

PACIFIC
Currents

Aquarium of the Pacific

FALL 2021



**Tentacles, Ink
& Intelligence!**

Be Like an Octopus— Adapt and Thrive

BY KATHERINE HANNIBAL



ROBIN BRIGGS

THE STORY OF OCTOPUSES IS ONE OF TRIUMPHANT CHANGE, INTRICATE NETWORKS, AND NECESSARY SACRIFICE. One of the oldest known animals, these majestic creatures have stood the test of time. At 296 million years old, with over 300 species, they have metamorphosed from hard-shelled creatures to intelligent organisms. Octopuses can actively edit their genetic makeup, allowing them to quickly adapt to their environments. They are known for their color-changing chromatophores that alter almost instantly to match any new landscape, but their intelligence goes deeper than that. Their whole body is a large neural network that creates a web of understanding and feeling. Studies even show that octopuses are able to learn from past experiences by adapting and creating new outcomes.

These intellectual beings also understand the power of sacrificing for something greater than themselves. At the end of their spawning season, both male and female individuals die as they create offspring. They spend the end of their lives furthering and bettering their population. From their neural network to their ability to modify behavior at a moment's notice, ending with the ultimate sacrifice, octopuses can serve as a model for redefining aspects of human society.

As an ecologist, I strive to understand the relationships between organisms and their environments. If you listen in on a conversation between two ecologists, you may hear the phrase “everything is connected.” This phrase encapsulates the idea that the world functions as a web, with every decision having an impact on every environment and organism. As a society, we must look to ecosystems and living things to teach us about the ability to coexist, adjust, and reimagine new ways of life. Currently, our world is at a tipping point. Several events this year have served as a catalyst for needed change,

with many asking “what happens next?” Recently the Intergovernmental Panel on Climate Change report reiterated the fact that anthropogenic climate change is rapidly affecting the way ecosystems function, threatening our lives as we know them. While this may seem disheartening, we can embrace the mutability of the octopus, reexamining our past behaviors and adapting to create actionable goals to improve the future. The climate crisis needs leaders in both individual and collective change, working together toward a common goal.

Anyone can adapt to become an activist with the right tools and a desire to have an impact. Like an octopus swimming across the ocean floor, this work can be tiresome. While swimming, the octopus's heart stops beating. They may crawl across the seafloor to save energy, taking the phrase “work smarter, not harder” to new levels. While this may seem daunting, octopuses also teach us to adapt to the cards we are dealt using the tools we have around us.

Creating a measurable goal for climate change is as simple as identifying the intersection between what you're good at and what needs to be done. If you are someone who loves to write, try writing to your local and national government officials asking them to pass laws protecting the environment. If you are someone who loves to cook, try creating meals that use low carbon emissions and local products. If you're an entrepreneur, create a business model that reflects a circular economy, where products are reused in myriad ways rather than thrown away. Now is our chance to learn with the octopuses and rapidly adapt our behavior to sacrifice for the greater good. I, for one, look forward to crawling across the ocean floor, working smarter toward change. I hope you will join us.



Katherine Hannibal is an M.S. candidate in biology at California State University, Northridge, and has a B.S. in marine biology from the University of Rhode Island. After earning a Ph.D., Hannibal's goal is to become an outreach and education director, promoting STEM and environmental awareness to underserved youth.



Letter from the CEO

Dear Members,

TALK TO STRANGERS. That is the message of a new book, *The Power of Strangers* by Joe Keohane. Joe is on to something. The world is suffering a global epidemic of loneliness. Our nasty politics exposes a failure to connect with others who think and look differently than we do.

The solution? Talk to strangers, especially strangers who are not part of your normal circle: that slickly veneered man in his \$2,000 suit and \$6,000 glasses; that noisy young woman with tattoos crawling up her neck and onto her cheek and metal piercings that you cannot stop staring at; or that gargantuan football player whom you assume is, well, just a football player. Psychologists have coined a phrase “the lesser minds problem” to describe a universal tendency to assume other’s minds are less sophisticated and more superficial than one’s own. Only by talking to these strangers can we learn the truth: They are not lesser minds.

Several ingenious experiments have shown that talking to strangers reduces depression and boosts energy. It is no accident that the best predictor of happiness and wellbeing is a person’s social relationships.

I believe a variation of Keohane’s thesis works for animals, as well. Specifically, I hypothesize that connecting with strange animals is every bit as therapeutic as talking to strange humans. We connect with humans to feel like we belong. We connect with animals to appreciate how much beauty and reasons for awe are out there, outside our own species and our material inventions.

When you talk to strangers you learn they are not so different. When you learn about strange creatures, you realize they really are THAT different—and you are curious and delighted. Cephalopods offer a special mystery. They are short-lived (usually less than two years) and are not social. These traits usually mean an absence of flexible behavior and primitive cognition. Yet, when trained to recognize patterns, octopuses demonstrate learning and remembering prowess equal to five-year-old children.

Why do you think cephalopods are so smart? No other mollusks come even close to cephalopods in intelligence.

My favorite cephalopod trick is that of the male cuttlefish who displays mating coloration on one side (one half) of his body as he courts a female. Meanwhile, on the other side of his body he displays female coloration to dupe any on-looking males into thinking he is a she, and hence not a competitor for the affections of female cuttlefish. Remarkable: one half of your body courting a female on your left, while the other half of your body takes on the appearance of a female to any males on your right so they will not steal your beloved.

Strange people and strange animals make life wonderful.

Sincerely,

Peter Kareiva

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Pacific Currents is published for members of the Aquarium of the Pacific. Please send your comments to our editorial staff at pacificcurrents@lbaop.org.

Our Mission: To instill a sense of wonder, respect, and stewardship for the Pacific Ocean, its inhabitants, and ecosystems.

Our Vision: To create an aquarium dedicated to conserving and building natural capital (nature and nature’s services) by building social capital (the interactions between and among peoples).

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The Aquarium of the Pacific is a non-profit 501(c)3 institution. To provide exciting and innovative exhibits and educational programs, we rely heavily on the generous donations of individuals, foundations, and corporations.





MADELINE WALDEN



MADELINE WALDEN

ISTOCK.COM/WILLIAMSHERMAN

Aquarium Helps Save Baby Seabirds

Elegant tern chicks in the Long Beach Harbor were falling into the water before they had fledged.

THE AQUARIUM ASSISTED in rescuing elegant tern chicks in the Long Beach Harbor this past summer. The birds had formed a colony on two barges in the harbor, and unfortunately, chicks started falling into the water. Because they had not fledged yet, meaning they had not grown their adult watertight feathers, the chicks would have drowned without the help of rescuers.

Staff members from the Aquarium went out on their boat to retrieve approximately thirty-five chicks each day from the water. The chicks were then transported to the clinic at International Bird Rescue (IBR) in San Pedro, where they were stabilized and hand-fed.

Organizations involved in this rescue effort included the Aquarium of the Pacific, IBR, the Oiled Wildlife Care Network (OWCN), California Department of Fish and Wildlife, California Science Center, Heal the Bay Aquarium, and Los Cerritos Wetlands Stewards. The Aquarium and partners' participation allowed the staff at IBR and OWCN to focus on the support and rehabilitation efforts at IBR's clinic.

Almost 600 chicks were rescued, and IBR estimates that about another 2,000 birds were saved thanks to the addition of low floating platforms installed near the

barges to help the birds get out of the water safely on their own.

In late July IBR began releasing rescued chicks back at the barge site. The released birds were marked with a non-toxic bright pink paint that wears off after about a month and a small red leg band, both approved by the USGS Bird Banding Laboratory. IBR staff members reported seeing the released chicks interacting with adults on the barge, suggesting they have successfully reintegrated into the colony. For more updates, visit birdrescue.org and click on Blog.

To help fund the care and feeding of the chicks, donations can be made at birdrescue.org. We also ask that people keep their distance from these barges and reduce speeds in this area when boating in the harbor.

Elegant terns are coastal seabirds that have nesting sites in Southern California and Baja California, Mexico. They migrate to Northern California in late summer and early fall, then migrate as far south as northern Chile in the winter. Although not listed as endangered, elegant terns are considered vulnerable because they rely on just a few nesting sites that are under threat from human encroachment.

Ollie the Sea Otter Departs on a New Adventure

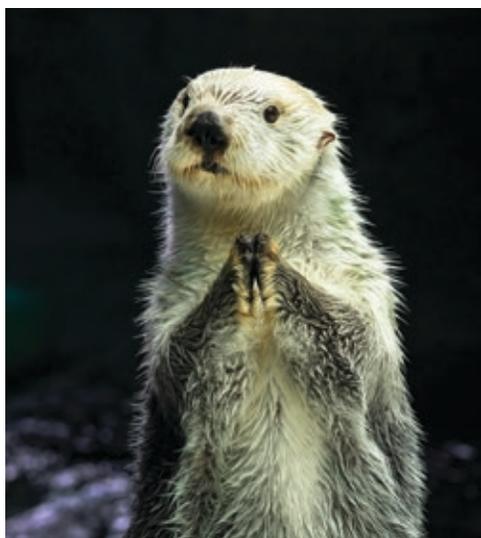
In her new role Ollie will help more people learn about sea otters and how we can help them.

OLLIE THE SEA OTTER was chosen to join another facility accredited by the Association of Zoos and Aquariums (AZA) and was transferred this past summer. She traveled by temperature-controlled cargo plane and was accompanied by two of the Aquarium's mammalogists to ensure her wellbeing and continuity of care at her new home.

When another AZA-accredited facility requested a sea otter from the community, we volunteered to assist them in establishing a new colony. Ollie's move is based on several factors, including that due to her age, she would be unable to serve as a potential surrogate mother to rescued pups that will be coming to the Aquarium in the future.

Ollie was rescued and deemed non-releasable in September 2010 when she was just two weeks old. She arrived at the Aquarium of the Pacific two months later and quickly took to her training. She was known at the Aquarium for her feisty behavior and tendency to steal food from her exhibit mates.

While we will miss Ollie very much, we are excited that she will be part of establishing another home for rescued sea otters and her story will continue to educate people on the importance of sea otter conservation.



Ollie arrived at the Aquarium eleven years ago as a rescued pup.

ROBIN RIEGGS



See New Animals on Your Next Visit

Find baby fish and new jellies at the Aquarium, including a species cultured here—a first for any U.S. aquarium!

IN RECENT MONTHS several new species have been added to exhibits at the Aquarium.

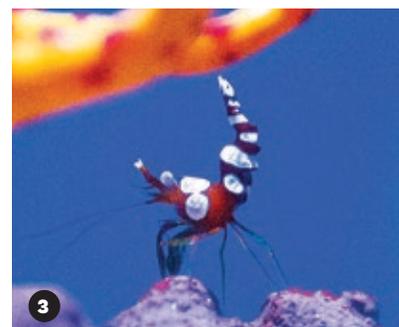
1 | Blue blubber jellies (*Catostylus mosaicus*): Find these mesmerizing jellies in the Tropical Pacific Gallery in the lagoon jelly exhibit near the end of the Tropical Tunnel.

2 | Beroe comb jellies (*Beroe cucumis*): Find these new comb jellies in the sea jelly area in the Northern Pacific Gallery. These animals were cultured in-house by Aquarist Josh Wagner and his team, a first for any U.S. aquarium.

3 | Sexy shrimp (*Thor amboinensis*): Baby sexy shrimp (named for their dance-like movements) were added to one of the Hidden Potential focus exhibits in the Tropical Pacific Gallery. These new animals were cultured at the Aquarium in behind-the-scenes nurseries.

4 | Blue-green chromis (*Chromis viridis*): Twenty juveniles of this type of damselfish were added to our Living Coral exhibit in the Tropical Pacific Gallery.

5 | Shiner surfperch (*Cymatogaster aggregata*): Juveniles of this fish species born and raised at the Aquarium were added to the Bays and Sounds exhibit in the Northern Pacific Gallery.





Tentacles, Ink & Intelligence

By Claire Atkinson

ROBIN REGIS



ROBIN REGIS



BRENT TRAFLET

Cephalopods have a sizable fan base among humans. We love them for their otherworldly appearance, their camouflaging and puzzle-solving abilities, and their fascinating mythology and lore. Meet the Aquarium’s cephalopods, including flamboyant cuttlefish, pamaja squid, and the giant Pacific octopus.

Meeting the Aquarium’s giant Pacific octopus—or GPO, as they are known at the Aquarium—up close, is an adventure that I won’t soon forget. You start by entering the Northern Pacific Gallery, venturing through a staff-only door, and then climbing up four hard metal rungs of a vertical ladder onto a platform that allows staff members to stand at the top of the exhibit to feed and care for the animals. I was met with two large black fiberglass barn doors latched with metal clasps. These doors open wide, providing a view of the whole exhibit. In the far corner at the surface of the water, Groot the GPO was resting mostly hidden, perched at the top of the clear acrylic window. All I could see was a narrow horizontal pile of pinkish-red undulating arms lined with suction cups as large as the size of a quarter.

To get his attention, the aquarist gently splashes water at Groot. Because he associates his aquarist caretakers with his regular offerings of food and toys, he quickly jets across the 8-foot-wide exhibit toward them. He moves with the agility of a cat and the speed of a hummingbird. His color becomes darker and more mottled and his skin becomes spiky—he’s excited to see his closest human friend, the one who climbs into his exhibit with him weekly

to clean. People can’t stay in Groot’s exhibit for long; the water is a frigid 48 degrees Fahrenheit.

Suddenly several octopus arms are draping over the edge of the doors searching us for the lingering taste of seafood, and I quickly realize this is a big animal, bigger than I perceived from afar. And he’s not yet full grown! I am cautioned to avoid his sharp beak at the center of his arms, but then urged to go ahead and touch the GPO. I gently lay my fingertips onto some of the suction cups of one of Groot’s arms and am instantly dazzled by the sensation of dozens of individually articulating suction cups exploring the surface of my skin. Finding nothing palatable, Groot attaches more and more suction cups until he has me by both forearms. It feels as though he could easily pull me headfirst into his underwater cave.

Groot’s slimy skin feels pillowy soft and smooth, yet his arms are ribbed below the surface with what feels like solid steel muscles. After Groot traps my arms, the aquarist gently but firmly pulls him off of me, noting that this doesn’t hurt him at all. Groot attaches his suction cups not as a reflex, but rather as a voluntary exploration that allows him to taste surfaces around him as he looks for food. GPOs can cling or release on a whim, and if Groot touches someone who has recently handled something with a strong smell, he often chooses to let go right away.

The interaction leaves me thrilled. I had not expected such a lively and intimate encounter with an animal that seems like it could outpace and outsmart me in every way. After all, each of the GPO's eight arms can operate and "think" independently, conducting eight different tasks at once. Most of their neurons are actually in their arms, so while they have one central brain, it's almost as if they also have eight mini-brains, one in each arm. While I am busy prying one of Groot's arms off my wrist, the others could be simultaneously cracking a crab's shell, looking for a gap in the exhibit's rockwork, and taking the lid off a peanut butter jar. A GPO can slip through tiny cracks or use its impressive strength to pry clam shells apart or lift heavy rocks. Here at the Aquarium they learn to sink toy boats stuffed with mussels and pull fish chunks out of dog toys with stunning speed. I wonder—should we use octopus federal agents to test bank vaults at Fort Knox?

Scintillating Cephalopods

In 2019 the Aquarium hosted a Cephalopod Movie Night with NPR's *Science Friday* show. The event featured short films about cephalopod science and a panel of experts to discuss the latest discoveries and answer questions from the audience. This was my first taste of cephalopod subculture; many attendees had intricately detailed cephalopod tattoos, and they eagerly rolled up their sleeves or pulled down their socks to compare body art. They wore tentacle stockings, octopus earrings, and squid shirts. They were clamoring to see new footage of the elusive vampire squid, and they were giddy to be among so many other fans of octopuses, cuttlefish, and squid.

Why are people so fascinated by cephalopods? What is it about these soft-bodied, tentacled creatures that engenders such devotion? Certainly, we appreciate the ways they are different from us. They have three hearts, they can shoot ink, and most of them (excluding nautiluses) have blue, copper-based blood. Their brains are donut-shaped, and they use venom to incapacitate their prey (a bite from a blue-ringed octopus can be fatal for humans). They look and move like something alien, although they have been here on Earth for millions of years longer than humans. Their color-changing and camouflaging abilities are jaw-dropping. Some are also bioluminescent. These and other attributes have inspired myths and legends in cultures around the world, from the Kraken, a sea monster from Norse mythology, to the god Kanaloa from Hawaiian culture, who would take the form of an octopus.

In some ways, however, they remind us of ourselves: They love a good puzzle, and they use tools. In 2009 scientists reported observing a veined octopus near Indonesia using coconut shells as a portable shelter. Scientists have also found evidence that octopuses like to play. A researcher in Canada found that octopuses will bounce an object around their tank using their jet.



The Cephalopod Family

Cephalopods are mollusks, related to animals with shells, like snails, mussels, and oysters. Ancient cephalopods first appeared in the fossil record about 530 million years ago. In that era, they were mostly slow-swimming animals with external shells. The only animals like these that survive to the modern day are chambered nautiluses and ram's horn squid. Cephalopods once dominated the sea—there are thousands more extinct species of cephalopods than there are in the ocean today. The modern cephalopod family includes just a few hundred species and ranges from the largest invertebrate animals on Earth, the giant squid, to the tiny squid in the genus *Idiosepius*, which only grow to about three-quarters of an inch long.

Characteristics in Common

In most cephalopods, the shell linking them to mollusks disappeared as the animals evolved over millennia. Squid still have an internal structure called a pen, a few octopuses have an internal cartilage shell, and cuttlefish have an internal shell called a cuttlebone that helps them maintain buoyancy. The characteristic they all share is having tentacles or a combination of tentacles and arms. What's the difference? Tentacles have suckers just at the ends and are used for feeding, while arms have suction cups on their entire length. Most cephalopods have eight to ten arms. Some have both arms and tentacles, and some only have tentacles, like nautiluses, which have about ninety. Many cephalopods can regrow an arm if they lose one.

They also pack a lot into a relatively short lifespan. Most cephalopods die shortly after mating. For GPOs, this means a life lasting three to five years. Some squid and octopus species live just six to twelve months. Females, especially among octopus species, are very dedicated mothers, spending their final days tending to their eggs and doing nothing else. For Aquarist Angelina Komatovich, caring for octopuses at the Aquarium as they enter this phase of life, called senescence, is always difficult. "The first few [octopuses] that I had were female. And so it's not a surprise. The day you see those eggs, you know. You can offer her food, and she's not going to take it. She's not going to leave her cave," she says.

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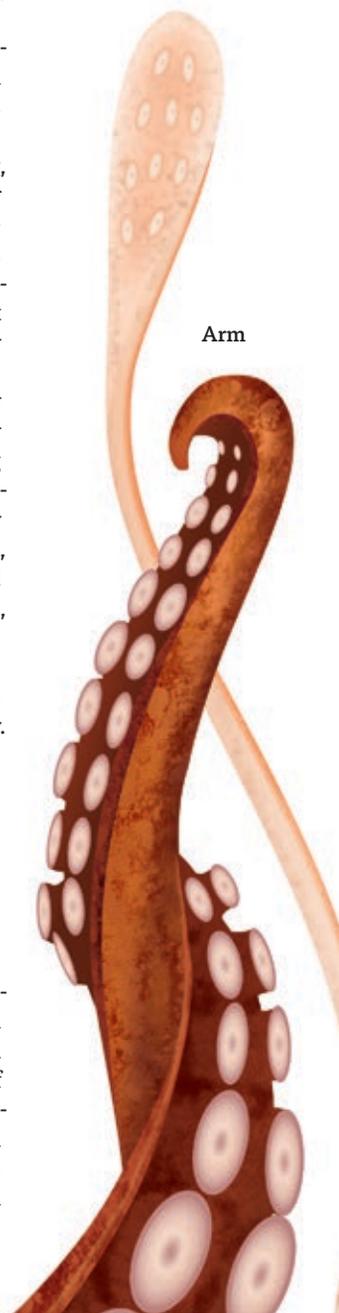
Giants at the Aquarium

The giant Pacific octopus is perhaps the Aquarium's best known cephalopod. Its exhibit can be found in the Northern Pacific Gallery past the diving birds and sea jellies.

This species is called giant for a reason. It is considered the largest octopus species, and the largest on record weighed about 110 pounds and its arms spanned 16 feet. The Aquarium keeps careful weight records of the Aquarium's GPOs. To weigh an octopus, the aquarist carefully scoops the creature out of the water and places it in a plastic basket. GPOs can live in tide pools in the wild and can be out of the water for up to fifteen

Tentacle

Arm



minutes—time they might spend moving from pool to pool in search of food. According to Aquarium records, Godzilla was the Aquarium’s largest GPO, weighing in at 60 pounds.

GPOs are also incredibly strong. Each suction cup on an adult octopus can hold about 10 pounds of pressure, and each arm has approximately 250 suction cups. Staff members at the Aquarium say there is no winning a game of tug-of-war with a GPO. If Groot grabs a scrub brush while someone is in his exhibit cleaning, they simply let him have it and pull out a spare.

The Aquarium’s GPOs all have had names starting with the letter G, in reference to the word “giant” in the common name. Past GPOs have included G3PO, Gari, Georgia, Geronimo, Gunda, Gia, Grad, Gumball, Gus, and Godzilla. These octopuses have made popular subjects for photography lovers visiting the Aquarium and are well loved by followers on social media, as well. A video of Godzilla sinking a toy boat full of mussels on TikTok has had 6.5 million views.

Enrichment

Toys are an important part of octopus care at the Aquarium. The aquarists create games for the octopuses by stuffing food into various toys and even complex objects made of plastic pipes and seeing how long it takes for the octopus to figure out the puzzle. This provides enrichment for the octopus, as it gets to exercise its outsized intelligence in pursuit of a snack. One of the staff’s favorite GPO enrichment activities, however, requires no toys at all. They place a different type of food in each of the octopus’s eight arms and stand back to watch the animal’s excitement, evidenced by rapid color and skin texture changes, as it tastes eight different types of food at once.

Personalities

The Aquarium’s GPOs all have had different personalities, the staff reports. Some have been calm and polite; others have been more mischievous or feisty, shooting a jet of water at the aquarist as soon as they open the barn doors or blocking the drain to make their exhibit overflow. Some would daintily take small bits of food one piece at a time, while others would grab the whole container of food or steal food from all the sea stars in their exhibit. “It can be like trying to put away laundry in a room with a toddler who’s pulling everything out of the drawers at the same time,” Komatovich says.

At two different aquariums, it has been reported that the animals learned to turn out the lights over their exhibits by squirting a jet of water at the bulbs, short-circuiting the power supply. This not only demonstrates their ability to learn and problem solve, but also their capacity to adapt to different environments and create conditions that they prefer.

More Cephalopods to See

In 2018 the Aquarium created a new exhibit in the Tropical Pacific Gallery called *Tentacles and Ink* to highlight cephalopods. Since then it has housed bigfin reef squid (1) and a day octopus (2). Elsewhere in the gallery, visitors can find more cephalopods from warm waters. Flamboyant cuttlefish (3) and pajama squid (4) are both on view in the Tropical Pacific Gallery. These tiny creatures share a focus exhibit in the Hidden Potential exhibit area.

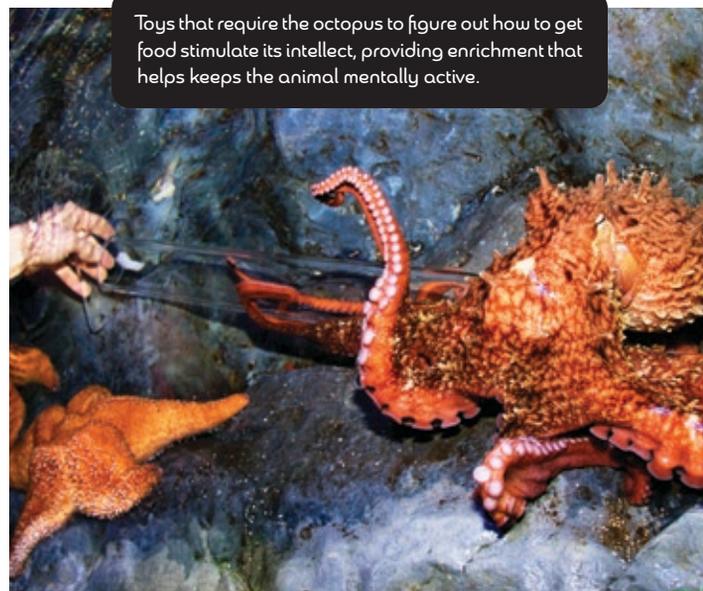
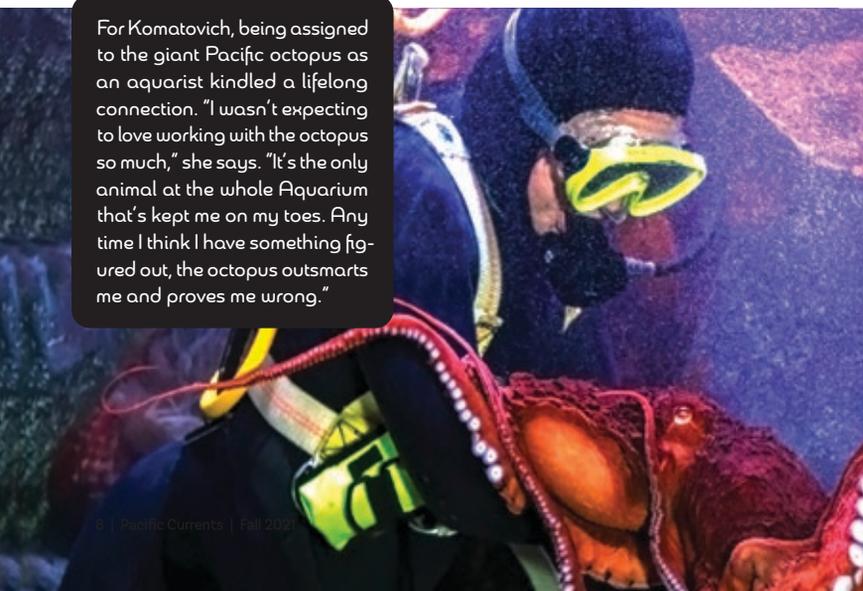
Flamboyant cuttlefish get their common name from their dazzling coloration, which pulsates nearly constantly like a psychedelic electronic billboard. This is thanks to the pigment-filled chromatophores in their skin. This colorful display is defensive, says Aquarist Alexandra Lawlor, noting that their flesh contains a toxin harmful to would-be predators. In their rest state, these cuttlefish are typically brown, blending in with rocks and sand. In the wild, flamboyant cuttlefish can be found in the Indo-Pacific Ocean from Indonesia to Northern Australia. Adult females are larger than males, reaching up to 3.5 inches and 2.5 inches in length, respectively. They generally use their eight arms to “walk” along the seafloor as their primary mode of locomotion.

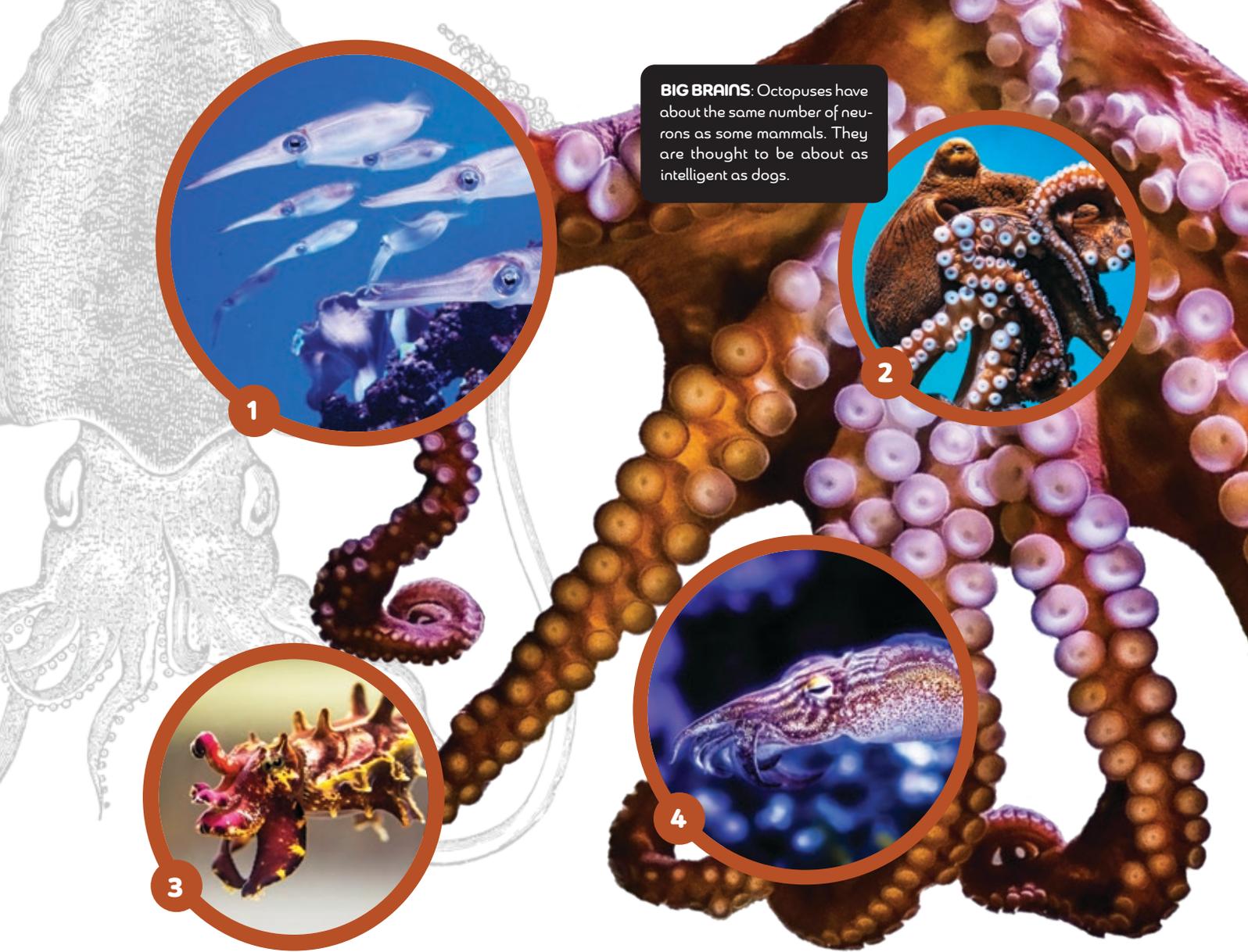
Pajama squid are also found in the Indo-Pacific around Australia and are similarly small, topping out at about 3 inches long. Their common name is a misnomer; these animals are actually a type of cuttlefish that get their common name from their striped coloration, resembling old-fashioned striped pajamas. They like to spend their time partially buried in sand on the seafloor.

The Aquarium has had success breeding these two cuttlefish species. Lawlor watches for mating behaviors, when the males start to approach the females and touch their faces with their tentacles. Once she sees that activity, she begins to keep an eye out for eggs, which the females usually like to stash underneath a rock. The eggs are the size of small peas, and as they get close to hatching, the young cuttlefish inside can see through the membrane. In the wild, they would watch their parents hunting for food to learn what’s good to eat in their area. At the Aquarium, they are kept behind the scenes in a cozy nursery until they are large enough to mingle with the adults in the public exhibit.

For Komatovich, being assigned to the giant Pacific octopus as an aquarist kindled a lifelong connection. “I wasn’t expecting to love working with the octopus so much,” she says. “It’s the only animal at the whole Aquarium that’s kept me on my toes. Any time I think I have something figured out, the octopus outsmarts me and proves me wrong.”

Toys that require the octopus to figure out how to get food stimulate its intellect, providing enrichment that helps keep the animal mentally active.





BIG BRAINS: Octopuses have about the same number of neurons as some mammals. They are thought to be about as intelligent as dogs.

1

2

3

4

Conservation and Stewardship

Currently, there are only a few octopus and cuttlefish species that are endangered. In fact, some cephalopods are experiencing significant population growth in some places. Warmer ocean waters brought on by climate change are preferable for many cephalopod species, and some are also taking advantage of humans having removed top predators from the ocean food web. Cephalopods serve an important role in their ecosystems as both predators and prey for animals like sharks, marine mammals, fish, and seabirds.

Despite their relative abundance, cephalopods still face the same threats that all marine species face, including pollution, potential overfishing, and changes to the balance of life in the ocean due to climate change. As humans, it is our responsibility to ensure we are fishing responsibly to protect cephalopods and their food sources, keeping pollution out of the ocean, and doing what we can to slow and reverse the impacts of climate change.

For some people, discovering a love of cephalopods is an entry point into ocean stewardship. We come to love

the ocean and feel compelled to learn more about it and protect it because we love the creatures who call it home.

“Many people are fascinated by these unique looking animals for many reasons,” Assistant Curator Janet Monday says. “At the Aquarium, people are fascinated watching our octopuses propel themselves backward across the exhibit changing their colors in an instant. Using specialized cells on their skin called chromatophores, this instant change in color cannot be replicated by any other order of animals. Their sophisticated intelligence is also fascinating! The aquarists at the Aquarium are challenged everyday to come up with new ways to stump our octopuses, who have become very proficient at solving puzzles to get their food.”

**OCT
8**

WORLD OCTOPUS DAY!

Follow the Aquarium on Facebook, Instagram, Twitter, and TikTok to see special photos and videos as we celebrate World Octopus Day on October 8. Learn fun facts about the Aquarium's octopuses and how we care for them here.





Photographers Night

■ Sunday, October 3

* Member Events

Please join us for these select events just for our members and donors.

Member Appreciation Night

■ Thursday, November 18

6:30 P.M.–9:00 P.M.

Join us for an evening at the Aquarium for members only! You'll enjoy visiting your favorite animals in one of your favorite places.

- Free for members (reservations required)
- Call (562) 437-3474 to reserve



* Special Events

The Aquarium of the Pacific hosts a variety of performances, fundraisers, and other special events throughout the year. Check our website for more details and additional events.

California Coastal Clean-Up Day

■ Saturday, September 18

9:00 A.M.–12:00 P.M.

Join the Aquarium in cleaning up Long Beach as part of the statewide Coastal Clean-Up Day. The public is invited to help Aquarium staff clean the beach located at Ocean Blvd. and 72nd Place. Help protect our ocean and marine life by picking up trash. Gloves, bags, and a spirit of camaraderie will be provided. Please look for the Aquarium booth to check in and receive your cleaning supplies. No RSVP necessary.

- Free
- Find us at the Peninsula and lot at Ocean Blvd. and 72nd Place

Photographers Night

■ Sunday, October 3

6:00 P.M.–10:00 P.M.

Professional and amateur photographers are invited to capture the Aquarium's wildlife in photos during exclusive photographers-only hours. Meet vendors, attend workshops, and meet other wildlife photo enthusiasts.

- \$36.95 per person

Seniors Day

■ Monday, October 4

8:30 A.M.–1:30 P.M.

The Aquarium will open its doors for free to people ages fifty and above on Seniors Day. Special exhibits and presentations for seniors will be featured. Advance reservations required for everyone.

- Free to visitors ages 50 and over with a valid photo ID.

Aquarium 5K Run/Walk

■ Saturday, October 9

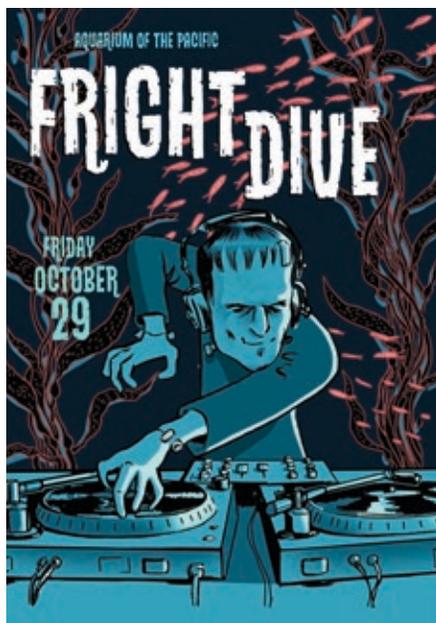
7:00 A.M.–12:00 P.M.

The Aquarium will partner with the Long Beach Marathon events team to host their 5K Run/Walk on Saturday, October 9, at 7:00 a.m. The scenic course will loop through Rainbow Harbor, Queensway Bridge, Catalina Landing, and around the Aquarium. Participants will receive a race t-shirt, finisher's medal, and a voucher for reduced Aquarium admission. Advance reservations required.

- \$60 per participant
- Registration: aquariumofpacific.org/events/info/5k/



For information, visit aquariumofpacific.org or call (562) 590-3100, ext. 0. Events subject to change based on current health protocols. Advance reservations are required for all Aquarium visits and events. Please visit pacific.to/memberhub for more information or to make a reservation.



Fright Dive

■ **Friday, October 29**
7:30 P.M.-11:00 P.M.

Come see the spooky side of the Aquarium at our adults-only event full of scarily good music, art, food, and drinks. Costumes are encouraged, with extra points for Aquarium-themed costumes (some restrictions apply). Night Dive is an event for adults only (18+) with local bands performing right next to the fish, DJs spinning, works of art, cocktails and drinks, and food trucks on the front plaza.

- \$19.95 per Aquarium member, \$24.95 per non-member, food and drink sold separately.

NOAA and Our Planet Day

■ **Saturday, November 6**
9:00 A.M.-2:00 P.M.

Find out what the National Oceanic and Atmospheric Administration (NOAA) does for you, our nation, and our world at this annual event. The event will feature interactive booths where you can learn more about a variety of NOAA programs, the ocean, and weather. Learn how NOAA, a government agency, works to understand and predict changes in Earth's environment to help protect people and property and to conserve and manage coastal and marine resources.

Scout Day

■ **Sunday, November 7**
9:00 A.M.-4:00 P.M.

The Aquarium welcomes Scouts and their families and friends to visit at a reduced rate! Cub Scouts and Girl Scouts are invited to complete steps toward badges utilizing self-led activity sheets that are specifically designed for Scouts. Downloadable activity sheets are available on the Scout Day webpage. Print these at home before your visit. Scout leaders or parents are expected to facilitate the Scout's learning experience and guide them through the steps for badge requirements. Some steps cannot be completed at this event and need to be completed at home. Scout leaders and parents: It is advised to review the Scout council approved activities prior to this event for each badge your child wishes to complete.

- \$19.95 per child, \$24.95 per adult, must be purchased online in advance.

Veterans Day

■ **Thursday, November 11**
9:00 A.M.-6:00 P.M.

In celebration of Veterans Day, the Aquarium honors veterans and military personnel. These men and women are invited to enjoy the Aquarium with free admission on Veterans Day.

- Free for veterans and military personnel with service I.D. Reservations required.



Aquarium Holidays

■ **December 4-23**
9:00 A.M.-5:00 P.M.

Aquarium Holidays kicks off on December 4 with the Holiday Treats for the Animals festival and runs through December 23. It features festive décor, shopping, snowfall in the Great Hall, and appearances by Santa Diver and Aquarium characters in their holiday outfits. On weekends December 4 through 19, including Holiday Treats for the Animals festival, the Aquarium will have photo opportunities with Santa and Hanukkah storytelling with opportunities to play dreidel. Also during Aquarium Holidays, the Aquarium will host a Kwanzaa celebration.

- Free for members

Aquarium Closed

■ **Saturday, December 25**

New Year's Eve (18+)

■ **Thursday, December 31**
8:00 P.M.-1:00 A.M.

Ring in 2022 on New Year's Eve at the Aquarium! Dance as much as you want and when you need a break, grab a drink from the cash bar and go see your favorite animal friends. You can also get your grub on with tasty bites on sale in Café Scuba. Doors open at 8:00 p.m., countdown is at midnight, and then the party won't stop until 1:00 a.m. You can dress to the nines or go casual; just leave the New Year's resolutions at home and remember to bring the fun!

- To be announced
- Open to ages 18+ only

 Reservations for each event will be available at aquariumofpacific.org at least two weeks in advance.

 Capacity is limited. Advance reservations are required. No walk ups. Keeping our guests and staff safe is our top priority. Masks are required for all ages 2 and over. For the most current information, go to aquariumofpacific.org/safety



Moompetam: American Indian Festival

■ Sat. & Sun., September 18-19

* Festivals

Experience our community's diverse cultures and their connections to the ocean and environment.

Moompetam: American Indian Festival

■ Sat. & Sun., September 18-19
9:00 A.M.-5:00 P.M.

In celebration of California's coastal American Indian cultures, the Aquarium will host its seventeenth annual Moompetam Festival. This celebration will feature traditional cultural craft demonstrations, storytelling, music, and dance celebrating the indigenous California maritime cultures, including Tongva, Chumash, Acjachemen, Costanoan, Luiseno, and Kumeyaay.



Baja Splash Cultural Festival

■ Sat. & Sun., October 2-3
9:00 A.M.-5:00 P.M.

In celebration of National Hispanic Heritage Month, the Aquarium will host its twentieth annual Baja Splash Cultural Festival. The event features live music and dance representing cultures in Mexico and Central and South America. Educational programs, booths, and other special activities are included.

Southeast Asia Day

■ Sunday, October 17
9:00 A.M.-5:00 P.M.

The Aquarium will celebrate its seventeenth annual Southeast Asia Day. The festival's program will highlight the cultures of Cambodia, Thailand, Vietnam, Myanmar, Laos, and Indonesia. Guests will enjoy music, dance, and cultural craft demonstrations. Children will have the opportunity to partake in arts and crafts.

Scarium of the Pacific

■ Sat. & Sun., October 30-31
9:00 A.M.-5:00 P.M.

Discover the creatures lurking in the depths at the Aquarium of the Pacific's twenty-second annual Scarium of the Pacific—a spooktacular educational Halloween event for the whole family. You can enjoy special Halloween programs, including the annual children's costume contest, magic shows, and spooky storytelling. Plus, pick up supplies for Halloween-themed crafts and coloring sheets you can complete at home.

Autumn Festival

■ Sat. & Sun., November 13-14
9:00 A.M.-5:00 P.M.

Delve into the arts, cultures, and marine environments of Asia during the Aquarium's twentieth annual Autumn Festival. The Autumn Festival highlights the traditions and cultures of Japan, China, Korea, and the Philippines through a weekend of learning opportunities and family entertainment celebrating the rich diversity of Asian and Asian-American cultures. The festival will feature traditional crafts, music, dance, cultural arts exhibits, and storytelling.

Holiday Treats for the Animals

■ Sat. & Sun., December 4-5
9:00 A.M.-5:00 P.M.

In celebration of the holiday season, Santa Diver will be delivering an ocean of gifts to the Aquarium for its animals, including penguins, sea otters, seals, sea lions, lorikeets, and fish. Aquarium Holidays begins with this festive weekend.



**Ocean Sewage Alliance
| Dr. Stephanie Wear**

■ Wednesday, November 3

ISTOCK.COM/BOSCHETTO/PHOTOGRAPHY

*** First Wednesdays**

The Aquarium's free First Wednesdays lecture series features scientists, authors, and other experts presenting an illustrated talk in one of our theaters. These events include opportunities to meet the speaker, book signings, and a cocktail/social hour.



**Robots and the Sea |
Dr. Gaurav Sukhatme**

■ Wednesday, October 6
7:00 P.M.-9:00 P.M.

Dr. Gaurav Sukhatme, chair of the University of Southern California's science and engineering department, will give an overview of his lab's recent work with underwater robots focusing on safe operations in regions of substantial ship traffic, biological sampling for water quality monitoring, and the inspection of underwater structures.

**Ocean Sewage Alliance
| Dr. Stephanie Wear**

■ Wednesday, November 3
7:00 P.M.-9:00 P.M.

Dr. Stephanie Wear, senior scientist and strategy advisor at The Nature Conservancy, will discuss pollution in the ocean from untreated wastewater and a new global campaign aimed at educating the public



COURTESY OF THE PORT OF LONG BEACH

about ocean sewage. Dr. Wear recently joined the Aquarium's Board of Directors.

**Aquatic Academy Course:
Ports and Sustainability**

■ Wednesdays, November 10 & 17
and December 1 & 8
7:00 P.M.-9:00 P.M.

This fall learn about the local Ports of Los Angeles and Long Beach, the environmental impacts of the shipping industry, and how the ports are addressing sustainability. Ports drive economic growth and are an essential feature of today's world. The downside is ports can sometime pollute coastal waters and the air and add greenhouse gases to the atmosphere. Learn why the Port of Long Beach is considered one of America's best ports.

Aquatic Academy courses foster lifelong learning and dialogue on issues related to the ocean and environment. These short courses for adults bring together experts in science, business, conservation, policy, and education to share their knowledge and experiences with attendees. The Aquatic Academy offers a series of four evening classes in which attendees hear presentations and panel discussions from scientists and other experts. Participants get in-depth information about timely environmental and societal topics and the most current research and analysis from the speakers.

- \$25 for members and students, \$40 for non-members.
- Info/Tickets: (562) 590-3100 or pacific.to/aquaticacademy



Groot, the Aquarium's giant Pacific octopus, puts on a dazzling display in his exhibit. He currently weighs just over 21 pounds, and if he catches up to his predecessor Godzilla, he could reach up to 60 pounds.



*Aquarium
of the Pacific*

ADD-ON EXPERIENCES

Classes and Tours

Connect with the Aquarium through both in-person and virtual experiences that offer up-close views of our animals and exhibits. Your purchases help support the Aquarium as it recovers and grows from the impacts of the COVID-19 pandemic.

In-Person Programs

Animal Encounters

Meet and interact with one of your favorite Aquarium animals during an Animal Encounter. This program offers a chance to train a sea lion, meet a feathered friend, feed a shark, or hang out with a penguin.

- Approximately 30 minutes
- \$135 per member and \$150 per nonmember; minimum 2, maximum 4 participants from same household
- (562) 590-3100, ext. 0
- Visit aquariumofpacific.org for dates and times



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Virtual Programs

Aquarium Adventures at Home

Bring the family together for a night of fun-filled activities at home, including a live virtual connection with the Aquarium and an adventure kit that is shipped directly to you.

- \$50 per member household, \$70 for non-members
- Fourth Friday of each month

Underwater Artists

Create art while exploring ocean animals and habitats during this educator-led virtual experience.

- \$10 per household
- First and third Saturdays of each month

Zoom Animal Appearance

Invite one of the Aquarium's animals to your next virtual birthday party or Zoom meeting. Meet our animals up close and learn about them from our animal care staff in this private program.

- \$750
- Flexible dates and times based on advance reservations

Online Academy

Tune in to the Aquarium's Online Academy for free interactive programming for kids of all ages. Visit pacific.to/onlineacademy for current scheduling. In addition to live programming, the Online Academy offers a large library of pre-recorded sessions on the Aquarium's YouTube channel.

- Grades PreK-12

Whale Watching Cruises

Gray Whale Watching Trips

■ Fall Season

Enjoy a voyage out in the open Pacific Ocean in search of one of the world's longest-migrating mammals. Learn new, exciting information about gray whales and other local marine life from an on-board Aquarium educator. Cruisers will also have the opportunity to spot dolphins, seals, sea lions, and other marine animals. Read about recent sightings on the Aquarium's whale watch Twitter feed (@OceanWatchLB).

- **Members: \$27 per adult, \$22 per senior (ages 62+), \$19 per child (ages 3-11). Non-members (includes Aquarium admission): \$58.95 per adult, \$54.95 per senior, \$44.95 per child.**
- 2 to 2.5 hours
- (562) 590-3100, ext. 0 or on our website

Virtual Resources

The Aquarium offers a library of free virtual resources to engage Aquarium members. Check out the following opportunities to connect with the Aquarium.

The Pacific Pals Show!

Tune into the Aquarium's social media channels for a closer look at the Aquarium, including animal feeds and behind the scenes tours with your favorite Pacific Pals.

- All ages

Webcams

Want to check in on your favorite Aquarium animals from your living room? Webcams, hosted by explore.org, placed in seven exhibits, allow your family to visit the Aquarium virtually. Now, you can take webcam exploration even further with the Aquarium's Webcam Resource Kits (available at pacific.to/webcamkits). These kits include lesson plans and videos that provide guided exploration of the Aquarium webcams.

- Grades K-8

Career Connections

Introduce your teenager to a variety of STEM (science, technology, engineering, and math) careers through the Aquarium's Career Connections series. By exploring the jobs of scientists working at the Aquarium, participants will learn more about current research and career opportunities. The series is available at pacific.to/careerconnections

- Grades 6-12

Conservation Series

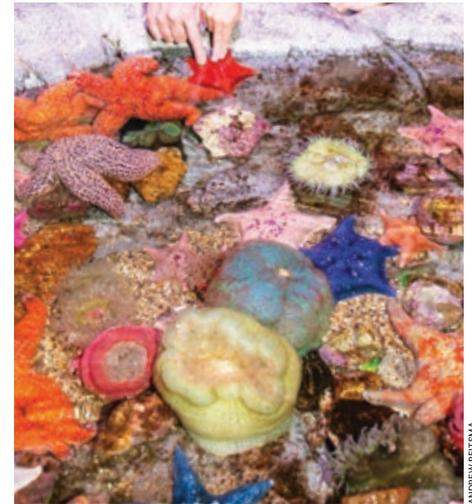
Explore current conservation projects and meet the professionals who have dedicated their lives to conservation. Visit pacific.to/conservationseries for videos, discussion guides, and activities related to conservation and sustainability.

- Grades 6-12

Lectures

Watch hundreds of lectures by artists, photographers, scientists, conservationists, explorers, and more. Visit pacific.to/lecturearchive for the full selection.

- Adults



ANDREW REITSMA

Virtual Field Trips

The Aquarium is offering Virtual Field Trips for schools, homeschools, and care facilities for learners of multiple ages. These educator-led programs run live from our studio on site. Our educators will help you and your students explore various topics based on grade level, like recognizing shapes and colors, comparing sharks and fish, and even discussing conservation and human impacts on ecosystems. Prices range from \$100 to \$250, depending on the program.



Can you help Axl the Axolotl find all 5 hidden octopuses?

When agreeing to a game of hide and seek, Axl totally forgot that octopuses are ink-credible masters of disguise!

Did you know?



Octopuses don't have bones, so they can squeeze into teeny, tiny hiding spaces!



Octopus skin has the special ability to change color and texture helping these animals to hide in their habitats. They have different types of muscles that change the pattern of brown, black, yellow, red, and orange on their bodies. They also have another type of muscle that can make their skin smooth, bumpy, or even branchy.





Octopuses belong to the cephalopod family, which means they are related to squid, nautilus, and cuttlefish. What do they have in common?



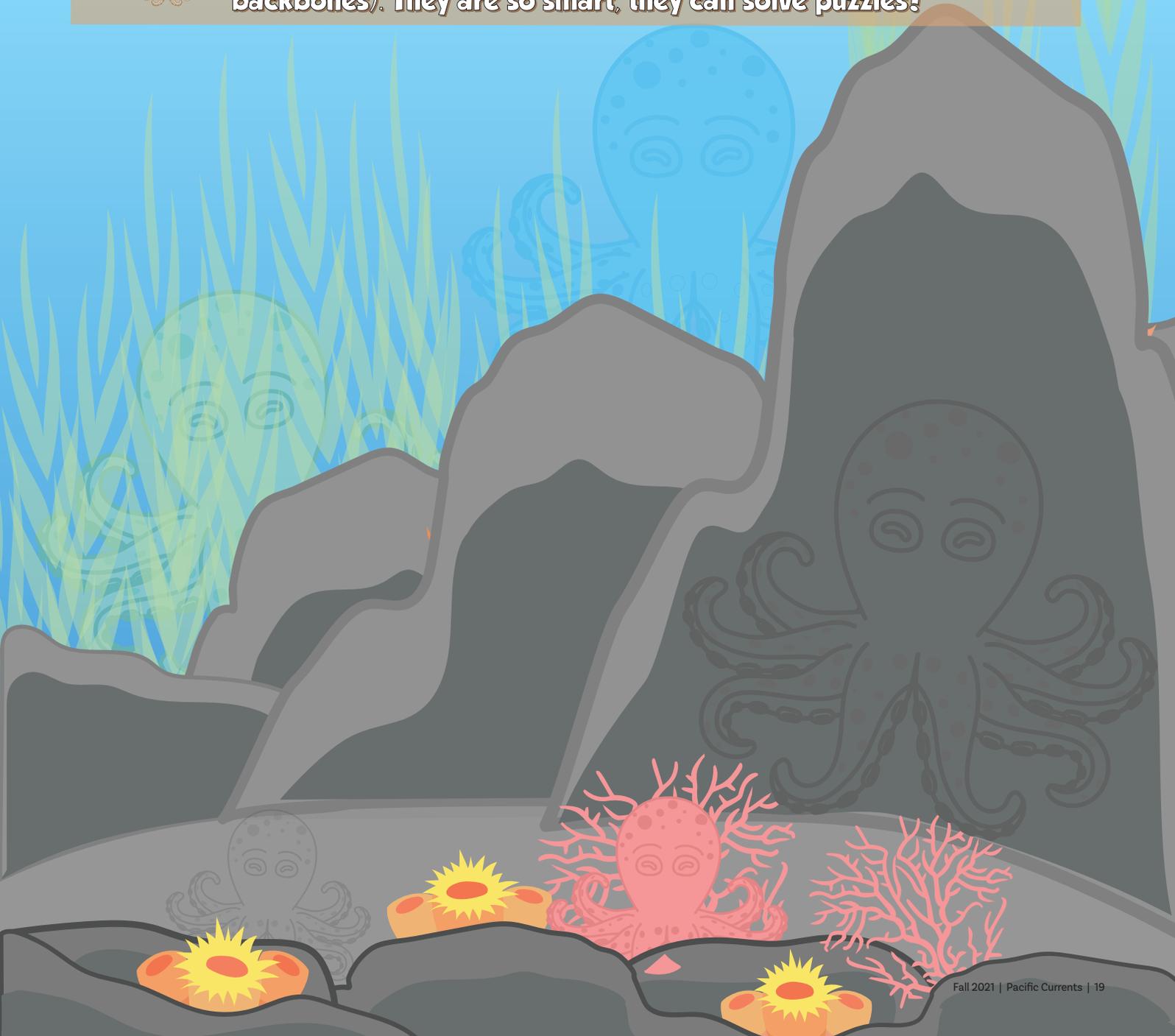
Scientists think that octopuses might dream because they have been seen twitching their arms and changing color while sleeping, just like they do when they're awake!



Octopuses have three hearts!



Octopuses are the smartest invertebrates (animals without backbones). They are so smart, they can solve puzzles!



AQUARIUM

Animal Facts



ROBIN RIGGS

NORTHERN PACIFIC GALLERY

Giant Pacific Octopus

Enteroctopus dofleini

The giant Pacific octopus is considered the largest octopus species, with the largest on record reaching 110 pounds and an armspan of 16 feet. These animals live in the northern Pacific Ocean along the coasts of Japan and North America, from Alaska to Southern California. They live four or five years and feed on crustaceans, mollusks, fish, and smaller octopuses. Giant Pacific octopuses can be found in shallow tide pools, but will also inhabit deeper waters, often around reefs or pier pilings. At the Aquarium, the giant Pacific octopus exhibit is in the Northern Pacific Gallery between the sea jellies exhibits and the Coastal Corner Touch Lab.

TENTACLES AND INK EXHIBIT | TROPICAL PACIFIC GALLERY

Day Octopus

Octopus cyanea

Usually active during the day, the nearly three-foot-long day octopus can hide in plain sight. This highly intelligent marine mollusk is found in the warm tropical waters of the Pacific Ocean. Shooting out a cloud of dark ink when startled, the octopus can quickly jet away from its confused predator.



ROBIN RIGGS



ROBIN RIGGS

NOT CURRENTLY ON EXHIBIT

Bigfin Reef Squid

Sepioteuthis lessoniana

Bigfin reef squid have eight arms and two feeding tentacles. They are found around coastal rocks and reefs in the Indo-Pacific and around the Hawaiian Islands. The fastest-growing large marine invertebrate, bigfin reef squid can grow to 13 inches long and 1.3 pounds in just four months. Like many cephalopod species, bigfin reef squid have a short lifespan of about eight months.

Giant Sea Bass Reared at the Aquarium Surfaces in Local Ocean

DURING THE SUMMER someone fishing from a kayak caught a giant sea bass and posted a photo on social media asking for help identifying the species. Aquarist Nicole Leier, the Aquarium's resident giant sea bass expert, used the fish's unique pattern of spots to identify it as one of the fish that was raised at the Aquarium. This giant sea bass was released in local waters as part of our conservation program to help save this endangered species from extinction.

The juvenile giant sea bass was caught close to the location where it was originally released on April 28. The person who caught it reported that the fish was safely released back into the water. This sighting was reported to the community science program developed at the University of California, Santa Barbara, called Spotting Giant Sea Bass, which is designed to track individual fish based on their spot patterns. **To learn more about the Aquarium's efforts to restore local giant sea bass populations, visit aquariumofpacific.org and click on Saving Species.**



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A Unique Setting for Your Event

The Aquarium of the Pacific's award-winning Pacific Visions wing provides a unique venue for private events, including outdoor picnics and indoor receptions or dinners. Other spaces available include the Great Hall, Shark Lagoon, and adjacent Shoreline Aquatic Park.

yourevent.aquariumofpacific.org 562-951-1663 AOPCatering@longbeach.cc.com
 100 AQUARIUM WAY LONG BEACH, CA 90802





Teens Explored Ocean Issues in Aquarium's Inaugural High Tide Film Festival

THE AQUARIUM received eighty submissions from high school students in twenty cities across Southern California for its inaugural High Tide Film Festival presented by Dr. Allen and Charlotte Ginsburg.

Students in grades nine through twelve submitted three-minute films in three categories: Ocean and Me, Thriving in a Changing Climate, and Responsible Seafood. A panel of seventy-two volunteer judges selected bronze, silver, and gold winners in each category, as well as two honorable mentions. The judges comprised sixty Aquarium staff members and a group of twelve community representatives, including city councilmembers, local business owners, school officials, and others.

The finalists attended an awards ceremony in the Aquarium's Honda Pacific Visions Theater on June 2, 2021. The winners received cash prizes (\$1,000 for bronze, \$1,500 for silver, and \$2,000 for gold) and four tickets to the Aquarium.

Students in grades nine through twelve submitted three-minute films in three categories.

CATEGORY: OCEAN AND ME



GOLD

Our Friend, The Ocean

Katelyne Gonzalez, Whitney High School, Cerritos



SILVER

Señora Océano

Omar De Leon, Bonita High School, La Verne



BRONZE

SCUBA,

Kalani Ono, Lakewood High School

CATEGORY: THRIVING IN A CHANGING CLIMATE



GOLD

Dreaming of the Deep

Darwin Melchiorre, Sage Oak High School, Redlands



SILVER

Ocean Life: Thriving in a Changing Climate

Liam Wright, San Marino High School



BRONZE

The Fight Against Climate Change

Lana Missios, Long Beach Polytechnic High School

CATEGORY: RESPONSIBLE SEAFOOD



GOLD

Kelp California

Davey Schneider, Serrano High School, Wrightwood



SILVER

Conservative Seafood

Dedrin Thompson, Long Beach Polytechnic High School

STAFF PICKS



HONORABLE MENTION

HOME

Alan Mai, El Modena High School, Orange



HONORABLE MENTION

My Best Friend

Jack Irwin, Long Beach Polytechnic High School

Seafood for the Future Launches New Solutions Webpage

SEAFOOD FOR THE FUTURE (SFF), the Aquarium’s sustainable seafood program, recently launched a new webpage showcasing all its current projects and initiatives, which include efforts to educate the public about sustainable seafood, assess barriers to increasing our domestic seafood supply, and showcase seafood experts, including scientists, farmers, and fishers.

From this page, you can access SFF’s two video series. The most recent, *Exploring Sustainable Seafood*, features panel discussions with seafood experts. *Ocean to Table: Stories of Food, Farming, and Conservation* travels to seafood farms around the U.S. and highlights ocean conservation issues connected to seafood farming.

SFF is also working on a project to understand and address some of the challenges and opportunities for permitting of conservation and commercial marine aquaculture in California.

“SFF’s projects involve collaborations with many partners, from government and nongovernment organizations to academics and seafood industry groups,” said Kim Thompson, SFF program director. “Our goal is to bring their ideas together to support the growth of responsible marine aquaculture in the U.S. as part of a more sustainable, resilient, and nutritious food future. But to get there, we need to address the barriers that stand in the way as well as the opportunities available.”



Visit aquariumofpacific.org/seafoodfuture/solutions to learn about Seafood for the Future’s current programs and watch SFF’s video series.



MAGELINE WALDEN



Accepting Applications

THE AQUARIUM is accepting applications this fall for its second cohort of students for its African American Scholar Program. The submission deadline is December 31, 2021, and winners will be announced at our African-American Festival in February. For details visit aquariumofpacific.org/africanamericanscholar. This initiative is made possible thanks to donor support. To encourage others to give toward the program, an anonymous donor pledged a \$10,000 matching gift. Your gift supports the next class of scholars! To make a donation, visit aquariumofpacific.org/africanamericanscholarfund



Jerry R. Schubel was presented with a certificate recognizing him as president emeritus of the Aquarium of the Pacific on July 7, 2021, when he returned to the Aquarium to present a lecture on his new book, *The Future Chesapeake: Shaping the Future*.

Philanthropy



ROBIN RIGGS

AmazonSmile: An Easy Way to Support Your Aquarium

WE SEND OUR THANKS to all our members who have already set the Aquarium as their beneficiary when shopping on AmazonSmile. When you do, Amazon donates 0.5 percent of your purchase back to the Aquarium and its 12,000 animals. Thanks to you, more than \$3,300 has been donated from AmazonSmile since 2014, with over \$1,500 coming in during 2021, alone. If you are looking for help selecting the Aquarium as the beneficiary on your Amazon account, learn more at aquariumofpacific.org/give/amazonsmile.

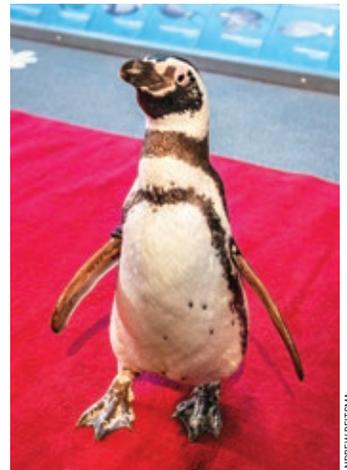
Virtual Blue Whale Gala Featured Celebrity Appearances and Raised Over \$347,000

THE AQUARIUM'S first-ever virtual Blue Whale Gala fundraiser was held on Saturday, June 12, and raised over \$347,000. Comedian Iliza Shlesinger hosted the event, which was streamed on a private platform for all 413 sponsors, guests, and ticket purchasers.

Viewers experienced surprise cameo appearances by Aquarium animal ambassadors, discovered how the Aquarium is contributing to the recovery of endangered species, and celebrated the Aquarium with a toast to its bright future, given by Board Chair Kathie Eckert and the Pacific Pals.

Charles Annenberg Weingarten, founder of *explore.org*, was presented with the Ocean Conservation Award and the evening program concluded with a musical performance by Kodi Lee, winner of *America's Got Talent* Season 14 and long-time participant in our Festival of Human Abilities. "We thank all of the sponsors, ticket purchasers, members, and supporters for making the Virtual Blue Whale Gala a huge success," says Ryan Ashton, the Aquarium's vice president of development.

The Virtual Gala was hosted by comedian Iliza Shlesinger and featured appearances by Kodi Lee and Aquarium animals.



ANDREW REITSMA

Donor Spotlight: Mark Paullin

MARK PAULLIN has been an Aquarium Board Director since 2015. He recently pledged \$1,000,000 to support Aquarium operations as we reimagine the role of a public aquarium in meeting our shared challenges of the twenty-first century. We asked Paullin to share what the Aquarium means to him.

AQUARIUM: Mark, what is it about the Aquarium of the Pacific that motivated you to get involved?

PAULLIN: We're blessed with a world-class aquarium right in our backyard with a singular commitment to conserve the Pacific Ocean, its inhabitants, and ecosystems. The mission to instill in each of us wonder, respect, and a sense of stewardship for this ocean resonates with me. I'm excited by our outreach to under-resourced communities, our rich education programs, the engaging art and architecture, and our belief that, with effort, our healthy Pacific Ocean can thrive next to urban Los Angeles!

The Aquarium temporarily closed its doors to members and guests during the pandemic. What role did philanthropy play during that time?

The Aquarium struggled through the pandemic shutdowns, with January 2021 attendance 96 percent below prior year and February 2021 66 percent below. With our financial outlook at its bleakest, many Aquarium supporters, volunteers, and paid staff members stepped up, offering time, talent, and treasure, ensuring this vibrant institution would weather the COVID storm continuing as a resource for all of us. It was heartening to see that this entity matters to so many!

The Aquarium has been a leader in informal science education and local conservation efforts. Is there an Aquarium conservation story that has a special connection for you?

In the 1950s our family would often explore local tide pools, where I would find beautiful abalone shells scattered in the sea grass. By the 1970s, the local white abalone, the largest and best tasting, had become nearly extinct in local waters. Fast forward to the 2000s when the Aquarium partnered with the National Oceanic and Atmospheric Administration, National Marine Fisheries Service, and the California Department of Fish and Wildlife to rear and cultivate white abalone in our disease-free laboratory. It's thrilling to me and my family that Aquarium divers are now placing and monitoring those same abalone in local waters! Volunteers and paid staff are helping each day with this and other conservation efforts.



Paullin is an Aquarium Board Director and a dedicated ocean steward.

You are a surfer and someone who enjoys spending time in the ocean. What ocean issues are you most interested in making sure others know about?

Our love for the ocean is innate, and everyone wants healthy and clean coastal waters. Yet human activity continues to be the primary threat to our oceans. Our sea life is threatened by microplastics, drift nets, overfishing, raw sewage spills, and coastal overdevelopment (not to mention the world's largest DDT dump site in the Catalina Channel). I am heartened by our efforts to identify and control these impacts, but controlling global warming and stabilizing ocean temperatures is the primary challenge of our lifetimes.

As the Aquarium looks toward the future, what are you telling people about how they can be involved and help?

The Aquarium, one of Southern California's most popular destinations, is a magnet for ocean and animal lovers, science teachers and STEM [science, technology, engineering, and math] students, families young and old, children on field trips—in short, everyone. It's a magical place for all, thanks to volunteers and philanthropists. We need more of both to build new exhibits, save more endangered species, join additional conservation efforts, offer broader virtual education, and keep our Aquarium comfortable, modern, and accessible for all. Join us!

Aquarium
Board of
Directors

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president and CEO
- **Mr. Anthony T. Brown**,
VP of Finance/CFO
- **Ms. Cecile Fisher**,
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- **Mr. Kurt Schulzman**
- **Mr. Michael Sondermann**
- **Mr. Donald "Tip" Tippet**
- **Mr. Thomas Turney**
- **Dr. Stephanie Wear**
- **Mr. Stephen Young**

(as of September 1, 2021)
aquariumofpacific.org

Aquarium Accolades

These awards were presented to honorees during festivals held this past spring and summer.

Que Keju

Heritage Award

The Aquarium presented the Heritage Award to Que Keju at the Pacific Islander Festival in June. His son Bruce Keju accepted the award on his behalf. Keju has dedicated countless volunteer hours teaching and sharing the culture of the Marshall Islands and advocating for Marshallese community members.

Keju, known in his community as Uncle Que, was born in the Marshall Islands and immigrated to the United States as a young adult in the mid-1970s. He was a founding board member of the Jake Jebol Eo Club, or JJEC, the first Marshallese nonprofit organization in the United States, where he helped develop cultural programs to preserve and share Marshallese traditions.

Keju has been a dedicated advocate for the Southern California Marshallese community. He has provided free translation, interpretation, and other assistance navigating the healthcare, education, career building, and financial systems.

Keju, who is a school district administrator in Orange County, provides local Marshallese students with guidance, translation, and support on their college entrance applications, financial assistance applications, and with other essential student services.

Keju serves as a liaison between The Republic of the Marshall Islands and the many Marshallese communities nationwide. He travels nationally as a certified Marshallese interpreter for the courts, one of only a handful of individuals certified. He serves as an advisor and advocacy partner for various Pacific Islander organizations, including Marshallese Youth of Orange County, Marshallese Assembly of God Orange County, and Marshallese Ministries of Orange County.



The Heritage Award was presented at the virtual Pacific Islander Festival, which featured hula and other performances.



Wendy Ngau received the Corinne Monroe Earth Day Award at the Aquarium's virtual Earth Day Celebration.

Wendy Ngau

Corinne Monroe Earth Day Award

The Aquarium presented the Corinne Monroe Earth Day Award to Wendy Ngau, who was a senior at Long Beach Polytechnic High School at the time, during its Virtual Earth Day Celebration in April.

Ngau has been passionate about environmental justice for many years, particularly relating to how air quality impacts marginalized communities. She has been a vocal leader among her peers in environmental justice trainings and through her work as a co-founder of the Reviver Club for community service at Poly High School.

Ngau is a youth leader at Khmer Girls in Action (KGA), a local organization whose mission is to build a progressive and sustainable Long Beach community through gender, race, and economic justice.

During her four years as a youth leader with KGA, Ngau has been involved with various campaigns, including the Invest In Youth Campaign. She co-facilitated a writing workshop at the Young People's Budget Hearing in 2018. Ngau was also one of the awardees for the League of Women Voters award in 2020, following a performance of one of her poems at a resilience community event hosted by the Aquarium in 2019.

"This award digs deep and it resonates with our group's mission, and that is to be inclusive."

– Bruce Keju

Untreated Wastewater Threatens Ocean Health

A new campaign is aimed at shifting our perspective on wastewater.

ACCORDING TO THE UNITED NATIONS, approximately 80 percent of the world's wastewater is discharged into the environment untreated, and the majority ends up in the ocean. Untreated wastewater can cause disease, close shellfish beds, stress coral reefs, produce marine dead zones, devastate fisheries, and deter tourism.

To help raise public awareness about this issue, which may be even greater in scope and impact than the problem of plastics in the ocean, the Aquarium has joined the Ocean Sewage Alliance (OSA), a collective committed to “re-potty training the world.”

OSA's current efforts include a social media campaign to raise awareness of the threats posed by sewage in the ocean and help the public see waste as a potential renewable resource that could be used as biofuel, fertilizer, or even converted to fresh drinking water. In addition to the Aquarium of the Pacific, some of the other nineteen partner organizations to date include the Wildlife Conservation Society, Surfrider Foundation, and The Nature Conservancy.

Visit oceansewagealliance.org to learn more about untreated wastewater in the ocean and potential solutions addressing the issue.

SCIENTIST JOINS THE BOARD

The Aquarium's partnership with OSA is due to the efforts of a new member of the Aquarium's Board of Directors, Dr. Stephanie Wear—the first scientist to join our board. Dr. Wear is a member of OSA's steering committee and is a marine ecologist, conservation strategy advisor, and global spokesperson at The Nature Conservancy. She is also a visiting scientist at the University of California, Los Angeles' Institute of the Environment and Sustainability and the Duke University Marine Lab. Her research focuses on reducing threats to ocean ecosystems like coral reefs, and her latest work with The Nature Conservancy examines the often-unrecognized role that sanitation plays in conservation on both human and ocean health around the globe.

WHAT YOU CAN DO

The Ocean Sewage Alliance offers suggestions of ways that people can help protect the oceans when it comes to wastewater:

- **Refrain from flushing pharmaceuticals or personal hygiene products down the toilet.**
- **Regularly maintain your home's stormwater gutter system, as well as any on-site septic systems, if you have one.**
- **Start breaking the taboo surrounding human waste by talking about the issue with your friends and family.**



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MEET DR. WEAR ON NOVEMBER 3

The First Wednesdays lecture series brings scientists, authors, and other experts to the Aquarium for an illustrated talk. On November 3, meet Dr. Stephanie Wear, scientist and strategy advisor at The Nature Conservancy, who will discuss pollution in the ocean from untreated wastewater and the Ocean Sewage Alliance's new campaign aimed at educating the public about this issue. The event is free, but reservations are required. Call (562) 590-3100 or visit aquariumofpacific.org/events.

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