

STUDENT PROJECT REPORT TO THE UNIVERSITY OF HAWAII MARINE OPTION PROGRAM

Marine Outreach and Education Project: Ocean Day and Earth Fair 2014

DURATION

February 14th, 2014 – April 11th, 2014

PROJECT LEADER

Katrina Peterson
Marine Option Program
University of Hawaii at Hilo

ADVISOR

Lisa Parr; site coordinator
Marine Option Program
University of Hawaii at Hilo

Table of Contents

Abstract.....	2
Introduction.....	2
Objectives.....	3
Methods.....	4
<i>Site Location</i>	4
<i>Creating an activity</i>	5
<i>Designing an exhibit</i>	5
<i>Presenting at Earth Fair</i>	5
<i>Material list</i>	6
Results.....	7
Future Considerations.....	7
References.....	9
Appendix.....	10
<i>Ocean Day worksheet</i>	10
<i>Earth Fair worksheets</i>	11

Abstract

Ocean awareness and education are important at both global and local levels. Through developing interactive activities for kids and their families at community events, it is possible to spread environmental education to a variety of community members. The Ocean Day Mālama Kanaloa Festival and UH Hilo Earth Day Fair are both large events held in Hilo, Hawaii, that promote marine and environmental education and awareness. The goals of this project were to create an interactive activity with a worksheet, observation tanks, and touch pools for kids and their families at these events. The objectives were to control the number of people at the touch pools at a time, and also create a learning component to the activity. Materials were supplied by the UHH Marine Science department, UHH MOP, the PIPES office, and PACRC. Invertebrates were collected from Onekahakaha Beach Park and brought to the events. The activity was well liked by community members and event organizers at both events and did help to manage the number of people at the touch pools. Overall the project went smoothly but could be improved with more volunteers, animals, and preparation.

Introduction

The ocean is the largest natural resource on the planet, covering over 70% of Earth's surface area. It plays a vital role in regulating climate, supplying both living and non-living resources, and is a large source of social and economic goods and services worldwide. In 2011, the ocean economy, which includes six economic sectors that depend on the ocean and Great Lakes, contributed more than \$282 billion to the U.S. GDP and provided more than 2.8 million jobs for the United States alone (NOAA 2014). With Americans making over 910 million trips to coastal areas every year, it is crucial that we all know how to respect this resource and utilize it responsibly. Worldwide the ocean is facing several obstacles including the destruction of coastal habitats like mangroves, coral reefs, and marshlands. Specifically, coral reefs are especially vulnerable and approximate 30 percent of the world's reefs are already completely gone (*Conference on Ocean Literacy Report 2006*). Coral reefs are areas of importance because of the resources they supply such as food, storm protection, and economic benefits. Hawaii is a unique place that attracts millions of tourists annually, and is dependent on this economic industry to provide for the local economy (State of Hawaii 2010). Having an educated and ocean literate community is vital in order to make informed decisions about protecting and managing Hawaii's main resource: the ocean.

The waters surrounding the Hawaiian Islands are facing numerous threats including shoreline development, land-based sources of pollution, damage by tourists and divers, and over-fishing (DAR 2014). The overall wellbeing of many Hawaiian communities depends on the health of these ecosystems because of the huge economic role the ocean plays. To protect and manage the ocean and its resources, it is critical that those that live here and visit are educated about how to take care of it. Informal education through outreach events has the ability to play a large role in supplementing community education (Bell & Lewestein 2008). By taking advantage

of informal learning opportunities and creating engaging ways to teach community members about their local environment, it is possible to increase the level of ocean literacy and understanding (*Conference on Ocean Literacy Report 2006*). Hawaii's past, present, and future is centered on the ocean, and it is crucial that the next generation learns how to interact with the ocean sustainably.

The Ocean Day Mālama Kanaloa Festival (referred to as Ocean Day) is an event that began in 2007 and focuses on raising marine & coastal resources awareness throughout East Hawaii. It is held in Hilo, Hawaii, and has grown to be very popular within the community, attracting over 2000 people. The event showcases information on local marine and coastal research, cultural performances, and also how to get involved with 'āina and kai stewardships, among other things (2014 ODMKF). These presentations and exhibits are oriented towards getting kids interested in ocean sciences, and teaching them how to be more aware and conscientious of their local marine ecosystems. A variety of community and student groups contribute to this event annually, including the UHH Marine Option Program (MOP). The MOP program has historically arranged and facilitated marine touch tanks at this event, where kids and their parents alike could freely engage with marine invertebrates, with the supervision of student volunteers. The touch tanks are a main attraction to the event, and the exhibit attracts almost everyone who attends the event.

Ocean awareness and education is very important to preserve and protect the unique place that Hawaii is, and Ocean Day is the ideal opportunity to reach out to the community and share that message. There has never been a take home message or lesson delivered through the touch tanks, and being that it is one of the most popular activities at the event, there needs to be something added to it. It is very important that people know how to respect the animals in the ocean, treat them appropriately, and also be aware of the damage we can do to them or the hazards they present to us. To get this message across, at Ocean Day 2014 I created an exhibit where kids and their parents could learn about and observe animals while completing a drawing activity. After completing their drawing activity they received a pass which allowed them into the touch tank area where volunteers facilitated smaller groups of kids and explained how to interact with the animals without harming them. In this report I will discuss how this method went, and the challenges associated with it.

Objectives

- 1) Design an exhibit for Ocean Day with multiple tanks for observing animals (sea slugs, cone snails, collector urchins, banded urchins, upside-down jellyfish, and hermit crabs) with neat facts next to them, and two large touch tanks where people could interact with the animals.
- 2) Create a drawing activity which would prompt kids to make observations about the animals they saw in the observation tanks.
- 3) Present a smaller setup of the activity from Ocean Day at the UH Hilo Earth Day Fair.

Methods

This project was conducted at two sites: Hilo Bayfront Park, and UH Hilo. Ocean Day Mālama Kanaloa Festival took place at the Hilo Bayfront Park in Hilo, Hawaii (Figure 1). The activity was setup at the end of the row of booths in the corner of the events tent area. This area is ideal for an event of this scale because there is a lot of space to spread out and allow the tanks to be spread across several tables and many people to check it out at once. The second site was at the University of Hawaii at Hilo Campus Center Plaza for the Earth Day Fair 2014 (Figure 2). The booth was set back out of the way of other booths and again there was more space to spread out on tables to allow students to pass by. All supplies were either borrowed from the UH Hilo Marine Science department (MARE), UHH MOP, Pacific Aquaculture and Coastal Resources Center (PACRC), or from the PIPES office. No additional purchases were necessary to support any part of this project.

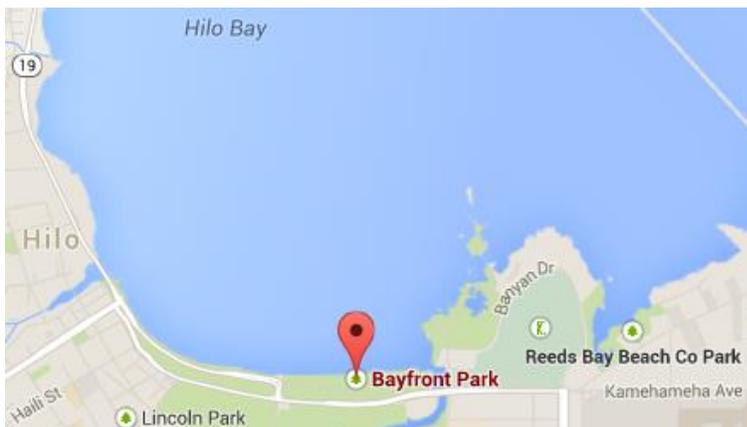


Figure 1. Hilo Bayfront Park located on Hilo Bay in Hilo, HI.



Figure 2. University of Hawaii at Hilo located in Hilo, HI.

Creating an Activity

To create this activity, I spent many hours finding examples of activities on aquarium education sites, and informal teaching guides. The activity needed to be simple enough that kids could do it on their own, not take too long, but also require a bit of creativity and thought. What I ended up making was a worksheet that asked the kids to draw 2-4 of the animals they saw, they could also name the animals or write down any facts they knew or had learned as well (Figure 4, 5, 6).

Designing an Exhibit

Materials for creating the exhibit activity were borrowed from MARE, MOP, PACRC, and the PIPES office.

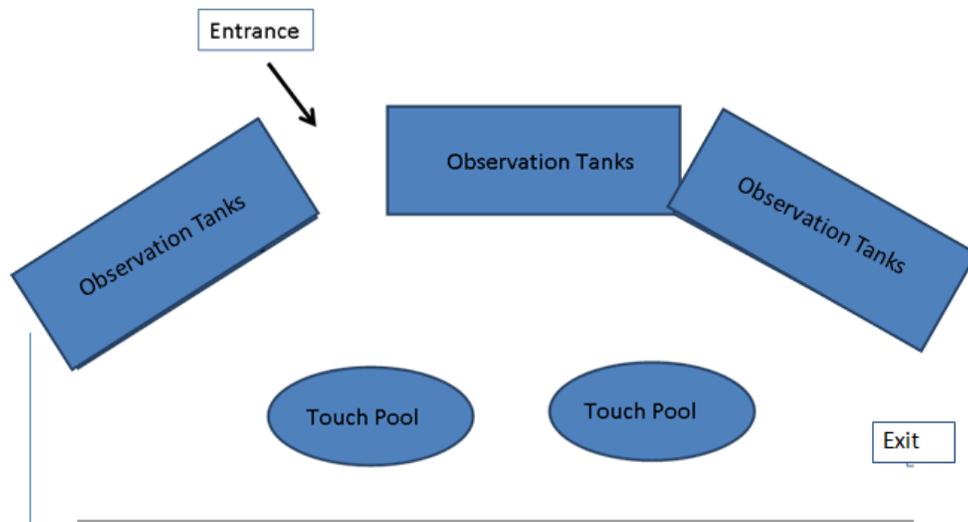


Figure 3. The table setup for Ocean Day.

The three tables for the observation tanks had a total of nine small tanks (containers) on them, and were setup in front of the two larger touch pools. Kids needed to finish their drawing activity prior to entering the touch tank area. Once they finished the worksheet they received a stamp to enter the touch pool area. This allowed for the volunteers to have a more manageable amount of kids at one time, and prohibited kids from running back and forth.

Presenting at Earth Day

The Earth Day Fair booth was scaled down considerably for multiple reasons; there were only limited number of volunteers (2 of us total), there were less resources available for use at the event, and the event was much smaller and scheduled for a shorter period of time. For Earth Day only 8 tanks were put out, and only 2 smaller pools were available for students to interact with. For this event I was anticipating groups of 20-30 students coming every 20-30 minutes and

therefore designed a scavenger hunt activity with facts about the animals as well as observable traits. I made two different versions, one with a simplified vocabulary for younger students, and the second for older secondary school students.

The second time doing the activity, I anticipated a more manageable experience. However, student groups did not come every 20-30 minutes as anticipated, which made controlling the students with the animals much more challenging especially since there were only two of us. I was told by several teachers and chaperones that the reading level on the handouts were far too advanced for many of the students so we quickly (even they older students) ran out of the easier work sheets within an hour.

Setup and Collection

All the animals were collected from Onekahakaha and Chocs Beach Parks in Keaukaha, Hawaii. Although we did not collect rocks or corals, we did get a copy of the DAR collection permit and had someone listed on the permit out collecting with us. It took approximately three hours to collect everything from the water, and this part was also the easiest to find volunteers for. The animals were transported in closed containers back to the MARE wet lab and kept overnight with aerators. The seawater used for the tanks at the event was collected in 5-gallon carboys from PACRC.

Setup began approximately two hours before the event started to ensure enough time to transport animals and drive up next to the booth location. It only took about an hour to tear down the booth and then take the animals back to the beach parks where they were taken from.

Materials

Supplies	# Used	# Recommended
Small plastic collection containers w/ lids	8	8-10
Two small pools to be used as touch pools (PACRC)	2	2
Eight plastic tubs to use as observation tanks	8	8
Carboys and 5-gal buckets to transport seawater	7	10, maybe more
Folding tables (6 ft) for observation pools	3	3, plus card table
Large buckets for resting tanks	2	2
Clipboards	15-20	As many available
Colored pencils and markers	A lot	As many available
Signs labeling all the animals in the observation tanks, and listing cool facts about them	10-15	One per species
Worksheets (half sheets)	300	300 was enough
Aerators for overnight aeration and at the event (with separators on tubing)	8	8
Interpretive signs labeling where to enter, exit, and not to touch animals displayed on the tables and in resting tanks	6	Labeling each

Results

The touch pool exhibit was far different than from previous years. Having the additional observation tanks that were just for people to look at were well liked by many people that stopped by to check out the exhibit. These viewing tanks were good because they allowed people to check out the animals without having to jump in the crowd at the touch tanks, and they displayed many animals that had never been at Ocean Day before. Having fact cards and the names of the animals was also well liked.

At Ocean Day the method used to control the volume of people at the touch tanks was only partially effective. Although the worksheet initially kept people waiting their turn, there was no way to control the number of people doing the worksheet at one time, and there was no system to move people out of the touch tanks. This resulted in the touch tank area still becoming crowded, especially since the space was limited and parents typically accompanied their kids. Frequently there were times when there were so many kids at each touch pool that the volunteers couldn't actually monitor what was happening with the animals. We attempted to enforce the rule that only the volunteers could hold the animals and the kids could just touch them, however it was not enforceable.

The challenge with the Ocean Day setup was that the walkway to get back to the touch pools needed to be small enough to monitor who came in, but it also was doubling as an exit point since on the left side were the resting tanks, on the back side where ply boards, and on the right there was a lot of cords on the ground. What eventually ended up happening were people trying to exit towards the right, which was hazardous because the cords were a tripping hazard, and the aerators and tanks were at risk of being knocked over should someone trip. We ended up taping down the cords and trying to put something over them to avoid this. It would be helpful if people could exit from behind the touch pools because it is mostly likely the area where no power cords will be and it would have a better flow.

At Earth Fair, the touch pools did not go as planned. Student groups were supposed to come to the tables every 20-30 minutes, however it ended up being groups passing by every 10-15 and then resulted in random kids coming over just to check it out. This was largely due to the location being in campus center, so there was no way to necessarily keep people out. The clue worksheets had too hard of a reading level for the majority of students, or there was just zero interest in students doing the activity.

Another objective that was mentioned in the proposal was creating a guidebook for future students within directions on how to recreate this project. I was not able to carry out this objective, due to lack of time.

Future Recommendation

In the future, it might be ideal to have the touch tanks only available for touching for only certain portions of the festival, like two hours in the morning and two hours in the afternoon. Although the touch pools are a main attraction, I don't think that there is a way to keep all of the

animals alive for 6+ hours of being handled. I would recommend having the observation pools and perhaps only having the touch pools open for maybe 3 or 4 hours max. If the touch pools were to be done the same way at Ocean Day again, I would recommend having at least 2 volunteers at each touch pool at one time to be able to monitor animals. An adequate number of volunteers are crucial for being able to run this attraction because of the number of people that you need to interact with throughout the day. Having between 7-9 volunteers at once would be ideal; to watch the touch pools, hand out worksheets, give out stamps, answer questions, add freshwater to tanks, remove and replace animals, sharpen pencils, etc. Also developing a system that only allowed a specific number of people at a time, for a set amount of time would be helpful to control the amount of people. If timing was to be enforced, it would be crucial that people are aware of that and it is conveyed appropriately.

If the activity was to be done at the UHH Earth Fair again, it would be ideal to be able to use a lab or classroom. This would make it only accessible to specific groups, and control the environment as well. Setup with the tanks and aerators would be simple because power could be supplied without using extension cords, which were a tripping hazard at the campus center location. Again, it would be important to have plenty of volunteers, possibly one volunteer for every 4 or 5 students attending. Being able to use classroom space would give students more room to write on their papers as well, since clipboards are usually in short supply.

One of the primary objectives of this project to create a meaningful learning activity because of the importance of ocean literacy. Although the exhibits at Ocean Day and Earth Fair did offer visitors more of a learning experience, this project didn't assess how much people actually learned from the activity. Promoting ocean conservation and awareness is crucial for the preservation of this resource, and it is important that this project continues to improve and offer visitors a meaningful and educational experience.

References

Bell P, Lewenstein B, National Research Council (2008) Learning Science in Informal Environments: People, Places, and Pursuits. National Academies Press, Washington DC.

Conference on Ocean Literacy Report (2006) National Marine Sanctuary Foundation, Silver Spring MD. December, 2006.

Coral Reefs (2014) Hawaii Division of Aquatic Resources. State of Hawaii

Hawaii Facts & Figures (2011) State of Hawaii Dept. of Business, Economic Development & Tourism. 4-10

How important is the ocean to our economy? (2014) National Ocean Service

NOAA Education Strategic Plan 2009-2029. Washington DC, USA

2014 Ocean Day Mālama Kanaloa Festival: Application for Facility Use- Special Requests, Department of Parks & Recreation.

Appendix

<p>You are a scientist exploring the Big Island! Your job is to observe four of the species that you see on the tables and draw, describe, and name the animals in the boxes below! When you are pau get a stamp to enter the <i>touch tank zone!</i></p>	<p>You are a scientist exploring the Big Island! Your job is to observe four of the species that you see on the tables and draw, describe, and name the animals in the boxes below! When you are pau get a stamp to enter the <i>touch tank zone!</i></p>
	
	

Figure 4. The worksheet was the one used at Ocean Day Festival, the kids and their parents went around to each observation tank and drew what they saw in the tanks.

Clue	Common name of Organism
This organism detaches one of its arms from its central disk to escape from predators.	
This organism ejects its internal organs when it is disturbed.	
This organism eats algae off of rocks and corals, and sometimes puts things on its body for camouflage or food storage.	
These animals carve their way into the rocks with their teeth and spines.	
This eats and stores chloroplasts in its body which can keep the organism alive for a couple months without it even eating! (hint: get a close look)	
I have a “foot” that I use to stick myself to rocks, and a type of tongue that acts like a harpoon to sting prey.	
This is a carnivorous animal that can deliver a powerful and painful sting with its bristles.	
This animal is hard and lumpy, but will turn limp or “melt” when it is handled too roughly or stressed.	

Version 1

Figure 5. This worksheet was the “advanced” version of the worksheet created for older students at the UH Hilo Earth Fair.

Clue	Common name of Organism
This animal has skinny arms with tube feet on them; it can detach its arms to escape from predators.	
This animal is long and smooth, and when it gets scared it spits out its insides!	
This animal grabs things off the floor with its feet and holds it on the outside of its body to hide	
These animals use their spines and teeth to dig holes for themselves in the rocks	
This animal has two antennas (just like bugs do) and is colored to blend in with the sand	
This animal hides inside of its shell, and uses its tongue to sting its prey	
This animal hides under rocks, and has bristles that sting when you touch them.	
This animal is hard and lumpy, but will turn limp or “melt” when it is handled too roughly or stressed.	

Version 2

Figure 6. This worksheet was the “easy” version of the worksheet created for older students at the UH Hilo Earth Fair.