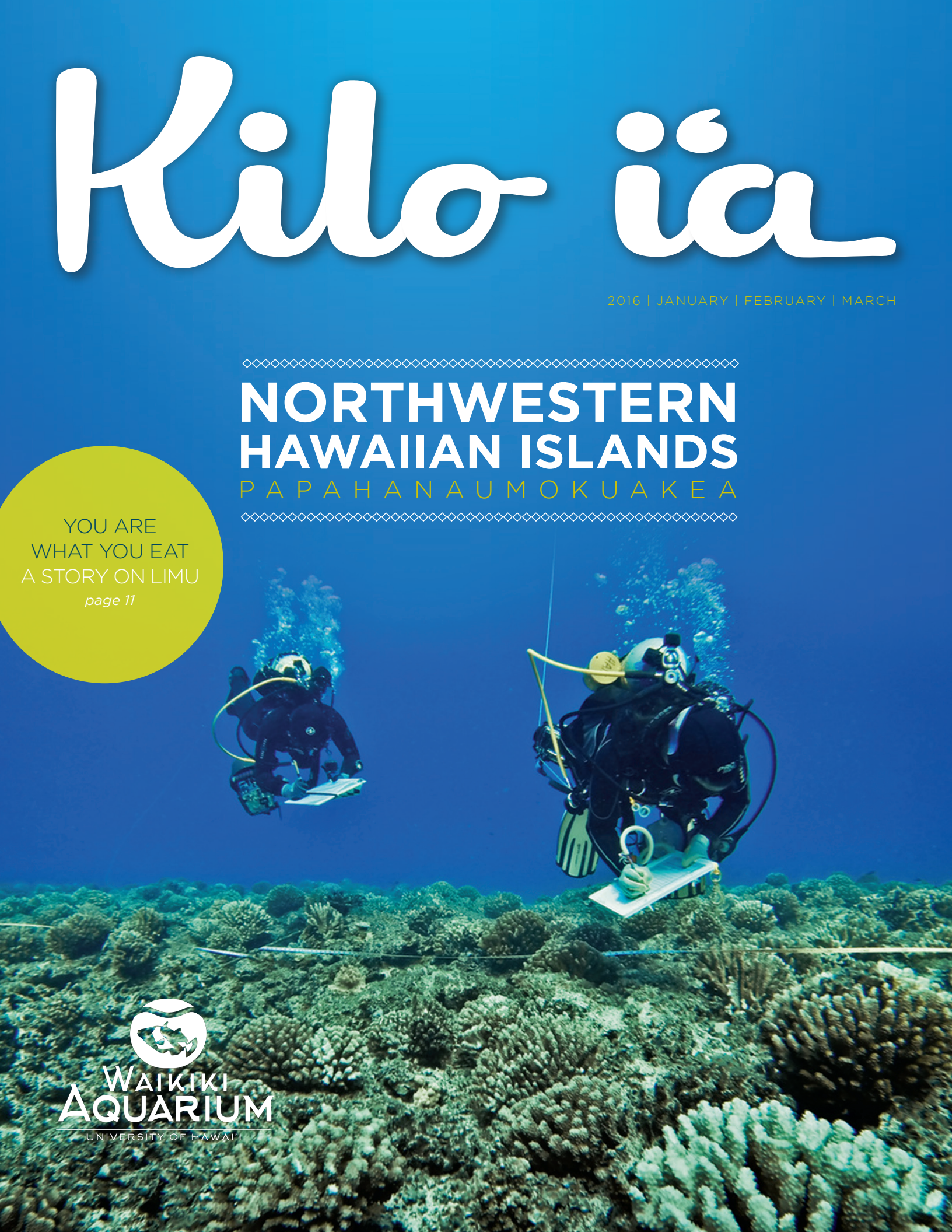
Kilo iā

2016 | JANUARY | FEBRUARY | MARCH

NORTHWESTERN HAWAIIAN ISLANDS

PAPAHANAUMOKUAKEA

YOU ARE WHAT YOU EAT
A STORY ON LIMU
page 11



WAIKIKI AQUARIUM
UNIVERSITY OF HAWAI'I

Left to right: Gerard Fort, MaryLou Foley, Dr. Andrew Rossiter

DIRECTOR'S MESSAGE

After coordinating and implementing yet another successful Ke Kani o Ke Kai summer concert series, all involved at the Aquarium have stepped back into their main responsibilities. With autumn fast approaching, heralded by unusually wet weather, we are looking ahead to upcoming activities and programs, and to continuing our ongoing efforts at constant improvement. One sign of success in this area has been the annual Family Night, which has grown in po yearly. This year themed around Explorers, the August event by over 400 members, their fa d guests.

Upcoming e de Me ight on Novemb , following ular for ar's event, will fe . Bring a picnic and c t to be missed i e next Ad ished Lect s, featurin re fish d deep wate ex yle. Scheduled for Nov ahou School Chapel, Dr Pyle w nt some of his groundbreaking discove he marine life found at 300-400 feet studied using rebreather diving tec Details of these and other upcoming e n be found elsewhere in this issue an the Aquarium's website.

Recently, the overharvesting of sea cucumbers in Hawaii has been in the headlines after unscrupulous collectors were photographed with huge numbers of sea cucumbers all taken from the same site. The animals have a market value to restaurants for food and also for traditional Asian "medicine" (of no scientifically proven benefit). Collection at these levels is unsustainable, and the Department of Land and Natural Resources are to be applauded for swiftly imposing a moratorium on the commercial exploitation of sea cucumbers in Hawaii, and limiting the number allowed to five per person. ecent report documen in other parts of and e decimated mber populatio some area ing only 3% of wha there only s ago. It is hoped th such a tra averted for Hawaii's r ether fo ucumbers in particula marine eneral.

er, wh d r mber of a ought cumbers were (they are lly related to starfish and sea urchins) d who were unaware of their important role in the marine ecosystem (they process detritus on the sea floor). Partly in response to this, we have decided to include in future issues of Kilo'ia a section highlighting the biology of marine organisms, so as to give readers a better understanding of the evolution and ecology of some of the amazing creatures found around Hawaii's shores. We hope you will both learn from and enjoy this new section. Similarly, we are always open to suggestions for new sections or topics that you, our members, would like to see included in the magazine. We welcome your comments, and thank you for your continued support.

Dr. Andrew Rossiter

Kilo ia

Issue Number 195
2016 JANUARY | FEBRUARY | MARCH

EDITOR
Becker Communications

ART DIRECTOR
Jairus Kiyonaga

PHOTOGRAPHERS
Blake Thompson
Leon Ho

PRINTING
Reskyu

Kilo i'a is published quarterly by the University of Hawai'i and the Friends of Waikīkī Aquarium and is dedicated to increasing the community's knowledge of the Waikīkī Aquarium and Hawai'i's marine life.

Waikīkī Aquarium
2777 Kalākaua Ave.
Honolulu, HI 96815-4027
PHONE (808)923-9741
FAX (808)923-1771
www.waikikiaquarium.org

WRITE TO US AT kiloia@waikikiaquarium.org

PRINTED ON RECYCLED PAPER WITH ENVIRONMENTALLY FRIENDLY INKS

MANA'O

Traditionally, the kilo i'a was an expert of fish and marine life. He studied the behaviors and movements of i'a. 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.

Cover Photo Credit: Chris Wall/HIMB

RECENT EVENTS

DISTINGUISHED LECTURE SERIES

On November 19, we welcomed world-renowned exploratory diver, Dr. Richard L. Pyle from the Department of Natural Sciences at Bishop Museum, for a lecture entitled “Creatures of the Deep.” The lecture focused on Dr. Pyles pioneering work in deep-sea dives of 200-500 feet, discovery of hundreds of new fish species and innovations in the field of technical diving.

Left to right: Charlie Loomis, FOWA; Lee Bell, Oceanic Hollis; Dr. Richard Pyle, Bishop Museum; Dr. Ruth Fletcher, Director of Professional Programs, Punahou School

MYSTICAL MERMAID CELEBRATION

A pod of mermaids splashed through the Aquarium for our Mystical Mermaid Celebration on November 8. Keiki of all ages dressed in their best scales and fish tails for a special fashion show, pictures with a mermaid, and beautiful live paintings by local artist, Patrice Federspiel.

BEACH CLEAN UP

In support of our mission to protect Pacific marine life, our dedicated volunteers took part in a beach clean up on November 21. They removed trash and other debris from the beach and park areas around the Waikīkī Aquarium.

MEMBERS NIGHT

On November 8th, Friends of Waikīkī Aquarium (FOWA) members enjoyed a waddling-good time learning about penguins. Following the FOWA Annual Meeting, members moved over to the Aquarium lawn and enjoyed picnic dinners and movies by moonlight on the lawn – complete with popcorn. A special full-length episode of The Octonauts and The Penguin Counters were shown on a 20-foot inflatable screen, providing a fin-tastic evening of cinema.

Our youngest members enjoyed learning from the beloved Octonauts crew of eight adorable animals who explore the ocean in search of adventure from their undersea “Octopod” base. The second feature followed a team of field biologists on a journey to one of the world’s most fastest-warming regions, Antarctica, where they tracked the impact of climate change and ocean health – one penguin at a time.

A special thank you to Silvergate Media, Getzels Gordon Productions and Funflicks Outdoor Movies for their generous support!

UPCOMING EVENTS

Photo Credit: The Moana Surfrider

PICTURE

PICTURE

PICTURE

RAINGARDEN PICTURE

CELEBRATING OUR LEGACIES

Our partners at the venerable Moana Surfrider are celebrating 115 years of service and commitment to Hawai'i this March. Under the leadership of General Manager Larry Hanson, the Moana Surfrider continues to value and serve its community, specifically through its partnership with the Waikīkī Aquarium.

In December, the Moana featured an ocean themed Holiday tree with a portion of the proceeds from the sale of ornaments benefitting the Waikiki Aquarium. In March, the Moana celebrates its 115 year and our 112th birthday with a special concert featuring internationally known recording artist Makana. In June, the Waikiki Aquarium is the recipient of its signature restaurant The Beach House Table 53 program. Please see our website for additional details.

Our sincere thanks to Larry Hanson, Stuart Kotake and the entire staff of the Moana Surfrider for their support!

SAVE THE DATE!

Our next Distinguished Lecture Series is on April 7, 2016.

MAUKA TO MAKAI

Our annual Earth Day celebration, hosted by the Department of Health-Clean Water Branch and City & County of Honolulu Environmental Services, will be held on April 23, 2016. In support of our mission and to reinforce its commitment, the Department of Health-Clean Water Branch provided the Waikiki Aquarium with a rain garden in 2014. Rain gardens are shallow depressions strategically placed and planted with vegetation in order to capture storm water runoff from impervious surfaces.

Supported by Kamehameha Schools Publishing, this event is free and open to the public and will highlight the impact we make on water sources from Mauka to Makai and how we can help to keep our oceans clean. Families are invited to join us for educational activities focused on the preservation and protection of our environment.

KAMEHAMEHA AD (3.75" X 2")

Koi Show

February 13 & 14

Join the Waikīkī Aquarium as we host the 9th Annual International Koi Show on February 13 and 14, 2016. Hawaii's largest koi show will feature hundreds of top-quality koi for purchase and display. In addition, koi experts will lead educational seminars and guests will enjoy a variety of authentic Japanese performances and activities.

Nishikigoi, commonly referred to as 'koi,' originated in Niigata Prefecture, Japan and have more than 80 varieties. The koi is the national fish of Japan and serves as a combination of both art and biology. Rich in variety and very peaceful ornamental fish, these "living jewels" are easy to raise. Judges will focus on four characteristics when choosing this year's grand champion: size, symmetry, pattern and color.

For more information, check out http://www.waikikiaquarium.org/interact/annual-events/international-koi-show/.

Size

In addition to other key characteristics, bigger is better when it comes to koi. The size of the koi often correlates with its age and koi quality is often more certain with older koi.

Symmetry

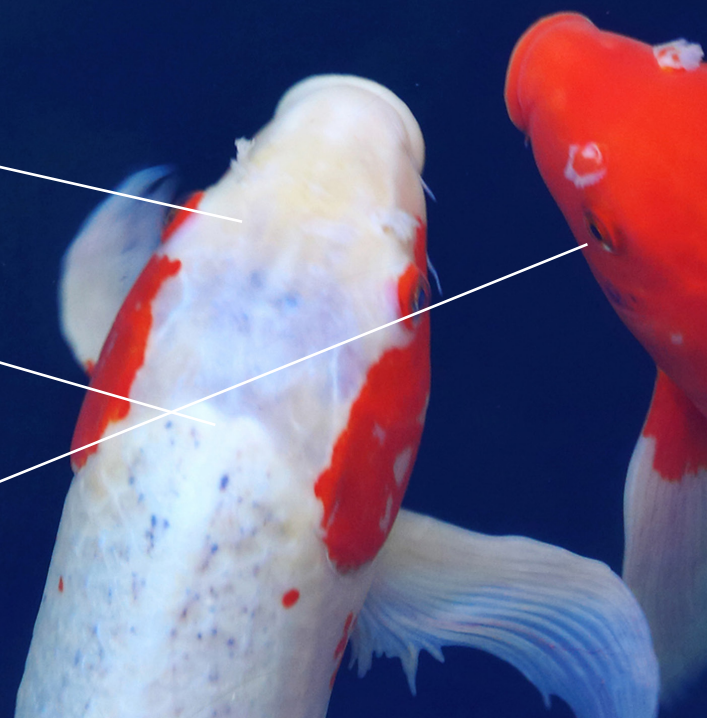
Desirable koi should have symmetrical physical attributes such as its fins, shoulders and head. In addition, its colors and patterns should also have a level of symmetry.

Pattern

Distinct and unique patterns that are uniform and lack blemishes are very important when grading koi.

Color

The purity and depth of color is key when looking for koi. Pay specific attention to the purity of whites, depth of blacks, boldness of reds and lust of golds and platinums.



VOLUNTEER SPOTLIGHT

Volunteer Interview and spotlight by Volunteer writer: Neha Sharma

Not your ordinary retired, married couple, Brian and Caryll are familiar faces at the Waikīkī Aquarium. As Educators they volunteer at the touch pool, Monk Seal Habitat, and interpret the exhibits, so visitors get the most educational experience possible.

Both originally from Ohio, the couple first set eyes on Hawai'i when Brian was stationed at Kane'ohe Bay in 1963. According to Caryll, it was love at first sight. "I think that's when we really found a home in Hawai'i, and that's what made it so easy to come back here," she says with a smile. As for the Waikīkī Aquarium, there were a number of factors that led to the couple's effort to get involved, including "its history, its status, and its proximity," explains Brian.

Caryll and Brian most certainly have found a home at the Aquarium. As Caryll explains, it's "incredibly fun interacting with all the people, all the different nationalities. And of course, we're giving back to the community. I think that's what keeps us here – we feel appreciated and we really like the feeling of o'hana."

Outside their time spent volunteering, Brian and Caryll make an effort to stay active and healthy. They play tennis, hike, and do outrigger canoe paddling. The couple also loves to travel. "We just came back from Korea!," says Caryll. In fact, one of the couple's favorite things about the volunteer community at the Waikīkī Aquarium is that it is so accommodating of their travels. "We have the opportunity to take a break from volunteering and go traveling, and then we can come back and start right where we left off. A lot of places won't let you have that kind of flexibility," Caryll explains.

As for their favorite experiences at the Aquarium, Brian always looks forward to the Ke Kani O Ke Kai summer concert series and Caryll loves Family Night – "the kids really enjoy all our efforts and the staff are so creative!" In the coming months, Brian and Caryll look forward to enjoying the various opportunities offered by the Waikīkī Aquarium.

VOLUNTEER ENRICHMENT

The Waikīkī Aquarium Volunteer Center aims to inspire Aquarium volunteers through enrichments, such as educational lectures by Dr. Richard Pyle and other world renowned marine biologists, snorkel tours, reef walks, special tours of Coconut Island and, most recently, a mammal and fish training enrichment field trip to Dolphin Quest at Kahala Hotel. Dolphin Quest senior mammal trainers demonstrated current research being done on hormones through blowhole sampling, suction cup tracking devises, and dolphin heart research by using endoscopy and trained breathing behaviors. This research is made possible through skilled and dedicated training based on trust, enrichment items, proper diet and a safe atmosphere. In addition to Dolphin training, they also train their fish and rays to identify shapes and textures during feeding; this type of training is called target training and it allows for better care of the animals. Dolphin Quest shares this research free to community groups like the Aquarium volunteers and school groups. Aquarium Volunteers wanted to say a big thank you to the trainers at Dolphin Quest for sharing their training and research!

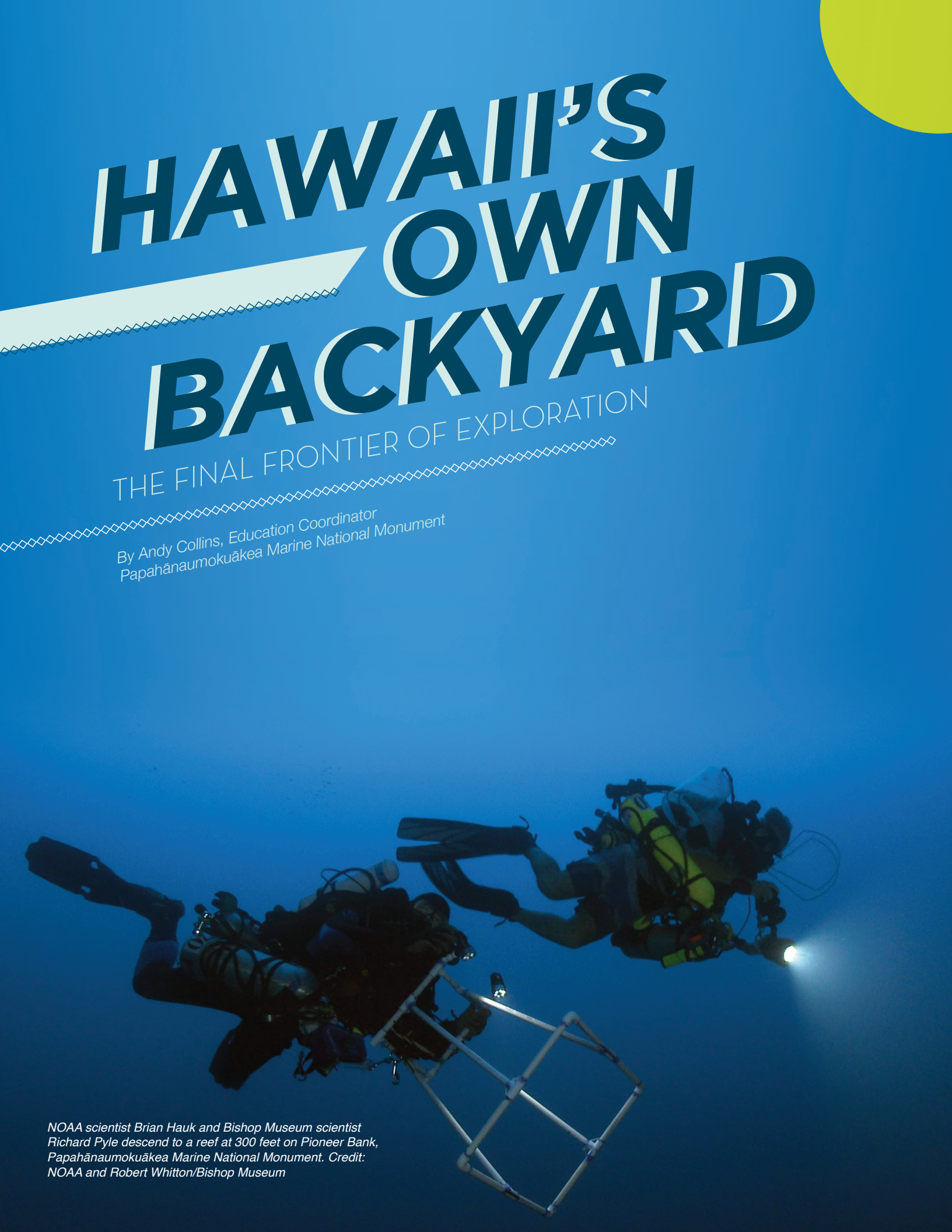
We hope you join our volunteer ohana!

Becoming a Waikīkī Aquarium volunteer is easy and so rewarding. There are volunteer positions inside and outside, flexible and long-term, and no experience is necessary. To apply today, visit www.waikikiaquarium.org/support/volunteer to start the application process.

HAWAII'S OWN BACKYARD

THE FINAL FRONTIER OF EXPLORATION

By Andy Collins, Education Coordinator
Papahānaumokuākea Marine National Monument



NOAA scientist Brian Hauk and Bishop Museum scientist Richard Pyle descend to a reef at 300 feet on Pioneer Bank, Papahānaumokuākea Marine National Monument. Credit: NOAA and Robert Whitton/Bishop Museum

Snorkeler counting fish at Kure Atoll in Papahānaumokuākea Marine National Monument in the northwestern Hawaiian Islands.

Photographer: NOAA Office of Papahānaumokuākea, 2006 Claire Fackler

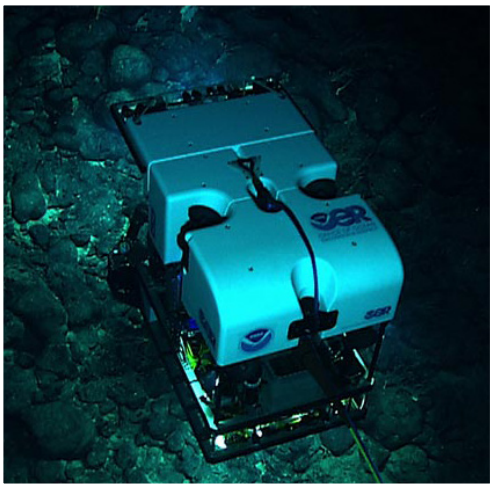
Papahānaumokuākea Marine National Monument and World Heritage Site in the Northwestern Hawaiian Islands is one of the largest marine protected areas on Earth and mostly unexplored. Nearly every year NOAA research expeditions to the Monument document new marine species and new species records.

Annual reef assessment and monitoring expeditions, conducted since 2000, attempt to document change over time in the marine areas within recreational SCUBA diving and snorkeling depths. One of the major changes observed over the last 15 years has been change in coral cover due to bleaching events and impacts from algal blooms. In 2014, several reefs in the Monument experienced severe coral bleaching due to abnormally high seawater temperatures causing the third major coral bleaching event in the Northwestern Hawaiian Islands. In August 2015, a team of scientists from NOAA and the Hawai'i Institute of Marine Biology revisited sites inside the Monument where they had documented bleaching in 2014. While some areas exhibited recovery, other areas such as the coral reefs around Lisianski Island showed coral mortalities ranging between 85 to 100 percent, with little to no signs of recovery. This is particularly troubling since one of the coral species with the highest levels of mortality in the Monument is an endemic species with few colonies elsewhere in the Hawaiian Archipelago.

In 2015 abnormally high water temperatures appear to be focused in the main eight Hawaiian Islands rather than in the Northwestern Hawaiian Islands and this may allow some coral recovery up in the North. However, with rising global temperatures, corals across Hawai'i and around the world are likely to see more bleaching events in the near future.

Two other NOAA research expeditions to the Northwestern Hawaiian Islands this summer allowed scientists to explore deep-sea habitats never before seen by human eyes.

Researchers aboard our nation's first and only Federal exploration vessel, *NOAA Ship Okeanos Explorer*, conducted two missions to deep-sea ridges, seamounts and unique geologic features along the Hawaiian Archipelago using a two-body remotely operated vehicle (ROV) system tethered to the ship. The deepest dive was down to 4,829 meters (nearly 16,000 feet, or 3 miles!) southeast of Maro Reef. This was also the deepest dive ever conducted inside the Monument.

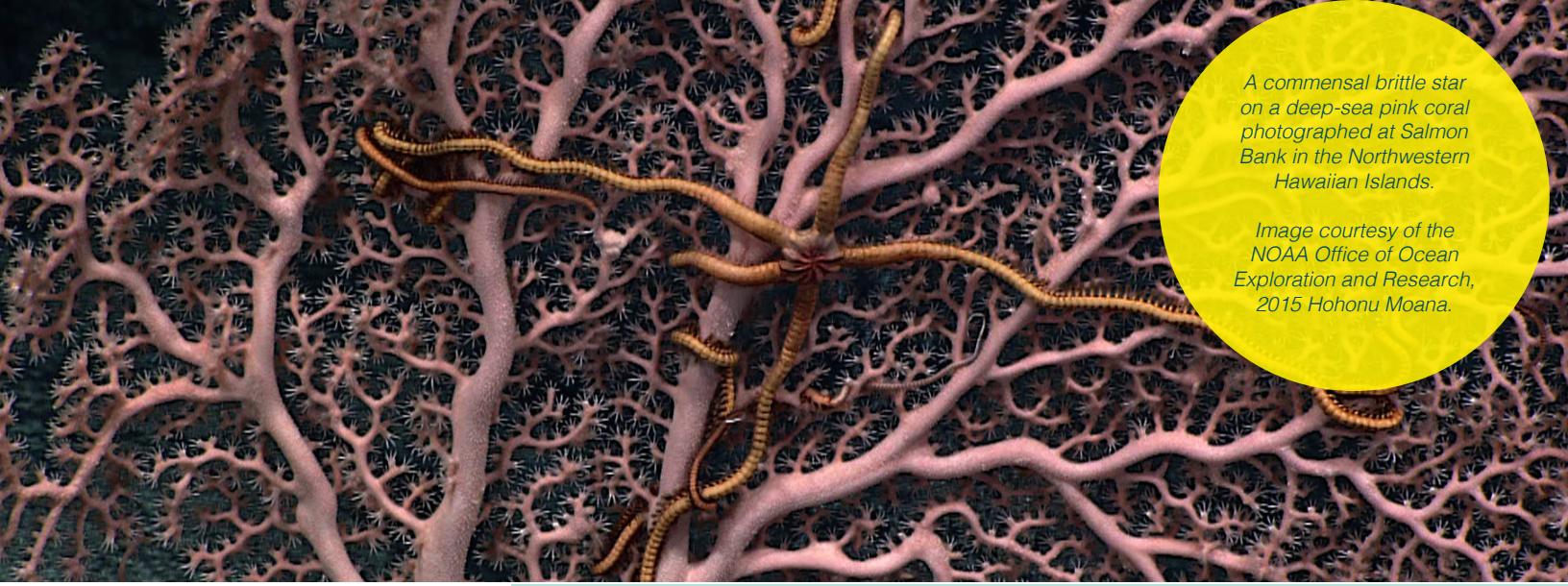


The ROV Deep Discoverer explores the deep waters of the Monument. Credit: NOAA Office of Ocean Exploration and Research, 2015 Hohonu Moana

Footage from the ROVs' high-definition cameras was broadcast live on the Internet for public viewing and scientific use. Scientists from around the world were able to participate in these expeditions remotely by viewing live streams over the Internet and providing scientific interpretations in real time. This near instantaneous collaboration allowed land-based scientists to request that the ROV change course and investigate areas of interest during the dive. Giant sponges, large communities of deep-sea corals, unique fish, invertebrates and fascinating deep-sea geologic features were among the stunning observations made from the missions. The ROV also collected biologic and geologic samples, which were shipped to labs around the world for study. Most of the invertebrate specimens collected represent new species or new records for the Hawaiian Archipelago.

Rare species at a depth of 300 feet at Kure Atoll in Papahānaumokuākea Marine National Monument. Left: a new species of wrasse (family Suezichthys). Center: unidentified species of sea urchin. Right: Struhsaker's damselfish (Chromis struhsakeri), never before seen by divers (this species of fish was previously known only from deep trawls and submersible observations). Credit: NOAA and Richard Pyle/Bishop Museum

Later in the summer, scientists aboard NOAA Ship Hi'ialakai surveyed mesophotic areas around a number of the seamounts, atolls and islands within Papahānaumokuākea Marine National Monument. Utilizing closed-



A commensal brittle star on a deep-sea pink coral photographed at Salmon Bank in the Northwestern Hawaiian Islands.

Image courtesy of the NOAA Office of Ocean Exploration and Research, 2015 Hohonu Moana.

circuit rebreather technologies, researchers from NOAA, Bishop Museum and University of Hawai'i surveyed coral reef areas between 50 and 90 meters depth. This depth stratum is one of the least explored in the marine realm since only recent advances in SCUBA diving technology have made it safe and cost-effective to conduct explorations to these depths, and it is generally too shallow for submersibles given the great expense of those technologies.

The surveys conducted at the northernmost atolls in the Hawaiian Archipelago revealed an extremely high abundance of species found only in the Hawaiian Islands. On some of the deep reefs surveyed, 100 percent of the fishes recorded were endemic – meaning that they are all unique to the Hawaiian Archipelago. This is the highest level of endemism recorded from any ecosystem on Earth. The mission also documented what are thought to be new records for the region, and possibly a new species of seahorse found at a depth of 90 meters on Pioneer Bank.

New species or records can take several years and extensive deliberation amongst taxonomic specialists before they are confirmed, so we will have to wait for final word on these observations.

Andy Collins is the Education Coordinator for Papahānaumokuākea Marine National Monument and oversees the Monument's education programs on three islands. Last August he participated in an expedition to the Monument that located the wreck of the USS Mission San Miguel at Maro Reef.

MORE FROM THE EXPEDITION

Expedition science leads Christopher Kelley (background) and Daniel Wagner (foreground) monitor an ROV dive in the science control room of the Okeanos Explorer. Credit: NOAA Office of Ocean Exploration and Research, 2015 Hohonu Moana

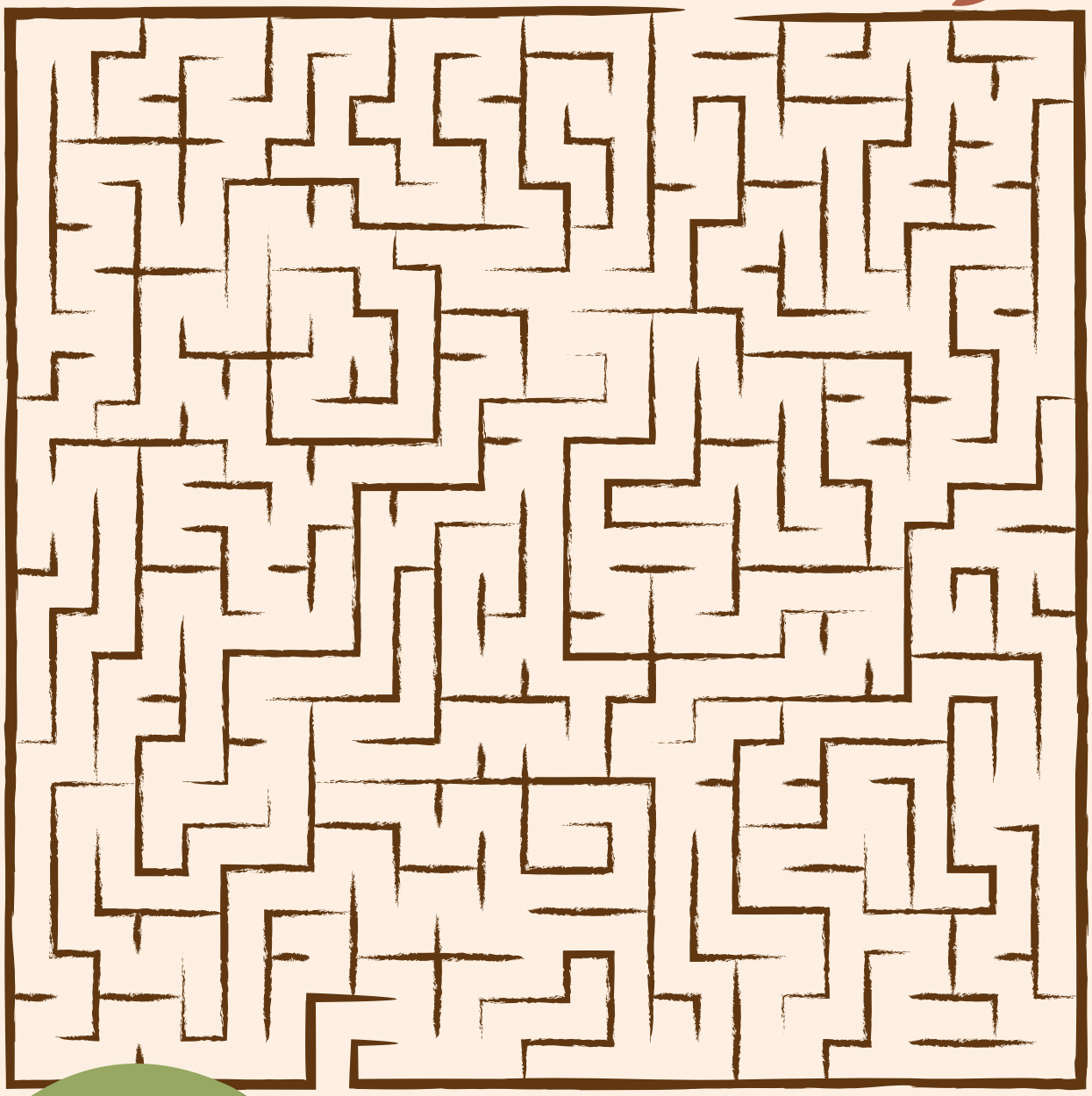
A new species of seahorse collected by NOAA scientists at 300 feet on Pioneer Bank inside Papahānaumokuākea Marine National Monument. Credit: Brian Hauk/NOAA

The ROV Deep Discoverer being brought back on deck of the Okeanos Explorer after a successful dive. Credit: NOAA Office of Ocean Exploration and Research, 2015 Hohonu Moana

A high-density community of deep-sea corals and sponges at a depth of 2,000 meters (that's more than a mile deep!) surveyed during the expedition. Credit: NOAA Office of Ocean Exploration and Research, 2015 Hohonu Moana

SEA SQUIRTS

THIS LITTLE HERMIT CRAB NEEDS TO MOVE INTO A NEW HOME. CAN YOU HELP IT GET TO ITS NEW SHELL?



YOU MADE IT! NOW THIS LITTLE CRAB HAS A NEW COZY HOME THAT'S THE PERFECT SIZE!

EDUCATION CLASSES

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.

KEIKI TIME

Wednesdays at 9:15 a.m.
January 20th (Fish)
January 27th (Turtles)
April 6th (Fish)
April 13th (Turtles)
April 20th (Sharks)
April 27th (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 kids 1 to 4 years-old. $10/person, $6/member.

CRITTER ENCOUNTERS

Mondays January 25th, February 1st, February 29th, March 14th at 9:30 am

Wednesdays, February 10th and 24th, March 2nd, 9th 16th, 23rd, 30th at 10:00 am

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.

BEHIND THE SCENES

Every Thursday 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).

AQUARIUM AFTER DARK

Tuesday March 15 at 6:30-8:30 p.m.

Discover if fish sleep on an after-dark flashlight tour of the Aquarium. Find the sleeping spot for the red-toothed triggerfish or the rock-mover wrasse. Are yellow tang always yellow? Come for a class followed by a tour of the exhibits. Minimum age 5 years; youngsters must be accompanied by an adult. $14/adult, $10/child (Members receive a 40 percent discount).

CLASSES FOR GROUPS

Waikīkī Aquarium offers a variety classes for community and family groups from 8 people to 45 people. Book a Private Aquarium Tour or 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.

ACTIVITY REGISTRATION FORM

NAME(S)

Adults _____ Phone (Home) _____

Children/Ages _____ Phone (Work) _____

Address _____

City/State/Zip _____ Email _____

PLEASE REGISTER ME FOR

Activity	Session	Date(s)	Number of Adults/Children	Price
	/			
	/			
	/			
	/			

Total amount of payment enclosed (check payable to "University of Hawai'i"):

IF PAYING BY CREDIT CARD

Credit card # _____ VISA ☐ MC ☐

Expiration Date _____ Last three digits of security code on back of card _____

I am a FOWA Member Yes ☐ No ☐

You are What You Eat

By Dr. Celia Smith, Professor of Botany, University of Hawai'i at Manoā

Most people would agree that a healthy reef has lots of colorful fish and an occasional shark that swims through. But our healthy reefs are also home to hundreds of species of marine plants. Like plants on land, these ocean plants provide food for those colorful reef fish, urchins and even the green sea turtle, Chelonia mydas. Most locals would also know that a few of our reef plants, the limu, are the food of our luau and the latest ono innovation, poke bowls. Beyond food, though, reef plants provide shelter and even absorb nutrients from surrounding water. These observations lead us to realize that reef plants are fundamental to Hawai'i's coral reefs. In recent decades many of Hawai'i's reefs have changed dramatically, and the negative impacts are far reaching.

A Hawaiian honu with the tumor-forming disease fibropapillomatosis caused by invasive algae species.

Photo Credit: Chris Stankis

After World War II, increases in shipping and international research brought non-native marine plants, also called seaweeds, to Hawai‘i. Because these species are not native to any Hawaiian ecosystem, most of these introductions probably failed without anyone detecting them. However, a few species did survive and now thrive on Hawaiian reefs. Also during this time, agriculture and wastewater from our growing urban population and tourism infrastructure introduced unprecedented amounts of nutrients to many of our reefs. Seaweeds were in the right place to acquire extra nitrogen and outcompete natives. The combination of non-native species and increased nutrients shifted many reefs from native limu to seaweeds, a state that persists today.

Because reef plants are food for reef herbivores, increases in native limu should benefit the herbivores that eat these plants. For green sea turtles, our honu, this could be particularly true. Honu rely almost exclusively on larger reef plants as food. Historical records show that green turtles were once widespread and abundant in Hawai‘i but were heavily harvested and neared extinction in the late 1960s. Since protection under the U.S. Endangered Species Act in 1974, the green turtles have been a conservation success story in Hawai‘i, and their population has grown at roughly 5 percent a year.

Sargassum polyphyllum.

For honu, though the proliferation of invasive seaweeds seemed to have caused more harm than good. No one knows precisely when, but a tumor-forming disease known as fibropapillomatosis, or FP for short, appeared in honu, sometime after 1950. By the early 1980s, the disease was widespread in some locations and caused many strandings and deaths. Many feared that after decades of hunting, the depleted population would now succumb to this new disease. Though this has not occurred, NOAA records show that the disease persists. FP is the number one cause of death for honu, by far, since such records have been kept.

So what is causing the disease? Today there is scientific consensus that the tumors appear because the turtles are infected with a herpesvirus. Though dozens of studies have confirmed this, in some ways this is an odd explanation. Typically for herpesviruses, they may be widely distributed in the host population, but symptoms of disease do not always show up.

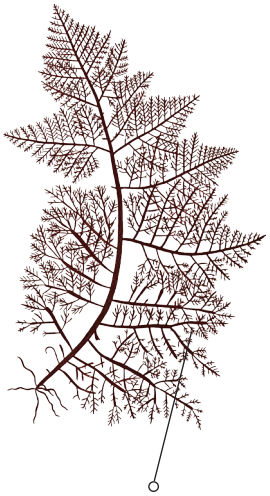
In 2010, Dr. Kyle Van Houtan from the National Oceanic and Atmospheric Administration (NOAA) and colleagues published a PLoS One paper that linked

Pterocladiella capillacea.

FP to nutrients increases from land-based sources, a ‘nitrogen footprint‘ for watersheds. With this exciting breakthrough came a proposed mechanism. These researchers tied together the ability of all plants to store nitrogen as an amino acid, arginine, which has a critical role in FP. Arginine is an essential factor and required by the herpesvirus for tumor development. They suggested that in times when nutrients load into coastal water, seaweeds take up extra nitrogen from the environment and synthesize arginine that seaweeds store in their tissues. If turtles graze on seaweeds from nutrient rich habitats, then turtles are eating arginine-loaded tissues that promote the herpesvirus and thus tumors. The turtles were literally eating themselves sick.

In 2014, Dr. Van Houtan and Botany researchers Meg Dailer, Migiwa Kawachi and I published new results in PeerJ. We tested Van Houtan‘s mechanism by analyzing the tissues of limu and seaweed tissues based on their habitat status. The support for Van Houtan‘s mechanism has become even stronger with realization that turtles grazing on seaweeds in impacted sites increased their arginine intake up to 14 times when compared with background level from a diet of plants from healthy reefs.

In an interesting twist, early NOAA data also



Pterocladiella capillacea.

record that green turtles in some coastal areas were covered in tumors, and then kilometers away, turtles could be disease free. The disease seemed to be tied to sites, not other factors, as expected by the nitrogen-footprint concept. This key observation led us to propose that if we can cut the nutrient loading into coastal ecosystems, the algae, native and invasive species, will eventually have less arginine stored in tissues. Experiments on Maui are underway to test this concept as we continue to try to find ways to use this information to help manage the health of our coastal species – for grazers, limu and us!

MEMBERS LIST

Patrick & Jamie Ahler
Jason Aleshire
Steve Allen
Kate & John Doe Ambash
Darius Amjadi & Beverly Davis
Gabriel & Eleanor Amos
Marion Ano
Dr. Bud Antonelis & Ms. Brandy Antonelis
Ralph Aona & Tonia Mahi
Lance & Yau Lee Arakaki
Mr. Elvin Arroyo
Douglas Ascalon
Kenneth & Mae Au
Patricia Conjugacion Augustine
Ronald & Yuko Baker
Roger & Jana Baniaga
Sean & Maryann Barr
Robert Barry
Trina Bashem
Gary & Pat Bilyk
Paul Bishay & Marisol Tirado
Scott & Norie Bloom
Kendall Bossert
Thomas & Katie Brady
Chalen Brown
Mr. & Mrs. Brown
Richard & Jacey Brown
Cong Bui
Gerald & Takara Bullock
Thomas Burke & Marie Wagner
Joshua & Miriam Caliboso
Mrs. Melinda Call
Suzanne Carlos
Bruce A. Carlson
Jennifer and Christopher Carter
Charaspden Chardenpakdi & Frank Kim
Chris & Jun Young Yim Chase
Jeremy & Ashley Cheng
Keric & Amanda Chin
Ms. Deane M. Chinen
Brandon & Grady Choi
Carole Chun
Kenneth B. Chun
Mrs. Louise Chung
Travis & Hannah Clegg
Adam & Alane Cole
Jeff & Donna Conklin
Mr. & Mrs. Edward K. Conklin
Nancee Crispin
Denis & Beverly Curry
Myrna Daguio & Jennifer Tucker
Kathryn & Kevin Daisey
Eryn David
Sanna Saks Deutsch
Ms. Yolanda Deweese & Mr. Cleveland Mederios
Andy Do
Askok C. Do
Craig & Nicole Dobson
Rodney & Anicque Domingo
W. C. Donnelly
Mr. Robert & Dr. Cherie Dubats
Patti Eisinger
Lyndall & Jackquelyn Ellingson
Dr. Ardis Eschenberg and Mr. Gary Paulson
Devin Eselius
Robert & Jennifer Evans
Bernard Fajota
Gregory & Janet Fong
William & Helen Foote
Mr. & Mrs. David and Jocelyn Franks
Phyllis Frus
Elaine Fujimoto & Bessie Au
Taku & Carolyn Fujimoto
Drs. Roy & Christine Gal
Bric & Heather Galuteria
Pat & Hoagy Gamble
Levi & Michelle Geer
Matt Gilbert & Noriko Bansai
Christy Glab
Dr. Dru Gladney & Dr. Nancy Chen
Rodney & Bette Go
Michelle Goodin
Mark Goto
Angela Grace
Kevin & Christine Greenwell
Tiffany & Andrew Gromlich
Drs. Hagino & Ashton
Renee Haili
Mr. Shuji Hamamoto
Todd & Lynn Hamamoto
Kay Hampton
Donald & Shirley Hasenyager
Jay Hashimoto
Kumiko Hayashi
Wallace T. Hayashi
Mr. & Mrs. Rick Hendrix
Natif Henry
Ryan Higa & Jacqueline Tellei
Virginia Hinshaw
Hazel Hirayama, Joy Matsukawa & Dayle Hirayama
Victor & Ida Ho
Joseph & Kimberly Holland
Becky Kimball Hommon
Travis Hong & Eileen Zorc
Liane & Brian Hoole
Gene & Josephine Horita
Amiee Horton
Jake Houseman & Alicia Moy
John & Michiko Hudson
Calvin Huynh & Ang Nguyen
Celeste & Ken Ibara
Scott Imada
Charlene S. In & Paul Billington
Kathryn K. Inkinen
Glen & Lynne Inouye
Todd & Jennifer Inouye
Alexis Inso & Barbara Gacki
Chiyo Ishibashi
Alanna Isobe
K. Jensen
Walter & Ellen Jinbo
Keisuke & Noriko Jo
Michelle & Daniel John
Tatiana & Dominic Johnson
Olivia and Queenie Jove
D. Wayne & Nanette Judd
Hoyoon Jung & Eunjoo Lee
Dr. Janet Kalus
Dr. Mary Jo Noonan & Dr. Adam B. Kanis
Derek & Alyssa Kauanoe
Guy Kellogg & Hanh Nguyen
Mark & Kathleen Kilby
LUNA
Yong Shin & Hyun Ok Kim
Joy & Bob Kinzie
Linda Knox
Tad & Lynn Kobayashi
David H. Kotomori
Thomas Kruemmel
Mr. & Mrs. Dudley Y. Kubo
Brownie Kuk
Jeffrey Kuwabara
Mrs. Kimiko LaHaela Walter
Patrick & Maile Lam
David E. Latham
Dennison Lau
Mr. & Mrs. Michael Lau
Ronald & Valerie Lau
Ryan & Stephanie Lau
Wendell & Bonnie Lee
Xavier & Yasuko Leleu
Mr. & Mrs. William B. Lennan
Henry Leoiki & Jennifer Leoiki-Drino
Aaron & Stephanie Leong
April K.Y. Leong
Mr. and Mrs. Herman Leong
Brian & Karen Libby
Wilbert & Valerie Liu
Michael & Tiffani Lloyd
Ms. Kimberly Locksley
Jeffrey Loh & Caroline Chang
Mr. & Mrs. Charles W. Loomis
Mr. & Mrs. Tim Lucas
Adele Lum & Blair Akiona
Eric & Kelly Lum
Kevin & Nikol Luoma
Troy & Danna Lyman
Mrs. Nancy Lyum
Donna Makishima
Shawn Manini
Kaleen & Jason Martin
Leilani Martin
Michael & Brigitte Mcmahon
Linda McNamara
L. Richard Melcher
Philip Meltmar
Tate Metler & Rebeccah Rodrigues-Metler
Mr. Jon H. Miki
Cafey Millard
Ralph & Janet Miller
Carole R. Milner G.G.
Chiyoko Mirikitani & Yaeko Moritomo
James & Hannah Miyachi
Sydney and Katie Miyasato
Marcella Montoya
Mrs. Brandy Moreland
Peter Moser & Kolby Moser
Mr. & Mrs. Edwin Motoshige
Eric Mueller
Todd Murphy
Mr. & Mrs. Michael Muus
Jason & Raylene Nagai
Mr. & Mrs. George I. Nagao
Janice Y. Nakama
Ricky & Stacie Nakamura
Mr. and Mrs. Tim Newsham
Howard & Barbara Nihei
Ernest Naomi Nishizaki & Family
Amy No
Roy & Kathy Noda
Myles & Miwa Nomura
Eric & Maya Nouchi
Gilbert Olivera
Clinton & Kristen Ono
Mr. & Mrs. Kenneth N. Ono
Mark & Wendy Onodera
Alexander & Xuemei Ortiz
Enrick B. Ortiz, Jr.
Richard & Cindy Oshimo
Ryan & June Oshiro
Lisa Ota & Jane Ota
Mr. and Mrs. Eric Palacol
Kyle Pang & Jennifer Foley
Stephanie & Joanne Park
Diane Parker
Matthew & Amy Phillips
Miriam & Mark Pinho
Chad & Jessica Podoski
Peter & Marina Poerzgen
Megan Porter
Leilani Pyle
Casey & Serah Reed
Dr. & Mrs. Ernst & Ilze Reese
Randi & David Roberts
Tyler & Christy Robertson
Cade & Waileia Roster
Ann Ruby
The Ryckman Family
Tetsuaki & Yoshimi Saihara
Teri Sato
Robin Scanlon
Fabian & Ingrid Schloesser
Brooke & Naomi Schnider
Heather & Jacob Schuhlein
Mr. Gabe Scotti
Ms. Eileen Shea & Mrs. Lavonne Shea
Matthew & Sheri Shido
Mr. & Mrs. David Shinbara
John & Karin Shinkawa
Adam & Nikki Shinsato
Mr. Scott Shiraishi
Michael & Silvia Shower
Dr. Rajesh Shrestha
Chad & Danica Sills
Mrs. Sandra Simonds
Constance Smales
Kim Smith
Christopher Song
Rebecca Soon
Dr. & Mrs. Gary D. Stice
Matthew & Haruna Stone
Rachel Subido
Ben Suiso & Gail Tice
Hiro & Lori Sung
Victoria Sutton
Rika Suzuki
Andrea Swanson
Robert & Kaily Switson
Wayne & Sandra Takahashi
Lynette Tamashiro
Mark Tamashiro
Dave & Melissa Tamura
Miwako Tanahashi
Ted & Gayle Terayama
Wade & Kristi Teruya
Calvin Tong and Karen Tsubata
Judge and Mrs. Michael Town
Cheryl Kawaoka
Keith & Machiko Truelove
Mr. & Mrs. Dick Tsuda
Tsuyoshi & Rei Tsurumi
Travis & Diana Tucker
James & Wendy Umino
Mr. Kirk Urbanski
LiAnn Uyeda & Shannalei Allison-Tavares
Arthur Vargas
Shari Vasconcellos & Flory Visoria
Mr. & Mrs. Carl C. Vetter
Rick & Andrea Wagner
James & Ann Walkinshaw
Loren Watanuki
Heather & Blake Wawrzenski
Nancy D. Westcott
Adam & Rebecca White
Emi White
Paul & Jennifer White
Robert B. & Flora Whittier
Victor & Jennifer Winter
Brenda Wong
Drs. Jeffrey & Rupa Wong
Mr. & Mrs. Gregory and Caryn Wong
Randal & Yvonne Wong
Steffany & Keith Mark Wong
Taryn Wong & Talia Wong Tanaka
Thomas Woodrow
Mr. and Mrs. Solomon Woodward
Erin Wright
Thomas Yamachika
Yamagata Family
Derek & Cindy Yamamoto
Scott & Vonceil Yara
Isaac Yi
David Yoshishige & Nadine Doi
Tim & Paula Young
Mr. & Mrs. Elmer Y.S. Yuen
Lynn & Gloriette Zane
Ms. Alison Zecha

WALL OF FAME

OCTOBER - NOVEMBER 2015

The beautiful exhibits at the Waikīkī Aquarium and the valuable research and conservation efforts that go on behind the scenes are the result of the work of many. Mahalo to all those who support us through their generous donations.

CORPORATE SUPPORT

Alexander & Baldwin, Inc.
Art of Aloha- Patrice Federspeil
Event Photo Solutions
Foodland Supermarkets
Martin & MacArthur
Naturally Hawaiian, LLC
Patrick Ching

FOUNDATIONS, TRUSTS, GRANTS

Central Pacific Bank Foundation
University of Hawaii at Manoa SEED
Weissman Family Foundation

IN SUPPORT OF OUR MISSION

Garner Bemis
Jean M. Carr
Gail Grabowsky
David Harrison
Karen Honda
Sandra M. Kaneshiro
Robert Kim
Hanako L. Kuniyoshi
Leihoku Elementary School
April K. Leong
New Hope Christan School
Peter Poerzgen
Marilyn Potter
David Sakai
Vance Tokumoto
Wilfred T. Ikemoto
Valerie Wilson

IN MEMORY OF

Christine Ling
Julliette Ling

SCHOOL OF WISHES

Don & Judi Young

IN-KIND DONATION

Dr. Stephen Miller
Diamond Head Bakery
Hannah Powers
Oceanic Aevis
Papa Johns Pizza
Whole Foods

Left to Right: Laurie Komatsu, UH Foundation; Denis Isono, Executive Vice President, Central Pacific Bank; Dr. Andrew Rossiter, Waikiki Aquarium; Susan Utsugi, Senior Vice President & Director, Central Pacific Bank

SEED

University of Hawaii at Manoa SEED Initiative for Diversity, Equity, Access and Success (IDEAS) recently awarded a grant to the Waikīkī Aquarium in collaboration with Kapi'olani Community College ASL/English Interpreter Education Program. Kapi'olani Community College professor Jan Fried will work with Dr. David Nickles, Aquarium IT coordinator to produce four video descriptions in American Sign Language of selected exhibits offered at the Aquarium. The video will be accessible in ASL and available electronically on a Deaf guests smartphone or tablet. This initiative will be available by June 2016.

FRIENDS OF WAIKĪKĪ AQUARIUM BOARD MESSAGE

Left to right: Lee Bell, Oceanic Hollis; Nancy Taylor and Charlie Loomis, FOWA

DR. MILLER PICTURE

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

KILO I'A Issue Number 195
2015 JANUARY / FEBRUARY / MARCH

NON-PROFIT ORG.
U.S. POSTAGE PAID
HONOLULU, HI

THE WAIKIKI AQUARIUM'S MISSION

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

FEATURING OUR WINNER OF THIS YEARS CALENDAR PHOTO CONTEST!

Photo Credit: Shane Myers