

PACIFIC **Currents**

Aquarium of the Pacific

SPRING 2020



CORAL REEFS

NATURE'S UNDERWATER CITIES

What One Species Near Extinction Can Teach Us

To learn more about this topic, visit the Aquarium's YouTube channel to watch Bader's lecture, **A Story About People and Place: Lessons Learned in Vaquita Conservation.**

TOM JEFFERSON

THE MOST RECENT ESTIMATES suggest that just six to ten vaquitas still live in the northernmost portion of the Gulf of California in Baja, Mexico. These small porpoises have long coexisted with a fishing industry that relied on gillnets, which entangled vaquitas, causing them to drown in high numbers.

As scientists and conservationists analyze the vaquita's plight, they hope to apply lessons learned from this species to other dolphins and porpoises in similar situations around the world. Several species are undergoing population declines and face the same threats.

Aquarium Director of Education David Bader has served as co-lead coordinator and has conducted public outreach for the Association of Zoos and Aquariums' Vaquita SAFE program since 2015. In November 2019 Bader traveled to China and Argentina to attend workshops and talk with other experts about endangered cetaceans and share his perspective based on his work with the vaquita.

Franciscana Dolphin

Argentina's Franciscana dolphin faces a similar situation to that of the vaquita. Its population is currently at about 20,000, but rapidly declining at a pace of about one thousand each year due to entanglements in gillnets. This coastal marine species is listed as vulnerable on the International Union for Conservation of Nature's (IUCN) Red List.

Scientists at the AquaMarina Foundation have been tagging and releasing Franciscana dolphins to track their populations. They are also working with smaller artisanal fishing operations to reduce entanglements and engage fishers and the public about the dolphin's conservation.

Yangtze Finless Porpoise

The Yangtze River is China's largest river, and 400 million people live along its shores. The Yangtze finless porpoise is listed as critically endangered on IUCN's Red List, with a population of about one thousand. The Wuhan Baiji Conservation Foundation (WBCF) formed to support the Baiji river dolphin, which was declared extinct in 2008,

and is now working to help the Yangtze finless porpoise avoid the same fate.

The foundation is using a broad approach that blends conservation efforts in the porpoise's wild habitat with work focusing on a small population brought into human care with the foundation. WBCF has moved some porpoises into protected reserves set up along the river in oxbow lakes, and the finless porpoises have begun to breed in these protected areas.



Yangtze finless porpoise.

GRANT ABEL

WBCF is also caring for and breeding a number of finless porpoises at a facility originally built for Baiji river dolphins. Bader says this integrated approach means it is unlikely that the Yangtze finless porpoise will face extinction. The wild population, which had seen steady declines, seems to be stable at this time.

An Integrated Approach

Because of the human element that factored into the vaquita's decline, social

solutions were just as important as ecological solutions. Strong environmental regulations can have the side effect of devastating a community of people, giving them few alternatives to support themselves. This was demonstrated with the 2015 gillnet fishing ban in the Gulf of California, which resulted in higher rates of societal problems. A more holistic view is required for conservation, Bader says. He and others in the field are championing community-based conservation and public engagement that integrate environmental actions with social responsibility.

Community-based conservation and engagement prioritizes listening to local community members, understanding the issues they face, drawing from locals' base of knowledge about their area and the environment, focusing on the community's aspirations, and looking for areas where those aspirations and conservation goals intersect.

"We have learned a lot of tough lessons from the vaquita," Bader said. "Extinctions in the ocean are an emergent threat, and it is not too late to act to preserve biodiversity. And we are more likely to see success if local communities are empowered to take the lead in developing conservation programs and have a relationship with scientists and government that is built on trust. As highlighted in Pacific Visions at the Aquarium, through science and innovation, we can provide prosperity for people and protect nature. These lessons can be applied in saving the Franciscana dolphin and Yangtze finless porpoise."

Scientists with the AquaMarina Foundation in Argentina release a tagged dolphin.



COURTESY OF AQUAMARINA

Letter from the CEO

Dear Members,



THIS SPRING WE ALL FACED AN UNPRECEDENTED CHALLENGE IN DEALING WITH THE IMPACTS OF THE CORONAVIRUS. After we closed our doors to the public on March 13, our staff jumped into action. Our education department, web developers, and social media team created the Aquarium Online Academy as a way to continue connecting with the public while so many were staying at home. Meanwhile, all

animal care duties were carried out by two alternating teams of husbandry staff members, allowing normal operations to continue while social distancing.

We gathered all of the Aquarium's existing online offerings, from live webcams to our extensive lecture archive, and jumpstarted several new programs for the Online Academy. On every weekday the Aquarium remained closed, our educators broadcast live classes online for five different age levels. Our beloved Pacific Pals puppets created a new show called *The Daily Bubble* to share news from the Aquarium, along with a few laughs. And our social media team streamed live views of exhibits, interviewed staff members, and shared photos and other posts to engage our followers and lift their spirits. Their appreciative feedback was overwhelming, and our website traffic and social media engagement reached new highs.

As we look ahead to the summer, we are all looking forward to opening our new exhibit, *Coral Reefs: Nature's Underwater Cities*. We developed this exhibit to shine a light on coral reefs, some of the most biodiverse and densely populated ecosystems in the ocean. People around the world value coral reefs as beautiful places to snorkel and scuba dive. Millions of people also rely on coral reefs as good places to harvest seafood and for the benefit they provide as nursery areas for young fish. Reefs also protect our coastlines from storm surges, breaking up battering waves before they reach the shore, and could be the source of new medicines to cure human diseases.

Climate change presents a grave threat to coral reefs. Warming seawater and an altered chemical balance threatens corals' ability to thrive, putting all the above-mentioned benefits at risk. However, if we slow and eventually reverse the rate of climate change, in time coral reefs can rebound.

You will have the chance to learn more about these issues and see corals and other reef inhabitants up close this summer at the Aquarium. Explore the newly reimagined Tropical Pacific Gallery, where the *Coral Reefs* exhibits are located. Then, visit Pacific Visions to see a new show about coral reef ecosystems in the Honda Pacific Visions Theater. This new experience will take viewers on a virtual dive to the ocean's stunning coral reefs.

The new exhibits and programs will also give you ideas of what you can do to help protect coral reefs. Read this issue's feature story on page 6 and the Conservation Corner column on page 27 for details.

Thank you for your ongoing support.

Sincerely,

Jerry R. Schubel

Cover: At Black Rock, a dive site in Raja Ampat, Indonesia, a plethora of small, colorful fish (*Pseudanthias* sp.) swim in a current passing over a coral reef. The fish are catching tiny zooplankton that ride the ocean current.

ISTOCK.COM/PNIUP65



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As the vaquita porpoise faces extinction in Baja, conservation experts and scientists are applying lessons learned to other threatened and endangered porpoise species around the world.

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6 Coral Reefs: Nature's Underwater Cities

Coral reefs are among the most biodiverse ecosystems in the ocean. This summer at the Aquarium, explore coral reefs and learn what is being done to help them survive and thrive in a changing ocean.

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Learn what you can do to protect coral reefs. While climate change is the biggest threat they face, reducing pollution and responsible travel are also important ways to help corals.

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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.



Arrival of a New Sea Otter Launches New Rescue Program

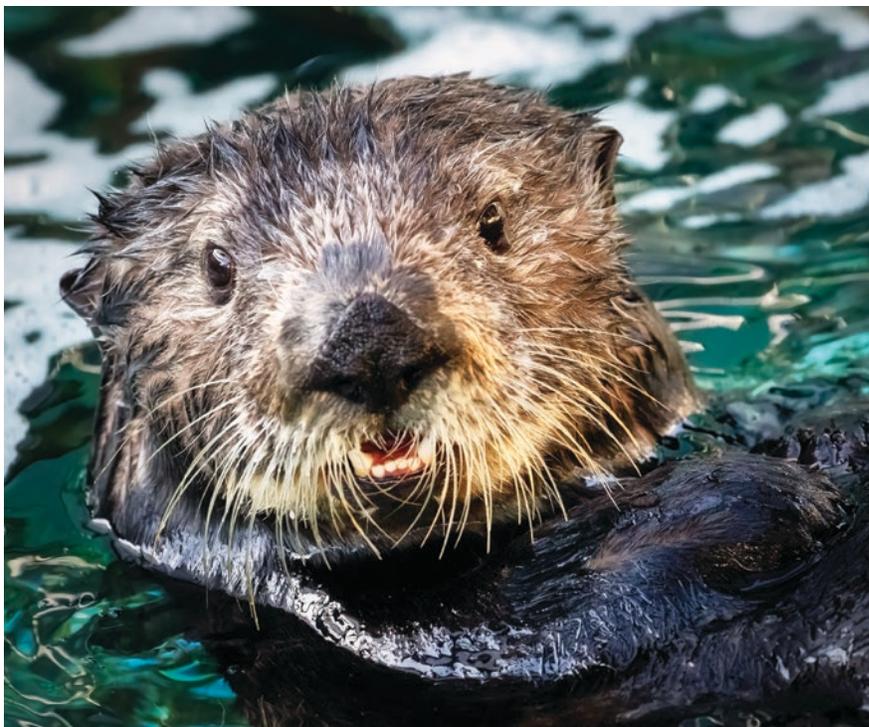
Millie moved into the Sea Otter Habitat in February.

IN LATE FEBRUARY the Aquarium welcomed a new sea otter, a four-year-old female named Millie, who joined the other otters in the Sea Otter Habitat in the Northern Pacific Gallery. At the same time, the Aquarium announced that it will become a partner facility for rehabilitating stranded sea otter pups, rearing them with the help of surrogate mothers, and coordinating their release back into the wild.

This project makes the Aquarium a partner with Monterey Bay Aquarium in its sea otter surrogacy program. The Monterey Bay Aquarium has rescued, rehabilitated, and released stranded sea otter pups since the 1980s, helping in the recovery of wild populations of this endangered species. Millie successfully raised a pup previously through this program, and based on her experience and disposition, experts believe she is ideally suited to serve as a surrogate mom.

The new surrogacy area at the Aquarium of the Pacific will be built behind the scenes of its Molina Animal Care Center and will accommodate three to four rescued sea otter pups each year. In addition, the Aquarium will develop interpretative material to educate the Aquarium's visitors on the surrogacy program and the significance of recovering southern sea otter populations.

A lead grant from the California's State Coastal Conservancy Sea Otter Recovery Grant Program will support the initial construction of the sea otter surrogacy facility. The Aquarium is also engaging in a public fundraising campaign to support the surrogacy program. To donate, visit pacific.to/saveseaotters or call (562) 951-1701.



Millie can be distinguished from the other sea otters by the dark brown fur on her head.



The Aquarium's sea otters are served a diet of restaurant-quality seafood, including shrimp and clams.



Experts at the Aquarium believe Millie is ideally suited to serve as a surrogate parent to orphaned pups.

Meet Tropical Animals in New Coral Reefs Exhibit

The Aquarium has added dozens of new species, including many tropical fish and these three featured animals.

THE AQUARIUM'S NEW *Coral Reefs: Nature's Underwater Cities* exhibit will feature several highlighted animals to help visitors learn about coral reef inhabitants and their roles in these complex ecosystems.

Most of the new animal exhibits created for *Coral Reefs* are located in the Tropical Pacific Gallery, where visitors will be able to see parrotfish, with their notoriously large front teeth; the intriguing longhorn cowfish; various species of pufferfish; and colorful butterflyfish.

In addition, the Aquarium will spotlight the following fascinating animals:

GREEN SEA TURTLE

Look for a green sea turtle in the Tropical Reef Habitat at the Aquarium. It has been more than a decade since the Aquarium had a green sea turtle as part of its exhibits, although its veterinary staff has rehabilitated and released more than a dozen of these turtles in the past twenty years.

Green sea turtles live all over the world, including in the nearby San Gabriel River and surrounding areas. They make long migrations to reach their nesting beaches in tropical and subtropical areas. Otherwise, they prefer nearshore areas, including lagoons and reefs, where they forage for algae and sea-grasses, helping maintain balance in reef ecosystems.

Green sea turtles are listed as endangered under the Endangered Species Act.

RED-FOOTED BOOBY

The Aquarium is welcoming a red-footed booby named Sula as an animal ambassador during the launch of *Coral Reefs*. Red-footed boobies are seabirds that live in tropical areas around the world. They live in colonies and nest in coastal trees and shrubs, where coral reefs and lagoons provide hunting grounds for food. Also, some studies indicate that their droppings can help the productivity of coral reefs. Sula is named after this species' scientific name: *Sula sula*.

Sula is one of only two red-footed boobies known to be living at a zoo or aquarium. Throughout the summer she will make appearances at meet-and-greet sessions with an Aquarium staff member, allowing visitors to see her up close and take photos.

FLASHLIGHT FISH

Flashlight fish cover and uncover an organ under each eye filled with bioluminescent bacteria, appearing to flash on and off like a flashlight. These distinctive fish will be on view in an exhibit called *Glowing Reef* in the Tropical Pacific Gallery during the *Coral Reefs* exhibition this summer.

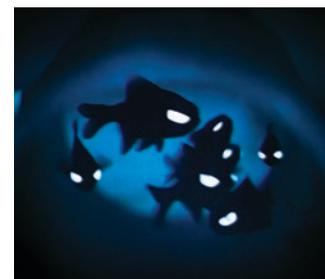
Flashlight fish live in the Indo-Pacific Ocean near coral reefs. They tend to hide in caves during the day and come out at night to feed on the reef, using their lights to detect prey.



Green sea turtle



Sula the red-footed booby



Flashlight fish

Harbor Seal Recovers from Cataract Surgery

Shelby has made good progress during her recovery, and her vision continues to improve.

SHELBY THE HARBOR SEAL underwent surgery in January to remove cataracts in her eyes. The surgery was successful, and Shelby spent several months behind the scenes recovering while closely monitored by the veterinary and husbandry staff.

Shelby was completely blind before this surgery. Now, she is able to follow moving objects and hand signals. While her eyes have a gray sheen that will improve but may never fully resolve, staff members report that they can see notable improvements in her eye comfort and vision.



Shelby moved into the separated recovery area next to the main exhibit in the spring.



CORAL REEFS

NATURE'S UNDERWATER CITIES



Corals come in all shapes and sizes, with whimsical forms and colors.

Coral reefs are among the most biodiverse areas in the world ocean, and they are home to a quarter of all ocean fish species. Reefs are also highly valuable, as they bring in billions of dollars through tourism and serve as fishing grounds, providing millions of people with a source of food. We also cherish them for their natural beauty and the important role they play in ocean ecosystems.

This summer at the Aquarium, explore the amazing diversity of coral reefs and learn what is being done to help them survive and thrive in a changing ocean.

How Reefs Form

There are three main types of reefs. **Fringing reefs** grow outward from shorelines and around islands. **Barrier reefs** also grow outward from shorelines, but they are separated from the land by water. **Atolls** form when a volcanic island sinks below sea level, leaving the reef surrounding it in an oval or circular shape with a lagoon in the center. Corals grow slowly, and it can take up to 10,000 years for a coral reef to form. It can take hundreds of thousands to millions of years for a volcanic island to turn into an atoll.

Cities are full of bustling activity and a dense network of buildings, parks, and streets, with millions of residents on the go day and night. Coral reefs are nature's underwater cities: They are teeming with diverse life and are home to millions of animals living in close quarters, just like our cities.



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FRINGING REEF



ISTOCK.COM/VLADIMIR OYCHINIKOV

ATOLL



ISTOCK.COM/MARK EVANS

BARRIER REEF



While they take up less than 0.1 percent of the ocean floor, coral reefs support more than 25 percent of all ocean fish species.

Tropical reef-building corals prefer clear, shallow water, but reef communities also form in conditions in deeper water where sunlight does not penetrate. Deep-sea corals can be found more than 10,000 feet (3,000 meters) below the surface on continental shelves, canyons, and seamounts.

Lagoons are also important components of reef communities. A lagoon is a body of water separated from larger bodies of water by a natural barrier. Atoll lagoons and coastal lagoons between barrier reefs and the shoreline serve as protected areas, where many species of marine life can grow and thrive.

Thanks to their location and structure, coral reefs protect coastlines by interrupting waves and dissipating their energy before they come ashore. This could become an increasingly important role as the changing climate results in more frequent, stronger storms and rising sea level.

Coral Biology

Corals are in the phylum *Cnidaria*, which also includes sea jellies and anemones. These animals all possess stinging cells that help them capture food. You can see the family resemblance when you look at corals up close. Most corals are made up of colonies of hundreds of individual animals called polyps. Each polyp has a stomach with a mouth at the opening surrounded by tentacles. These

tentacles have stinging cells, like sea jellies and anemones do. The cells help capture food, provide defense, and clear away debris.

Coral reefs form when free-swimming coral larvae attach to hard surfaces and begin to grow. The polyps secrete a calcium carbonate skeleton, and over time these structures can grow very large and weigh several tons. Known as stony corals, these colonies take many shapes, from branching corals and table-like structures, to ball-shaped or mushroom-shaped corals, or encrusting corals that grow in a thin layer.

Soft corals are also made up of colorful polyp colonies, but do not form hard skeletons (some have a flexible skeleton, others have none at all). They can be found in reef ecosystems living among stony corals, often having the appearance of trees, bushes, fans, or grasses.

Most reef-building corals have algae living in their tissues in a symbiotic relationship. The coral provides the algae space to live and grow and nutrients from its waste, and the algae produce food from sunlight for themselves and the coral through photosynthesis. For this reason, corals are sensitive to changes in light and temperature.

Corals reproduce through spawning. This happens once a year, cued by the lunar cycle and water temperature. Corals release eggs and sperm into the water, where fertilization takes place. After about four days, the resulting

larvae settle onto a hard surface and begin to change into adult polyps. The polyps can reproduce asexually to expand the colony. When they are old enough, they will spawn to reproduce sexually, starting the life cycle again.

Coral Reef Communities

Coral reefs are communities that operate in a finely tuned balance. In addition to the symbiotic relationship between corals and the algae that live in their tissues, there are other examples of mutually beneficial relationships.

Clownfish have such a relationship with anemones on coral reefs. Clownfish make their homes in a host anemone, where they swim safely among the anemone's stinging tentacles. The fish have a layer of mucus that protects them from stings, and staying close to their anemone protects them from predators. In turn, the clownfish cleans the anemone and provides it with nutrients.

Coral reefs are also home to animals that help manage reef populations and control the balance, like parrotfish. These fish use their large, sharp teeth to scrape off chunks of coral and eat the algae that lives inside, as well as some of the coral. In this way, parrotfish influence which corals live where on the reef and in what abundance.

Threats

When reefs experience changes, this can threaten the balance of life on the reef. Many human activities are causing harmful impacts, and the most serious threat is climate change.

Corals and their algae are adapted to stable water temperatures. When the water temperature rises, corals expel the algae that live inside their cells, causing coral bleaching. This means corals lose their primary source of food and the colorful pigments that protect them. If the water temperature returns to normal soon enough, the algae will return. But if the temperature stays high, the corals die.

Other human activities that harm reefs include those that result in pollution. Coastal development near coral reefs, such as construction of hotels, roads, and housing near the beach, causes sediment to run into the ocean, sometimes covering and smothering corals. Agricultural fertilizers that run off land into the ocean also disturb the balance, causing an abundance of nutrients to enter the water, which can lead to an algae bloom. Algae blooms block sunlight and consume oxygen that corals and other marine species need. Offshore oil drilling can also threaten marine ecosystems like coral reefs, and plastic waste in the ocean can get lodged in coral reefs' nooks and crannies and make corals sick.

Destructive fishing practices can also harm coral reefs. Trawling, in particular, uses equipment that drags along the ocean floor, breaking corals and undoing the centuries-long process of building the reef. Overfishing certain species disrupts the balance of life on the reef, which can lead to overgrowth of algae.

These threats combined have put coral reefs in danger of disappearing. We must take action to protect and conserve coral reefs, and fortunately we have the knowledge and tools to do so. Plus, organizations and communities around the world are engaged in coral conservation efforts that are helping to turn the tide.

Coral Conservation

Communities that live near and benefit from coral reefs have traditional knowledge and are well positioned to lead in conservation efforts to protect their reefs, such as eco-tourism projects, sustainable fishing practices, and reef

restoration programs. It is important for governments and non-governmental organizations working in these areas to empower local people to take the lead. Often, local people have the most knowledge about the reefs and the issues they face.

Scientists are also working directly on coral reef restoration programs. The Aquarium has partnered with SECORE International, a non-profit organization dedicated to restoring damaged reefs in Guam and Palau. SECORE scientists and Aquarium staff members grow corals on specially designed ceramic tiles in a laboratory setting. Then, these tiles are placed on nearby reefs to grow into new coral communities.

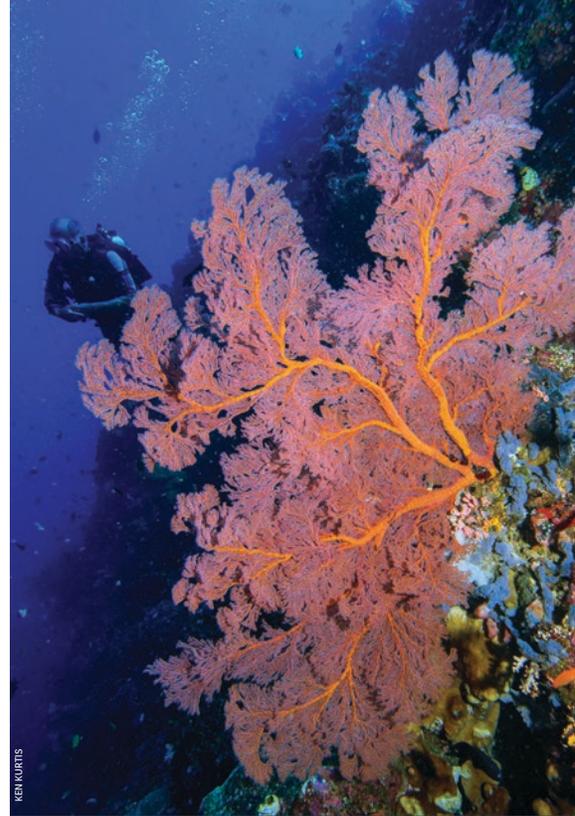
Scientists have identified some corals that show the ability to tolerate or recover from stress like warmer water, meaning they may be more resilient to climate change. These "super corals" may help scientists develop conservation plans for coral reefs as the impacts of climate change progress.

At the Aquarium

This summer the Aquarium's Tropical Pacific Gallery will be transformed into an exhibition celebrating coral reefs. Visitors will have the chance to see examples of various coral reef environments and the colorful animals that call them home. Exhibits will include a coral lagoon habitat functioning as a nursery for juvenile fish, a showcase of rescued corals confiscated by the U.S. Department of Fish and Wildlife, an exhibit of coral eaters such as parrotfish, an exhibit highlighting bioluminescent and fluorescent animals on coral reefs, and more.

The Aquarium will also have brand new shows playing daily in the Ocean Theater, Great Hall, and Pacific Visions. The new Honda Pacific Visions Theater show will feature stunning imagery of coral reefs and animated characters representing coral reef animals. It will teach audiences about the threats coral reefs face and what is being done to help.

Visit the Aquarium's website for updates on the opening of *Coral Reefs: Nature's Underwater Cities* and special opportunities and hours for members.



KEN KURTIS

This summer at the Aquarium, explore coral reefs and learn what is being done to help them survive and thrive in a changing ocean.



KEN KURTIS



KEN KURTIS

* Member Events

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

Coral Reefs

We look forward to offering our members special opportunities to enjoy our new Coral Reefs exhibit and programming. Visit our website for the latest information.



ROBIN RIGGS



ROBIN RIGGS



ROBIN RIGGS

Visit aquariumofpacific.org for event information.

* Special Events

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

Shark Lagoon Nights

■ **Fridays, June 5 & 12**
6:00 P.M.–9:00 P.M.

Get up close with the ocean's ultimate predators for free during Shark Lagoon Nights. Guests will have the opportunity to touch bamboo sharks, epaulette sharks, and cownose rays and see large sharks, such as sand tiger and zebra sharks in the Aquarium's Shark Lagoon. Cold beer, sodas, and snacks are available for purchase. Live music is offered on select evenings.

World Ocean Day

■ **Monday, June 8**
9:00 A.M.–5:00 P.M.

The Aquarium will celebrate World Ocean Day on June 8. Aquarium visitors can learn about climate change, ocean pollution, and other ocean issues by viewing films and shows and exploring exhibits. All of this is in celebration of the ocean, which covers 70 percent of Earth's surface and remains almost entirely unexplored.

Late Nights

■ **Sundays, June 21–Sept. 6 (except August 30)**
5:00 P.M.–8:00 P.M.

During Late Nights this summer the Aquarium will remain open until 8:00 p.m. (until 10:00 p.m. on July 4). Visitors will have the opportunity to journey through the Pacific Ocean to meet more than 12,000 animals, including sharks they can touch, penguins, sea otters, and sea lions. Please note: The Lorikeet Forest aviary closes at 5:30 p.m.

- Free for members, \$19.95 for non-members after 5:00 p.m.

Teacher Family Day

■ **Friday, June 26**
9:00 A.M.–12:00 P.M.

Teachers and school support staff are invited to explore the Aquarium with their families during Teacher Family Day. Education staff and partner organizations will be present from 9:00 a.m. to 12:00 p.m. for teachers to learn more about Aquarium field trips and free resources to utilize in their classrooms.

July 4th Late Night & BBQ

■ **Saturday, July 4**
5:00 P.M.–10:00 P.M.

You can enjoy a July 4th evening BBQ at the Aquarium and experience the ambiance of the Aquarium at night. Guests can visit more than 12,000 animals, view the Long Beach fireworks, and enjoy some fresh grilled BBQ this Independence Day. The BBQ is from 6:00 p.m. to 8:00 p.m. Choose between seating on the Harbor Terrace and Front Plaza or premium seating on the Veranda (space is limited). You can also experience Pacific Visions on this evening, as the entire Aquarium, except Lorikeet Forest, will be open late in celebration of the holiday. Please note: Lorikeet Forest closes at 5:30 p.m. Space is limited, so advance reservations are highly recommended.

- BBQ | \$64 per adult member, \$28 per child member; \$79 per adult non-member, \$43 per child non-member. VIP seating: \$79 per adult member, \$38 per child member; \$94 per adult non-member, \$53 per child non-member.

Kids Night

■ **Fridays, July 24 and August 21**
6:30 P.M.–9:00 P.M.

Calling all kids! Bring your parents in for an evening full of fun. Enjoy kid-friendly activities throughout the Aquarium, including live entertainment, crafts, photo opportunities, and special animal shows.

- Free for members; \$19.95 for non-members

We hope to offer all the events listed, but due to the unprecedented circumstances, we may need to cancel, alter, or create virtual versions of these events. Please visit our website for the latest information.

First Responders Day

Friday, September 11

9:00 A.M.-5:00 P.M.

Police officers, sheriff's deputies, firefighters, doctors, and nurses receive free admission on September 11. Contact your union or association to purchase discounted tickets for friends and family before coming to the Aquarium.

- Free for doctors, nurses, police officers, sheriff's deputies, and firefighters with a current and valid service ID.

California Coastal Clean-Up Day

Saturday, September 26

8:00 A.M.-12:00 P.M.

Join the Aquarium in cleaning up the beach at the end of the Peninsula at Ocean Blvd. and 72nd St. in Long Beach as part of the statewide Coastal Clean-Up Day. Help protect our ocean and marine life by picking up trash. Gloves and bags will be provided. Look for the Aquarium booth to check in and receive your cleaning supplies. No RSVP necessary.



Sept. 26: California Coastal Clean-Up Day

ANDREW REITSMAN



Sept. 19-20: Moompetam Native American Festival, Sept. 26-27: Baja Splash

* Festivals

Experience our community's diverse cultures and their connections to the ocean and environment. All festivals are free for members; members' guests receive 20% off regular admission.

Moompetam Native American Festival

■ Sat. & Sun., September 19-20

In celebration of local Native American cultures, the Aquarium will host its sixteenth annual Moompetam Festival. This weekend celebration will feature traditional cultural crafts, storytelling, educational programs, live demonstrations, music, and dance celebrating California's indigenous maritime cultures, including Tongva, Chumash, Acjachemen, Costanoan, Luiseno, and Kumeyaay.

Baja Splash

■ Sat. & Sun., September 26-27

In celebration of National Hispanic Heritage Month, the Aquarium will host its nineteenth annual Baja Splash Cultural Festival featuring live entertainment, crafts, educational programs, and special activities. Mariachi music, Mexican folkloric and Aztec dance troupes, interactive mural painting, Salvadoran dance, Guatemalan performances, and other special programs are featured. Guests can also learn more about the amazing animals of Baja, Mexico, and how to help protect them.

For tickets and information, visit aquariumofpacific.org or call (562) 590-3100, ext. 0.

* Guest Speakers

Lectures are free for Aquarium members, teachers, seniors age 62 and up, and students with valid I.D. and advanced reservations. Otherwise, tickets are \$5. All lectures start at 7:00 p.m. and are streamed live. Visit aquariumofpacific.org/news/lectures.

GRUNION GAZETTE
www.thegrunion.com

COURTYARD
BY MARRIOTT
LONG BEACH DOWNTOWN



Seafood for the Future to host panel discussion.

Panel Discussion | A New Definition for Sustainable Seafood

■ Date to be announced

In a recent peer-reviewed paper, researchers from universities in the U.S. and around the world challenge the conventional definition of sustainable seafood. The researchers propose a wider set of social and environmental considerations to reframe sustainable seafood, taking a more holistic view.

This panel discussion will include two of the paper's authors, Michael Tlusty, Ph.D. (University of Massachusetts, Boston) and Peter Tyedmers, Ph.D. (Dalhousie University). They will discuss how our current definition of sustainable seafood needs to change and how we can support a responsible seafood supply that provides more nutritious food while supporting ecosystems and people. They will be joined by Tiffany Waters from The Nature Conservancy, and the panel will be moderated by Kimberly Thompson, director of the Aquarium's Seafood for the Future program.

- Check aquariumofpacific.org for the date announcement.



August 27: Bart Shepherd will discuss the California Academy of Sciences' coral reef restoration efforts.

Luke Fairbanks | Bridging the Gap: Insights from the Social Sciences for U.S. Marine Aquaculture

■ June 25

Marine aquaculture is a growing part of the seafood system in the United States, but what are the social and political implications of this growth? How has it been influenced by peoples' values and attitudes toward seafood production and coastal environments? In this lecture Luke Fairbanks will explore insights from the social and policy sciences to better understand the processes, challenges, and opportunities associated with marine aquaculture. According to Fairbanks, social science research offers critical insights and opportunities to inform responsible marine aquaculture growth and improve the well-being of coastal communities across the United States. Fairbanks is an assistant research professor in the Division of Coastal Sciences at the University of Southern Mississippi's School of Ocean Science and Engineering in Ocean Springs, Mississippi.

Jeffrey Bennett | Global Warming Demystified

■ August 11

Jeffrey Bennett will answer questions about the science of global warming, while showing that the solutions to this important problem are ones that people of all persuasions can agree on. Bennett is an astrophysicist and author of the book, *A Global Warming Primer: Answering Your Questions About the Science, the Consequences, and the Solutions*.

Bart Shepherd | Hope for Reefs: Advancing the Science of Coral Reef Restoration

■ August 27

Bart Shepherd will discuss the California Academy of Sciences' coral reef restoration efforts. In partnership with colleagues from SECORE International and the zoo and aquarium community, the organization is developing techniques for large-scale restoration by seeding damaged reefs with sexually reproduced corals grown on self-attaching substrates. This approach helps maintain genetic diversity and significantly reduces the labor and time required for restoration. This work, along with research in their onsite aquarium laboratories, will accelerate the development of the scientific and practical cultivation techniques needed to give coral reefs a hopeful future. Shepherd is the senior director of Steinhart Aquarium at the California Academy of Sciences and co-director of the Academy's Hope for Reefs initiative.

Visit our website for new lectures added throughout the summer.

Access the Guest Speaker Series and More Online

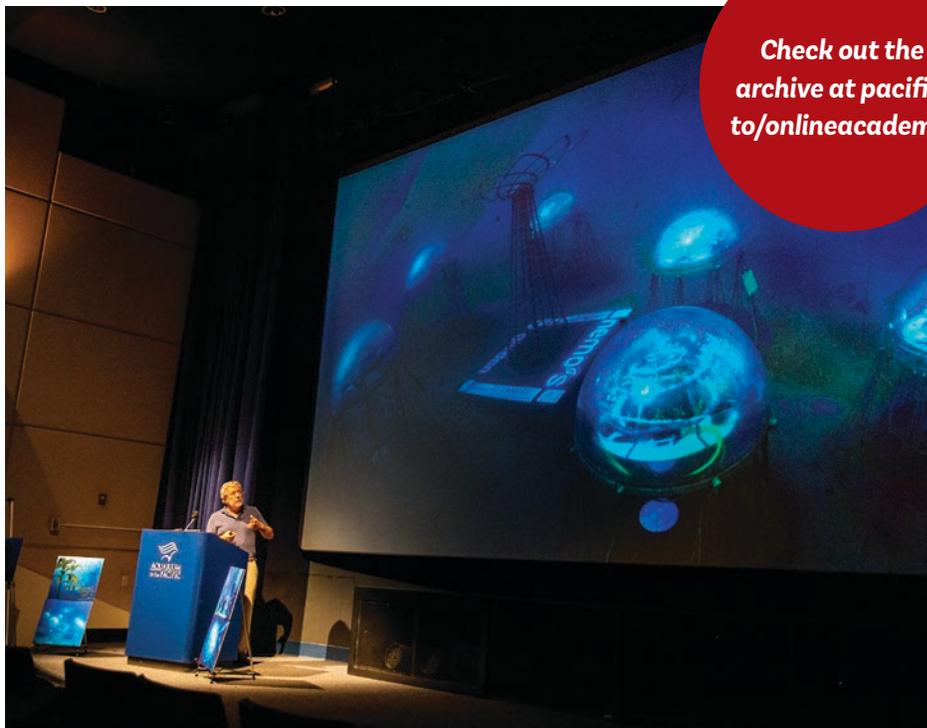
■ Catch up on archived lectures from the Guest Speaker Series online.

Our lectures cover a wide variety of topics, from ocean research and conservation to how we can use art to build connections to nature and among people. Each speaker also records a short video Aquacast at the Aquarium, and this archive is also available on the website. Interested in climate change and sustainability? The Aquarium has created a mini-series on each of these topics, gathering lectures into modules that can be viewed consecutively.

Take a short course on climate change, sustainability, or California's environmental issues. These modules are available as playlists at youtube.com/aquariumofthepacific.

The Aquarium's Aquatic Academy courses for adults are also available online. Watch a series of courses taught by leading experts on topics ranging from climate change to sea level rise, extreme weather, and California and water.

These and other resources are available at aquariumofpacific.org/news/aquariumacademy. You can also view lecture and Aquatic Academy video collections on the Aquarium's YouTube page by clicking on the Playlists tab.



Lectures dating back to 2010 are available on the Aquarium's website.

Check out the archive at pacific.to/onlineacademy.

ANDREW REITSMA



ROBIN RIGGS



ANDREW REITSMA

Other online resources include live webcams from inside several Aquarium exhibits, interviews with staff members, a virtual tour, and educational activities for children and families.



Sula the red-footed booby is one of the Aquarium's Animal Ambassadors. Visitors can see her during meet-and-greet sessions on the Aquarium floor this summer. Red-footed boobies are seabirds that live in tropical areas around the world. They live in colonies and nest in coastal trees and shrubs, where coral reefs and lagoons provide hunting grounds for food.

*Aquarium
of the Pacific*



ADD-ON EXPERIENCES

Educational Resources

Many of the Aquarium's educational resources for kids and families are available online.

Classes for Kids

Find classes for various ages with the Aquarium's educators on our YouTube page. Classes cover ocean science topics for all grade levels, from pre-K to twelfth grade. Visit youtube.com/aquariumofthepacific.

Observe Marine Life

Use the Aquarium's Webcam Resource Kits to help children make scientific observations by watching ocean animals on our live webcams. Visit aquariumofpacific.org/teachers/webcamkits/.

Career Connections

Learn about careers that use STEM (science, technology, engineering, and mathematics) skills and what paths kids can follow to those careers. Visit aquariumofpacific.org/teachers/career_connections.

Online Learning Center

Read up on your favorite Aquarium animals by finding the species profile in our Online Learning Center at aquariumofpacific.org/onlinelearningcenter.

EcoAlliance App

Explore topics from Pacific Visions and take on sustainability challenges in the Pacific Visions EcoAlliance App for iPhone and Android devices. Available in the App Store and Play Store.



ANDREW HETSMA

Homeschool Opportunities

Homeschool Days

■ Tuesday and Wednesday, September 8-9 | 9:00 a.m.-12:00 p.m.

Join the Aquarium on Homeschool Days to learn with other home-school families. Aquarium educators will guide families through learning stations that allow students of all ages to experiment, investigate, and explore ocean habitats and animals.

- Free for members, \$7 per non-member

NOW BOOKING: Octopus Encounters

The octopus animal encounters are now available for booking. The octopus exhibit in the Northern Pacific Gallery was renovated, improving the area for encounters and making it wheelchair accessible.



ROBIN RIGGS



Visit our website or call for the latest information on these programs.

Whale Watching

CRUISES

Whale Watching and Dolphin Cruise

■ Seasonal

The Pacific Ocean is home to many wondrous animals year 'round. Join us as we search for dolphins, seals, sea lions, and other marine life on our Whale Watching and Dolphin Cruise. This is an experience you and your family will not soon forget!

- Members: \$25 per adult, \$20 per senior (ages 62+), \$15 per child (ages 3-11). Non-members (includes Aquarium admission): \$49.95 per adult, \$45.95 per senior, \$33.95 per child.
- 2 to 2.5 hours
- (562) 590-3100, ext. 0



Blue Whale Watching Trips

■ Summer Season

Join naturalists and experts from the Aquarium for an ocean voyage in search of the largest animal on the planet—the blue whale. Along the way we will also have the opportunity to spot dolphins, seals, sea lions, and other marine animals. You can find out about recent sightings by following @OceanWatchLB on Twitter.

- Members: \$45 per adult, \$35 per senior (ages 62+), \$25 per child (ages 3-11). Non-members (includes Aquarium admission): \$59.95 per adult, \$24.95 per senior, \$56.95 per child.
- 3 to 3.5 hours
- (562) 590-3100, ext. 0

Tours & Encounters

These programs are opportunities to see the Aquarium in a different light and get up close to the animals.

Behind-the-Scenes Tours

See what it takes to maintain a world-class aquarium, from water filtration to animal care and feeding. Venture to the top of our largest exhibit and discover more about the Aquarium!

- \$15 per member, \$19 per non-member
- Children must be age 7 or older.

Animal Encounters

Animal encounters offer a chance to feed an octopus, train a sea lion, feed a shark, or hang out with a penguin.

- \$99 per member, \$109 per non-member (Aquarium admission included).
- Pre-registration required at least 24 hours in advance.
- Age restrictions apply.

VIP Experiences

■ By reservation.

Get even closer in this special animal encounter experience! Tour the Aquarium, meet two separate animals, and have exclusive experiences only for VIPs. Choose from Penguins and Pinnipeds or Sharks and Rays.

- \$330 per member, \$350 per non-member (Aquarium admission included).
- Pre-registration required at least two weeks in advance.
- Age restrictions apply.

Dive Immersion

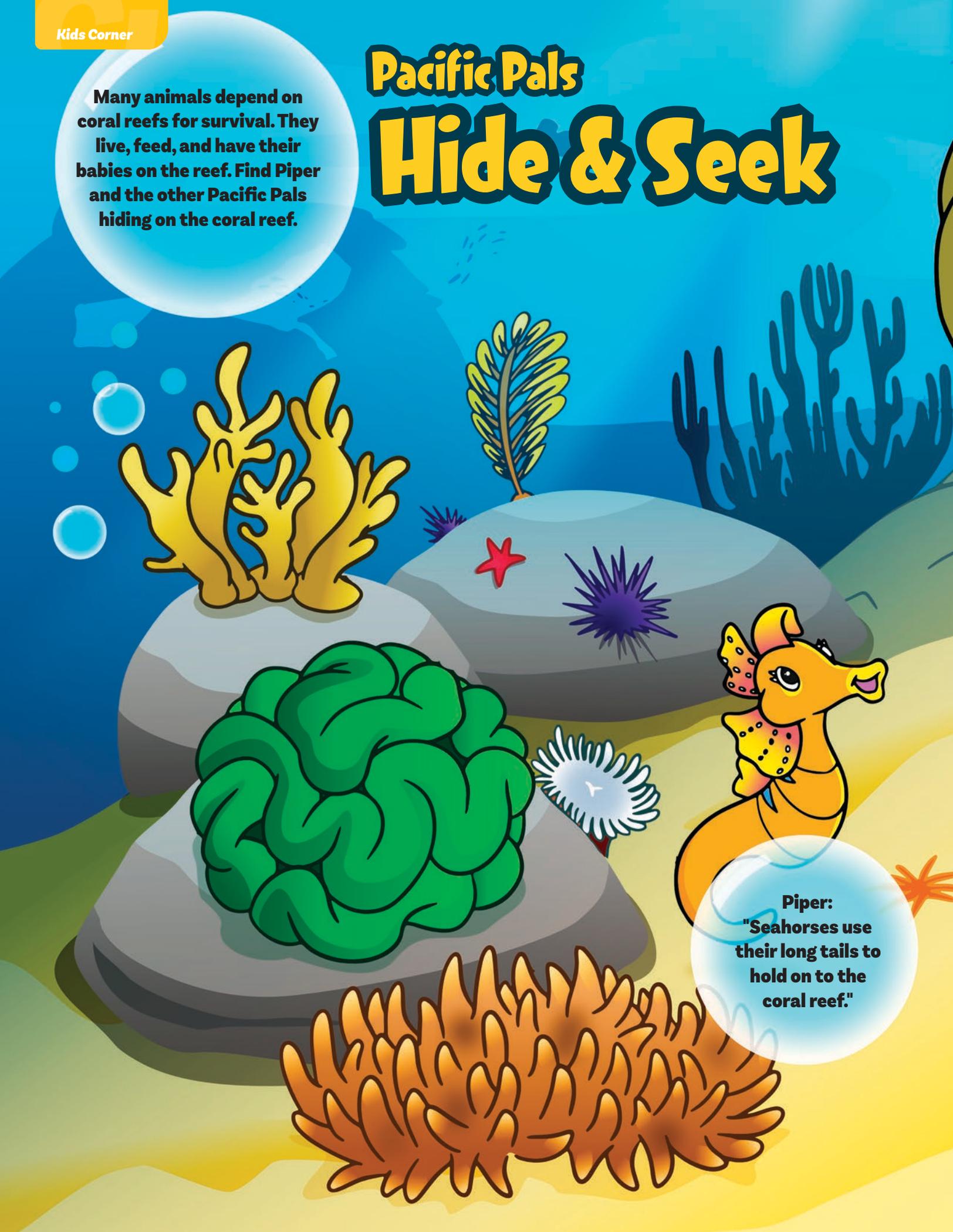
■ Daily with reservation 3:00 P.M.-5:00 P.M.

Certified SCUBA divers can dive in our warm 350,000-gallon Tropical Reef Habitat with more than 600 animals.

- \$279 per member, \$299 per non-member
- Age 15 and up. Please note: Ages 15 to 17 require a supervising adult to also sign up for the dive.

Many animals depend on coral reefs for survival. They live, feed, and have their babies on the reef. Find Piper and the other Pacific Pals hiding on the coral reef.

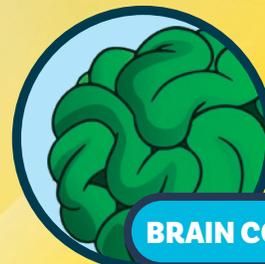
Pacific Pals Hide & Seek



Piper:
"Seahorses use their long tails to hold on to the coral reef."

Coral comes in all different shapes, sizes, and colors. Can you spot the following types of corals?

Bertrand:
"Coral reefs are home to all kinds of animals, including eels. They hide in the reef during the day, and are active at night."



BRAIN CORAL



SEA PEN



BUBBLE CORAL

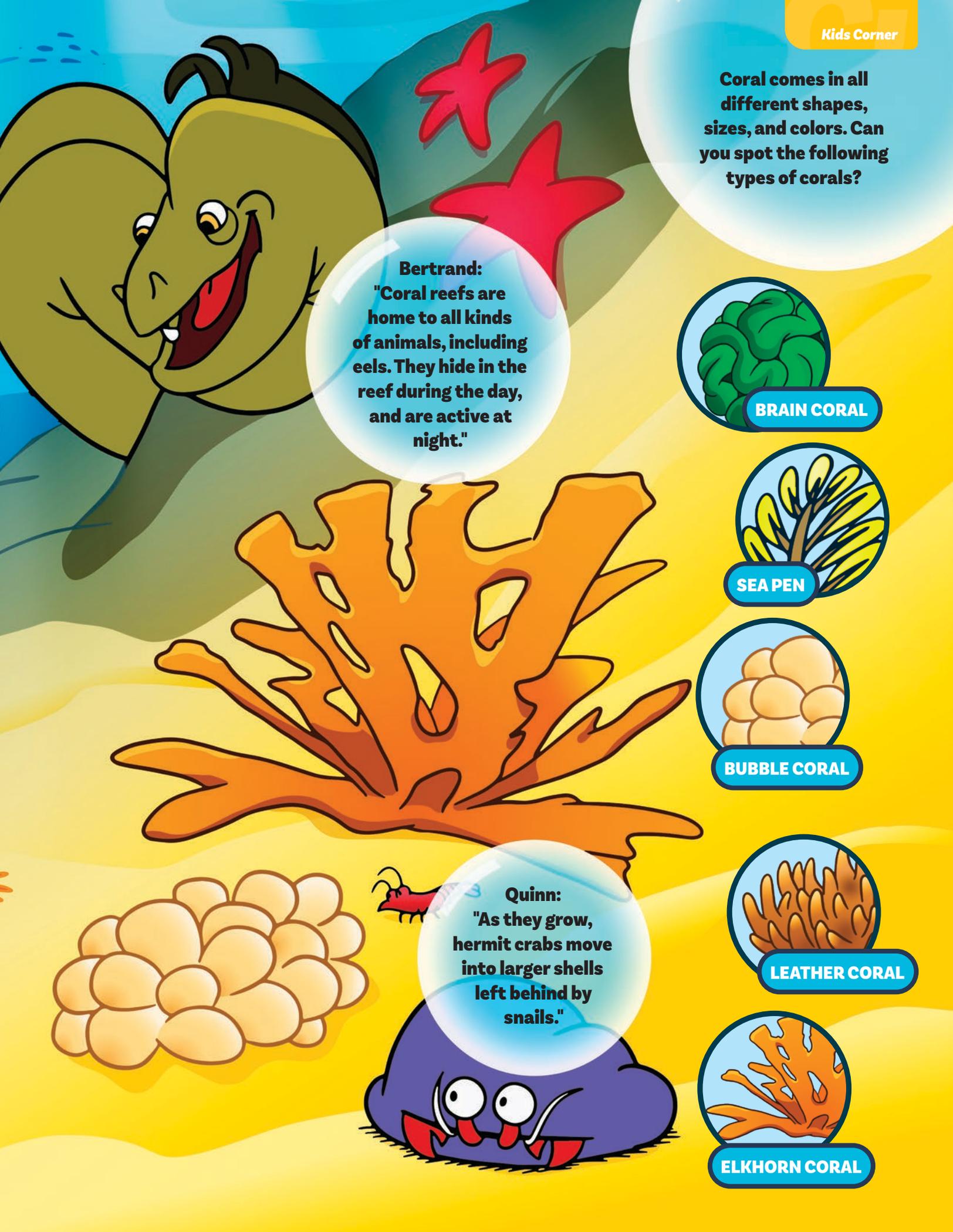
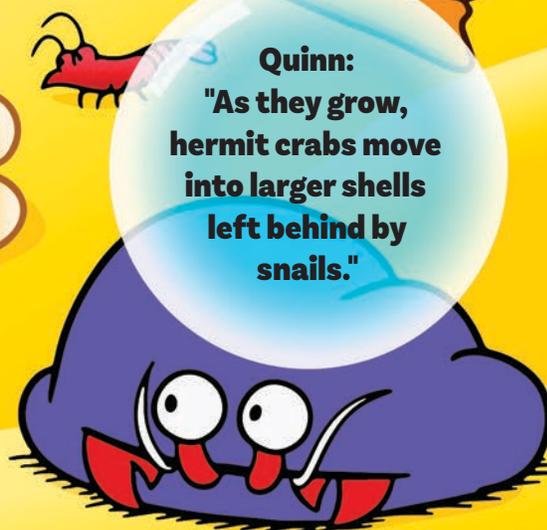


LEATHER CORAL



ELKHORN CORAL

Quinn:
"As they grow, hermit crabs move into larger shells left behind by snails."



Animal Facts



ROBIN RIGGS

CORAL REEFS: NATURE'S UNDERWATER CITIES, CORAL PREDATORS | TROPICAL PACIFIC GALLERY

Parrotfish

Scaridae sp.

Parrotfish use their large, sharp beaks to scrape off pieces of coral and eat the algae that lives in the coral's tissues as well as the coral's calcium carbonate skeleton. Through this process, parrotfish and other species that eat coral help to control coral growth. They digest coral skeletons into the fine, white sand we find on tropical beaches.

CORAL REEFS: NATURE'S UNDERWATER CITIES, HIDDEN POTENTIAL | TROPICAL PACIFIC GALLERY

Pom Pom Crab

Lybia edmonsoni

These tiny coral crabs can be found carrying living sea anemones in their claws, giving them the common names of pom pom or cheerleader crabs. The anemones help protect them from predators and even assist the crabs in getting their next meal. The anemones have stinging cells that the pom pom crab can use to deter predators by "punching" them, so this crab is sometimes also called the boxing crab.



ISTOCK.COM/SCUBALUNA



JONATHAN RACKA

CORAL REEFS: NATURE'S UNDERWATER CITIES, DEEP REEF | TROPICAL PACIFIC GALLERY

Black Coral

Family Antipathidae

There are between 100 and 200 species of black coral. Contrary to their common name, black corals come in a variety of colors, but their stiff skeleton is black or brown in color. Black corals are found in many places in the ocean, but are most common in deep waters. They thrive in low-light conditions, where swift currents bring food to them.

Learn more about giant sea bass at the Aquarium on our website.



Juvenile giant sea bass have a golden brown color. Adults are usually grey with black spots.

Aquarium and Partners Release Giant Sea Bass Juveniles in the Wild

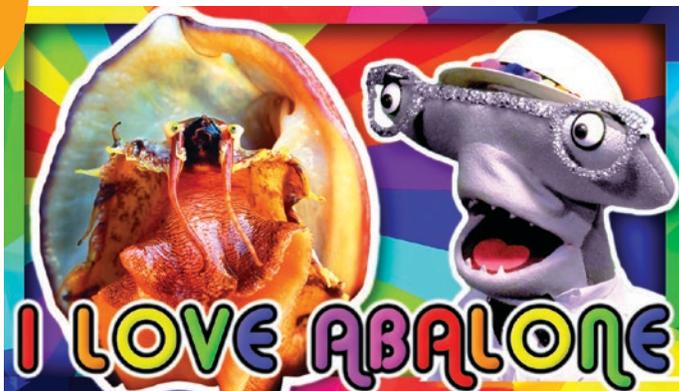
CALIFORNIA STATE UNIVERSITY, NORTHRIDGE (CSUN), the Aquarium of the Pacific, and Cabrillo Marine Aquarium have announced a successful joint effort involving raising and releasing juvenile giant sea bass into the ocean.

In early March the partners conducted the first of the planned releases off California’s coast. Giant sea bass are listed as critically endangered on the International Union for Conservation of Nature’s Red List. Their populations are believed to be increasing slowly after years of decline.

In the past giant sea bass have been notoriously difficult to breed in an aquarium setting. The Aquarium of the Pacific was the first public aquarium to successfully hatch and raise a baby giant sea bass in 2016. After that initial success, aquarium professionals and researchers gathered to share their knowledge, and more juveniles were successfully hatched and raised in succeeding years.

The releases are conducted with approval from the California Department of Fish and Wildlife. The release locations will be kept confidential among the project partners, allowing the young fish to acclimate to their new home.

Aquarium visitors can see adult giant sea bass in the Honda Blue Cavern exhibit, the first aquarium-born juvenile Yutaka in the adjacent Amber Forest exhibit, and other juveniles in the Southern California/Baja Gallery.



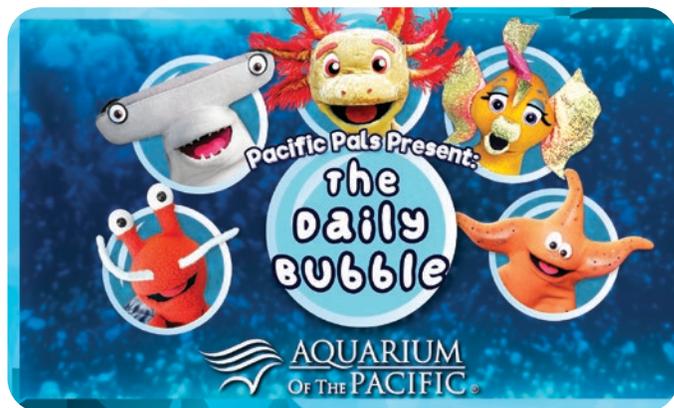
Seymour Shark sings the praises of this endangered marine snail in a new video.

Pacific Pals Release “I Love Abalone” Music Video

IN MARCH THE AQUARIUM’S PACIFIC PALS RELEASED a new music video called “*I Love Abalone*,” celebrating these endangered marine snails and the collaborative conservation work being done to help save them. Featuring Seymour Shark performing the lead vocals, the song details the challenges abalone face in reproducing in the wild and what the Aquarium and other helpers are doing to boost local abalone populations.

Catch up with the Pacific Pals and their new show *The Daily Bubble* on the Aquarium’s YouTube page.

Visit the Aquarium’s YouTube channel (youtube.com/aquariumofthepacific) to see the video and leave a comment for the Pacific Pals.



The Pacific Pals share fun crafts, animal facts, and news about the Aquarium on their show.



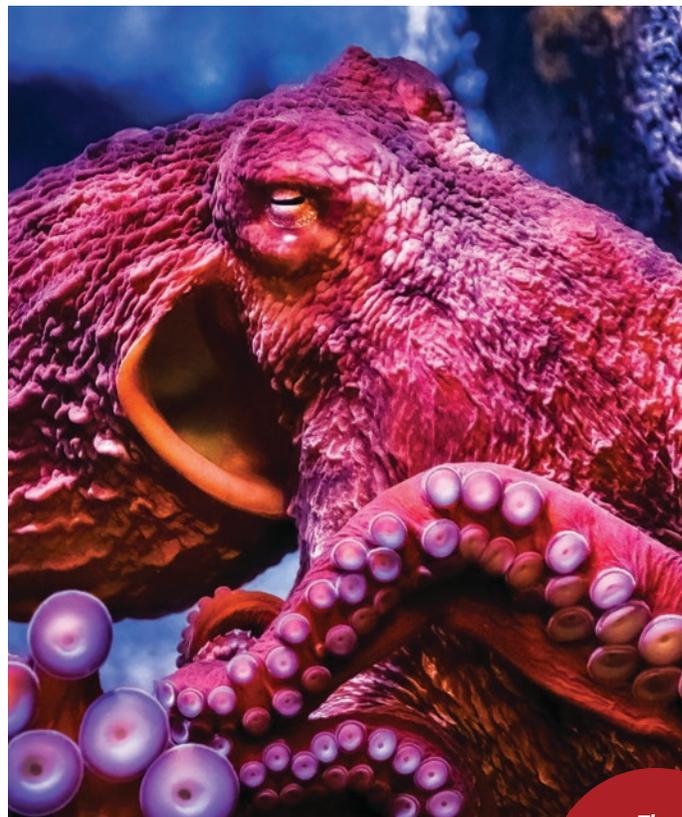
Aquarium Releases Report on the Future of California's Offshore Oil Rigs



IN JANUARY THE AQUARIUM HOSTED a forum that brought together experts from state and local governments, scientists, and representatives from the fishing industry and other groups to learn more about California's offshore oil rigs and what should happen with them as they reach the end of their productive lifetimes.

During the forum, attendees reached a consensus that because the underwater structures serve as artificial reefs and de facto marine protected areas, the state and residents should investigate all options for the oil rigs, from full removal to turning them into artificial reefs or repurposing them as bases for ocean research, monitoring, renewable energy production, or aquaculture.

The full report and videos from the forum are available on the Aquarium's website at aquariumofpacific.org/mcric/forums.



Meet our giant Pacific octopus up close and learn how the husbandry staff feeds and cares for this fascinating animal.

The exhibit was renovated last fall, improving access.

New Octopus Encounter Now Booking

THE AQUARIUM IS OFFERING A NEW OCTOPUS ENCOUNTER after completing a renovation of the giant Pacific octopus exhibit in the Northern Pacific Gallery. The new construction improved access behind the scenes, making octopus encounters wheelchair accessible. Visitors using a wheelchair will now be able to experience an octopus encounter at a newly added second octopus exhibit behind the scenes.

Godzilla, the Aquarium's giant Pacific octopus, is back on view in the public exhibit. The new behind-the-scenes exhibit will house a second octopus for encounters.

The octopus encounter is available on Thursdays and Fridays at 2:45 p.m. The cost for members is \$99 per person, and participants must be at least seven years old. Call (562) 590-3100 to reserve.

To learn more about animal encounters and VIP experiences, visit pacific.to/encounters.

BOOKING 2021 DATES



A Unique Setting for Your Event

The Aquarium of the Pacific's new award-winning Pacific Visions wing provides a unique venue for private events. Host a picnic on the front plaza with the backdrop of the stunning glass biomorphic building. Hold a reception or sit-down dinner in the new art gallery surrounded by a coral wall, projections of ocean life, and a virtual waterfall. Or choose from a variety of other spaces, including the rooftop Veranda, Great Hall, Shark Lagoon, or even the adjoining Shoreline Aquatic Park. Whether it is for picnics, formal receptions, or sit-down dinners, the Aquarium offers a variety of venues that immerse you in the beauty of the ocean and will create lasting memories for your guests.

*Aquarium
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yourevent.aquariumofpacific.org

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Fundraising Highlights

The Aquarium of the Pacific spotlights recent stories of supporters who have helped further our mission and vision.

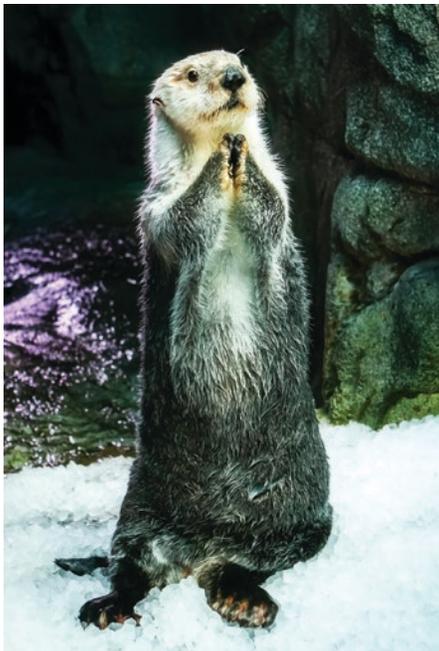
SoCal Honda Grants “Random Act of Helpfulness” to School Group

THE HELPFUL HONDA GUYS IN BLUE visited the Aquarium on January 17 to surprise a group of seventy-five fifth graders from La Colima Elementary in Whittier. After the group finished their Shark Mythbusters education program, the Helpful Honda people gifted free nectar cups to all students so they could feed the birds in Lorikeet Forest.

The SoCal Honda Dealers are an Aquarium sponsor and provide surprise experiences to visitors on select Saturdays throughout the year. Honda drivers who spot the Helpful Honda people at the Aquarium have the opportunity to receive items like free parking, free behind-the-scenes tours, and discount vouchers for the gift store, courtesy of the SoCal Honda Dealers Association.



The Helpful Honda Guys helped students feed the lorikeets.



ROBIN RIGGS

Contributions from our donors support our animal care, education, and conservation programs.

Message from the Aquarium

"THANK YOU TO ALL of our donors and our members of the Pacific Circle and Steward Circle! The Aquarium of the Pacific is honored and proud to have so many supporters that share a belief in our mission. Your dedication and generosity creates an impact that ripples throughout the Aquarium and beyond. Thank you for sharing our commitment to our community and our planet." – Ryan Ashton, vice president of development.

To learn more about our Pacific Circle and Steward Circle memberships, please visit AquariumofPacific.org/pacific_circle or call (562) 951-5387.

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(as of April 30, 2020)
aquariumofpacific.org

Education Donors

Thank you to the following donors for their support of the Aquarium of the Pacific's education programs for students, families, and our community in 2019.

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There are ways you can support your Aquarium's mission while still preserving your assets for retirement and providing for your family

SOME GIFTS TO CONSIDER

Gifts from a Will or Trust
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To learn more about these types of charitable gifts and how you can support the Aquarium of the Pacific, please visit aquariumofpacific.myplannedgift.org or contact us directly at rashton@lbaop.org or (562) 951-1701.

Aquarium **Accolades**

The Aquarium presents awards to individuals and organizations in recognition of their service to the community and achievements in conservation.



Kathie Nirschl, Aquarium vice president of human resources, presented the Glenn McIntyre Heritage Award to Dani Bowman.



Aquarium CFO Anthony Brown presented the Heritage Award to H. Maxie Viltz.



Hamid Torabzadeh was selected as the Aquarium's 2020 Young Hero Award winner.

Dani Bowman

Glenn McIntyre Heritage Award

The Aquarium presented the Glenn McIntyre Heritage Award to Dani Bowman at the Festival of Human Abilities in January in recognition of her work to help individuals with autism express their talents and develop career opportunities.

Bowman is on the autism spectrum. Through her company DaniMation Entertainment and her summer camps, she has taught animation to more than 1,500 teens and young adults with autism and other different abilities. DaniMation Entertainment also employs musicians, artists, and voice actors with autism.

Bowman also serves as an overseas ambassador for Anna Kenney Online, which promotes inclusion and equality for children and adults with autism.

H. Maxie-Viltz

Heritage Award

The Aquarium presented the Heritage Award to H. "Max" Maxie-Viltz at the African-American Festival in February. Maxie-Viltz is a lifelong resident of Long Beach and owner of Village Treasures, which showcases African art and culture and serves as a community gathering place that hosts book signings and art exhibitions.

Maxie-Viltz has long had an interest in supporting African cultural arts programs in Long Beach and helped establish the African-American Festival at the Aquarium. In 1988 she helped found the African Cultural Research and Study Group of Long Beach.

She currently serves as vice chair of the St. Mary Medical Center Board of Ambassadors, board member for the Historical Society of Long Beach, and committee member for the International City Theater Community Partnership, which provides scholarships and exposure to theater for youth in Long Beach.

Her contributions to the community also include providing training and mentoring for youth through the Pacific Gateway Program. In 2019 she was appointed by Councilman Al Austin II as co-chair of the committee for the establishment of the African American Cultural Center of Long Beach.

Hamid Torabzadeh

Young Hero Award

The Aquarium selected Hamid Torabzadeh as its 2020 Young Hero Award honoree in recognition of his extensive volunteer work and his dedication to environmental awareness and public health.

Torabzadeh is fifteen and is an aspiring physician-scientist who has conducted research assistantships at California State University, Long Beach's Department of Biomedical Engineering and Department of Mechanical and Aerospace Engineering.

Torabzadeh participated in Youth Leadership Long Beach's Environmental Youth Leadership Program and Growing Beyond Earth's Maker Contest, in which he served as a mechanical lead to create a prototype for a system maximizing food production. He won the 2019 Green Jackrabbit Award in Long Beach Polytechnical High School PACE's Green Gold Environmental Business Plan Competition for his plan, which outlined a zero-waste grocery store.

His extensive volunteer work includes serving as a Blood, Health, and Safety Division Officer for the American Red Cross Youth Organization and volunteering at the VA Long Beach Healthcare System and Ronald McDonald House in Long Beach.

How You Can Help Protect Coral Reefs



Climate Change

Climate change is the biggest threat to coral reefs. Rising ocean temperatures can cause corals to bleach and die. However, if temperatures return to normal in time, corals can recover. This can give us hope. If we act quickly to slow and reverse the rate of climate change, we can give corals time to adapt and a chance to survive and thrive.

We can help by reducing our own carbon footprints, learning more about climate change and its impacts, and talking with friends and family to share knowledge.

You can reduce your use of fossil fuels in several areas. Reduce the number of flights you take each year. Use public transit, bike, or walk instead of driving to your destination. And make your home energy efficient.

For more information on these topics, check out the Aquarium's guides to climate resilience posted on our website at aquariumofpacific.org/conservation/climate_resilient_long_beach.

Reducing Pollution

Ocean pollution is harmful to corals and other reef animals. Fertilizer that runs into the ocean from land can harm corals by causing an algae bloom. Oil spills are harmful to coral reefs. Development on the coast can cause sediment to run into the ocean, covering coral reefs. Plastic waste can damage corals, as well.

Ensuring that coastal development and agriculture reduce their impacts on coral reefs is a complex task, but individuals like you can keep track of how the food you eat is grown, learn more about offshore oil drilling, and follow coastal developments near you to stay well informed and consider how these might affect the ocean.

Activities you can directly control to reduce ocean pollution include reducing your use of single-use plastic items and packaging, participating in beach clean-ups, and selecting sunscreen and other personal care products that do not contain ingredients that are harmful to reefs.

Vacations and Travel

When you visit tropical destinations, be sure to support tour operators like cruises and snorkeling trip operators that follow sustainable practices and demonstrate coral reef stewardship.

Take the time to learn about how the local community uses the reef and what they are doing to conserve it.

Consider offsetting the carbon emissions created by your airline flight and rental car by donating to conservation organizations that work to support coral reefs and the ecosystems connected to them, such as mangroves, beaches, and estuaries.

PACIFIC
Currents



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