

Kilo iā

Quarterly Membership Publication of the Friends of the Waikiki Aquarium

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◆◆◆◆◆ FRIENDS OF THE WAIKĪKĪ AQUARIUM ◆◆◆◆◆

Dear friends,

Happy New Year from your Friends of the Waikiki Aquarium ohana! As we look forward to all of the possibilities and opportunities that a new year brings, we also want to take the time to reflect on how fortunate we were in 2018. Mahalo to all of our friends, partners and members who made it possible for us to support the Aquarium's mission to inspire and promote understanding, appreciation, and conservation of Pacific marine life.

With the arrival of the new year comes a period of change and transition at the Waikiki Aquarium. FOWA Executive Director Keane Akao has moved on due to unforeseen circumstances. We wish him well and thank him for his contributions over the last year. The search is on for a new Executive Director and we will continue to keep you apprised of our efforts in this area.

We look forward to continuing to present our signature events in 2019, including the Distinguished Lecture Series, Members Night and our ever-popular Ke Kani O Ke Kai summer concert series.

Thank you, again, for your unwavering support of the Friends of the Waikiki Aquarium.

Chris Cole
Friends of the Waikiki Aquarium Board of Directors



AQUARIUM MESSAGE

Kilo i'a

Issue Number 205

2019 | JANUARY | FEBRUARY | MARCH

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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.

Much research has been conducted on sea level rise and its impact on landmasses around the world, with scientists and researchers publishing new information every day on the many processes at work. As a direct consequence of climate change, sea level rise is especially important for us to understand in Hawaii, where our vulnerability as an island chain situated in the Pacific Ocean puts us at risk for a wide variety of its repercussions.

With sea level rise, there are a number of physical processes at work, including ongoing wave flooding, coastal erosion, and storm drain backflow and runoff, just to name a few. Recent 2018 studies have shown that a new understanding of these processes makes Hawaii nearly twice as vulnerable to future sea level rise as was previously estimated. Further studies have also found that, contrary to popular belief, Hawaii's coastal areas are not the only areas that would be impacted by sea level rise, advancing the claim that all low-lying areas as well as those immediately close to the shoreline are susceptible to sea level-related threats.

With sea levels rising an estimated one inch every five years and universal flooding increasing over 300 percent in the last 20 years, it's vital now more than ever to consider the widespread impact that sea level rise can have on all of Hawaii's vulnerable land areas, from coastal regions to low-lying inland areas.

Dr. Andrew Rossiter,
Director, Waikiki Aquarium



VOLUNTEER GIVES BACK

Alyssa Edu

Alyssa was a member of our 2016-2017 Teen Interpreter Program, designed to provide youth with the opportunity to learn more about Hawaiian marine life and share that knowledge with visitors from around the world.

What inspired you to do this project?

From the day I learned about the correlation between coral bleaching and chemical (conventional) sunscreens, I knew then and there that I was going to make a change and spread awareness. The ocean has played a large part in my upbringing and I felt it was my duty to help keep it safe and prospering, so that future generations will be able to see and appreciate it just as much as I do. Creating my own sunscreen was my way of helping to educate others and truly make a difference.

How did you develop Maluhia Organics?

Creating Maluhia Organics Sunscreen was no easy task. It took nearly half a year as well as extensive research and trial and error to produce a product I was truly satisfied with. There were many steps I needed to take to create this product, including deciding what natural ingredients would provide optimal SPF coverage; staying educated on all essential oils; and determining the precise, specific dosage of each ingredient. I also decided to take the project one step further and create my very own kukui nut oil, to put my own unique spin on the normal sunscreen.

Where did you sell it?

I advertised Maluhia Organics mainly via social media, specifically Instagram, to reach a wider audience. Throughout this project, I also reached out to multiple sunscreen organizations such as Goddess Garden for guidance in helping me maximize the impact of this project. Included in the Sunscreen Bags are Tin of Maluhia Organics Sunscreen (Goddess Garden: Sample Sunscreen Packets, Sticker, Button, Toxicity Card), and Jersey Shore Lip Balm.

Any additional comments?

Reef-safe sunscreen/mineral-based sunscreen is so important, especially here in Hawaii. Many of us consider the ocean our second home, so it's vital to take care of it and help spread the word on this timely issue. When I found out about the sunscreen bill that was recently approved, I was ecstatic! It's amazing to see that the state is acknowledging this issue and doing something about it. With the law that just passed, people everywhere are learning more about this issue and converting from conventional to mineral-based sunscreens, which is amazing to see. Hopefully I can improve on my sunscreen, with the end goal

Age: 18

School: Washington State University in Pullman

Area of study: Health Nutrition & Exercise Physiology, Minor in Business



Mahalo to Alyssa Edu for your innovative project! Alyssa is kindly donating all Maluhia Organics Sunscreen proceeds to support renovations to the Waikiki Aquarium's Living Reef Exhibit. We are inspired by your hard work and dedication to protecting our waters and minimizing harmful effects on our coral reefs.

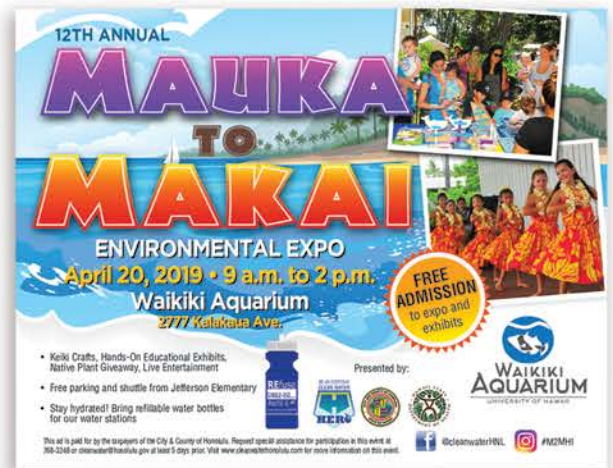


UPCOMING EVENTS

12th Annual Mauka To Makai Environmental Expo

Visit the Waikiki Aquarium for the 12th Annual Mauka to Makai Environmental Expo on Saturday, April 20. Held annually in celebration of Earth Month, this free family-friendly event promotes keeping Hawaii clean, protected and free of pollution, from the mountaintops to the ocean.

From 9 AM to 2 PM, guests will enjoy interactive booths, live entertainment and a variety of hands-on learning activities and displays that showcase the preservation and protection of Hawaii's land and sea. Food will be available for purchase, and complimentary water stations will be situated throughout the Aquarium (guests are encouraged to bring refillable water bottles).



Get excited for Ke Kani O Ke Kai 2019, the Waikiki Aquarium's popular annual summer concert series! We'll be making announcements on this year's lineup soon, but for now, mark your calendars for the 2019 five-concert series dates:

- June 13, 2019
- June 27, 2019
- July 11, 2019
- July 25, 2019
- August 8, 2019



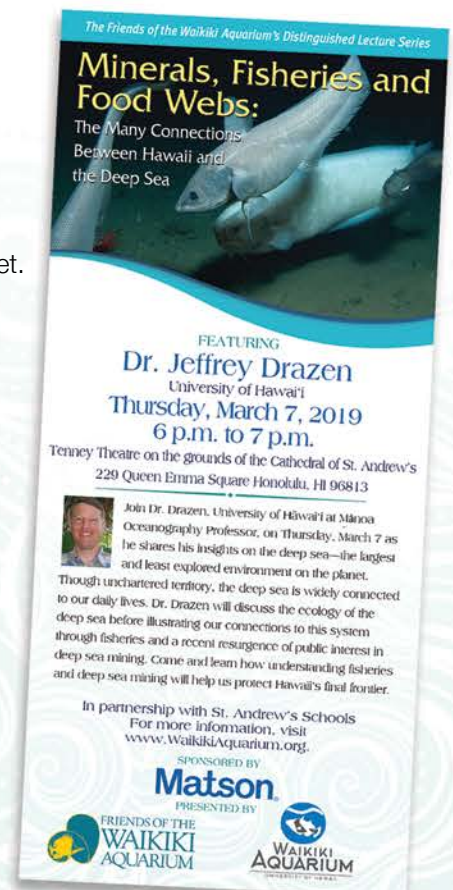
Minerals, Fisheries and Food Webs:

The many connections between Hawaii and the Deep Sea

Thursday, March 7, 2019 • 6 p.m. to 7 p.m.

Tenney Theatre on the grounds of the Cathedral of St. Andrew's

Join Dr. Drazen, University of Hawai'i at Mānoa Oceanography Professor, on Thursday, March 7 as he shares his insights on the deep sea—the largest and least explored environment on the planet. Though uncharted territory, the deep sea is widely connected to our daily lives. Dr. Drazen will discuss the ecology of the deep sea before illustrating our connections to this system through fisheries and a recent resurgence of public interest in deep sea mining. Come and learn how understanding fisheries and deep sea mining will help us protect Hawaii's final frontier.



WHALE WATCHING in Hawaii



Jason Moore_HIHWNMS

Lisa Peralta_HIHWNMS



Cindy Among-Serrao_HIHWNMS



Every winter, humpback whales make the seasonal trek from the chill of Alaska to Hawaii's warm waters, where they pass the time breeding, giving birth, and nursing their calves. This humpback homecoming is a thrilling time for the people of Hawaii, as we have the privilege of spotting these majestic marine mammals in their ocean home all winter long.

Also known by their Hawaiian name "Kohola," humpback whales hold deep cultural significance to Native Hawaiians, who view Kohola as a family aumakua, or spiritual ancestor who takes the form of an animal. Because of its cultural and historical importance, these aumakua are revered by both Native Hawaiians as well as the larger community, and treated with the utmost respect.

When seeing a humpback whale for the first time, it's easy to understand why they deserve such honor and respect. Ranging in size from 40 to 50 feet and weighing up to an incredible 45 tons, humpbacks are in fact remarkably graceful creatures, and can thrust nearly half of their bodies out of the water in a grand gesture known as breaching. They're also strong swimmers, using their flukes, or large tail fins, to propel them through the water.



Cindy Among-Serrao_HIHWNMS



Alicia Piavis_HIHWNMS

Currently in the midst of whale watching season, Hawaiian Islands Humpback Whale National Marine Sanctuary in partnership with the National Marine Sanctuary Foundation will host their annual Ocean Count on the last Saturdays in January, February and March. This community citizen science project is hosted every year during peak whale season and promotes public awareness about humpback whales, the sanctuary, and shore-based whale watching opportunities on Oahu, Kauai and Hawaii Island. By providing a snapshot of humpback whale sightings from the shore, volunteers tally these sightings and document the animals' surface behavior during the survey in an effort to supplement ongoing scientific research.

More than 300 volunteers are expected to participate in Ocean Count on Saturday, January 26, February 23 and March 30, and you can be one of them! Register for Ocean Count in advance at oceancount.org.


And if you want to see humpback whales up close and personal, trust our friends at Star of Honolulu to treat you to an ocean experience you'll never forget. From now through April 5, 2019, Star of Honolulu is offering Hawaii's most popular whale watch cruise daily, complete with guaranteed whale sightings, a Child FREE special, a crew of certified Naturalists and more. Call (808) 983-7827 or visit www.StarofHonolulu.com to book your cruise today.




Alicia Piavis_HIHWNMS

WINTER'S "MUST DO" ECO-TOUR WHALE WATCH


January 2 – April 5, 2019






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(\$40 value)



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of Honolulu



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StarofHonolulu.com

Hawaii I.D. required for purchase.
* One child (age 3-11) per paid adult is FREE on cruise-only packages. Ask for details. ♿



Members' Night

Mahalo to everyone who joined us on Saturday, November 17 for Members' Night! We hope you had an amazing time interacting with fellow members during this celebration of all things Aquarium. A special thank you to Tanioka's Seafoods and Catering and Temari Hawaii for spending time with us!



Distinguished Lecture Series

On Wednesday, November 14, we were pleased to host Dr. Scott Rowland, University of Hawaii at Manoa professor, as part of our Distinguished Lecture Series. Dr. Rowland's discussion, "The Spring-Summer 2018 Eruption of Kilauea," engaged attendees with reports on the active shield volcano that dominated the geologic news cycle last spring and summer. A professor in the Department of Geology & Geophysics and a prominent researcher in the community, Dr. Rowland has studied Kilauea, Mauna Loa and other volcanoes since the mid-1980s.

Waikīkī Aquarium Celebrates 115th Birthday



We're so excited to sea-lebrate the Waikīkī Aquarium's 115th birthday! Since opening its doors on March 19, 1904 to present day, the Aquarium has played a significant role in Hawaii's history, delighting visitors and residents alike with its engaging exhibits, special events, public lectures, activities and classes, live displays, and more.

As the second-oldest public aquarium in the US, the Waikīkī Aquarium was established in an effort to "show the world the riches of Hawaii's reefs." Since then, it's evolved into one of the premier aquariums in the nation, showcasing more than 500 marine species and maintaining more than 3,500 marine specimens in tandem with a variety of public exhibits, education programs and extensive research that focuses on the unique aquatic life of Hawaii and the tropical Pacific. Through its various initiatives over the past 115 years, the Waikīkī Aquarium continues to fulfill its mission to inspire and promote

understanding, appreciation, and conservation of Pacific marine life.

So swim on down to the Aquarium on **Sunday, March 24** for a full day of family friendly birthday festivities! From 9 a.m. to 2 p.m., we're filling the Aquarium with birthday cheer, complete with live entertainment, keiki activities, arts and crafts, delicious food and more. Special highlights include a crafts and education station, art with acclaimed Hawaii artists Patrick Ching and Dennis Mathewson, a creative LEGO display, and hands-on fun with the American Cetacean Society and Pigtales & Crewcuts. Then get ready to be wowed by entertainment courtesy of Halau Hale O Kahala and Park Rats Ukulele Group, as well as inflatables and a puppet show by Storybook Theatre of Hawaii.

For more information about this very special event, call (808) 923-9741 or visit www.waikikiaquarium.org. We can't wait to celebrate 115 years with you!



VOLUNTEER SPOTLIGHT

Volunteer Holiday Appreciation

Every December the Aquarium shows its appreciation to our dedicated volunteers at the annual Volunteer Holiday Party. This year, nearly 150 volunteers and their guests were treated to a memorable evening of good food, fun, and wonderful prizes thanks to our generous sponsors:

- Aqua Aston
- Duke's Waikiki
- Hula Grill
- Kona Brew
- Hard Rock Cafe
- Aqua Zone
- Kualoa Ranch
- Dennis Mathewson Art
- Mignardise Confections

The Friends of the Waikiki Aquarium supported this volunteer event and many others throughout the 2018 year. We look forward to seeing what 2019 has in store!



Photos courtesy of Event Photo Solutions LLC

CLASSES & ACTIVITIES

AQUARIUM'S TOP 5

Mondays at Noon

Learn more about the oldest giant clam in captivity, those weird and wonderful seahorses, and fish unique to the Aquarium during this short presentation, free with Aquarium admission.

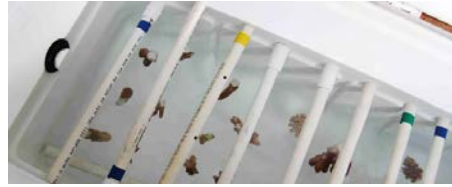


AFTERNOONS AT THE AQUARIUM

Wednesdays at 2:00 PM

Join the Aquarium for an interactive learning activity near the Aquaculture Deck. Free with Aquarium admission.

BEHIND THE SCENES



Tuesdays at 3:00 PM

Learn more about how our staff and volunteers care for our exhibits and animals with a behind-the-scenes tour! Peek behind the glass to inspect the tanks, then visit the Coral Farm and the Jelly Hale, where sea jellies are raised. Accessibility is limited. Minimum age: 7 years; youngsters must be accompanied by an adult. Members: \$9.60 for adults and \$6 for children ages 7-12 (Non-members: \$16 for adults and \$10 for children ages 7-12, plus Aquarium admission).

HAWAIIAN REEF ANIMALS

Thursdays at 10:00 AM

Get a sneak peek behind the scenes and learn about Hawaiian reef animals. Hold a sea star, feel a sea cucumber and feed an anemone. This 30-minute program is a great addition to any visit to the Waikiki Aquarium. Perfect for families with children ages 4 and up. \$2 per person, plus Aquarium admission.



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



WOVEN APPROACHES

Understanding Ecological Impacts of Community Management

By Mehana Blaich Vaughan

Communities across Hawai'i are working tirelessly to restore local level management of fisheries based on traditional knowledge and practices.

In Hā'ena, on the island of Kaua'i, community leaders and fishermen and women have worked for 30 years with the State of Hawai'i to develop local fishing rules based on traditional knowledge.

A prime example of the importance of incorporating local knowledge is the success seen in Mākua, a lagoon within Hā'ena enclosed by a large fringing reef. Elders describe Mākua, whose name means "parent" in Hawaiian, as a key spawning area. One woman recalled being told as a young girl not to walk close to the shoreline in this area because footsteps would scare the baby fish into deeper waters, where they would be eaten by predators. Based on the elders' historical knowledge of this area as a key hatchery and feeding area, the community has banned all entry into a portion of Mākua, not only for fishing but also for recreational activities such as snorkeling, diving, and kite surfing which they understand disturb the fish.

When community leaders proposed the Mākua protected area as part of their local level management rules, certain state agencies required additional documentation of Mākua's importance, along with the impacts of non-extractive uses on fish populations. So, Hā'ena community members invited

researchers from the University of Hawai'i (UH) at Mānoa to conduct studies which verified that the area was indeed a hatchery. Now that the Hā'ena rules have become law, UH students who worked on these and other Hā'ena fishery studies as part of their graduate work are returning to help the community document the impacts of local level policies and management, including regulation of recreational uses at Mākua. In April 2018, a major flooding event cut off the highway along with tourist access to Hā'ena, offering an opportunity to measure effects of this unanticipated area closure.

Two of the researchers, Jade Delevaux and Kosta Stamoulis, surveyed Hā'ena most recently in July 2018 and again, the first weekend in September 2018. While there, they worked with fishermen who described how close to shore the schools of fish are now coming. As one fisherman exclaimed, "It's just how I remember growing up. I never thought I would see it this way again in my lifetime, but now my grandchildren are seeing it."

The researchers are now working with fishermen to develop techniques to document fish populations based on local knowledge of fish behavior and aggregation. They are piloting use of underwater cameras to capture behavioral changes as well as increases in abundance. Initial surveys by these researchers, as well as others working with the State of Hawai'i Department of Aquatic Resources, document increased numbers of fish as well as an increase in individual



in Hā'ena After the Floods

sizes under community-based management. These findings support the importance of developing laws and management approaches based upon community knowledge, for example, of key places, like Mākua, that should be left alone to replenish and restock surrounding areas.

In the summer of 2018, the Hā'ena community was able to raise funds to hire four summer interns, all high school students from local families. These students spent the summer learning techniques, passed down from generation to generation, to monitor ecological health of these fisheries. They are looking holistically at environmental indicators, from the mountain to the sea and throughout the year, to account for seasonal changes in the ecosystem.

The students' work is part of a larger project guided by Pelika Andrade, faculty with UH at Hilo and Hawai'i Sea Grant, and Emily Cadiz, a graduate of UH Mānoa's Department of Natural Resources and Environmental Management. The students are connecting with other communities in Ka'ūpulehu on Hawai'i Island and as far away as New Zealand, who are not only applying traditional knowledge in contemporary policy and management, but also reinvigorating and adapting this knowledge for everyday use well into the future.

About Ka Pili Kai

Hawai'i Sea Grant's free biannual magazine celebrates the people and places across the Pacific region and our deep

connection to all things related to the sea through vivid photographs and inspiring stories. To read the latest issue or subscribe for free, please visit <http://seagrants.soest.hawaii.edu/resources/ka-pili-kai/>.

About Dr. Mehana Blaich Vaughan

Dr. Mehana Blaich Vaughan is an environmental social scientist whose work focuses on indigenous and community-based natural resource management. She comes from Namahana and Kalihiwai Kaua'i, at the intersection of the rural moku (districts) of Halele'a and Ko'olau. Vaughan's research, teaching, and outreach are all interconnected around themes of eco-cultural restoration, 'āina-based education, and community or collaborative management. Students in her classes participate in research projects that meet community needs, and community members help to serve as teachers.

Vaughan is an assistant professor at the University of Hawai'i at Mānoa in the Department of Natural Resources and Environmental Management in the College of Tropical Agriculture and Human Resources. She is jointly appointed in the Sea Grant College Program under the School of Ocean and Earth Science and Technology and Hui 'Āina Momona, an effort to build connections between the University system and rural Hawai'i communities to enhance community level capacity for natural resource management.

Vaughan is the Author of *Kaiāulu Gathering Tides*.



Day ☆ Octopus

The octopus is a cephalopod mollusc, most closely related to squid, cuttlefish, and the chambered nautilus. Octopuses completely lack the shell that characterizes more distant mollusc relatives like the snails and bivalves, but they have the same basic body design: a head with eyes, a muscular foot (modified into eight arms), and a sac-like body mass that encloses the internal organs and gill chamber. The body mass is covered by a muscular layer of tissue called the mantle. In molluscs that do have shells, it is the mantle tissue that produces this external skeleton. Although the octopus lacks a shell, it is not without defenses and shows many fascinating adaptations for survival. The feature most responsible for the octopus' success is its well-developed nervous system.

Octopuses are probably the most "intelligent" of invertebrates and have demonstrated the ability to learn from experience. The octopus relies on its extraordinary sensory systems, brain, and motor coordination in all aspects of its life. The brain, enclosed in a protective "cranium" of cartilage, interprets sensory input from the eyes and other sense organs, and controls the delicate movements of eight very active arms. Octopuses monitor their environment, detecting prey, potential predators, and other octopuses using large and well-developed eyes that can form accurate images and detect slight movements. Their highly coordinated arms are also covered by sensory receptors that detect crustacean or molluscan prey as they crawl over the reef.

The octopus escapes detection by both prey and predators thanks to its ability to change skin color and texture to match its surroundings. Millions of pigment cells (chromatophores) in the skin expand or shrink when stimulated by the nervous

system, creating color patterns that can be changed instantly. In addition to camouflage, the chromatophores can be activated to create patterns used in communication with other octopuses. Other tiny muscles in the skin contract or relax to change the texture of the octopus' skin surface.

Octopuses are highly mobile predators that use their eight arms to crawl swiftly across the bottom. Short, darting movements and fast escapes are made by jet propulsion as water is inhaled into the mantle cavity (gill chamber) and then forced out through the siphon. The octopus captures mollusc or crustacean prey with a swift pounce before enveloping them in the arms and webbing of its body. The mouth is located on the underside of the body, in the center of the arms. As the prey is held fast by the suckers, a toxin produced by the salivary glands is injected to paralyze the prey and additional secretions containing digestive enzymes liquefy the flesh. The octopus then uses its parrot-like beak to tear the softened meat into small bites.

In the absence of a hard, protective shell, the well-developed nervous system of the octopus is an important part of its defense. Recognition of predators or a rival octopus depends largely on sight and color changes in the skin, which may camouflage the octopus or exaggerate its size to make it appear more threatening. For fast escapes, the octopus ejects a cloud of black ink from a special gland inside the mantle cavity. The ink is held together by mucus, forming a shape to distract the predator while the octopus escapes in a different direction. If cornered, an octopus can curl its arms back over the vulnerable head and body mass, exposing only the muscular suckers and sharp beak to the predator.



NEW & RENEWING MEMBERS

from October 2018 - December 2018

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Mr. and Mrs. Patrick Ahler
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Catherine & John Alo
Karen & Thomas Ambrosi
Anspach-Kobashigawa Ohana
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Lina Arquero
Nake'u Awai
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Herman & Angela Berger
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Adam & Lauren Bookatz
Adam & Lauren Bookatz
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Jodie & Mike Burgess
Sara Burley
Brandi Cadiz
Robert Calvert & Mary Rydell
Marilyn Carlsmith
Karen Carlson
Jean M. Carr
Ms. April Cascasan
Kim & Greg Chamberlain
Michael & Qianqian Chan
Walter & Pamela Xiaolei Chang
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Ms. Delores A. Clark
Michele & Michael Chavez-Pardini
Deane Chinen
Christopher Ching and
Sarah Graner
Jonathan & Nalani Ching
Mark Kahi Ching
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Travis Agustin
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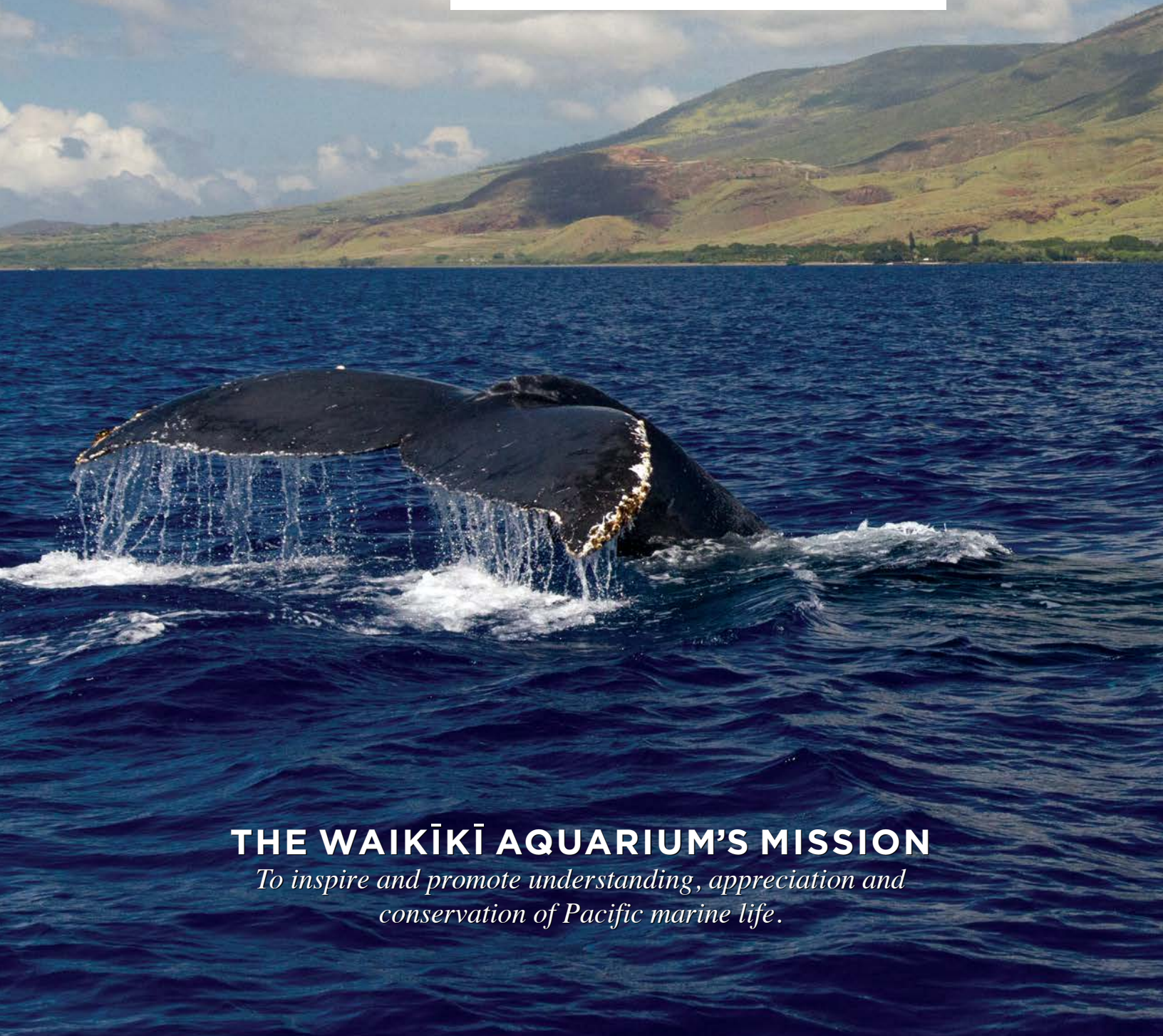
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