

Kilo iā

2016 | OCTOBER | NOVEMBER | DECEMBER

The Life of Sea Urchins

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Come see these Rock Boring sea urchins (*Echinometra mathaei*) at the Waikīkī Aquarium touch pools



Photo Credit: Greg McFall, NOAA

AQUARIUM MESSAGE

It's an exciting time for marine life with the expansion of the Papahānaumokuākea Marine National Monument to the largest marine protected area on Earth. Previously an area of 139,797 square miles, the fully-protected conservation area will now span 582,578 square miles. The expansion of this marine protected area is wonderful news and important to the survival of thousands of marine species.

Home to more than 7,000 species, a quarter of which are found nowhere else on earth, the marine ecosystems of the Northwestern Hawaiian Islands are threatened by

ocean acidification, warming and other impacts of climate change.

The Waikiki Aquarium is home to a Northwestern Hawaiian Islands exhibit, offering visitors a snapshot of the monument's unique marine life and ecosystem. Our 5,100-gallon exhibit features a living ecosystem representative of that found in the world's most isolated islands. Organisms like table corals, masked angelfish, yellow barbell goatfish and Japanese pygmy angelfish that are rarely seen around the main Hawaiian Islands are on display.



Visit our Northwestern Hawaiian Island Exhibit in Gallery 4

Kilo i'a

Issue Number 198

2016 / OCTOBER / NOVEMBER / DECEMBER

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PRINTING

Reskyu

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

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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.

RECENT EVENTS



Concert-goers enjoying live, local music at our summer concert series.

Ke Kani O Ke Kai

The Waikiki Aquarium made a splash with its Ke Kani O Ke Kai Summer Concert Series, featuring some of Hawaii's best in music and local cuisine. This year's star-studded lineup featured multiple Na Hoku Hanohano award winners like Chad Takatsugi, Streetlight Cadence, Amy Hanaiali'i, Maunaloa, Melveen Leed and more! Food was provided by our restaurant partners – Haili's Hawaiian Food, Cactus Restaurant, Laverne's Lunch Wagon & Catering and A Place to Eat – with a portion of the proceeds benefiting the Aquarium.

A big Mahalo to our presenting sponsor, Outrigger Hotels & Resorts, and our Seahorse Symphony, Coral Chorale and Anemone Tune sponsors for their support this year. Proceeds from the concert series will benefit upcoming Waikiki Aquarium programs and projects.



Seahorse Symphony Sponsors (\$5,000)

- Beth Chang, Realtor
- Elite Parking
- Michael J. Marks Foundation
- Northwestern Mutual

Coral Chorale Sponsors (\$3,000)

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Anemone Tune Sponsors (\$1,500)

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- Marr Jones Wang
- Michael D. Rudy
- Mildred Tyson Foundation
- Pono Pacific Land Management, LLC

Other Sponsors

- Hawaii Dental Service \$500
- McKeague and Haley, Inc. \$250

2014 Na Hoku Hanohano award-winner, Streetlight Cadence, entertained a crowd of over 700 guests at the June 23rd concert.



Family Night: Marine Mysteries

Family Night was waves of fun, as almost 500 ocean detectives roamed the Aquarium grounds to solve the Case of the Missing Octopus. Keiki also learned how mantis shrimp eyes work, how bobtail squid glow, why box jelly stings hurt, where puka shells come from, what a cookie cutter shark bite looks like and much more.



Monk Seal Pin

On August 24th, Hard Rock Cafe unveiled a new monk seal pin. Created in partnership with the Communication Arts Program at Honolulu Community College, a portion of the proceeds from pin sales will benefit the Waikiki Aquarium. Visit Hard Rock Cafe Honolulu and pick one up at the Rock Shop for only \$12.



Marine Educators' Night

The Waikiki Aquarium welcomed marine educators on October 7th to explore the Aquarium while discovering new educational resources and catching up with old friends. NOAA's Ocean Explorer website and the "How do we Explore" curricula were highlighted, and educational non-profits and organizations provided instructional materials for teacher. Mahalo to NOAA's Ocean Explorer program and the National Marine Sanctuary Foundation for being our program sponsor.

RECENT EVENTS

Members Night at the Aquarium

Members swam by on November 13th for our annual Members Night. The evening featured a special presentation of Finding Nemo, which was shown on a 16-foot inflatable screen providing a fin-tastic evening of cinema -- popcorn included.

There were keiki activities like pipe cleaner marine animal crafts, new climate change puzzles and games, and Hawaiian shells and sands.

Guests packed dinner and enjoyed a picnic on the Aquarium lawn under the moonlight.



Moon Jelly Witches, Mystical Mermaids, Batfish and More Descend on the Aquarium for Halloween

Guests joined Harry the Halloween Hermit Crab and the Waikiki Aquarium for some spook-tacular fun on October 30 and 31. We celebrated Halloween with Moon jelly witches, mystical mermaids, batfish and more! Keiki who came dressed in their Halloween costumes received free entry (per paying adult) and entered our costume contest for their chance to win a \$125 Hard Rock Cafe gift card!

Mahalo to our program sponsor,
Aqua-Aston Hospitality.

AQUA-ASTON
HOSPITALITY



The Secret Life of Sea Urchins

For many locals, the sea urchin is most often associated with the delicious sushi dish uni, but these animals also are very important in maintaining coral reef health. Urchins are preyed upon by many marine organisms, including: birds, sea otters, fishes, crabs, octopuses, and sea stars. They also play a key role as herbivores in keeping algae (*seaweed*) in check.

Herbivores are essential to a healthy reef: without them, beautiful coral reefs can become algal forests in a very short period of time. While most urchins are generalist feeders, meaning that they are not very picky about what they eat, their love of algae makes them a great candidate for keeping algae from dominating coral reefs. This task has become much more difficult for all reef herbivores since the introduction of invasive seaweed species.

With the increasing threat of invasive (*non-native seaweeds that displace other native organisms*) seaweeds we are looking to a specific urchin to be the reef “cleaner”. The native collector urchin (*Tripneustes gratila*) is well-known for its habit of placing algae, rocks, and debris on its body and typically has a black body with short white, black and orange spines that radiate in five double rows from the center of the chest. The common urchin can be found in the intertidal zone, as well as to depths of 15 meters.

Since the 1950s, there has been an increase in the number of invasive seaweed species. The most common are Gorilla Ogo (*Gracilaria salicornia*), Spikey Seaweed (*Acanthophora spicifera*), and Leather mud weed (*Avrainvillea amadelpha*). These invaders have been transported to Hawai‘i in many ways, with the most common being for aquacultural purposes and accidental introductions on the hulls of ships.

Several efforts have been put forth in order to combat these invasive species. On a small scale these efforts include community based algae removals put on by many community and state groups including the Waikiki Aquarium in partnership with Dr. Celia Smith’s lab at the University of Hawai‘i at Mānoa. On a much larger scale the Department of Land and Natural Resources (DLNR) has been raising and out-planting urchins on the reefs in tandem with removal efforts in the Kāne‘ohe Bay area.

Anuenue Fisheries Research Center (AFRC) on Sand Island has been raising collector urchins from eggs to juveniles for out-planting on our reefs. Currently, the local population of collector urchins is too low to effectively control invasive seaweed growth, so AFRC and DLNR have been working to out-plant more urchins in Kāne‘ohe Bay.

Since 2011 approximately 300,000 dime sized collector urchins (5 months old) have been released onto several of the patch reefs in Kane‘ohe Bay. These urchins in combination with algal removal efforts, have led to a decrease in the overall biomass of these invasive seaweeds in the bay.

The Waikiki Aquarium has also participated in this effort by out-planting more than 200 of the AFRC raised urchins onto the reef flat directly in back of the Aquarium. While the invasive species in this area are different than those in Kane‘ohe Bay, they are no less damaging to the reefs.

Current research, some of which has been aided by the Waikiki Aquarium, examines the feeding preferences of collector urchins on native and invasive seaweeds. Other recent studies have focused on the survivability, the reason behind their “collecting” behavior, and effects of ocean acidification on growth and gonad size. Each study has the ultimate goal of bettering our understanding of how these organisms can aid us the struggle against invasive species and climate change.

As an island community, the ocean is very important to us. Hawaiians knew the ocean was the life of the island. Maintaining a healthy coral reef system is not only beneficial to the animals that live there, but also to our community and culture. Preventing invasive species of all types from moving in, and reducing the presence of invasive species has been and should continue to be an ongoing community project.

VOLUNTEER SPOTLIGHT

It was another busy year for the Waikiki Aquarium, filled with so many great events that would not have been possible without all of our dedicated volunteers. We are so thankful for our wonderful volunteer 'ohana who have supported the Aquarium throughout 2016 and look forward to another fin-tastic year!

Some of the many activities included:

- 112th Birthday Celebration
- Sprint Appreciation Dinner at Cafe Julia
- Whale Watch Tour on the Star of Honolulu
- Coconut Island Tour
- Ke Kani O Ke Kai
- Monk Seal Enrichment
- Tea with the Director
- Beach Clean Up



If you'd like to join our volunteer family, please visit the Aquarium website or call the Volunteer Office at 808-440-9020.



Become a Volunteer at the Waikīkī Aquarium!

Volunteers are ambassadors, representing the Waikīkī Aquarium by engaging visitors of all ages and backgrounds in one-on-one conversations and small group presentations! We offer a variety of opportunities including:

- Aquarium Educators
- School Support Group Docents
- Gift Shop Volunteers
- Aquarist Assistants
- Special Events

The training and time commitments for all of these opportunities vary based on the volunteer position.

To apply, complete the following steps:

- Complete the Volunteer Application located on the Volunteer Page of WaikikiAquarium.org
- Upload background Check to Application Profile
- Schedule Meet-and-Greet Session at Volunteer Center

Applicants must be 18 or older; no experience necessary. Benefits of becoming an Aquarium volunteer include:

- Aquarium Membership
- Inclusion on your resume
- Free enrichments, events, and activities
- Opportunity to meet lots of new and interesting people

Reef-Safe Sunscreens Are Key

Department of Land and Natural Resources



Photo credit: DLNR.

Sunscreens are essential to protecting human skin from the sun but beach-goers must also be conscious about the damage they may be causing to coral reefs. Recent studies have identified a compound commonly found in sunscreens called oxybenzone to be the cause of deformities in coral larvae (planulae) and an increased rate of coral bleaching that puts coral reef health at risk, reducing resiliency to climate change.

"One of the most important things you can do if you plan to get in or near the ocean in Hawai'i is to use a sunscreen that does not contain oxybenzone," said Dr. Bruce Anderson, administrator of the DLNR Division of Aquatic Resources. "Sunscreen chemicals wash off swimmers, surfers, paddlers, spearfishers, divers, and other ocean users. Even if you're just sunbathing on the beach, using beach showers will wash chemicals into the ocean. Researchers have found oxybenzone concentrations in some Hawaiian waters at more than 30 times the level considered safe for corals."

Protective sunscreens are especially important in Hawai'i where tropical latitudes result in direct sunlight that has less atmosphere to travel through than places farther from the equator. As a result, less of the sun's harmful ultraviolet (UV) radiation is filtered out and it's easy to sunburn. Sunscreens contain either minerals or chemicals as active ingredients to filter out UV, including oxybenzone.

This chemical, however, has negative effects not only on coral reefs but also on human health. Oxybenzone, octinoxate and homosalate have been shown to cause disruptive reproductive system effects due to their hormone-like activity. Oxybenzone and octinoxate have also been associated with moderate to high rates of skin allergy.

According to Anderson, "The only way you can know whether a sunscreen contains oxybenzone is to read the label. Some sunscreens may claim to be 'reef safe', but there is no agency which regulates that kind of claim. You really have to look at the ingredients."

He also recommends using water resistant sunscreens and those that contain mineral filters such as zinc oxide or titanium oxide. Rash guards and wet suits also reduce the area of exposed skin and thus the amount of sunscreen needed.



Badger Swap Table

SAVE THE DATE:
Waikiki Aquarium Gift Shop
December 8 • 2 to 4 p.m.

Featured products: Badger Sunscreens





School of Wishes

We welcome your donations toward a specific item on our wishlist. If you have any questions please contact MaryLou Foley at (808) 440-9027.

RESEARCH

\$2,000

MICROSCOPE
UPGRADES

*For research
tracking*

\$5,000

IPADS & SOFTWARE

\$15,000

EXHIBITS WATER QUALITY SYSTEM

LIVE EXHIBITS

\$10,000

LED LIGHTS FOR EXHIBITS

\$20,000

MATERIALS TO UPGRADE
HISTORICAL EXHIBITS

COMMUNITY OUTREACH

\$2,500 - 7,500

RADIO STATIONS AIR TIME FOR
PROMOTION OF AQUARIUM EVENTS

\$25,000

ENERGY EFFICIENT
AQUARIUM IDENTITY
MINI SUV

FACILITIES

\$360

(4) NIGHT SECURITY LIGHTS

\$770

DEMOLITION HAMMER DRILL

\$1,900

OUTDOOR SHADED LUNCH AREA

EDUCATION

\$2,500

INTERPRETIVE MATERIALS

\$8,000

CORAL CART

*To be used for
educational
activities*

GRAPHICS

\$400

CANON EOS REBEL T5
DIGITAL SLR CAMERA KIT
WITH EF-S 18-55MM IS II LENS

\$450

HUION GT-190S DRAWING TABLET

*To be used for in
house graphics*

INFORMATION TECHNOLOGY

\$500

20 BLUETOOTH IBEACONS

\$750

5 PIXSTAR PHOTO FRAMES

\$2,000

FLUKE NETWORKS AIRCHECK
WIFI TESTER

VOLUNTEER SUPPORT

\$500

(3) INTERPRETIVE STATION
UMBRELLA MISTERS

\$750

SNORKEL & MASKS FOR LIVE
EXHIBITS VOLUNTEERS

HAWAIIAN PLANT GUIDE

WĀIKĪKI AQUARIUM INTRODUCES NEW HAWAIIAN PLANT GUIDE

Enhancing the visitor experience, we recently unveiled a new self-guided Hawaiian Plant Tour featuring endemic (native) and indigenous coastal plants. The new guide supplements the current visitor experience, which includes free audio wands available in multiple languages, interactive touch screens at various exhibits, and volunteer-led activities throughout the Aquarium.

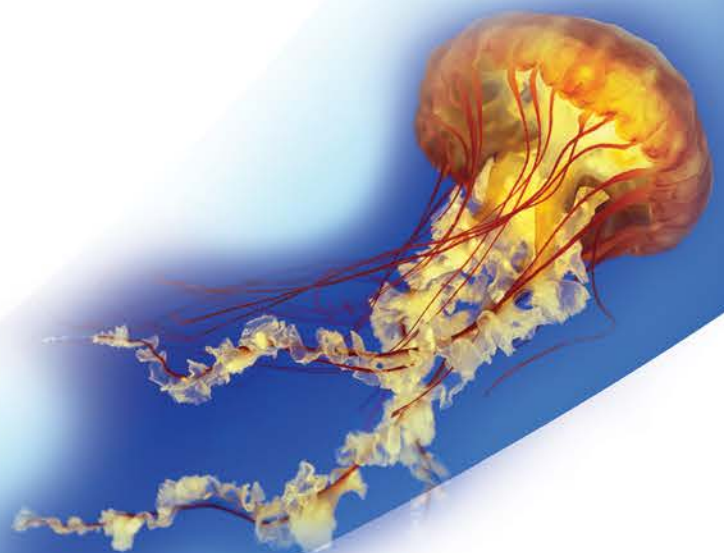
Available with admission, the tri-fold guide includes a map of where the plants are located within the Aquarium, as well as descriptions of and various facts about each of the species. Among the fifteen highlighted species are shrubs, ferns, vines, flower plants and trees. Some of the featured plants include the kukui or candle nut tree (*Aleurites moluccana*), a large tree with nuts rich in oil and used to clear the ocean waters for fishing; 'ākia, (*Wikstroemia uva-ursi*), a native shrub with bark, roots and leaves that are used to release a narcotic for stunning fish; and milo or portia tree (*Thesesia populnea*), a canoe plant with flowers that resemble the open mouth of the puhi lau milo or undulated moray eel.

Be sure to pick up a copy at the front desk during your next visit or find it on our website at <http://www.waikikiaquarium.org/experience/plants-seaweeds/hawaiian-plant-guide/>.

THE SCIENCE OF THE STING

Ever wonder why box jellyfish have such a powerful sting? Waikiki Aquarium's Education Department in conjunction with the John A. Burns Medical School have developed a new class for middle school students: The Science of the Sting. Using both the animals on exhibit in the Aquarium, and a lab set-up for the class, students will learn about venomous animals in Hawai'i. Topics covered include careers in biomedical science, venomous vs. poisonous animals, how sting treatments work, and why animals are venomous. Students will learn about nematocysts, the harpoon-like venom delivery system found in the stinging cells of corals, sea jellies and anemones by feeding anemones. Students will also shoot a model of a nematocyst at "prey."

If your middle school class is interested in participating, you can call 440-9007 or email roney@waquarium.org for more information.



CLASSES & ACTIVITIES

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.

Afternoons at the Aquarium

Every Wednesday 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

Fishes, turtles, 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, \$6/member.

Exploring the Reef at Night

Tuesday, December 13th, 7:00-9:00 p.m.

Search for night-active crabs, lobsters, eels and octopuses. Look for sleeping parrotfishes, triggerfishes and day octopuses in their dens. For the adventurous, ages 6 years and up; youngsters must be accompanied by an adult. Participants should be comfortable in the ocean, both day and night. \$20/ adult, \$15/child. \$15/adult \$10/child for members.

Critter Encounters

November 24, 21, and 28 at 9:30 a.m.
December 5 and 12 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 Waikiki Aquarium. Perfect for families with children 4 and up. \$5/person plus Aquarium admission.

Classes for Groups

Waikiki Aquarium offers a variety of classes for community and family groups from 8 to 45 people. Book a Private Aquarium Tour or 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@waqarium.org.

Register online at
[www.waikikiaquarium.org/
interact/activities-classes/](http://www.waikikiaquarium.org/interact/activities-classes/)

***Join us for one of our many
youth activities!***



The HAWAIIAN Turkeyfish

The Hawaiian turkeyfish (*Pterois sphex*) is one of 28 species of scorpionfishes that inhabit Hawaiian waters, 11 of which are endemic. Known as the showy member of the scorpionfish family, the Hawaiian turkeyfish has a habit of spreading its spiny fins when disturbed, a display reminiscent of a turkey's tail. This species is in sharp contrast to others in the scorpionfish family, which is generally highly camouflaged. It can grow up to 8 inches long, with a fantastic body displaying alternating white and brown/reddish bars. It exhibits elongated pectoral fin rays that extend nearly twice the length of the fin membrane.

The Hawaiian turkeyfish is uncommon and may be found resting motionless, perched sideways or hiding upside-down on the ceiling of a cave or crevice. A lucky daytime diver may occasionally spot it in the early morning or late afternoon. Named for their venomous fin spines capable of inflicting serious or fatal wounds, scorpionfishes put up a formidable defense against their predators. A nocturnal hunter, turkeyfishes prey on crustaceans (i.e., small crabs, shrimps) and small fish. As a skilled ambush predator, it corrals prey with its fan-like pectoral fins and has a lightning fast gulp reflex, much like the frogfish.

A sting from a scorpionfish in Hawai'i is very rare, but can be extremely painful. A sting on the hand from the Hawaiian turkeyfish has been described as having your fingers slammed repeatedly with a hammer. The most dangerous of the scorpionfishes, the stonefish, has been responsible for fatalities in the water but fortunately not in the Hawaiian Islands. As always, snorkelers and divers should avoid touching the reef and placing their hands into crevasses.

Turkeyfish are prized as "ornamental fish," thus collected in the wild for sale to aquarium hobbyists. Many areas around Hawai'i have been stripped of these fishes by commercial fish collectors, which only confirms the need to expand our marine protected areas.

In contrast to our rare, endemic species, two Indo-Pacific lionfish species (*Pterois volitans* and *P. miles*) have achieved notoriety during the past decade as they have quickly invaded the western Atlantic, raising major concerns about their impacts on native communities. Between 2004 and 2010, lionfish populations were found to have increased rapidly. In 2010, lionfish accounted for nearly 40% of the total predator biomass in an ecosystem. This increase in abundance coincided with a rapid (over just two years) 65% decline in the biomass of the 42 Atlantic fishes recorded as lionfish prey. These invasive lionfish have spread throughout

the Caribbean and as far south as Venezuela and north to North Carolina. Because of its extreme toxicity and potential as an invasive species, it is unlawful to import this fish into the state without special permits from the Hawai'i Department of Agriculture. The Hawaiian turkeyfish, is similar in appearance to these invasive species, but is a distinct species found only in Hawai'i.

Look for our Hawaiian Turkeyfish and Hawaiian Lionfish in the back of Gallery 3. We hope our wonderful windows to the sea will inspire you to learn more about marine life and conservation.

The Gift That Keeps on Swimming

This holiday sea-son, you can share your love for marine life with the Waikiki Aquarium's Christmas Membership gift certificates. The Aquarium offers six membership gift categories, including:

- Family Plus Membership (two adults, their children and two guests) for \$90
- Family Membership (two adults and their children) for \$65
- Grandparents Membership (two grandparents and up to six grandchildren) for \$65
- Individual Membership for \$45

*Children must be 18 years of age to be qualified as a child covered by membership

Members will have advance access and special discounts to functions throughout the year, along with these benefits:

- A full year of free admission to the Aquarium
- A year's subscription to the quarterly publication Kilo i'a
- A 20 percent discount at The Shop at the Waikiki Aquarium (excludes books)
- Invitations to exclusive member-only Aquarium events
- Rental of the Aquarium for evening events and daytime birthday parties
- Free saltwater pickup for home/office aquariums
- Free or discounted admission to select aquariums and zoos around the country
- Discounts with local businesses

To purchase a Christmas Membership gift certificate, visit www.waikikiaquarium.org or call the membership office at (808) 440-9054, or visit the Waikiki Aquarium's front desk. For more information about Aquarium memberships or to download an application, email membership@waquarium.org.



NEW & RENEWING MEMBERS

from May 2016 - June 2016

Mrs. Stephanie Ackerman
Mr. Richmond Ae'a and Ms. Alohi Ae'a
Mr. & Mrs. Lionel Aguiar
Mr. & Mrs. Timothy Aguilu
Mrs. Gailyn Ahuna-Lum
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FRIENDS OF WAIKIKI AQUARIUM BOARD MESSAGE

More than 300 volunteers help to make our mission to inspire and promote understanding, appreciation and conservation of Pacific marine life possible. We'd like to recognize one of our beloved Aquarium volunteers who lost his battle with cancer earlier this year.



Ed Van Wattering, a.k.a. "Special Ed", started volunteering as an Aquarium Interpreter and Educator back in September of 1993. He was a regular weekly face around the Aquarium, always arriving early for his shift to entertain the front desk staff with a funny joke, interesting anecdote or to just talk story.

Even after his passing, Ed continues to be a part of the Waikiki Aquarium, as he left a donation to support all of our programs. We extend a big Mahalo to Ed and his family — he will be truly missed.



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