Kilo ia

2017 | APRIL | MAY | JUNE

Saving Monk Seals

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Waikiki Aquarium
University of Hawaii

AQUARIUM MESSAGE

I recently took part in a fascinating meeting on marine plastics. Hosted by Monterey Bay Aquarium, the invitation-only Aquarium Plastic Pollution Symposium: Opportunities to Advance Solutions was attended by more than 100 professionals from 20 aquariums across the U.S. and Canada, along with experts from scientific institutions, nonprofit organizations, government agencies and a food and retail service provider.

During the symposium, the group discussed how aquariums can work together to address the huge but underreported problem of plastic pollution in our oceans, rivers and lakes. Some of the data presented underlined the scale and urgency of the task at hand: a 2015 study published in the journal Science estimates an average of 8 million metric tons of plastic enters the ocean every year. That's enough to fill five grocery bags with plastic for every foot of coastline in the world! Plastics cannot biodegrade, they simply break down into smaller and smaller particles, and at present rates, by 2050 the weight of plastic in the ocean will exceed that of fish. Harmful chemicals leached by plastics are present in the bloodstream and tissues of almost every one of us.

Aquariums are on the front line of ocean education and ideally situated to educate and inform their visitors about the harmful impacts of plastic pollution. Aquariums are highly trusted sources of science-based information and, according to research, are trusted more than most other public and private agencies.

Over 80% of marine plastic pollution is land-based, and almost 70% of this is single-use disposable plastics (SUDs): items like cigarette lighters, cigarette butts, plastic straws, coffee lids, disposable bags, etc. In contrast to environmental challenges on the scale of global climate change (Yes, it does exist!) and ocean acidification, which will require international government-level agreements to address, curbing the use of SUDs can be undertaken at the individual level, and help slow the rate of pollution of our oceans. Over the coming year, the Waikīkī Aquarium will undertake a drastic reduction in its own use of SUDs, and begin providing education about plastic pollution, and what you can do to help.

By reducing the sources of single-use plastic, together we can make the world's oceans, lakes and rivers, healthier habitats for the animals that live there, and a healthier world for future generations.

Enjoy your summer!

Andrew Rossiter

Dr. Andrew Rossiter
Director, Waikīkī Aquarium

Kilo iʻa

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MANAʻO
Traditionally, the kilo iʻa was an expert of fish and marine life. He studied the behaviors and movements of iʻa. The kilo stood at a high point of land overlooking the ocean to watch for an expected school of fish and steered the fishermen in the school's direction. The success of surrounding the school was entirely up to the kilo.

RECENT EVENTS

LEGO Movie Kick Off

On February 4, families joined the Aquarium for a special LEGO Movie kick off event. Our partners at LEAHI did a special LEGO build of Batman and the Joker, and guests had an opportunity to win prizes like LEGO Movie passes to the February 6 premier and special promotional items.

10th Annual International Aloha Koi Show

On February 11 and 12, koi enthusiasts swam by the Aquarium to view hundreds of rare and top-quality koi on exhibit and display at Hawai'i's largest koi show. Koi were judged on four key characteristics: size, body conformation, pattern and color. This year's grand champion was Robert Armstrong with his kohaku koi.

Mahalo to our sponsors:

AQUA-ASTON HOSPITALITY

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ARMSTRONG FOUNDATION

Community Service Project

On March 26, the Waikīkī Aquarium hosted Barrett, the Honors College from Arizona State University. Twenty-five students took time out of their trip to participate in a community service project cleaning up the park and beach area around the Waikīkī Aquarium.

Andrew Tinker (13), John Hein, Jen Tinker-Hein, Holly Tinker (10), Alison Tinker, Sara Tinker (7), Carole Tinker, George Tinker, Jeff Tinker

The Tinkers Celebrate 50th Anniversary

In January, George Tinker, son of former Aquarium Director Spencer Tinker, visited the Aquarium with his family, as he and his wife, Carole, celebrated 50 years of marriage. Tinker recalled growing up with the old Aquarium and the construction of the present one and was pleased to see the recent progress that has been made.

Dr. Robin Baird

Dr. Robin Baird, author of *The Lives of Hawai'i's Dolphins and Whales*, joined the Aquarium on February 14 for a special presentation in our Aquarium classroom to educate marine enthusiasts about cetaceans. In the past, most publications on the subject in Hawai'i focused on spinner dolphins and humpback whales. Dr. Baird set out to change this by observing and documenting other species of whales and dolphins in Hawaiian waters. His talk covered the more than 25 species he has documented over the past 17 years.

Storm Water Rainworks & Teacher Totes

In partnership with the Department of Transportation's Storm Water Management Program, the Aquarium recently revealed a new Rainworks stencil on Aquarium grounds. The stencil, that can only be seen when wet, promotes the importance of creating a #TrashFreeHawaii and what the community can do to make this possible. Storm Water also donated teacher totes this May, complete with educational information, activity sheets, pencils and more.

UPCOMING EVENTS

Table 53 Fundraiser

In June, the Moana Surfrider will partner with the Waikīkī Aquarium for its signature Table 53 program. Dine at Beachhouse at the Moana and a portion of the revenue will be donated to the Aquarium throughout the month of June. We are so thankful for wonderful partners like our friends at the Moana who continuously support our mission.

Ke Kani O Ke Kai

Our popular summer concert series, Ke Kani O Ke Kai, returns in June with live entertainment from some of Hawai'i's top performers and 'ono food from local restaurants under the stars. The major fundraiser for the Friends of Waikīkī Aquarium, Ke Kani O Ke Kai is one of the most unique ways to experience the Aquarium.

A different restaurant will be paired with each concert. Doors open at 5:30 p.m., concerts begin at 7 p.m. and conclude at approximately 9:30 p.m.

Tickets are $50 for adults, $20 for children (ages 5-12) and free for children 4 and under. Tickets for FOWA members are $30 for adults, $15 for children. Food, beer, wine and other beverages will be sold separately. For tickets or information, visit www.waikikiaquarium.org/kkokk.

Slop and Swap!

Snakes can shed their skin, but humans cannot, so it is imperative that everyone takes the proper steps to protect their skin. On Friday, May 26 from 10 a.m. to 1 p.m., the Aquarium will partner with Badger Sunscreen and the American Cancer Society for a Badger Swap in conjunction with National Skin Cancer Awareness Month. Visitors can bring in their sunscreen tubes and bottles and receive a bottle of Badger's organic, reef-safe sunscreen in return.

World Oceans Day

Celebrate World Oceans Day with the Aquarium on Thursday, June 8. A day of global ocean celebration, this year's international theme is *"Our Ocean, Our Future."* Among the activities will be beach clean-ups, onsite educational activities, invasive algae removal and spotlight of those in the community that are making an effort to protect the ocean.

Save the Date!

Ke Kani O Ke Kai concert series dates are as follows: June 15, June 29, July 13, July 27, August 10

Photo Credit: Meredith, Sunn Photography

SUSTAINING NATURE'S BOUNTY

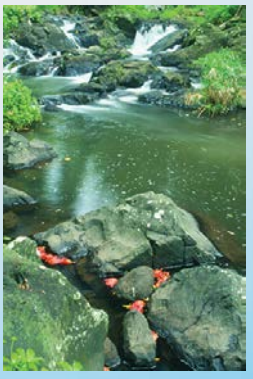
By: Honolulu Board of Water Supply

Our fresh water supply is intimately dependent upon a continuous chain of events called the water cycle. This cycle involves the ongoing movement of water from ocean to land and back again, beginning with ocean evaporation from the sun. The winds lift and push the moist air up against O'ahu's steep mountains and as the rising moisture nears the mountaintops, it cools, forms clouds, and then condenses and falls as rain to the ground. If O'ahu had no mountain ranges and flat plains, the island wouldn't be able to capture enough moist air from the trade winds to support the variety of flora and fauna that live here now.

The island of O'ahu acts like a sponge; rainwater percolates through the ancient volcanic rock into dike zones and underlying aquifers. More than one billion gallons of rain fall on O'ahu every day. About one third is lost to evapotranspiration (the process by which water is transferred from the land to the atmosphere by evaporation from the soil and other surfaces and by transpiration from plants). Another third runs off into the ocean and the last third seeps into the aquifers. The source of O'ahu's drinking water supply is groundwater. Unlike surface water, groundwater stored in aquifers is more resilient to drought and of higher, more consistent quality, requiring less treatment. It is naturally filtered through the basalt rock, providing high-quality drinking water.

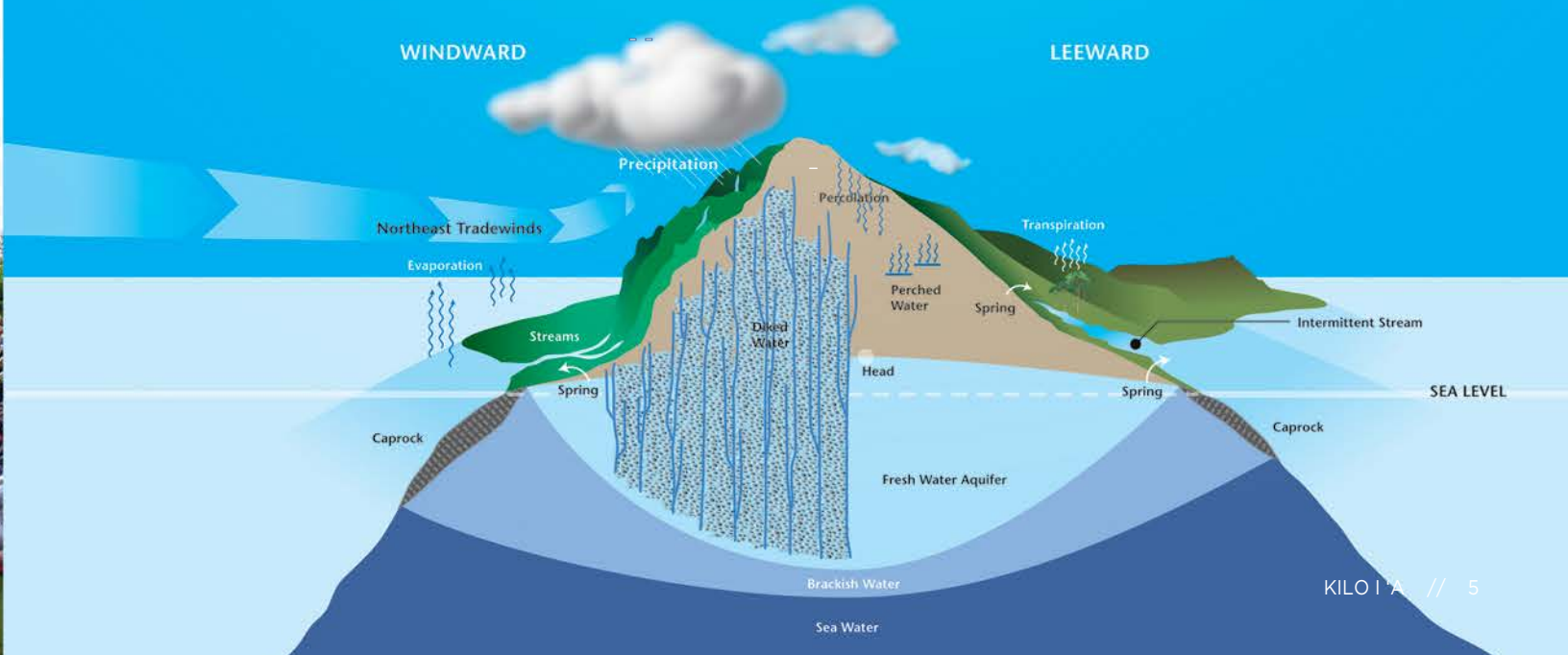
To our great benefit, O'ahu is ideal for catching and storing water. Trade winds blow from the northeast most of the year and bring warm moist air from the ocean onto the land. As the air is deflected up along the mountains, the air cools, forms clouds, and releases rain onto the land below.

Watersheds are immensely important to our water system and its overall health. A watershed is a diverse and highly organized ecosystem which specializes in the capturing of rain and atmospheric moisture from the air and sky. They are usually located in high mountains or valleys, which then divert the water into rivers and streams. Watersheds are composed of several layers of dense vegetation. O'ahu's watershed can also be described as a Hawaiian rain forest, which captures and saves large amounts of water. When watershed lands are not taken care of and become degraded, there are incalculable consequences that affect the water resources and environment. Rain falling on bare earth causes erosion. This means that water-retaining upper soil layers will wash away, resulting in water running off rather than filtering down to replenish the aquifer. Streams that originate from deforested mountains usually flood during rainfalls. The loss of stabilizing tree and plant roots result in landslides, and debris carried by streams ends up in the ocean coastal areas, causing siltation of coral reefs affecting ocean ecology.



Protecting and enhancing O'ahu's watersheds are integral to sustaining a healthy water supply and ecosystem over the ages.

What happens on both land and ocean play an important role in maintaining sustainable resources. Everyone is encouraged to take personal responsibility and make preserving and protecting our natural resources a daily habit so future generations can continue to enjoy the fresh clean water we have today. To learn more or to join the effort, visit the Board of Water Supply at www.boardofwatersupply.com.



Hawaiian Monk Seals

by Dr. Charles Littnan, NOAA Monk Seal Research Program

photo: John Gannon

As I sit down to write this article, it is the evening before we announce to the world an increase in the population of Hawaiian monk seals. It's a relatively modest increase, a jump from 1,300 to 1,400, and it may even be ephemeral, but when much of what we're hearing about the state of our environment these days is disheartening, a bump of 100 individuals is welcome. This news of the population increase will be well traveled by the time you read this, but tonight, it is a precious piece of information and glimmer of hope held by a small and dedicated team of NOAA researchers and managers.

Tomorrow, we will stand in front of the press at the Waikīkī Aquarium and celebrate all that has led to this accomplishment. It's symbolic that we hold this press conference at the Waikīkī Aquarium, because a decade ago we officially signed the Revised Recovery Plan for the Hawaiian Monk Seal, the road map for the work we do, in the very same spot. Tonight, though, before the news goes public, I find myself reflecting, taking stock in all that has been accomplished in monk seal conservation over the last 10, 20, and, even 30 years.

I started my career with monk seals in 2002, never thinking I'd still be this deeply invested today. I feel lucky and honored to be a part of this team. Fifteen years ago, I also would never have guessed how dramatically and wonderfully our mission would change, and how our family of fellow monk seal crusaders would grow. It's these changes I want to share.

Shifting Perceptions and Sharing Our Kuleana

After centuries of near complete absence from the main Hawaiian Islands, monk seals started returning in the 70s and 80s, but they did not really burst onto the public scene until the 90s. When I arrived in 2002, their population was still relatively small and only a fraction of our time was spent responding to seal issues here. Their newness also meant that residents and tourists alike didn't know what to make of these flippered sausages hauled out on beaches or cruising past surfers and swimmers at sea. With that came misinformation, fear, and at time, animosity. Many monk seal-related public meetings were punctuated with claims that the seals weren't native, ate the reefs clean of fish, and represented loss of fishing and beach access rights. These concerns translated into some pretty negative and colorful language on public web forums and at meetings. Sometimes, the fear and animosity was darker and more violent resulting in injury or sometimes death of seals. I remember wondering if seals and people could coexist in Hawaii. Of course, we often made missteps with various communities, and we were at times part of the "problem."

With time, we learned to listen better and share information more effectively and creatively and worked with others to help carry our message. To build trust, we prioritized transparency. At the same time, monk seals worked their magic. The sight of a pup awkwardly frolicking in the shore break softened even the hardest hearts. Over time, tempers cooled. Now, a chorus of voices share monk seal information filling a space that was once NOAA's alone. Our Federal and State partners rallied. Citizens hit the beaches, helping minimize seal disturbance and educating a curious public. Some volunteers even organized into formal associations like the Hawai'i Marine Mammal Alliance. A host of local and national NGO's advocated for monk seals, reaching audiences the Federal government never could. Respected leaders spoke to their communities, achieving a level of trust we could never replicate. One group, The Marine Mammal Center, even built a multi-million dollar monk seal hospital because of one simple reason: monk seals needed it.

I am amazed every day by the growth of this monk seal 'ohana. A kuleana once held by NOAA is now shared by many.

By the Numbers

Most everyone I know in conservation often wakes in the wee hours of the night, questioning whether they are really making a difference. They know statistics like the number of animals saved or amount of habitat protected, but they often can't fully assess the impact of their efforts.

We are blessed in the monk seal program with forbearers who built a robust scientific foundation that allows us to measure the impact of our work. In the last 10 years, our monk seal 'ohana has accomplished many things, including:

- Some 300 interventions that helped moms and pups survive imminent danger.
- The removal of nearly 850 metric tons of marine debris from the shorelines and reefs of our islands.
- The disentanglement of nearly 60 seals from marine debris and nets.
- The care and nourishment of 19 monk seals by Ke Kai Ola, the monk seal hospital operated by The Marine Mammal Center.
- The de-hooking of 38 monk seals on the beach and 16 surgical procedures to remove fishhooks swallowed by seals.

Photo credit: NOAA

These efforts, coupled with many other conservation activities over the last 35 years, have resulted in one important number: at least 28 percent of the monk seal population exists today because of a proactive life-saving intervention. This is our collective legacy. Our track record combined with the people, communities, government entities, and non-governmental groups that have responded to the monk seal cause makes me optimistic for the future. Fifteen years ago, I was cautiously hopeful we could recover the species. Now, if we all continue working together, I feel a greater sense of certainty for the future of Hawai'i's native seal.

VOLUNTEER SPOTLIGHT

SUMMER TEEN PROGRAM 2017

Looking for a fun and educational opportunity for your teen this summer?

For the last three years, the Aquarium has offered its Teen Interpreter Program. Students ages 14 – 17 have the chance to learn about Hawaiian marine life and share that knowledge by interacting with visitors from around the world who come to the Aquarium.

Alison, 16, of Kaimuki High School, loves mentoring young kids. She enjoys how interested and excited they are to learn. She says, "the smiles on their faces are very inspiring. My experiences at the Aquarium have very much influenced my choice in career and pathway. I really want to teach not just kids, but anyone, any age, about the ocean." She now finds herself sharing her marine knowledge whenever she goes to the beach or on school field trips.

To sign up your teen for this rewarding experience, go to www.waikikiaquarium.org, or call the Education Department at 808-440-9011 for more information.

VOLUNTEER ENRICHMENT

Ever wonder why our volunteers are so knowledgeable on a plethora of marine related topics? In addition to the rigorous online, classroom, and in-person training they get before becoming a volunteer, we strive to provide different enrichment opportunities for our volunteers. These opportunities include tours of off-site facilities as well as different enrichments on-site. For example, in 2016, we arranged tours of Bishop Museum, Hawai'i Institute of Marine Biology (HIMB), Oceanic Institute, NOAA's IRC building and most recently Anuenue Fisheries Research Center. On-site we provide different lecture series with organizations such as PacIOOS, NOAA, HIMB, and our very own staff of aquarium biologists.

If you are interested in volunteering at the Waikīkī Aquarium, visit our website at http://www.waikikiaquarium.org/support/volunteer/ to view the different opportunities and apply. For more information, contact the volunteer center at (808) 440-9020.

On-Site Monk Seal Enrichment with Monk Seal Biologist Leann Castle (Dec. 2016)

Tour of Anuenue Fisheries Research Center (Jan. 2017)

Tour of Oceanic Institute (Nov. 2016)

PLASTIC IN THE OCEAN

Consumption of disposable plastics has spiraled out of control, with over 33% of what we use being single use disposable (SUD) plastics. These SUD plastics are virtually everwhere and while they are used for just seconds, hours or days, their remains last forever. Research by The Ocean Conservancy on items collected during beach clean-ups, found the following top 10 items in marine plastic garbage. The top seven are either completely manufactured using plastic or contain plastic.

Every piece of plastic that has been created still exists, including the small amount that has been incinerated and become toxic particulate matter. While plastics may break down into smaller pieces, it does not biodegrade. These broken down pieces or "micro-plastics," float around our oceans and are consumed by marine animals, from the smallest of zooplankton to the larger marine animals, like the blue whale. Additionally, up to 30% of microplastics are primary microplastics, most of which come from abrasion of synthetic textiles while washing, and abrasion of tires while driving. The density of microplastics in some areas is so high it has been likened to an underwater smog. The scale of the problem is daunting and affecting ocean ecosystems and the health of marine life and humans worldwide.

The plastic ending up in the ocean results in entanglement, ingestion and habitat disruption. Today, there are five trillion pieces of plastic in our oceans, which is responsible for the deaths of hundreds of thousands of marine animals, birds and fishes each year. Recent research estimates that as many as 90% of all seabirds have swallowed plastic and at present rates, it is predicted that by 2050 the weight of plastics will exceed the total weight of fishes in our oceans and virtually any seabird found dead will have plastic in its stomach. This also extends to humans. University research estimates that anyone consuming an average amount of seafood would ingest about 11,000 plastic particles a year and it is certain that we all have plastic in our bodies.

Although plastics can never be completely removed from our environment, there are measures we can take to reduce our plastic footprint.

AT THE MANUFACTURING LEVEL

Some companies using plastic bottles have begun to address the problem, but the level of commitment varies. Five of the top soft drink companies sell over two million tons of plastic bottles each year, but use only a combined average of 6.6% of recycled plastics. While Coca-Cola is investing in developing more sustainable plastic bottles, Greenpeace is not impressed with such efforts and wants to see the elimination of SUD plastic bottles altogether. Even so-called 'biodegradable plastics' can solution is the move away from SUDs and minimize the amount of plastic that goes into our environment.

AT THE INDIVIDUAL LEVEL

- Bring a stainless steel bottle, ceramic cup or mug rather than drinking out of disposable plastics bottles or to-go cups.
- Buy soft drinks in cans or glass bottles, which can be recycled.
- Bring a reusable bag when shopping. Hawai'i is ahead of the curve in banning single-use plastic bags in supermarkets and stores.
- Refuse the plastic straw that comes in nearly every soft drink. Carry your own straw made of glass, paper, stainless steel or bamboo.
- Stop using products that have micro beads, which cam be found in face washes, liquid soap, toothpaste, and many other products meant to exfoliate.

Visit our website www.waikikiaquarium.org for more information about where to obtain these items and to start to play your part in reducing plastic pollution today. Also, be sure to volunteer for local beach clean-ups, which are put on by several organizations around the island, including the Waikīkī Aquarium.

Coastal and Ocean Information for You and Me

Surrounded by water, Hawai'i and other Pacific Islands communities are closely connected to the ocean through cultural, social, and economic ties that make it a vital natural resource. However, the ocean is a changing environment that can pose unique challenges to humans, coastlines, and marine ecosystems—on a daily basis and in the long-term. To help save lives and protect livelihoods and resources, the Pacific Islands Ocean Observing System (PacIOOS) was established in 2007 to provide accurate and reliable coastal and ocean data and information. The data empowers ocean users, federal and state agencies, emergency responders, scientists, industry partners, and local communities to make well-informed decisions.

PacIOOS collects, manages, and serves various real-time observations of the most recent ocean conditions for the Pacific Islands region. For example, a network of 14 PacIOOS wave buoys provides information on wave height, period, direction, and sea surface temperature in 30-minute intervals. Many ocean users rely on the data to better understand ocean conditions, 24/7. PacIOOS also maintains 13 nearshore sensors to monitor nearshore water quality through oceanographic parameters, such as water temperature and salinity. In fact, one of the nearshore sensors is mounted right outside the Waikīkī Aquarium! The sensors provide a continuous time-series of data to monitor nearshore environments and to assess impacts after heavy storms. In addition to a suite of observational data, PacIOOS also generates coastal, oceanic, and atmospheric high-resolution models to forecast conditions such as potential wave inundation, harbor surge, water temperature, and wind speed.

In order to make this wealth of information easily accessible, various user-friendly tools are freely available online. PacIOOS Voyager (http://pacioos.org/voyager) is an interactive mapping platform that allows users to choose from more than 1,600 individual data sets, including observational, satellite, and model data layers for the entire U.S. Pacific Islands region. With a focus on data sharing and transparency, PacIOOS also helps partner organizations, agencies, and institutions to make their data readily available. A well-known project that captured the attention of a wide audience is the Hawai'i tiger shark tracking study. While researchers from the Hawai'i Institute of Marine Biology tagged tiger sharks around Maui and O'ahu to study movement patterns and behaviors, all shark tracking data were made available to the public on the PacIOOS website. Empowering ocean users, resource managers, and community members with relevant ocean data is key to inform safe decisions.

PacIOOS is based within the School of Ocean and Earth Science and Technology (SOEST) at the University of Hawai'i at Mānoa, and is one of 11 regional associations that make up the U.S. Integrated Ocean Observing System (IOOS®). PacIOOS' region spans across the U.S. Pacific Islands, including the State of Hawai'i, U.S. territories, Freely Associated States, and the U.S. Minor Outlying Islands.

To learn more about PacIOOS, and to find data and information on waves, currents, water quality, shoreline inundation, tiger sharks, and more, please visit http://pacioos.org. If you have any questions or if you would like to provide feedback and suggestions, please contact us at info@pacioos.org.

Photo Credit: G. Walker, PacIOOS
Installation of a PacIOOS nearshore sensor outside the Waikiki Aquarium.

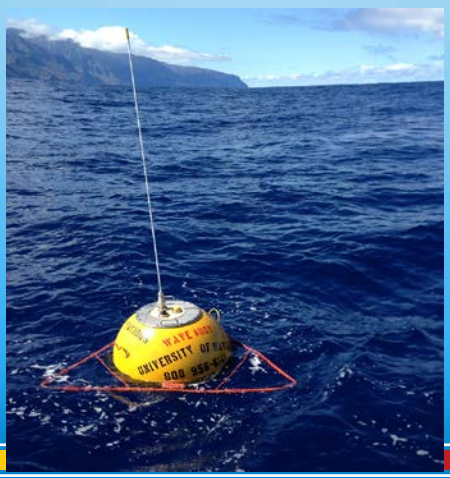


Photo Credit: K. Millikan, PacIOOS
PacIOOS wave buoy off Kauai's North Shore.

Photo Credit: M. Royer, HIMB
Shark Researchers tag a tiger shark with a tracking device in the waters off O'ahu's South Shore.

CLASSES & ACTIVITIES

CRITTER ENCOUNTERS

Mondays in April and May at 9:30 a.m.
Sneak-a-peek behind the scenes and learn about Hawaiian reef animals. Hold a sea star, feel a sea cucumber and feed an anemone. This half-hour program is a great addition to any visit to Waikīkī Aquarium. Perfect for families with children 4 and up. $5/person plus Aquarium admission.

Keiki Time

Wednesdays at 9:15 a.m.
April 26 (Seals)

Sharks, turtles, and seals are just some of the animals that will be highlighted in these classes for kids. Keiki will learn about sea creatures through crafts, singing, storytelling, dance and play. Designed for children 1- to 4-years-old. $10/person, $5/member.

Register online at www.waikikiaquarium.org/interact/activities-classes/

BEHIND THE SCENES

Thursdays at 3:00 p.m.
Learn what makes the Aquarium run, from fish food to quarantine, and many stops in between. Climb-up and peer into the backs of the exhibits. Visit the Coral Farm and the Jelly Hale, where sea jellies are raised. Minimum age 7 years; youngsters must be accompanied by an adult. Accessibility is limited. $16/adult, $10/child (Members receive a 40 percent discount).

SUMMER BY THE SEA

June 5-9:
Monday to Thursday 8:30 a.m. to 3:30 p.m.
Friday 8:30 a.m. to 5:00 p.m.

June 19-23:
Monday to Thursday 8:30 a.m. to 3:30 p.m.
Friday 8:30 a.m. to 5:00 p.m.

Spend a week of summer learning what lives in Hawaiian waters and along the shoreline. What's the best way to learn? By doing! Explore the Southshore from Waikīkī to Diamond Head. After a morning of outside adventures, the Aquarium turns into a classroom. Learn about the animals in our exhibits and watch them being fed on special behind-the-scenes tours. For aspiring marine biologists ages 8-12 years. All students should be confident swimmers. $325/child, $275/member.

AFTERNOONS AT THE AQUARIUM

Wednesdays at 3:00 p.m.

Every Wednesday, the Aquarium hosts an interactive learning activity near the aquaculture deck. Join us for a critter encounter or a marine science craft designed for families. Free with admission to the Aquarium.

TEEN VOLUNTEER PROGRAM

Applications due by May 26

Interested applicants must be available for at least one shift on Wednesday (morning or afternoon) or Thursday mornings for the entire month of July. All students must be in or entering high school in Fall 2016. To apply got to: http://www.waikikiaquarium.org/support/volunteer/volunteer-opportunities/

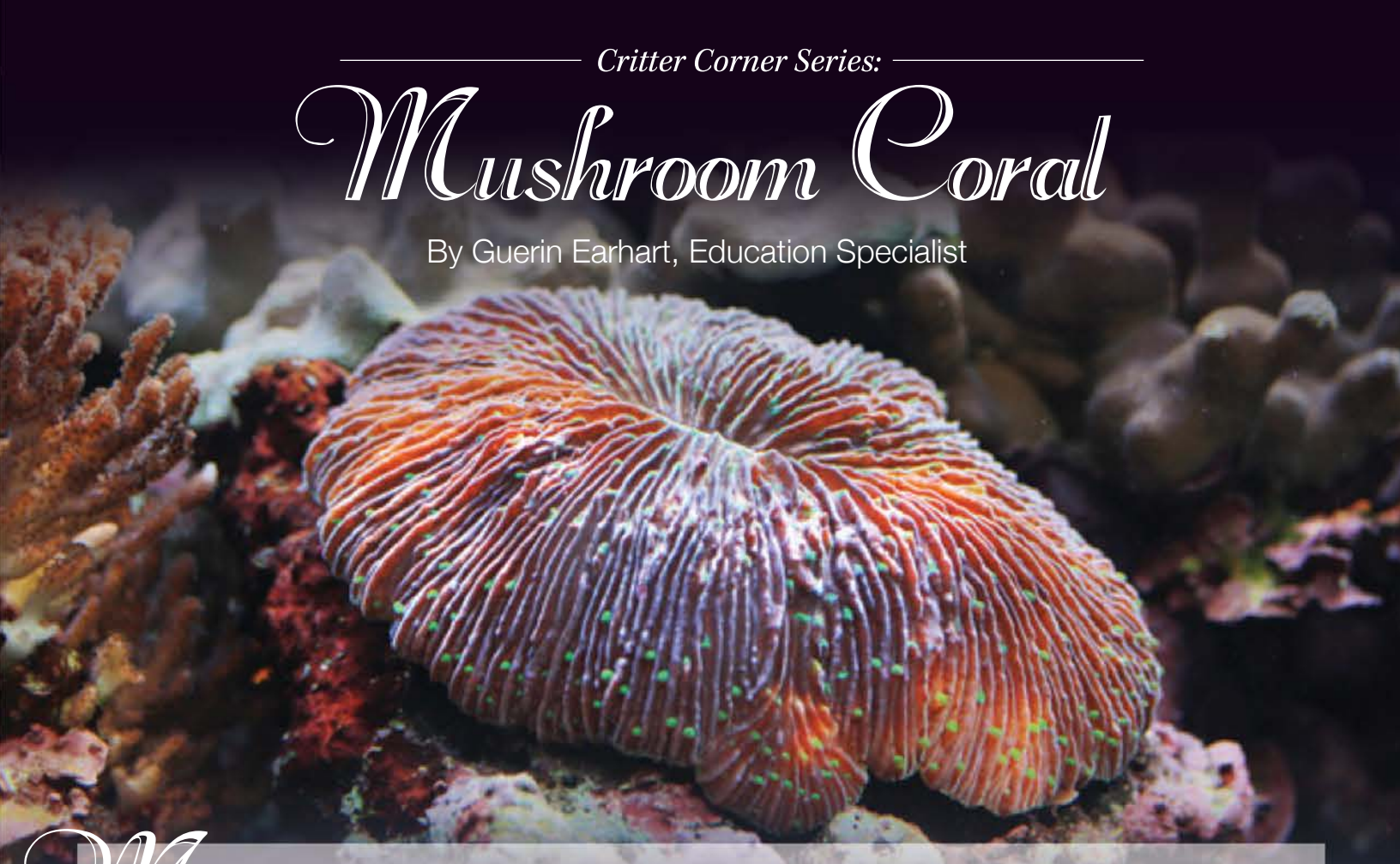
CLASSES FOR GROUPS:

Waikīkī Aquarium offers a variety classes for community and family groups from eight to 45 people. Book a Private Aquarium Tour, a Critter Encounter for your clan, or an Aquarium After Dark or Fish School for your club or scout group. Call 808-440-9007 for more information or email reservations@waquarium.org.

Critter Corner Series:

Mushroom Coral

By Guerin Earhart, Education Specialist



Mushroom coral is one of the most recognizable species of Hawaiian stony coral. Named for its oval shape and radiating skeletal walls (septa) that give this coral its mushroom-like appearance, these sharp septa also give rise to another common name, razor coral. In a mushroom coral, the central mouth is slit-like and the broad polyp surface is covered with widely spaced, stubby tentacles. Mushroom corals are suspension feeders and have tracts of hair-like cilia on the disc surface that collect particles dropping from the seawater. The cilia carry food particles to the mouth and carry sand and other non-food particles to the edge of the disc to dump them.

This disc-like coral is found on quiet water reefs like those in Kāne'ohe Bay, where solitary individuals live detached from the reef. Unlike most other Hawaiian corals, mushroom corals do not form colonies and, amazingly, each mushroom coral is a large single polyp. While most corals remain attached to the reef, mushroom corals are attached to the reef only when they are small. Young mushroom corals are attached to the reef framework by a limestone pedestal until the polyp reaches sufficient size. At this point, the pedestal breaks and the mushroom coral then lives unattached with its mouth side up. As larger individuals, they live loose on the seafloor. If overturned, mushroom corals can right themselves by taking water into the gut cavity, expanding one side of the body, acting as a wedge, to gradually raise the disc until it tips back over. This righting process can take up to several hours to complete.

Tissue remaining on the pedestal can grow to create another mushroom coral, which will break off as well. In fact, a single pedestal can generate many mushroom corals. This can be compared to the building process that creates colonies in other corals, but unlike other corals, the polyps in mushroom corals don't remain attached to one another. The pedestal arises from an original mushroom coral larva that settles on the reef. Adult mushroom corals release eggs or sperm into the seawater when they spawn. When these unite in fertilization, a larval stage called a planula develops. Carried by currents, the larva drifts until it settles onto a reef surface and starts the cycle of polyp formation.

Much like other reef-building corals, there are symbiotic plant-like cells (*zooxanthellae)* living inside the mushroom corals cells. Using nutrients from the water and their coral hosts, combined with sunlight, the zooxanthellae generate energy-rich compounds through photosynthesis. In fact, reef-building corals actually owe their success as builders to their tiny partners as the zooxanthellae's photosynthetic processing enhances the corals' abilities to produce the massive limestone skeletons that contribute to the reef framework. The formation of extensive reef environments would not be possible without this mutually beneficial relationship.

Look for these portabella-shaped corals on the bottom of our exhibits.

Fun Fact: Early Hawaiians used the skeleton of the mushroom coral as an abrasive for polishing canoes and other woodwork and for removing bristles from a pig's skin before cooking.

NEW & RENEWING MEMBERS

from January 2017 - March 2017'

Leona & Alvin Abe
Jon & Janelle Allen
Tanya & Paul Alston
Crystal & Kenneth Altizer
Anthony Amend & Nicole Hynson
Marion Ano
Wesley & Aya Au Hong
David & Cara Ball
Lesley & Eric Ballew
John Maurer & Kasey Barton
Carol & William Bass
Wayne & Stephanie Batzer
Brandon & Jennifer Bera
Dana & Alyssa Bergeman
Beverly Bertino
William & Vivian Best
Michelle & Ryan Bisbee
Paige Black and Tyler Watanabe
Deborah Blair
Amir & Sonia Borochov
Mr. and Mrs. Jerry Boster
Mrs. Felice Broglio
Betsy Brown
Christine & Lavelle Burgess
Thomas & Genie Bush
Elyse Butler
Miriam & Joshua Caliboso
Travis & Chelsie Cansell
Manu & Margo Capoor
Dr. Jeanne Carney and Anna Root
Shely Chang
So Young Chang
Jeremy & Ashley Cheng
Atsushi Chida
Keric & Amanda Chin
Dylan & Kanoelani Ching
Fernando & Verona Chiutena
Mr. & Mrs. Darrell Y.C. Chun
Noelani Chung and Kenneth Ma
Elizabeth Churchill
Jason & Jessica Condi
Tony Conjugacion
John Constantinou
Roger Couture and
Darlene Weingand
Ronald & Wendy Cunitz
Rex & Carol Dalby
Tricia Dang
Christine Diaz and Robert Lessary
Dayton Dove and Hannah Clilverd
Walter & Jennifer Drysdale
Barbara Dwyer and Bridget
Dwyer-Dial
John & Joan Dyer
Nobuko Earhart
Andrew & Barbara Endo
James & Laurie Fabrigas
M. Eleanor Fahrenwald
Stephen Flower
Elizabeth & Christopher Follett
Christopher & Nichole Frerichs
Nick & Denise Frey
Brandon Fujimoto
Patricia & Ronald Fukuda
Lee & Vonda Funai
Michael & Lori Furoyama
George & Noralyn Gabriel
Leslie Garay
Michael Garsva
Caren & David Gaud
Mr. & Mrs. Keola Gerell
Charles Gill
Sally Glenn
Christopher Goshi and
Chelsea Tomita-Goshi
Melissa & Sage Goto
Vivian Grasse
David Greenburg and Rebecca Ward
Marc & Rose Greenwell
Allison & Matt Guard
Andrey & Anna Gutrov
Emily & Kwabena Gyimah
Jenny & Kawika Haglund
Kealakai Hammond and
Louis Trujillo
Mary Hammond and Kevin Kuroda
Hae Won Han and Chang Kuk Lim
Burdene Hanes
Gary & Wayna Harbottle
David Hawkins
Clifton & Shari Heen
Manuela Henderson
Kaipo & Traci Henrikson
Jeanne Herbert
Stacy Hiramoto
Alan & Norma Hirota
Charlotte Ho Tsie
Brian Holbrook
Kelly Holden
Ko Moe Htun and Susan
Malterre-Htun
Bill & Laurie Hunt
Royce Hurst-Naranjo
Walter & Karen Ikehara
Chiyo & Seita Ishibashi
J.P. & Rachel Ivey
Mr. & Mrs. John L. Jacobs
Eric & Kay James
Jimenez Family
Jennifer & Travis Joerger
Christopher & Susan Johnson
Jeremy & June Johnston
Christine & Charlie Jones
Jay & Ann Kadowaki
Alton & Rae Kagawa
Maria Kahele
Keli'i and Makanani Kaneshiro
Jonathan & Amee Kang
Yang-En & Mindy Kao
Steve & Marilyn Katzman
David & Watcharaporn Kelley
Mark & Kathleen Kilby
Na Kim and Han Zhi Li
Kristan Kimura
Tangi & David Kioa
Lesley Kizzee
Masahiko & Chikako Kobayashi
M. Kwock
Wendy Lagareta
Daniel & Emi Lam
Joseph & Zara Lanig
Gina & Darryl Law
Perkin Lee
Sei & Christopher Lee
Tamara & Jurgen Lee
Timothy & Leticia Lee
Yevgeniy & Nadia Lendel
Shelby and John Lessary
Sue Lim and Richard Wallsgrove
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Mele Look and Scott Rowland
Howard & Loudi Lum
Dr. & Mrs. Douglas S. Luther
Dr. Frank Lutz
Garrett Maeda
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Mr. and Mrs. Mandawe
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Samantha Masca
Kevin Matias and Raquel Valverde
Haruka & Daisuke Matsumoto
Randall & Taryn Matsumoto
Bernice & Percy Matsunaga
Donald & Sara McPhee
Joseph & Sarah McQuillan
Ms. Kristin Meehan &
Mr. Joseph Pancho
Viktoriya Melnichenko
Sun Hee & Baron Mihu
Katherine Miller
Patrick & Ashley Miller
Darin & Antoinette Mingo
Marie Misawa
Alan & Brenda Mitchell
Mark & Pamela Miyashiro
Paula & Nathan Moore
Heather & Jerry Morgado
Mrs. Audrey Mueh &
Ms. Nicole Jones
Douglas & Betty Mukai
Darci Murakawa and Miles Oyasato
Cathy & Kenneth Nakagawa
Joy Nakagawa
Kristin & Kazuma Nakagawa
Gareth Nakamura
Tyson Tamashiro and
Kelli Nakamura
Jon & Toni Narimasu
John Needham
Lam & Whitney Nguyen
Lori & Fred Nishimura
Chivas & Patrick Nousianen
David & Leah Nygaard
Robert & Tara Oda
Marcene & Thomas Ogawa
Mr. Ken H. Oishi
Aaron & Saskia Oliveira
Clinton & Kristen Ono
Anthony & Moani Ortiz
Liane & Ward Otake
Noelia Paez and Edgardo Diaz
Eddie Park
Melanie Park
Blythe Patel
Hannah Pearson
Jeffrey Peterson and Sarah Grekin
Ethan Pien
Bruce Popkin & Gaile Labelle
Baron & Susan Powell
Steven & Margo Proctor
Dr. & Mrs. Keven Reed
Sean Remas
Brandy Reynolds
Andrew & Trisha Roberts
James & Amberleigh Rodriguez
Nicole Roganti
Julie & Rueben Rogers
Mr. & Mrs. Scott C. Rolles
Timothy Rooney
Sanae Rosenberg
Gloria Rydingsword and Dan Drown
Ahmad Sadri
Lee Saito and Kelly Kawaoka
Robert & Nicolle Sanpei
Mai Ly Schultz
Casi & Daniel Segawa
Mary & Francisco Segura
Heather Servaty-Seib and Broc Seib
Audrie Shacat and Debra Adams
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Carl & Helen Tanigawa
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Gregory Tieman
Bonny Tinebra
George Tinker
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Cheyenne Titsworth-Shumaker and
Landen Constantino
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Shelley Tokuda
Wayne & Mary Tokuhana
Kristina & Jason Tokunaga
Earlene Tom
John & Christina Tomoso
Dustin Truman and Ana Camacho
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Jacob & Katelyn Wong
James W.K. Wong and
Malia Okumura
Gordon Woods & Valaree Albertson
David Yamagata
Edmound Ybarra
Calvin & Sylvia Yokoo
Yukimichi & Tomomi Yokoyama
Michael Yoneshige
Lois Yonezawa
Sally Yoshida
Kelsy & Cheri Yoshimura
Kamakoa & Brion Zablan

Three Ways to Support the Waikīkī Aquarium

As a 501(c)(3) organization, the Friends of Waikīkī Aquarium (FOWA) is only able to fulfill its mission through financial donations, membership dues and corporate sponsorships. Here are a few ways you can contribute:

1. Ke Kani O Ke Kai

The Waikīkī Aquarium's annual Ke Kani O Ke Kai summer concert series is one of Hawai'i's most successful summer concert series, featuring five outdoor performances by the islands' top musical artists. Each concert hosts approximately 650 guests and provides an opportunity to support the Aquarium. For information on becoming a sponsor, call (808) 533-4165.

2. Amazon Smile

The Waikīkī Aquarium is a proud partner of Amazon Smile, a program that donates 0.5% of the proceeds from customers to support a charity of their choice. When shopping on Amazon, show your support of our aquatic friends by selecting the Aquarium as your favorite charitable organization.

3. Corporate Membership Program

You or your company can become an annual supporter of the Waikīkī Aquarium and its mission. Different levels include the Coral Reef Circle, Nautilus Circle, Mano Circle and Hawaiian Monk Seal Circle.

The Waikīkī Aquarium was recently the recipient of a generous donation towards general operations by the John R. Halligan Charitable Fund. The Halligan Charitable Fund's mission is to support artistic, cultural and civic organizations based in the Chicago and Honolulu areas.

Pictured left to right: Dr. Andrew Rossiter, Waikīkī Aquarium, Director; Donna Vuchinich, University of Hawai'i Foundation, President & CEO; Norman Gantz, John R. Halligan Charitable Fund, President.

FRIENDS OF WAIKĪKĪ AQUARIUM BOARD MESSAGE

David White, FOWA Board Member

In an age in which public aquariums worldwide boast of immense and numerous exhibits spread across dozens of acres, our aquarium stresses quality over quantity. The Waikīkī Aquarium is one of the nation's oldest aquariums and serves as a research facility for the University of Hawai'i .

As our Friends of Waikīkī Aquarium (FOWA) Board begins planning for needed improvements and additions throughout our facility, we must take into consideration the physical limits of our property, along with our economic reality. Our main focus when contemplating these next steps is keeping our aging facility safe and attractive, while also creating exhibits and experiences that are beneficial for both our animals and visitors.

Our operations would not be possible without the dedication of our staff and volunteers. Many departments work together to make an Aquarium visit both fun and educational. It begins with the friendly smiles of our front desk team, continues with the hard work of our blue shirted volunteers and often extends to the helpful attitude of our grounds crew, answering questions about plants unknown to many of our visitors. Behind the scenes, our live-exhibits staff is keeping our animals alive and healthy, while the education department is doing a terrific job creating lessons or teaching our youngest visitors in hopes of growing an appreciation for Hawai'i's marine environment.

It is through the generous support of our members and donors that we are able to continue to improve our beautiful facility and fulfill the mission of the Aquarium to inspire and promote understanding, apprecation and conservation of Pacific marine life.

We thank you all for your commitment to keeping our Aquarium one of the best!

University of Hawai'i at Mānoa
Waikīkī Aquarium
2777 Kalākaua Avenue
Honolulu, HI 96815-4027

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THE WAIKĪKĪ AQUARIUM'S MISSION

To inspire and promote understanding, appreciation and conservation of Pacific marine life.