



CITIZEN SCIENCE
for Conservation in Southern California
SYMPOSIUM

PRESENTATION
ABSTRACTS

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Lightning Round Presentations

10:00 a.m. — 11:30 a.m. in the *Ocean Theater*

Lightning Round Presentation Abstracts are on pages 1 - 5

Special Session Presentations

3:00 p.m. — 4:00 p.m. in the *Ocean Theater*

Special Session Presentation Abstracts are on page 6

Poster Presentations

4:00 p.m. — 6:00 p.m. at the Reception on the *Veranda*

Poster Abstracts are on pages 7 - 9

Overlap Between Blue Whale Location Patterns and Busy Shipping Lanes May Increase Risk of Ship Strikes off the Coast of Southern California

by Brayden Massie, Kailey Macpherson, Diana Pabón, Lindsey McVay, and Jacqueline Olvera;
Aquarium of the Pacific (AOP)

The Southern California coastline is home to two of the busiest ports in the United States, Long Beach and Los Angeles ports, causing high ship traffic. Coincidentally, these ports are the same feeding grounds of hundreds of baleen whales making them more susceptible to ship strikes. One of the most endangered is the blue whale (*Balaenoptera musculus*). We conducted a study to gain a better understanding of blue whale locations off of Long Beach coast and to determine the likelihood of ship strike. This study combines five years of data consisting of the total number of blue whale sightings and their locations, and data obtained from the Cascadia Research Marine Mammal Sighting Database. Results showed high concentrations of blue whale sightings overlapping the shipping lanes. Therefore, we propose moving the shipping lanes from areas of high frequency and expanding the precautionary area to take steps toward protecting these whales.

Project CRYSTAL: Citizen Science Goes to School

by Rossella Santagata, Hosun Kang, Sarah Kimball, Jennifer J. Long, Sara Ludovise,
and Chris Stillwell; *UC Irvine*

Environmental researchers from University of California Irvine's Center for Environmental Biology, education researchers from UCI's School of Education, and staff from Crystal Cove Alliance and Crystal Cove State Park collaborated to implement and study a citizen science project that engaged 27 4th/5th grade students in an ecology experiment designed to inform Park management decisions. During this project, environmental researchers, science educators, resource managers, and youth worked as partners to conduct solutions-oriented research in restoration ecology and to prepare the next generation of stewards of biological resources. We addressed the question of how to design an educational intervention that involved students in collaborative citizen science and promoted science learning outcomes, in this case systems thinking. Analysis of students' drawings and interviews revealed that despite learners' initially fragmented view of the ecological system, most made progress in their ability to understand the core features and interactions of a complex system.

Harmful Algal Bloom Watch (HABwatch): Long Beach

by David Merrill, Cassandra Davis, and Jennifer Lentz; *Aquarium of the Pacific*

HABwatch is a network of scientists and volunteers from science centers, aquaria, marine sanctuaries, and schools in Southern California that monitors local coastal ecosystems for harmful algal blooms (HABs) and educates the public about toxic events. HABwatch was formed in 2011 with support from USC Sea Grant, the Center for Ocean Science Education Excellence West, and the Southern California Coastal Ocean Observing System. The Aquarium of the Pacific has been participating in the HABwatch program since July 2015. Samples look for specific plankton and measure the frequency of occurrence in the sample. These observations provide a snapshot of the plankton found in Rainbow Harbor over the past 18 months and may provide insight into plankton growth patterns in the Southern California Bight.

Monitoring Coastal Cactus Wren in the Palos Verdes Nature Preserve

by Josh Weinik; *Palos Verdes Peninsula Land Conservancy*

The Land Conservancy established the Citizen Science Cactus Wren Monitoring Program to investigate habitat use by cactus wren within the Palos Verdes Nature Preserve. Recent modifications to a laborious and technical monitoring methodology have streamlined the survey process increasingly facilitating the inclusion of both casual and expert citizen scientists. Newly adopted methods also produced powerful data used to supplement triennial surveys of NCCP monitoring requirements, providing habitat managers with better understanding of wren habitat use. Collected data was analyzed on the basis of observation frequency to categorize the level of wren inhabitation adjacent to each survey trail route. Surveyed trails were assigned value reflecting level of observation including areas of high habitat use, nesting, and extirpation. This information will inform restoration and conservation efforts. Future study will adaptively document the frequency of cactus wren inhabitation within individual patches of cactus allowing for fine scale management of habitat patches.

Monitoring Wild Canids in the Palos Verdes Nature Preserve

by Josh Weinik; *Palos Verdes Peninsula Land Conservancy*

The Land Conservancy established the Wildlife Tracking Program in an effort to document wild canids (coyote, grey fox, and red fox) presence within the Palos Verdes Nature Preserve to better inform open space management and understand the population dynamics and movement of these species. Citizen science volunteers documented wild canid scat and tracks on over 16 kilometers of trail. This work has resulted in the creation of mapping documents that spatially describe track and scat observations. This work will inform land management about coyote and fox populations in the Palos Verdes Nature Preserve.

Citizen Science is Community Service

by Rosalind Helfand; *West Hollywood College Preparatory School*

As a teacher and nonprofits advisor, I've embraced citizen science as a means of community service for high school students, and a number of my students regularly participate in Natural History Museum of Los Angeles County wildlife hunts. Citizen science presents a unique opportunity for high schools and their students to engage in service. The data and observational contributions students make through citizen science are framed as a means to enhance their communities and inform decisions by policy makers as well as conservation efforts. More than community service, citizen science is service learning. Students learn about science while completing their service and gain skills that they can share with others when engaged in citizen science programs. Connecting with high schools through their community service programs is also a great way for citizen science programs to expand their outreach, impact, and longevity.

Linking Education, Conservation, & Resource Management through Citizen Science

by Kaitlin Magliano and Chris Halsch; *Crystal Cove Alliance*

Crystal Cove Alliance is the public benefit nonprofit of Crystal Cove State Park. Crystal Cove is unique in coastal Orange County because of its diverse natural resources, which include 3.4 miles of coastline, 2,600 acres of backcountry, and an 1,100-acre State Marine Conservation Area.

CCA's STEM programs leverage Crystal Cove as an outdoor classroom to immerse students and public park visitors in the science of conservation both on the water and in the backcountry. Learners become citizen scientists and take part in real research projects, designed and run in partnership with university researchers, and help Park managers answer questions about how to improve restoration and conservation efforts in Crystal Cove. CCA's school programs include a suite of pre- and post-trip curriculum that takes them through the scientific process, from conducting background research and forming hypotheses, to analyzing their data and presenting their findings.

Sand Crab Monitoring as a Way to Engage the Community

by Taylor Spesak and Keara Tuso; *Heal the Bay's Santa Monica Pier Aquarium*

At Heal the Bay's Santa Monica Pier Aquarium scientists, interns, and volunteers have been working to engage the community in hands-on science programs by collecting sand crabs (*Emerita analoga*) from the beach. The Santa Monica Pier Aquarium citizen science sand crab monitoring utilizes a modified methodology from the state-wide LiMPETS program, which engages youth along the California coast in real scientific research. Last year, we partnered with the Los Angeles Academy of Arts and Enterprise to help collect data. We use citizen science as an excellent way to engage youth in science and empower them to take action on scientific issues in their community. Our program has been running for roughly 18 months and we have had the opportunity to engage over 500 people with hands on scientific research in this time. Moving forward, we hope to continue inspiring the youth about the importance of scientific discovery!

Water Quality Monitoring of 303(d) Listed Streams in the San Bernardino National Forest

by Sherri Craig¹, Jennifer Byler¹, and Bill Wells²;
Fisheries Resource Volunteer Corps¹ and U.S. Forest Service²

The San Bernardino National Forest currently has twelve streams on the 303(d)-impaired waters list that are not meeting quality standards. Many of the listed streams have not been monitored or assessed in over 10 years. In addition, some of the streams were not sampled on public land managed by the San Bernardino National Forest.

This monitoring effort is providing an updated set of water quality data collected within the boundary of the San Bernardino National Forest utilizing trained volunteers.

We are in the early stages of this project, which is a two-year on going monitoring effort; our presentation will share the initial coordination of obtaining necessary equipment, training of volunteers and initial data results. It is our hope that many if not all of these streams and rivers can be delisted within the boundary of the National Forest.

Ocean Water Quality Monitoring in San Clemente

by Lisa Kerr and AP Environmental Science Students; *San Clemente High School*

We have been performing ocean water quality testing for the past 16 years. We test four beaches two times a week and upload the data to a website for community use. The testing is done by high school students and it utilizes the Quantitray method with Enterolert as the nutrient reagent to test for the presence of *Enterococcus* bacteria. We have 16 years of longitudinal data in regards to the water quality of our cities beaches.

Data Quality in Citizen Science: Applying Technology to Assess Volunteer Participation in Marine Wildlife Research

by Cassandra Davis¹, Barbara Ramon¹, Jennifer Lentz¹, and Dan Lawson²;
Aquarium of the Pacific¹ and National Marine Fisheries²

The San Gabriel River Sea Turtle Monitoring project applied technology to assess the accuracy of citizen scientist observations and population monitoring with the objective of providing ongoing assessment of real data reported by citizen science participants, identifying margins of error, and contributing to improved data and instructional protocol. Over a period of one year, accuracy and data quality were tracked by filming active monitoring stations. The evaluation of participants was randomized, and the use of video monitoring allowed for multiple passes analyzing the accuracy of live observation. The comparative data serves to validate the observational data and allows for further estimation of citizen scientist value in this ongoing study. This study revealed that video observation allows for independent, unbiased and in-depth analysis of volunteer findings in a manner that is both scalable and replicable, while adding a measure of data quality analysis that can benefit a variety of citizen science observation projects.

Development and Enhancement of the Michigan Invasive Aquatic Plant Citizen Monitoring Program

by Angela De Palma-Dow and Jo Latimore;
Michigan State University & MiCorps Cooperative Lakes Monitoring Program

The Exotic Aquatic Plant Watch (EAPW) is a specialized volunteer component of Michigan's Cooperative Lakes Monitoring Program. Although public interest in the EAPW is great, evidenced by high attendance at annual training sessions, volunteer enrollment and completion rates were initially quite low. To identify the barriers to enrollment and reporting we visited 41 lakes and volunteers during 2013-2016. Lake visits revealed that volunteers were uncertain how/where to sample, desired help in their efforts, and lacked confidence in correctly identifying plants. To address these findings, we improved protocol and teamwork training and also incorporated a new, lightweight and water-resistant Michigan-specific aquatic invasive plant field guide. After applying these strategies to the program, we saw a 23% increase in lake enrollment, 26% increase in data reporting and a 262% increase in aquatic invasive plant detections, when comparing 2016 results to 2013 data. These findings indicate that hands-on staff involvement and investment in training and resources are essential to increasing participation and reporting of aquatic invasive plants.

Developing a Citizen Science Program for the Multi-Agency Rocky Intertidal Network (MARINE)

by Andrea Maguire and Lisa Gilbane; *Bureau of Ocean Energy Management (BOEM)*

The Multi-Agency Rocky Intertidal Network (MARINE) is a unique partnership of agencies, universities and private groups committed to long-term monitoring of the rocky intertidal habitat. MARINE is working to develop a citizen science program to supplement its existing monitoring program and to fulfill outreach and educational goals. A pilot was launched at a permanent site in Santa Barbara, CA, where a trained site leader guides volunteers in utilizing simplified survey protocols. The next steps are to build upon this work to design and implement a sustainable citizen science program for MARINE. The goal is to develop a strategy that will add value for both MARINE and the volunteers. Areas that will be explored include: identifying key research questions and data needs; evaluating approaches that will yield accurate, useful, and trustworthy data; and developing solutions for known issues such as data quality and integration, resource constraints, and volunteer training and retention.

Citizen Science in the Classroom

by Moly Porter; *Natural History Museum of Los Angeles County (NHMLA)*

Teachers often ask for access to the real thing - at the Natural History Museum and the La Brea Tar Pits, it's most often access to the scientists themselves or opportunities to work with us on active scientific research projects. It might be the most difficult request to make a consistent reality, but it also promises one of the greatest rewards. For the past 4 years, we have been training teachers to use their school campuses as field research sites to activate the NGSS science and engineering practices as well as contribute data to our Urban Nature Research Center. Join me to hear about the different ways we are inviting teachers to participate in our Citizen Science initiatives, from fossils to squirrels, and beyond.

Building an Engaged Community: Tips for Communicating Citizen Science Projects

by Holly Rindge and Linda Chilton; *USC Sea Grant*

Many citizen science projects are focused on big issues such as water quality, sea level rise, and the conservation of species. Successfully meeting project goals requires project visibility and long-term community participation. How do you balance a variety of communication goals to support a project? This talk will explore what motivates volunteers to participate and what makes their participation worthwhile. Building on these motivations, the talk will share communication and marketing tips for increasing a project's visibility and sustaining positive engagement. If you know what motivates your audience, you can tailor communication and marketing efforts that speak to the common values and goals that you share. Lessons will be shared from the Urban Tides Community Science Initiative and other projects.

ACS/LA Gray Whale Census and Behavior Project Citizen Science: Recruiting and Retaining Volunteers

by Alisa Schulman-Janiger; *American Cetacean Society, Los Angeles Chapter*

The ACS/LA Gray Whale Census and Behavior Project, the only full season shore-based gray whale census, has been conducted by citizen scientists near Pt. Vicente, CA for the past 34 years. We collect baseline data for seasonal usage of the gray whale nearshore migratory corridor in the San Pedro Channel, document trends over time, record behaviors, and identify and record other marine mammals. We also interact with the visiting public at our site: the Point Vicente Interpretive Center. Our observation station is open 7 days/week, from 1 December through mid/late May, averaging ~12 hours/day. Teams of ~3-6 observers work in shifts of 3-6 hours/day, each with at least one veteran observer. Most observers volunteer for 1-3 shifts/week. The number of observers has varied between 55-110 annually; ~35-50% of effort hours are by a core group of 10-15 veteran observers who are volunteer more than 200 hours per season. Twenty-eight of this season's 95 observers have been with our project for over 10 seasons. In my presentation, I will discuss how we have recruited our volunteers: how they found out about our project, and why they joined us. I will also discuss how we retain them: why our observers say that they continue to stay involved in this project.

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Citizen Scientists Track Reef Health in California

by Katie Kozma and Jan Freiwald; *Reef Check Foundation*

Reef Check is an international organization with the mission of empowering people around the globe to save our reefs. The focus of the California program is to improve the health of California's rocky reef and kelp forest ecosystems. This is accomplished by training approximately 300 divers each year to carry out standardized scientific surveys of about 90 sites along the coast and then passing along the data and analyses to state resource managers. Reef Check's volunteer citizen scientists monitor inside and outside of California's network of marine protected areas (MPAs) using scientific protocols. This large scale-monitoring network can be used to identify regional population trends including the effects of local invasive species like *Sargassum horneri*. Based on the presence of this invasive, we've recently changed our monitoring protocols to be able to further quantify how this algal species is changing the dynamics of the ecosystems along the California coast.

Organizing a Watershed-Wide Citizen Science Network

by Erika Presley and Erin Snyder; *Riverside-Corona Resource Conservation District*

The Riverside-Corona Resource Conservation District (RCRCD) through The Southwest Resource Management Association (SRMA) has initiated and is in the process of developing a network of citizen science partners within the Santa Ana River Watershed. The Santa Ana Watershed Citizen Science Network is a collaborative of conservation practitioners, scientists, educators and citizens working to coordinate existing citizen science efforts, create new opportunities, and encourage wider citizen science participation and stewardship among the communities that live, work, and play in the Santa Ana Watershed. The Santa Ana Watershed Citizen Science Network intends to facilitate a collaborative and cohesive network for watershed-wide citizen science participation, aimed at engaging communities, classrooms and individuals in the monitoring and protection of the Santa Ana River and its ecosystems. This talk will focus on why a watershed-wide approach to Citizen Science is beneficial and how it can be done.

Estimating Urban Carnivore Populations Using Noninvasive Techniques via Camera Traps

by Korinna Domingo; *Santa Monica College*

I currently attend Santa Monica College and I am an accepted undergrad at Humboldt State University, where I will be getting my bachelors in Wildlife Management and Conservation. I hope to go on and be a field biologist working with large carnivores.

I am currently conducting my own research estimating carnivore densities around the Stough Canyon Nature center using noninvasive techniques such as camera traps. This piece of land is nestled in the Verdugo Mountains of Burbank, California and offers critical habitat for urban wildlife such as coyotes, raccoons, bobcats, mountain lions, fox, mule deer, and much more. In addition to the camera trap research, I am gauging people's attitudes towards carnivores around the area via surveys.

The way I wish to present my data is to look at the relationships between the activities of carnivores vs. time of day, temperature, moon phase, and ambient light.

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Southern California Bottlenose Dolphin Catalog Project for Citizen Scientists

by Margaret Snelgrove and Kera Mathes; *Aquarium of the Pacific (AOP)*

My presentation will be on the Aquarium of the Pacific's Citizen Scientist Bottlenose Dolphin Catalog Project. I will introduce myself, my connection to AOP, and then discuss how the project started as an offshoot of the Marine Mammal Photo Identification Program. The goal of this project is to create the first digital catalog of coastal bottlenose dolphins in Southern California. Using photos taken on the Aquarium's daily whale watches, connected through Aquarium of the Pacific, we can train citizen scientists to identify dolphins that have been seen in previous years. With the help of NOAA's National Marine Fisheries Service, we have the ability to compare dolphins from our sightings to their physical catalog of bottlenose dolphins. The future for this project is very bright and we welcome anyone, of any background, to volunteer and become a citizen scientist for us.

Ghost Gear, the Damage Abandoned Fishing Gear Causes

by Kurt Lieber; *Ocean Defenders Alliance*

Ocean Defenders Alliance removes ghost gear. Learn about the ways that abandoned commercial fishing gear is harming our marine wildlife and ecosystems. The whales that visit our coastal waters face dangerous man-made obstacles that can maim, and sometimes kill them. ODA utilizes volunteer SCUBA divers to remove this marine debris, and has been doing it since 2000.

Personal Impact and Awareness:

A Case Study Examining the Effects of Citizen Science Involvement

by Lynn Massey, Heidi Ziegler, Cassandra Davis, Jennifer Lentz, and Peggy Morrison;
Aquarium of the Pacific (AOP)

In 2010, the year-round presence of ESA-threatened green sea turtles (*Chelonia mydas*) in the San Gabriel River, located in Long Beach, California, was established through documentation of observations made by professional biologists and local citizens. Since 2012, local Citizen Science volunteers have participated in monthly sessions to document sightings of endangered green sea turtles residing in the San Gabriel Watershed. These volunteers provide valuable baseline data on the endangered green sea turtles residing in the San Gabriel Watershed for fisheries managers and academia to use in ongoing research efforts. From individuals who "think globally and act locally" to families seeking a unique learning experience to professionals interested in the community data, the San Gabriel River Sea Turtle Monitoring program has attracted a diverse population of individuals who are intrinsically motivated to participate in monthly observation sessions and contribute to longitudinal data collection. Examining four different cross-sections of involvement – self-reported data, individual interviews, citizen science demographics, and expanded volunteer commitment – this case study provides additional insight into the volunteer motivation and the impact of citizen science participation on individuals, their personal networks, and the local communities.

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Ocean Sanctuaries: Marine Citizen Science in San Diego

by Bridget Altman; *Ocean Sanctuaries*

I will introduce and briefly discuss three marine citizen science projects in San Diego from Ocean Sanctuaries: The Sevengill Shark Identification Project, The Yukon Marine Life Survey, and The Sharks of California Project.

Catalina Marine Society Projects

by Karen Norris; *Catalina Marine Society*

The Catalina Marine Society is chartered to advance scientific knowledge of the local ocean. We design projects for which SCUBA divers and boaters can use their expertise to deploy sensors that automatically record important ocean data. Other volunteers organize and analyze the measurements. The Society has made considerable contributions to the understanding of the Southern California Bight using ocean temperature measurements gathered by citizen scientists coupled with data obtained from universities and government laboratories.

Snapshot Cal Coast: Mobilizing Community Members to Document Species Ranges Along the California Coast

by Alison Young and Rebecca Johnson; *California Academy of Sciences*

In early 2016, the citizen science team at the California Academy of Sciences (CAS) worked with the California Marine Protected Area (MPA) Collaborative Network to coordinate Snapshot Cal Coast, a series of community-led bioblitzes along California's coast. This initiative was the first Network-wide project and an unprecedented effort to link a series of bioblitz events across one region to scale collective impact and the ability to collect species range data. Together CAS and the MPA Collaborative Network trained, supported, and mobilized volunteers and staff in documenting intertidal biodiversity along our coast from June 1-12, 2016. Hundreds of people from Del Norte to San Diego made over 7,000 observations of more than 900 species. Snapshot Cal Coast participants also documented dozens of species that had not previously been recorded on iNaturalist from the California coast. This talk will go over results, interesting findings, and how to participate in Snapshot Cal Coast 2017.

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