

## Presentation Abstracts

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### **Citizen Science for Natural Resource Management – Does participation foster awareness and stewardship?**

**Sarah Chase and Dr. Arielle Levine**, San Diego State University, Geography Department

While citizen science is frequently touted for the ability to foster environmental awareness and stewardship ethic among participants while collecting valuable data, there is little evidence to support this claim. My research seeks to better understand how, and to what extent, natural resource monitoring through citizen science influences volunteers' behavior and attitudes towards the resource being monitored. While other studies have sought to document statistically significant attitude and behavioral changes using a pre-post participation questionnaire, often with little success, this study examines participants' personal perceptions of attitude and behavioral change. Survey data were collected from seven citizen science programs monitoring a range of natural resources. Using a qualitative approach to explore participants' perceptions of their own attitude and behavioral changes offers unique insights where existing quantitative instruments have been inconclusive. These findings contribute to an improved understanding of program outcomes and may inform the development citizen science programs.

### **Using Citizen Science to Identify Sevengill Sharks**

**Barbara Lloyd and Michael Bear**, Ocean Sanctuaries

Ocean Sanctuaries, a San Diego NPO founded to support and create marine citizen science projects is using the pattern recognition algorithm in 'Wildbook,' a web-based application for wildlife data management, to identify Sevengill sharks in both California and South Africa.

### **Mission Bay Pollution Survey**

**Laura Coleman**

Mission Bay is a man-made bay that attracts hundreds of recreational boaters every year. In addition to its recreational qualities, Mission Bay is a valuable habitat for juvenile fish, marine invertebrates, birds, and aquatic plants. Sadly, Mission Bay has a reputation for being "gross" due to anthropogenic sources: run off and poor waste disposal. I am proposing a Citizen Science project called the Mission Bay Pollution Survey to monitor the pollution in Mission Bay and changes in underwater biodiversity. My long-term goal is to organize monthly cleanups at several locations in Mission Bay in order to monitor the type of pollution, the amount of pollution, the bottom type where the pollution occurs, and the underwater biodiversity. In addition to monthly cleanups, citizen scientists will be able to report their encounters with pollution in an online database.

### **Los Cerritos Wetlands Bird Counts**

**Mary Parsell**, El Dorado Audubon, local chapter of The National Audubon Society

El Dorado Audubon citizen scientists have been leading monthly field trips on Los Cerritos Wetlands since 2009. Los Cerritos Wetlands is an Audubon California Important Bird Area (Orange Coast Wetlands). "At Audubon California, bird science is a participatory activity. People take to the outdoors to pursue their love of birds, and we take advantage of the cumulative value of these outings in a number of ways. We encourage people to take part in a variety of monitoring activities, bird surveys, even a local Christmas Bird Count -- and all of this feeds back into our usable knowledge base."\* On our monthly field trips to Los Cerritos Wetlands citizen scientists record the bird species observed and count the number of each species. This data is then entered into eBird. "A real-time, online checklist program, eBird has revolutionized the way that the birding community reports and accesses information about birds. Launched in 2002 by the Cornell Lab of Ornithology and National Audubon Society, eBird provides rich data sources for basic information on bird abundance and distribution." \*\*

\*Audubon California/\*\*eBird

### **Empowering and Supporting Naturalists in Biodiversity Documentation for Research, Conservation, and Community Building**

**Alison Young and Rebecca Johnson**, California Academy of Sciences

Technology informs and enhances our work. Buoys and weather stations provide real-time meteorological and physical data. Satellites help us map forests and algal blooms. What if technology could provide current species-level biodiversity information while building a community of stewards? Citizen Science at the California Academy of Sciences is fostering a small but growing network of people making high-quality biodiversity observations in California through the iNaturalist platform. These observations provide valuable biodiversity data, mapping populations of invasive species and helping to track events like sea star wasting disease. This talk will expand upon the research and management benefits of a mobilized public empowered to document biodiversity, as well as the advantages of connecting people to nature and each other. We will provide tips for engaging people in this type of work, from reaching out to the current network of observers to building new communities through events and other citizen science projects.

## **Happywhale: a citizen science web platform to improve the participatory experience and quality of whale photographic identification studies**

**Ted Cheeseman, John Calambokidis, Ken Southerland, and Kiirsten Flynn, Happywhale.com**

Citizens have long contributed to California marine mammal science through sharing images of photographically identifiable whales. But photo-ID work has remained manual and time intensive, with little public feedback. This has left excellent potential data unutilized, and misses public educational opportunities from storied whales. In 2015 a pilot effort – Happywhale.com – began in collaboration with Cascadia Research (manager of most west coast large whale photo-ID catalogs) in the Monterey Bay region focused on humpback whales to both improve image management and make feedback accessible to contributors. Citizen scientists report that learning about the individuals in their photographs is engaging and rewarding, motivating them to contribute more and better photos, while automation is improving the quality, quantity and efficiency of data accessible to science. We present results of our pilot effort, steps underway to make findings public, and the applicability of this effort to other areas and species.

## **Sand crab monitoring as a way to engage the community about ocean health**

**Taylor Spesak and Catherine Hoffman, Heal the Bay**

Studying populations of sand crabs can provide a picture of a functioning, healthy ecosystem. At Heal the Bay, we are looking at sand crabs and their relation to ocean water quality and overall ocean health. In September we began collecting data on sand crab populations near the Santa Monica Pier using a method modified from the statewide LiMPETS program. We take into account several variables including variation in tides, days since the last rain, and water quality. In three months we have started to see trends in our data, but with the limited repetitions it is difficult to make definitive conclusions. As we collect more data, we hope to see trends more clearly. Moving forward we are looking to increase community engagement with this monitoring program by promoting our program to public visitors at the Santa Monica Pier Aquarium and as linked-learning for high schools.

## **Long Beach Fish Study:**

**William Preston Bowling, Aquarium of the Pacific, Resource Conservation District of the Santa Monica Mountains, Friends of the Los Angeles River (FoLAR)**

In 2008 FoLAR completed their two-year study of fish in the Glendale Narrows that can be found here <http://folar.org/wp-content/uploads/studies/fish-study-2008.pdf> With over 2000 fish collected, a dozen were taken to Dr. Gossett at Cal State Long Beach for sampling and found the fish are low in Mercury and Polychlorinated Biphenyls (PCBs) in comparison to other river fish. This was a collaboration with Citizen Scientists and Contracted Biologists. Fast-forward into 2016 where results of the two-year study of the Long Beach river fish will be compiled in a similar document. This study was a partnership between FoLAR and the Aquarium of the Pacific & Dr. Gossett at Cal State Long Beach has again been hired for the toxicity portion of this study. This was also a collaboration with citizen scientists, volunteer anglers and contracted biologists – truly a group effort from experts to nature-lovers from collection to the final document.

## **Urban Tides Community Science Initiative**

**Holly Rindge and Linda Chilton, USC Sea Grant**

You can help document the impacts of rising sea levels in your community! Urban Tides is a yearlong community based science effort to photo-document tidal lines, coastal flooding and erosion along our coast. Images provide critical information to help calibrate scientific models used to identify locations vulnerable to damage from future sea level rise. These tools and information enable community leaders and local governments to set priorities as they plan strategies that will help the region adapt. Working with scientists, we have designated a series of beach and wetland locations where photographs are needed the most. Urban Tides uses an innovative mobile app to ensure data accuracy. Public participation is critical to ensure quantity and geographic coverage of data. We have learned lessons about developing the program, building community engagement, working with scientists, and data collection methods and storage. Learn more at <http://bit.ly/100arhl>

## **Catalina Conservancy Divers: Lessons Learned for Volunteer Based Monitoring**

**Dirk Burcham and Thomas W. Turney, WIES-Catalina Conservation Divers**

The Catalina Conservancy Divers (CCD) was formed in 1991 as a support group of the Catalina Island Conservancy, a non-profit organization dedicated to preserving Catalina Island. CCD was a volunteer run organization with minimal institutional involvement. At its peak CCD conducted four ongoing monitoring programs at Catalina Island: Sea Temperature Recording, Key Species Monitoring, Kelp Census at USC Wrigley Marine Science Center and Urchin Census at USC Wrigley Marine Science Center. CCD became a model for volunteer based marine monitoring. Today the group is affiliated with USC and is known as WIES-CCD, or the Wrigley Institute for Environmental Studies – Catalina Conservation Divers. The WIES-CCD research data spans from 1992 to the present. In this presentation we will draw from our experience and give practical advice on starting and running a Citizen Science monitoring program.

## **Reef Check California – How scuba divers become expert citizen scientists**

**Jan Freiwald and Colleen Wisniewski**, Reef Check California

Citizen science has become widespread and contributes to many scientific goals. Programs focus on public engagement in resource management, research and data collection. While many projects benefit from the involvement of large numbers of volunteers to cover vast geographic areas, other programs rely on highly trained volunteers to implement monitoring or research projects. For example, citizen science projects in challenging environments and projects that require species identification at a moment's glimpse require specialized skills. Similarly, to collect quantitative data in situations in which data collection is expensive and opportunities are rare, programs need skilled and reliable volunteers. To participate in these projects, volunteers often need preexisting skills and/or go through extensive training programs. This presentation will explore how Reef Check California citizen scientists become highly skilled experts and collect quantitative data on subtidal rocky reef and kelp forest communities.

## **Visualizing Sea Turtle Surfacing Data**

**Heidi Ziegler**, Los Cerritos Wetlands Sea Turtle Monitoring Project

Chelonia mydas or green sea turtle is listed as "endangered" on the International Union for Conservation of Nature (IUCN) Red List of Threatened Species. These turtles are not typically found in a fresh water river but have been observed in the San Gabriel River in Southern California. The supposition is that the turtles are drawn to the warm water outflows of the existing power plants. The power plants are slated for shutdown in the next 10 years indicating that time is short to gather data to better inform potential river habitat conservation policies. As part of the Los Cerritos Sea Turtle Monitoring project, volunteers meet monthly, at pre-designated locations along the San Gabriel River, for half an hour to observe surfacing sea turtles. The goal is to record parameters such as size, time, direction of travel, and location to ascertain how many turtles may be present in the River at any given time. We present the data set through various methods to aid in its visualization. The Los Cerritos Sea Turtle Monitoring project is in its third year.

## **From Baseline Data Collection to On-Going Resource Management- 12 Years of Engaging Community in Citizen Science Along the San Diego River**

**Shannon Quigley-Raymond**, San Diego River Park Foundation

The San Diego River Park Foundation, a non-profit organization, engages over 400 volunteers annually in citizen science. In 2004, the first citizen science program, RiverWatch was developed to collect baseline water quality data. This program has successfully progressed into a robust ambient water quality monitoring program with concrete evaluation metrics. Developed in 2008, RiverBlitz citizen scientists assess two key stressors of ecosystem health: trash and non-native plants along the San Diego River. These citizen science efforts have led to a key role for the organization in managing and advocating watershed health through reporting results, sharing data and taking action. This presentation will highlight pathways to successes in engaging the community, effective use of results in land management and data sharing. It will also touch on a new effort, expanding assessment and monitoring into the headwaters where there is a data void and terrain and logistics are challenges to engaging volunteers.

## **Community HABwatch Program**

**Holly Rindge and Linda Chilton**, USC Sea Grant

You can be an extra set of eyes on the ocean to detect harmful algal blooms! 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. Volunteers collect and analyze plankton samples from beaches, estuaries, wetlands and harbors. Participants are trained in scientific methods of collection, observation, and identification of harmful algae. This effort increases the number of eyes on the ocean for early detection and sets into place a method for rapid response should harmful algae be detected. Working with partners, the program has developed data collection protocols, volunteer trainings, and a user-friendly database. HABwatch significantly increases the amount of information on the locations and timing of harmful algal species. Learn more at <http://bit.ly/1PGIgd6>

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## **Poster Abstracts**

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### **A framework of citizen science: how the nature of the resource influences methods and outcomes**

**Sarah Chase Dr. Arielle Levine**, San Diego State University, Geography Department

Citizen science programs monitor a wide range of natural resources and employ diverse techniques to engage citizens in science and monitoring. Yet to date, there has been no comprehensive review of citizen science programs to understand how the nature of the resource being studied influences the methods, outcomes, or appropriateness of participant engagement in citizen science. This poster presents a framework to explore how critical characteristics of the resource

being monitored and the ultimate goals of the program (research, monitoring, and/or education), influence the methods and approaches for public engagement in citizen science. It may be instructive for those wishing to incorporate citizen science into research and monitoring programs, providing insight regarding appropriate approaches for citizen engagement, as well as the strengths and limitations of citizen science for monitoring a range of natural resources.

### **A Teaching Aid to Enable Better Turtle Observation Data Collection**

**Heidi Ziegler and Dennis Ertsman**, Los Cerritos Wetlands Sea Turtle Monitoring Project

Through monthly half-hour turtle observation along the San Gabriel River, volunteers are asked to record a set of parameters, e.g., time, size, direction of travel and location, for each surfacing turtle. Volunteers receive training and are paired with more senior volunteers to increase the accuracy and completeness of recorded data. Yet in reviewing just one month's worth of data, it is observed that 23% of the sightings recorded had some missing information. To remedy this, we propose a teaching aid that presents various observation scenarios along with example erroneous data collection sheets. A missing or an incorrectly recorded parameter in each example is highlighted. The goal is to deploy the teaching aid in 2016 and measure its effectiveness in decreasing missing data.

### **Aliso Creek Turtle Organization and Rescue**

**Michael Skibsted**, St. Mary's

For the past several months I've been working to create an organization that will locate and rehabilitate turtles that have been abandoned by their owners in the Aliso Creek area of Aliso Viejo. I will be presenting how this organization is going to be formed and what steps others and I will undergo to get this organization up and running. With help this organization should be operational by September 2016.

### **Creating Pathways for Exploring and Monitoring Freshwater and Aquatic Environments**

**Erick Burre**, SWRCB-Clean Water Team

The Clean Water Team is the State's citizen monitoring program. This poster highlights some tools used statewide by watershed groups and educators to create pathways for exploring and monitoring freshwater and aquatic environments. (1) Visual Habitat Assessment for Wadeable Freshwater Streams is based on an EPA methodology. We have created an enhanced spreadsheet and videos that supplement basic instruction. (2) Environmental Monitoring User Manual for The Creek Watch App (IOS). By leveraging this free simple to use app, people can collect data that helps answer larger environmental questions. (3) The California Digital Reference Collection of Freshwater Benthic Macroinvertebrate Families. This interactive pdf brings aquatic invertebrate knowledge from the lab and library to the creekside. (4) Totally Trashed or Not: Conducting Rapid Trash Assessments. Nobody likes a trash filled creek. Unfortunately clean-ups are only temporary solutions. By conducting rapid trash assessments you can learn more about trash accumulations and their harm.

### **Los Angeles Coastal California Naturalists**

**Holly Rindge and Linda Chilton**, USC Sea Grant

This naturalist training program brings together traditional and scientific knowledge about coastal regions in California. It is designed to provide interpreters in the field with a strong understanding of the natural history of coastal California and foster support for new and ongoing citizen science projects. Through presentations and field trips, participants learn to apply knowledge of Southern California ecosystems to understanding both local and global environmental issues. Naturalists are ready to take an active role in natural resource conservation, education, and restoration. Learn more: <http://bit.ly/1mBIKAA>

### **Whale CITE: A Citizen Science Program for Whale Sightings Along the U.S. West Coast**

**Dan Lawson, Monica DeAngelis, Sarah Chase, Melissa Kent, Michelle Ferraro, Jacob Marziaz, Jen Jelincic, Arielle Levine, and Ellen Hines**, NOAA NMFS West Coast Region

Along the U.S. west coast, there is great potential to enlist the public to help collect large whale sightings data; through programs or platforms that currently exist as well as encouragement of new citizen scientists. Whale CITE is a multi-institutional program under development aimed at designing a standardized program to collect large whale sighting data along the U.S. west coast and provide a central repository for this data in a format that can be widely beneficial. Whale CITE will explore the usefulness of citizen science data to augment existing research programs for large whales, helping to inform management actions or other activities. Development and implementation of Whale CITE to successfully yield both scientific and educational outcomes requires significant planning and effort necessitating a broad collaborative partnership between NOAA's National Marine Fisheries Service, California State University's COAST partner universities, and other academic or private institutions and organizations interested in large whales.