undergraduate and graduate students contributing additional help with the acoustic research.



Gray whale abundance monitoring involved 15 weekly census counts of gray whales in the lagoon to monitor the number of whales in the lagoon each week and lagoon habitat use. Weekly census counts began on January 19th 2009 and continued until April 1, 2010, with the greatest number of adult whales counted on 27 February 2010 (256 adults and 17 mother-calf pairs). Overall, fewer mother-calf pairs were seen than in the previous three winters, suggesting that they may be utilizing other calving areas in Baja California. In contrast, counts of single whales were the highest seen in the previous three years, reaching a maximum count of 239 whales on 27 February. The low counts of mother-calf pairs may be related to the increase in single breeding animals that are known to harass and disturb females with calves.

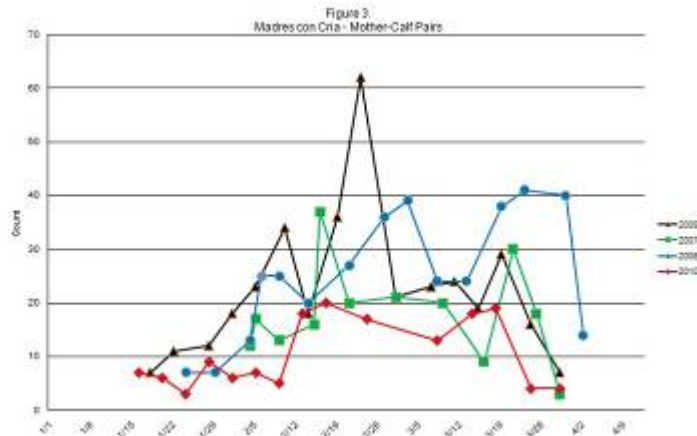
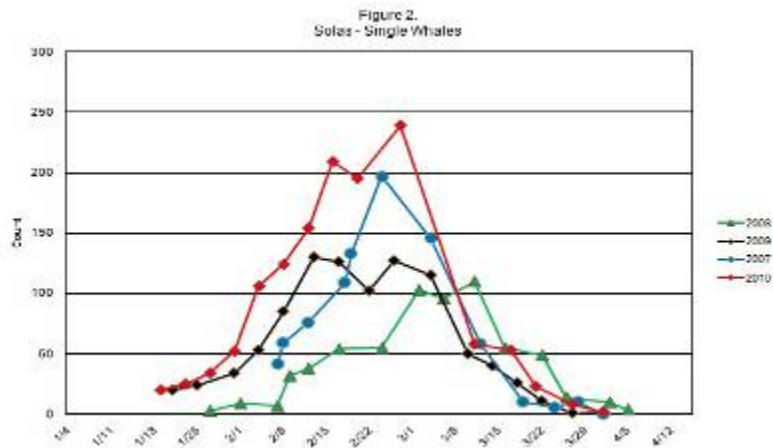
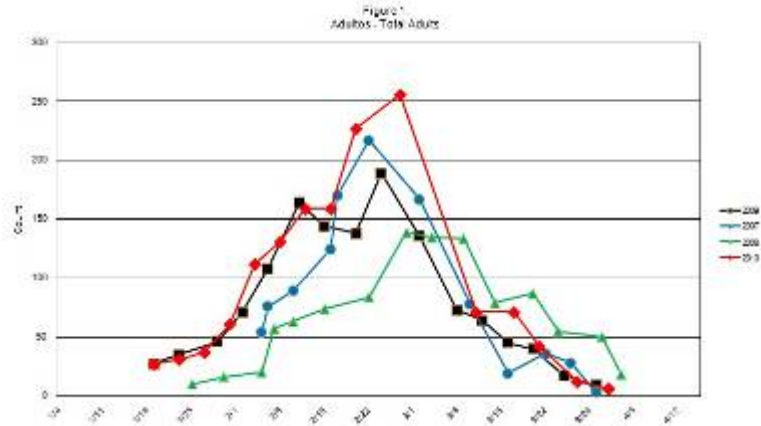
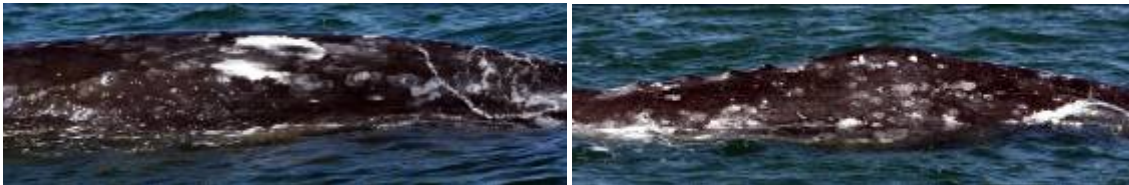


Photo-Identification and the Archiving and Management: The collection of photographic identification information (Photo-ID) of individual whales, especially females with calves will help to determine: if these female-calf pairs reside in Laguna San Ignacio all season, or if they are coming from other areas; will provide an indication of female breeding capacity for comparison with historical data; and will support the estimation of the % of “skinny whales” to evaluate possible climate change effects on the population. UABCS Master’s student Jessica Isadora is researching female whale calving intervals for her thesis research. There are now over 10,000 digital images of gray whales in the archive taken in Laguna San Ignacio from 2006-2010.



Separate catalogues for single whales and females and their calves will be posted on the new LSIESP internet web-site for access by researchers working in other portions of the whales’ range beginning in 2010-2011. These photo catalogues tell us which individual whales are returning to Laguna San Ignacio each winter. They also allow the calculation of calving interval for female whales and how many calves are born each winter, and the estimation of duration of stay within the lagoon each winter by determining the number of days between the first time a whale is photographed and the last day it was photographed.

The Acoustic Research included placing digital recording arrays at two stations: one within the lower lagoon whale-watching zone, and the second in a deep channel in the interior “closed” zone (no whale-watching) for comparison of these areas. Whale-watching panga drivers were provided with GPS units to accurately record their locations for analysis of outboard motor signal source strength and transmission underwater. Recordings also documented gray whale calls and naturally occurring biological and non-biological noise (e.g., tides, snapping shrimp, & fish). Acoustic recording tags were placed on individual whales using suction-cups to record underwater sounds heard by the whales (natural and man-made), the whale’s depth, and their movements and behavior underwater, which allowed documentation of sounds heard by the whales, and the whale’s movements and vocal behavior in response to underwater noise.



UNAM student Anaid Lopez U. is analyzing the gray whale sounds obtained from the “suction cup” recording tags for her Master’s thesis at UABCS to see if there are any differences between calls from single whales and those produced by mother and calf pairs. Her preliminary results suggest that: (1) the mother and singles have different call types, (2) mothers vocalize more while at the surface of the water and the single whales vocalize more while



diving near the bottom of the lagoon, and (3) some gray whale calls has a relationship with the strata, for example the “conga” call is more common at the surface, the “purr” and “quejido” calls are more common in the middle area of the lagoon, and the “ronroneo” call is very common in the recordings of whales on the lagoon bottom. The “ronroneo” call might be a new gray whale call recorded for the first time during this project.

Whale-Watching Analysis: UABCS researcher Ana Liria Del Monte M. continued her studies for her Master’s Degree focusing the trends of whale-watching activity in Laguna San Ignacio during the past decade in comparison with the number of gray whales that visited the lagoon each winter during the whale-watching operations. In 2010 Ms. Del Monte began working as a natural history educator for a whale-watching company in Cabo San Lucas, BCS while she continues with her Master’s studies at UABCS.



Ecological Function of Seagrasses in Laguna San Ignacio: Rafael Riosmena-Rodríguez, Ph.D. of the Programa de Investigación en Botánica Marina at UABCS and his students completed their second year of research to document and evaluate the distribution and ecological status of seagrass meadows (*Zostera marina* and *Gracilaria vermiculophylla*) that occur in the lagoon, and the invertebrates that live in and feed on the marine plants. They have documented a decline in the eel grass during the winter when the day’s are shorter, and an increase in the *Gracilaria* in the areas where eel grass used to be abundant. Their reports for 2009 and 2010 will be available on the LSIESP web-site and they will continue their research in 2011.



Laboratory Facilities Upgraded: Brian and John Symons (sons of Mike Symons) worked with LSIESP to obtain a sufficient number of new solar panels and a newer power controller to upgrade the solar-wind powered electrical system in the field laboratory so it can accommodate our growing number of researchers and students. While working as a member of the gray whale research team this year, John Symons installed the new equipment with help from everyone and by mid-winter the new solar panels were providing sufficient electricity to run the lab and all the research electronics. This upgrade will keep the project “off the grid” and eliminating the need to run an electrical generator during the winter.



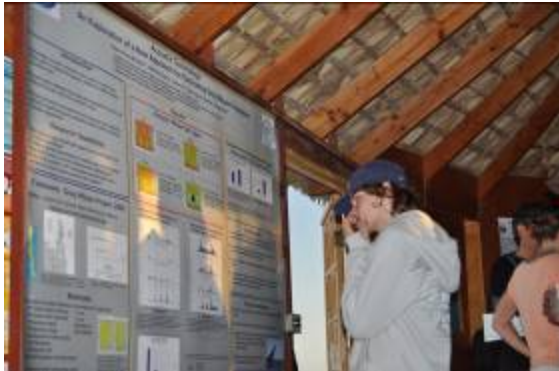
Community Outreach and Education

Local School Outreach and Classroom Presentations: In February LSIESP researchers and Jordan Bailey of the NGO Philanthropiece met with the school teachers at the Ejido Luis Echeverria School to plan classroom presentations about Laguna San Ignacio’s marine life and, the importance of conserving the lagoon habitat, and the natural history of gray whales. LSIESP researchers gave 8 presentations to primary, secondary, and middle-school students. The following week LSIESP researchers collaborated with the Eco-Tour Companies, the natural Resources Defense Council (NRDC), The Ocean Foundation (TOF), the International Community Foundation (ICF), and Philanthropiece to organize a whale-watching field trip for 105 of the students and their instructors, many of which had never seen a whale before.



10-year Anniversary Celebration of Sustainable Development at Laguna San Ignacio: On February 28 LSIESP researchers collaborated with the Association Rural de Interés Colectivo (ARIC), Philanthropiece, the International Community Foundation (ICF), The Ocean Foundation (TOF) and the Natural Resources Defense Council (NRDC) to host a symposium and community celebration of the 10-year anniversary of the March 2nd 2000 decision by the Mexican government to cancel the proposed development of a solar salt production facility at Laguna San Ignacio. The celebration showcased local economic and social achievements during the past decade, and provided a forum to share ideas and hopes for future sustainable development and conservation of the Laguna San Ignacio. Presentations included: Local Economic Development in Ejido Luis Echeverria; Eco-Tourism Development by ARIC; Laguna San Ignacio Conservation Plan by Pronatura; the Ecosystem Science and Research program

(LSIESP); and educational programs by Ecology Programs International (EPI). A panel of NGO, local business and civic representatives discussed topical local issues and concerns of the community. The symposium/celebration was attended by more than 100 guests that represented the local community, businesses, scientists, writers, conservationists, students, and interested visitors.



Ecology Program International (EPI) Pilot: LSIESP researchers worked with EPI's field directors to conduct a three day pilot study (March 27-29, 2010) for high school students to learn about research on gray whales at the lagoon, including photo-identification techniques used to identify individual gray whales. LSIESP researchers mentored 12 students in basic photo-identification methods and analysis. This pilot was very successful and LSIESP directors will work with EPI staff to develop additional programs for Mexican and US high school students in 2011.

Public Relations and Outreach: The LSIESP researchers participated in interviewed with television and media teams from Mexico, the United States (San Diego Channel 8 News), Australia, and the United Kingdom (BBC World News). LSIESP researchers also provided lectures on lagoon ecology and gray whales to several visiting Eco-Tourism groups that visited the lagoon. Following the winter field season, LSIESP researchers participated in academic and professional scientific meetings by making presentations and providing informational posters. Meetings included: the Mexican Marine Mammal Society (SOMEMMA in May 2010), The Scientific Committee of the International Whaling Commission (May 2010), and The Society for Marine Mammalogy (November 2009). To improve the LSIESP's outreach capability, we are updating our internet web-site (www.lsiecosystem.org) with new pages and many new interactive functions. The new website will serve as the primary source for LSIESP research reports, news and coming events. The new website will be available in August .

LSIESP Supported Students and Graduates: LSIESP researcher Ana Liria Del Monte M. (UABCS) began working in 2009 as a natural history educator for a whale-watching company in Cabo San Lucas, Baja California Sur while she continues with her Master's studies at UABCS. Anaid Lopez U. (UNAM) will defend her Master's Thesis on gray whale vocalizations and lagoon acoustics in September 2010. Jessica Isordia (UABCS) completed her first season as a member of the LSIESP gray whale research team and she began studying for her Master's degree at UABCS. Former LSIESP researchers and UABCS graduates Benjamin Troyo V. and Sergio Gonzalez C. continue their careers in marine conservation and education. Benjamin is working for Ecology Projects International (www.ecologyprojectinternational.org) in Costa Rica, and Sergio serves as a staff naturalist and environmental educator at Cabo Pulmo National Marine Park (www.cabopulmopark.com).

New Projects Initiated in 2010-2011

Avian Research and Monitoring Project: LSIESP enlisted three ornithologists to evaluate the status of marine bird breeding colonies on Isla Garza and Isla Pelacano in the lagoon. La Laguna Resident and naturalist Ranulfo Mayoral reported that as recently as the early 1990's thousands of marine birds, including Osprey fish eagles, Brown Pelicans, Cormorants, Reddish Egrets, Terns, and other species nested and reared young on the islands. These islands are unique in that most of the birds' nesting activities takes place on the ground, or in low

shrubs within a meter or less of the ground. For two weeks Bruce Reitherman and John Storrer, and Dr. Paul Spitzer surveyed the bird populations at Laguna San Ignacio. Reitherman and Storrer conducted baseline research on the islands' bird populations in the 1980s and this winter they noted a significant decline in nesting birds on the islands compared to their previous studies. During this year's survey they found evidence that coyotes have made their way onto the islands and appear to be disrupting nesting colonies and feeding on the birds and their eggs. Coyote tracks and fresh feces containing bird bones and feathers were common around the avian nesting sites, and one coyote was observed on Isla Garzas. LSIESP researchers will distribute a report on the status of the bird colonies on the islands and begin working with the local community, marine avian researchers and experts with experience on the conservation of island bird populations to develop a management plan that would control coyote predation and restore the avian nesting colonies.



Sea Lion Ecology in the Lagoon: California sea lions (*Zalophus californianus*) haul out in large number on the outer beaches of the lagoon's barrier islands in winter, and in summer they utilize the islands within the lagoon for haul-out areas. LSIESP provided local lagoon resident, naturalist, and researcher Ranulfo Mayoral with a digital camera system to begin photo-identification studies to document these sea lions during the summer, determine their numbers, and age/sex classes of individuals. Ranulfo is a graduate of the "RARE" naturalists training program and works as an eco-tour guide during the winter. Over time these photos will provide the information to determine when the sea lions are on the islands, how many sea lions are using the islands as haul-out habitat, and if any pups are born in the islands.

