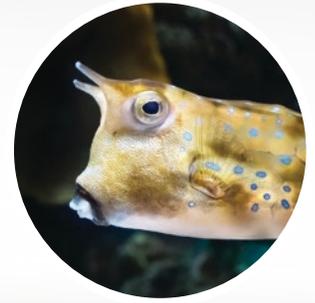


PACIFIC
Currents

Aquarium of the Pacific

SPRING 2017



**Opens
May 26**



FROGS

DAZZLING AND DISAPPEARING

Could California Lead the Way on Farming the Ocean?

IT MIGHT SEEM INCONGRUOUS, but one of the most important things we can do as we think about the future of the ocean is to consider how and where we grow the food we eat. Currently we use nearly half of Earth's ice-free land to grow our crops and livestock, and our agricultural practices are not scalable to meet the need for 70 percent more food by 2050. As our global population increases, it is inevitable that humans will turn to the ocean for more food. We are at a critical point; by starting now, governments can plan this process thoughtfully and ensure that any new development is responsibly managed to ensure a safe and sustainable seafood supply, while benefitting people and conserving nature.

California could serve as a model for a food system that integrates both land-based agriculture and responsible offshore aquaculture, or the farming of seafood. There are many factors that point to potential success. California has the largest agricultural economy in the country and is a hub for high-tech science and engineering industries. In addition, our coastline is home to working waterfronts with proximity to major consumer markets. Our state also has some of the highest standards for environmental protection, human health, and workers' rights, all of which would come into play with the development of a major aquaculture industry. Plus, Southern California's ocean has good conditions for aquaculture and is one of the most thoroughly studied areas of the World Ocean. Southern California has the potential to become a laboratory for designing and developing new strategies for us to live in greater harmony with our coastal ocean.

Our state also has some of the highest standards for environmental protection.

The Aquarium has been working to investigate all aspects of establishing offshore aquaculture in California. In recent years, the Aquarium has convened forums and workshops to develop the concept with representatives from government agencies, environmental groups, the commercial fishing industry, and seafood distributors. Reports from these meetings are posted on the Aquarium's

website. Visit aquariumofpacific.org and enter offshore aquaculture in the search box.

Seafood for the Future (SFF), the Aquarium's sustainable seafood program, has created a new interactive map to help the public learn more about the distribution, diversity, and innovation of marine farms in the U.S. The map has a special focus on existing operations in California. Using clickable icons based on GPS points, users can view individual farms and get information on species, growing techniques, total farm size, annual production, and production time.

With this developing expertise on aquaculture, the Aquarium has been tapped by international governments to provide input as other countries develop this industry. In 2016 Aquarium representatives attended a workshop for the Aquaculture Working Group under the Galway Agreement at the European Marine Science Educators Association in Belfast, Ireland. Also in 2016 Aquarium President and CEO Jerry Schubel presented a talk to industry, government, and non-government leaders at the World Ocean Council's Sustainable Ocean Summit in Rotterdam, Netherlands. You can read an essay version of this talk at pacific.to/aqessay.

The Aquarium will continue to explore marine aquaculture as a conservation tool and as an important way to support an environmentally, economically, and socially responsible food future.



Finfish and shellfish are both farmed in the United States. Visit our interactive map at seafoodforthefuture.org.



Letter from the CEO

Dear Members,



HERE AT THE AQUARIUM we are always investigating the best new methods for communicating science to our visitors. There are many complex environmental issues that are crucial for the public to understand as we make decisions about our future. From climate change and its impacts to the mechanics of our food system and the ways we produce energy, many aspects of human activity affect our environment, and we must make thoughtful decisions to ensure we live in harmony with nature.

I strongly believe in the Aquarium's focus on the arts as a way to communicate science and create emotional connections with issues affecting nature. I also believe it is important to hear the views and incorporate the perspectives of younger people.

For these reasons, the Aquarium has partnered with the ArtCenter College of Design in Pasadena, California, for nearly a decade. Students in the Designmatters program work with Aquarium experts to learn about ocean and environmental topics to create projects that address these issues. In 2016 the two partner institutions were awarded a grant from the National Endowment for the Arts to develop projects focusing on climate change and coastal resiliency.

The Aquarium and ArtCenter developed the Resilient Coastal Cities Studio to challenge students to conceptualize, design, and create an exhibit that would effectively communicate a call to action for the residents of Long Beach and other coastal cities for resiliency in the face of climate change. The outcome of this seminar will be used in future exhibits at the Aquarium.

The Aquarium has also begun new work on ocean issues with our founding sponsor Honda. I have joined the board of the new Honda Marine Science Foundation, and the Aquarium will be hosting two forums this year to bring together experts and examine ways to restore ecosystems and facilitate climate change resiliency. The first forum focused on a project called SoCal Oysters run by a group of students at the University of California, Santa Barbara's Bren School of Environmental Science and Management. SoCal Oysters is working to restore coastal areas and wetland habitats by introducing native oysters.

I invite you to come visit the Aquarium's new exhibits opening on May 26, including a new focus exhibit on archerfish, our newly remodeled exhibit on water in California, and *FROGS: Dazzling and Disappearing*, featuring about two dozen species of frogs and other amphibians. This exhibit is a continuation of our *Vanishing Animals* exhibit that helped our visitors learn about the pressures many species face and what we can do to make a difference.

Thank you for your ongoing support.

Sincerely,

Jerry R. Schubel

Cover: Pacific tree frog
BRIAN GRAY



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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).

Pacific Currents Staff: Editor/Writer: Claire Atkinson | Copy Editor: Cecile Fisher | Designer: Andrew Reitsma | Contributing Writers: Erin English, Alana Garibaldi, and Lindsay Yates.

Aquarium Hours: Open daily from 9:00 a.m.-6:00 p.m. except December 25.

Membership Office Hours: 8:00 a.m.-5:30 p.m. daily

Phone Numbers (562 area code):

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Membership 437-3474
Development 951-1605
Lost & Found 951-1733
Private Event Info 951-1663
Gift Store 951-1SEA (1732)



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.





The new exhibit will feature nearly two dozen species, including frogs, salamanders, and caecilians.



©MELISSA HARRIS/DOGGIT ZOO AND AQUARIUM

New Amphibians on Display for FROGS Exhibit

FROGS: Dazzling and Disappearing features nearly two dozen amphibian species.

THE AQUARIUM IS DISPLAYING about two dozen species of frogs and other amphibians in the Tropical Pacific Gallery in the new FROGS: Dazzling and Disappearing exhibit opening May 26. As a class of animals, amphibians are the most threatened on the planet due to a variety of factors. Several species face special conservation challenges.

The Panamanian golden frog (*Atelopus zeteki*) is believed to be extinct in the wild, but zoos and aquariums in the United States and Panama are working to maintain populations to ensure the survival of the species. Its native habitat is the forests of the Cordilleran Mountains in Panama. Its bright yellow coloration serves as a warning to predators that its skin secretes a highly toxic poison. Look for these frogs in the cylinder tanks on the right side of the exhibit area as you enter.

The Kaiser's newt (*Neurergus kaiseri*) comes from a small segment of the Zagros Mountains in Iran. This is a critically endangered species, with fewer than 1,000 estimated to remain in the wild. Its population has decreased due to habitat loss and illegal capture for the pet trade. These newts undergo a period of dormancy during the summer months when water is scarce. At the Aquarium, Kaiser's newts are displayed in a small exhibit in the arid desert habitat section.



ROBBI RIGGS

Archerfish Exhibit Added on Harbor Terrace

Watch these fish in action at daily feedings. Harbor Terrace is located outdoors on the first floor.

THE AQUARIUM HAS ADDED AN EXHIBIT featuring archerfish on the Harbor Terrace overlooking Rainbow Harbor. The exhibit is located next to the mudskipper exhibit outside the Aquarium's classrooms across from the Moon Jelly Touch Lab.

This new exhibit will be on public view starting May 26.

Archerfish have the ability to spit a jet of water above the surface as a method of hunting insects and other prey. They typically are found in mangroves and estuaries from India to the Philippines, Australia, and Polynesia.

Visitors will have the opportunity to see this unusual method of capturing food during daily feedings.

Correction

A photo caption on page 4 in the winter 2017 issue of *Pacific Currents* was incorrect. It should have read: Astaire (on the left) was named by Sea Fare donor Vicki Kane. Fisher (right) was named by a third grade class at La Cañada Elementary.

New Penguin Joins Aquarium's Colony

Meet "The Admiral," a new adult male who joined the colony in the June Keyes Penguin Habitat.

A NEW ADULT MALE PENGUIN ARRIVED at the Aquarium this spring and joined the waddle on exhibit on March 15. The newcomer's name is Admiral Fancy Pants, and Aquarium staff members have been calling him "The Admiral" for short.

Look for The Admiral on your next visit.

This penguin was exchanged with another accredited member of the Association of Zoos and Aquariums (AZA) for Newsom, one of the Aquarium of the Pacific's original birds. The exchange is part of the Species Survival Plan (SSP) for Magellanic Penguins, which is adminis-

tered by AZA. The SSP manages the population of Magellanic Penguins living in zoos and aquariums, and part of its aim is to ensure genetic diversity in this population. With Newsom reaching reproductive age, it was time to move him to an institution where he could find a mate and help to maximize the genetic diversity of this population. It is also hoped that The Admiral will find a mate at the Aquarium.

Newsom was one of the younger birds in the June Keyes Penguin Habitat when it opened in 2012. Since the exhibit opened, the Aquarium has successfully hatched and raised nine penguin chicks.

The Admiral is part of a Species Survival Plan for Magellanic Penguins living in zoos and aquariums.



ROBIN RIGGS

Baby Giant Sea Bass On View in Redondo Canyon Exhibit

See our tiny baby in an exhibit located near his parents, residents of Honda Blue Cavern.

A BABY GIANT SEA BASS THAT HATCHED AT THE AQUARIUM is now on public view in the Redondo Canyon exhibit in the Southern California/Baja Gallery on the first floor. This small fish was the result of a spawning event this past fall and was raised in a tank behind the scenes during its early months.

At its hatching, the baby fish was just 4 millimeters long. Now, it is about three inches long and is fed on a diet of mysid shrimp. It will take about fifteen years for this juvenile to reach its full adult size (up to 6 feet long and 500 pounds). At that age, aquarists may be able to determine its sex based on any mating behavior it displays. Until that time, it is not possible to determine its sex by sight.

Giant sea bass are a critically endangered species and difficult to breed in aquarium environments. Only one other facility has had preliminary success in breeding giant sea bass. The Aquarium is home to three adult giant sea bass, a well-established male-female pair that has been at the Aquarium since its opening and a younger male. All three are residents of the Honda Blue Cavern exhibit in the Great Hall. The well-established pair are the baby's parents.

Giant sea bass are critically endangered.

The Aquarium's three adult giant sea bass are each about 4 to 5 feet long.

ROBIN RIGGS





FROGS

DAZZLING AND DISAPPEARING

In some places at night or after a rainstorm, a chorus of croaking rises, making hundreds of small creatures seem larger than life. This is how many people experience frogs in modern life—by sound.

In Western culture, frogs have been characterized as both friend and foe—from a prince disguised as a frog to be transformed by a kiss, to Kermit, who sang that it wasn't easy being green. In other places, frogs are used by humans as a source of food or poison to coat darts for hunting. Frogs and their amphibian relatives have existed on Earth for millions of years and have become a part of our culture, but around the world they are rapidly disappearing. This summer at the Aquarium discover nearly two dozen species of frogs and other amphibians and learn about this fascinating group of animals that relies on both land and water to survive.

Clockwise from top left: mossy frog, yellow-banded poison dart frog, Amazon milk frog, mossy frog, and blue poison dart frog.

AMPHIBIAN BIOLOGY

Amphibians are divided into three main groups: frogs, salamanders, and caecilians (pronounced seh-SILL-ians). There are between 4,000 and 6,500 species of frogs and toads, about 400 species of salamanders, and fewer than 200 species of caecilians. Caecilians are legless amphibians that live underground or in water in the tropics. The word amphibian comes from the Greek word *amphibios*, meaning two lives. This description refers to their life cycle, which begins in water and moves to land.



Amphibians lay eggs in water or a damp area.

There are many different ways that amphibians reproduce, but in general, they lay their eggs in water or another damp environment. After the larvae hatch, they transform into tadpoles and breathe underwater through gills. Eventually the tadpoles metamorphose into their adult forms and transition to life on land, where they breathe air. Many amphibian parents lay their eggs and abandon them, but many also perform some type of parental care, from guarding the eggs to carrying tadpoles or babies on their bodies.

Because they are dependent on both aquatic and terrestrial environments, amphibians are particularly sensitive to changes in those environments. Their skin also makes them sensitive. They have no scales, feathers, or fur to protect them, so amphibians are vul-



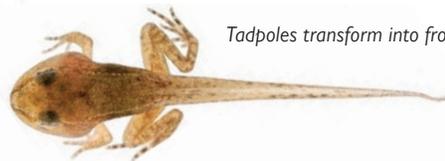
Tadpoles live in water.

nerable to pollution, attacks by predators, and even sunlight. For this reason, they are generally nocturnal. Their skin is also highly permeable (they can take in oxygen, or breathe, through it), making amphibians more vulnerable to pollutants, especially pesticides, fertilizers, or acid rain.

Amphibians are ectotherms, meaning that they are cold-blooded and rely on external sources of heat like sunlight to maintain their body temperature. They are also carnivores that feed primarily on insects.



Frogs live on land and breathe air. In water they absorb oxygen through their skin to breathe.



Tadpoles transform into frogs.

What is the difference between frogs and toads?

Toads are frogs, but we use the term toad to refer to those that have dry and bumpier skin. They also generally have shorter legs and bodies. And what about newts and salamanders? Newts are a type of salamander and generally live in water.



Frog



Toad



Salamander



Newt

FROG CALLS

Frogs make their vocalizations by forcing air from their lungs through vocal cords. Some frogs have inflatable vocal sacs that radiate the sound. Frog calls have several meanings. They serve as advertisements to females for mating and as signals by males to designate their territory. Some

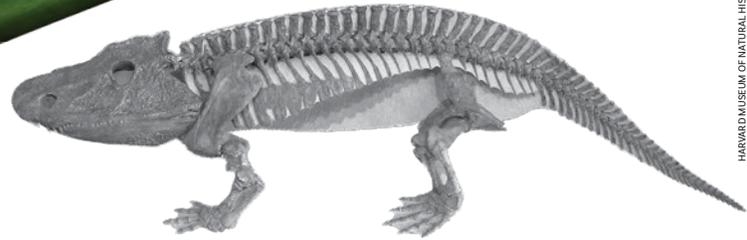
females have response calls. Some frogs also use a distress call when attacked or hiss or scream when attacking their prey. Frog choruses have actually been known to lower home values in areas where their volume can be deafening.

This bullfrog has inflated its vocal sacs to make its deep croaking call.





Pine barrens frog



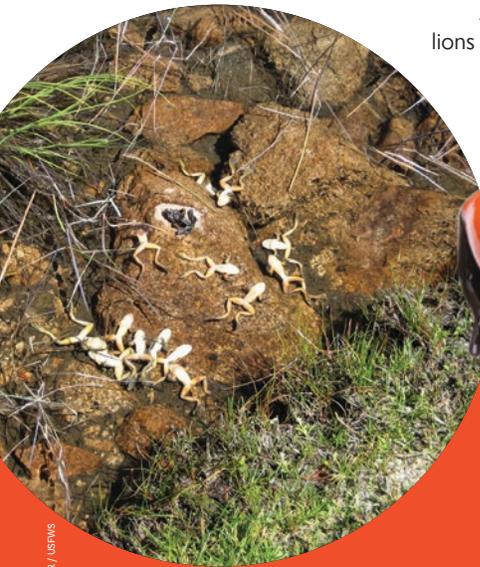
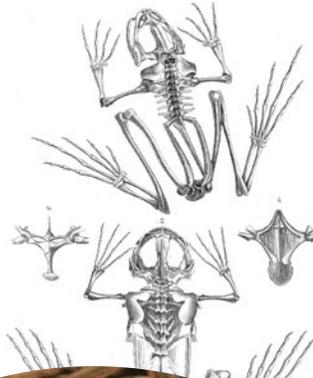
ADAPTATION AND DIVERSITY

Frogs and other amphibians have adapted over millions of years to survive and thrive in their ecosystems. Amphibians are thought to have evolved from bony fishes around 370 million years ago, before the dinosaurs. Fossil records show several of these ancient species to have been very large, the size of small cars and up to 13 feet long.

As Earth warmed and dried over millions of years, amphibians had to specialize

and adapt strategies for a wide variety of environments. This has driven the development of the thousands of species we have today and enabled amphibians to survive in very hot deserts, rainforests, temperate ponds and streams, and even frozen Arctic tundra. Amphibians live all over the world, on every continent, except Antarctica.

They are abundant and diverse in tropical regions, where the damp environment most suits them.



Splashback poison dart frog

Houston toad



BEHAVIORS

Amphibians deploy many interesting defensive and survival strategies. Frogs and toads, especially in dry places, have evolved ways to avoid water loss. Some bury themselves in a burrow for a period of hibernation while others form a cocoon or secrete a waterproof covering for their skin to retain water during inactive periods. Amphibians are vulnerable to predators because they are relatively slow-moving, defenseless, and easily digestible. They are hunted by snakes, lizards, turtles, birds, mammals, humans, and even other amphibians. To avoid predators, some frogs use camouflage and others secrete toxins or distasteful substances.

Poison dart frogs have one of the most deadly toxins, and the level of toxicity can increase depending on what they eat. Some amphibians can also detect scents or other chemical traces of their predators. Others simply jump away, flatten themselves to the ground, bite, or make a sudden startling vocalization. Some salamanders can lose their tail and regrow a new one to rapidly flee a predator. Other salamanders wrap their tail around the predator and exude mucus, partially immobilizing the predator.

Devastating Disease

Chytridiomycosis is a skin disease caused by a fungus affecting 30 percent of world's amphibian species. It exists in wild and captive populations of amphibians everywhere amphibians are found. Although the source of the disease has not been determined definitively, it is thought to have originated with global trade of amphibians for food, laboratory animals, and pets. With all the other threats amphibians face, the rise of this disease poses a special danger in wiping out broad swaths of their populations. Scientists are searching for ways to treat chytridiomycosis, including anti-fungal baths and thermal treatments for tadpoles. These treatments could help prevent local extinctions of amphibian species if scientists are able to collect, treat, and release the animals.



RICK KUYBER / USFWS

USFWS



Red-eyed tree frog

CONSERVATION

Amphibians today are emblematic of how an entire group of animals can be overwhelmed by threats to its survival. They are disappearing faster than other endangered animals because of their vulnerability to several compounding factors. In some cases, species are disappearing faster than they can be discovered, particularly in Central and South America. Threats to amphibians include:

- habitat destruction, thought to be the biggest threat,
- introduced and invasive species that outcompete native amphibians for resources and habitat,
- development that clears wetlands and forests and sends runoff of sediment and other pollutants into waterways,
- a fungal disease, chytridiomycosis, that within thirty years has caused the catastrophic decline or extinction of at least 200 species,
- climate change,
- drought,
- and the pet trade, which is decreasing in impact now that it is becoming better regulated and managed through captive breeding.

The Association of Zoos and Aquariums and other institutions and agencies, like the National Park Service, are doing conservation work to protect amphibians and help rebuild their populations. These programs breed the animals in zoos and aquariums then release them back into their native habitats in the wild. Breeding programs have helped to restore a species of giant salamander called hellbenders and bolster the critically endangered yellow-legged frog native to Southern California mountains.

At the Aquarium

Discover the dazzling diversity of frogs and their amphibian relatives at the Aquarium starting on May 26 in the new *FROGS: Dazzling and Disappearing* exhibit. Nearly two dozen animals in thematic displays, educational graphics, and interactive exhibits will highlight the beauty of and threats to these remarkable animals. The exhibit will trace the history of amphibians, their life cycles, the different environments they live in from deserts to rainforests, the diversity of species, and their surprisingly uncertain future.

Educational programming will include a new show played daily in the Great Hall and a mini-series of lectures on amphibians. Aquarium visitors will also be able to meet some of our new amphibian residents up close with a keeper at the frog cart.

WHY ARE AMPHIBIANS IMPORTANT?

While this question needs more study, it is known that amphibians are an important source of food for other animals. This is true at all amphibian life stages, from eggs to larvae to adults. Snakes seem to be the most dependent on amphibians, and declines of amphibian species that snakes rely on for food have been shown to lead to a decline in those snake species.

Amphibians also play an important role in keeping their aquatic environments healthy. Tadpoles graze on algae and other tiny plants, which helps regulate the amount of nutrients in streams, ponds, and lakes.

Frogs and salamanders can reach very high population densities, especially in a wet season when there has been a lot of successful breeding. These booms affect the populations of the animals the frogs and salamanders prey on.

Scientists still have much to learn about the roles amphibians play in the ecosystems they inhabit. Studies have been done to show what might happen if one species were to be removed from an ecosystem, but given the threats amphibians face as a whole, it will be important for scientists to study what might happen if an entire amphibian community disappears from a particular ecosystem.



Green and black poison dart frog

Blue poison dart frog



Thanks to Dr. Lee Kats, professor of biology at Pepperdine University, for his assistance with this article.

* Member Events

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

Adult Member Preview Night

■ **Monday, May 22**
6:30 P.M.–9:00 P.M.

Adult members (ages 21 and up only) are invited to view *FROGS: Dazzling and Disappearing* before its public debut. Come see thematic displays and educational exhibits featuring about two dozen species that reveal why these animals are disappearing and what you can do to help. You will also get to preview the new *Our Water Future* and archerfish exhibits.

- Free for members. Member guests receive 20% off general admission.
- RSVP: (562) 437-3474 by May 18

Family Member Preview Night

■ **Tuesday, May 23**
6:30 P.M.–9:00 P.M.

Aquarium member families are invited to a sneak peek at *FROGS: Dazzling and Disappearing*. Featuring about two dozen frog species and other amphibians, this ‘ribbiting’ exhibition will highlight the beauty of these remarkable animals, the threats they face, and what you can do to help them survive!

- Free for members. Member guests receive 20% off general admission.
- RSVP: (562) 437-3474 by May 19

Adult Member Night

■ **Thursday, September 28**
6:30 P.M.–9:00 P.M.

Calling all adult members (ages 21+ only)! This is the night where you can explore a kid-free Aquarium and get some quality time in with your favorite animals. More details to come as the event nears.

- Free for members. Member guests receive 20% off general admission.
- RSVP: (562) 437-3474 by September 24



June 4: Long Beach Chorale Concert.

* 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, April 28–June 9 (except June 2)**
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 and cownose rays and see large sharks such as sand tiger and zebra sharks in the Aquarium’s Shark Lagoon. Coffee, hot cocoa, beer, wine, desserts, and snacks are available for purchase.

- Free for everyone.

Mother’s Day Brunch

■ **Sunday, May 14**
10:30 A.M. –12:00 P.M.

Join us for a memorable Mother’s Day meal to celebrate the special women in your life. Then, explore the wonders of the Pacific Ocean and visit over 11,000 animals in the Aquarium’s exhibits. All-day Aquarium admission is included.

- \$54 for adult members
- \$18 for child members
- \$64 for adult non-members
- \$28 for child non-members

Night Dive

■ **Friday, June 2**
7:00 P.M.–11:00 P.M.

At the Aquarium’s Night Dive for adults ages 18 and up, enjoy live bands and DJs, check out food trucks in the front plaza, and see works of art by local artists.

- Free for members; \$17.95 for guests.

Long Beach Chorale Concert

■ **Sunday, June 4**
7:30 P.M.–9:00 P.M.

Join the Long Beach Chorale for a performance in the Great Hall, *Pirates and Pilgrims and Sailors—Oh My!* Swashbuckling dramas, weary pilgrims, and fantastic voyages are all on the program, which includes selections by Verdi, Dam Ethel Smyth, and Gilbert and Sullivan. Along the way you just might encounter a particular Modern Major-General! Doors will open at 7:00 p.m., giving the audience a chance to explore the Aquarium before the concert begins at 7:30 p.m. Refreshments will be available for purchase..

- \$25 for member adults, \$15 for member students/children; \$30 for adults, \$18 for students with ID/children 3-11

World Ocean Day

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

The Aquarium will celebrate World Ocean Day with an array of activities. 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 90 percent unexplored.

- Free for members; members’ guests receive 20% off regular admission.

Blue Whale Gala

■ **Saturday, June 10**
6:30 P.M.–11:00 P.M.

Save the date for the Aquarium’s Blue Whale Gala. This elegant black-tie event presented by the Aquarium’s Board of Directors will include an outdoor cocktail reception overlooking Rainbow Harbor and a gourmet dinner in the Great Hall of the Pacific, followed by dessert and dancing under the stars. Proceeds support the Aquarium’s education, ocean conservation, and animal care programs.

- \$500 per person
- RSVP: Jillian Koehring, jkoehring@lbaop.org or (562) 951-1613

Father’s Day BBQ

■ **Sunday, June 18**
11:30 A.M.–1:30 P.M.

Celebrate Father’s Day with the entire family at the Aquarium. Enjoy lunch with a view of Rainbow Harbor and delight in the underwater sea life of the Aquarium. Tickets go on sale May 9.

- \$49 per adult member, \$18 per child member; \$59 per non-member adult, \$28 per non-member child.

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

Summer Discounted Late Nights

■ **Sundays, June 18–September 3**
5:00 P.M.–8:00 P.M.

On summer Sundays, admission will be just \$14.95 for adults and children after 5:00 p.m., and the Aquarium will remain open until 8:00 p.m. The Aquarium's short films will be shown in the Ocean Theater throughout the evening. Please note: Lorikeet Forest closes at 4:30 p.m.

- Free for members; \$14.95 for guests.

Teacher Family Day

■ **Friday, June 23**
9:00 A.M.–12:00 P.M.

Teachers are invited to treat themselves and a guest to a day of wonder and exploration at the Aquarium. Education staff members and informational tables will be available for teachers to learn more about field trip opportunities and resources. Also, discover our new summer exhibits, including *FROGS: Dazzling and Disappearing*. This event is intended for teachers working in schools. Please bring a school or district ID, pay-stub, union card, or other proof of eligibility.

- \$6 admission to all preK-12 teachers and school support staff with valid identification. Friends and family are only \$10 per person with a limit of four.

July 4th Late Night and BBQ

■ **Tuesday, July 4**
MULTIPLE SEATINGS, 5:00 P.M.–10:00 P.M.

Celebrate Independence Day with a visit to the Aquarium to view the Queen Mary fireworks display, dig into our annual BBQ starting at 5:00 p.m., and enjoy special extended hours. General admission after 5:00 p.m. is \$14.95.

- BBQ Cost (includes admission): \$54 per adult member, \$18 per child member; \$64 per non-member adult, \$28 per non-member child.

Night Dive

■ **Friday, August 25**
7:00 P.M.–11:00 P.M.

At the Aquarium's Night Dive for adults ages 18 and up, enjoy live bands and DJs, check out food trucks in the front plaza, and see works of art by local artists.

- Free for members; \$17.95 for guests.

First Responders Day

■ **Monday, September 11**
9:00 A.M.–5:00 P.M.

Police officers, sheriff's deputies, firefighters, and EMS employees 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 police officers, sheriff's deputies, firefighters, and EMS employees with a current and valid service ID.

Homeschool Days

■ **Wed. & Thur., September 13–14**
9:00 A.M.–12:00 P.M.

Homeschool networks, students, parents, and teachers are invited to the Aquarium's Homeschool Days. While the Aquarium will be open to the general public, no classroom-based school trips will be booked during these days. This will allow our educators to bring you ocean-related activities and biofacts throughout the morning. These engaging learning stations will allow students of all ages to experiment, investigate, and explore marine habitats and concepts.

- \$6 per person

California Coastal Clean-Up Day

■ **Saturday, September 16**
9:00 A.M.–12:00 P.M.

Join the Aquarium in cleaning up the beach at the end of the Peninsula 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. Please look for the Aquarium booth to check in and receive your cleaning supplies. No RSVP necessary.

- Free for everyone.
- Location: The beach at the end of the Peninsula at Ocean and 72nd, Long Beach
- (562) 590-3100, ext. 0 or 1-800-COAST-4U (1-800-262-7848)

Seniors Day

■ **Wednesday, October 4**
8:30 A.M.–1:30 P.M.

The Aquarium will open its doors for free to people ages fifty and above. Special exhibits and presentations for seniors will be featured.

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

Aquarium 5K and Kids Fun Run

■ **Saturday, October 7**
7:30 A.M.–2:00 P.M.

The Aquarium will be partnering with the JetBlue Long Beach Marathon to host the annual one-mile Kids Fun Run and the 5K Run/Walk, which will actually run through the Aquarium! Sign up early for the 5K, spaces are filling up fast! The Kids Fun Run will open for registration in June.

- Aquarium 5K: \$35; Kids Fun Run: Free
- Info: runlongbeach.com or (562) 427-4606

Photographers Night

■ **Sunday, October 8**
5:30 P.M.–10:00 P.M.

This is your chance to take the photos you have always wanted at the Aquarium. Professional and amateur photographers are invited to capture the Aquarium's wildlife during exclusive "photographers only" hours. Meet vendors, test new equipment, attend workshops, and meet other wildlife photo enthusiasts.

- \$26.95 per member
\$29.95 per non-member

Sea Fare

■ **Saturday, October 21**
7:00 P.M.–11:00 P.M.

Save the date for the Aquarium's thirteenth annual Sea Fare fundraiser. Sip and savor your way through the Aquarium galleries with an open bar and tastes from over 25 local restaurants, bid on an array of items in the live and silent auctions, and dance with the fish. Proceeds will benefit the Aquarium's education, conservation, and animal care programs.

- \$125 per person

* Festivals

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

Pacific Islander Festival

■ **Saturday & Sunday, June 3–4**
9:00 A.M.–5:00 P.M.

Discover the rich and diverse cultures of the Pacific Islands through traditional craft demonstrations, educational programs, and music and dance performances. The Aquarium's annual Pacific Islander Festival will celebrate various cultures, including Hawaiian, Fijian, Marshallese, Chamoru, Tahitian, Samoan, Tongan, Kiribati, and Maori.

Moompetam Native American Festival

■ **Sat. & Sun., September 16–17**
9:00 A.M.–5:00 P.M.

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

Baja Splash Cultural Festival

■ **Sat. & Sun., September 23–24**
9:00 A.M.–5:00 P.M.

Celebrate Hispanic Heritage Month and Mexican Independence Day with live entertainment, crafts, educational programs, and more. The diversity of Hispanic cultures will be highlighted through song, dance, art, and cultural displays. Mariachi music, Mexican folkloric and Aztec dance troupes, interactive mural painting, Salvadoran dance, Guatemalan performances, and other special programs are featured.

Southeast Asia Day

■ **Saturday, September 30**
9:00 A.M.–5:00 P.M.

The Aquarium will celebrate its annual Southeast Asia Day highlighting the beauty and diversity of the cultures of Cambodia, Thailand, Vietnam, Myanmar, Laos, and Indonesia. Guests will enjoy live performances, including music, dance, and cultural craft demonstrations. Children will have the opportunity to partake in arts and crafts.

Scarium of the Pacific

■ **Sat. & Sun., October 14–15**
9:00 A.M.–5:00 P.M.

Discover the creatures lurking in the depths at the Aquarium's annual Scarium of the Pacific—a spooktaacular educational Halloween event for the whole family. Enjoy special Halloween programs, including the annual children's costume contest, the creepy coloring contest, magic shows, underwater pumpkin carving, spooky storytelling, and kooky crafts, and meet eerie animals in the Great Hall.

* Guest Speakers

Lectures are free for members, teachers, seniors 62+, and students with valid I.D. and advanced reservations. \$5/non-members. All lectures are streamed live on the Aquarium's website at aquariumofpacific.org/aquariumlive.

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Robert Pomeroy | *Might As Well Go Surfing: Biomass Utilization in a World with Oil at \$50 a Barrel*

■ **Tuesday, May 2**
7:00 P.M.–8:30 P.M.

Algae biofuels are the subject of significant research, but they are impractical when petroleum is selling at or below \$50 per barrel. Robert Pomeroy will discuss the ongoing research and outreach in algae biofuels and biopolymers. Pomeroy is a professor of chemistry and biochemistry at the University of California, San Diego, where he also mentors undergraduate students in algal crop protection. His lecture will focus on polyurethanes and his group's proof of concept technology: an algae surfboard.

Daniel Goldman | *The Physics of Mudskippers and Other Land Locomotors*

■ **Wednesday, May 17**
7:00 P.M.–8:30 P.M.

Daniel Goldman, professor of physics at the Georgia Institute of Technology, was the lead author of a study published recently that investigated how aquatic animals transitioned to dry land millions of years ago. The scientists used robotics and mudskippers to study how these animals climb ashore in various conditions. Goldman will discuss the findings of this study.



PERRY HAMPTON

Mudskipper

Panel Discussion | *Will Farmed Fish Save Our Oceans, Delight Our Palates, and Provide Healthy Food for All?*

■ **Thursday, May 25**
7:00 P.M.–8:30 P.M.

Peter Kareiva, from the Institute of the Environment and Sustainability at University of California, Los Angeles (UCLA), will moderate a panel discussion with Aquarium President and CEO Jerry Schubel on the subject of aquaculture, or farmed seafood. Panelists will discuss a recent study by conservation scientists at University of California, Santa Barbara, on the economics and sustainability of offshore aquaculture, how aquaculture could serve the restaurant industry, and the details of running an aquaculture operation. This lecture is supported by Boeing and UCLA's Oppenheim Lecture Series.

Jonathan White | *Tides: The Science and Spirit of the Ocean*

■ **Tuesday, May 30**
7:00 P.M.–8:30 P.M.

Writer, sailor, and marine conservationist Jonathan White will discuss and sign copies of his latest book, *Tides: The Science and Spirit of the Ocean*—the result of his search for the world's largest and fastest tides. White has written for the *Christian Science Monitor*, *Sierra*, *The Sun*, and other publications.

Lee Kats | *Hollywood Amphibians: A Movie Star's Life*

■ **Thursday, June 8**
7:00 P.M.–8:30 P.M.

Did you know? The classic frog sound often heard in movies is usually the sound of a Pacific tree frog, native to parts of California. For over twenty-five years Dr. Lee Kats and his students at Pepperdine University have studied the amphibians that inhabit streams and wetlands around Los Angeles. As with many amphibians around the world, it appears that local amphibians are imperiled because of habitat loss, invasive species, and alterations in climate. Dr. Kats will discuss these changes and the challenges ahead for local frogs and salamanders.

Peter Godfrey-Smith | *Other Minds and the Evolution of Consciousness*

■ **Tuesday, June 27**
7:00 P.M.–8:30 P.M.

Tracing the evolutionary relationships between different kinds of marine animals



June 8: Lee Kats, *Hollywood Amphibians: A Movie Star's Life*.

tells us a lot about how and why consciousness might have evolved. In his lecture Peter Godfrey-Smith will discuss how and why octopuses and other cephalopods have a special place in this history. Godfrey-Smith is professor of history and philosophy of science at the University of Sydney and distinguished professor of philosophy at the Graduate Center, City University of New York. He is the author of *Other Minds: The Octopus, the Sea, and the Deep Origins of Consciousness*.

Matt Wandell | Bringing Deep Ocean Animals to the Surface

■ **Wednesday, July 12**
7:00 P.M.-8:30 P.M.

Matt Wandell will discuss his efforts in collecting and exhibiting mesophotic coral reef fishes, pygmy seahorses, and deep water corals. Wandell is a senior aquarist at the Monterey Bay Aquarium and was previously a biologist at the Steinhart Aquarium at the California Academy of Sciences in San Francisco.

Robert Schallmann | The Department of Defense and Wildlife Management: A Tale of Two Missions

■ **Tuesday, July 18**
7:00 P.M.-8:30 P.M.

The Department of Defense controls and conserves over 30 million acres of land for military training and readiness. These lands are also home to over 350 endangered or threatened species. Robert Schallmann has served as the conservation program manager at Naval Weapons Station Seal Beach since 2003 and is responsible for overseeing the natural resources program, including the management of several endangered, threatened, and at-risk species. This presentation will provide an overview of how the military's natural resources programs meet this challenge, while highlighting the successes and opportunities for conservation in our backyard.



October 12: Rebecca Tarvin, *Why Don't Frogs Poison Themselves?*

COURTESY OF REBECCA TARVIN

Kerry Kriger | SAVE THE FROGS! Translating Science Into Action

■ **Tuesday, August 29**
7:00 P.M.-8:30 P.M.

Why are frogs disappearing worldwide, and what can be done to save them? Join Dr. Kerry Kriger for a discussion on amphibian conservation. He will provide an introduction to the natural history of amphibians, the threats they face, why amphibians are important and worth saving, and ways his organization protects amphibians and empowers citizens to make contributions to the betterment of the planet. He will also share photos of amphibians from around the world. Dr. Kriger is the founder and executive director of SAVE THE FROGS!

Michael Prather | Reporting from the Front Line: Where Science Meets Government

■ **Thursday, September 7**
7:00 P.M.-8:30 P.M.

Dr. Michael Prather has been active in the United Nations' Intergovernmental Panel on Climate Change (IPCC) assessments since 1992 and was among those IPCC authors receiving the 2007 Nobel Peace Prize. He will share a behind-the-scenes account of this unique interaction between governments and the world's leading scientists. Prather is a distinguished professor of Earth system science at the University of California, Irvine.

Peter Whybrow | The Well-Tuned Brain

■ **Wednesday, September 27**
7:00 P.M.-8:30 P.M.

Psychiatrist and neuroscientist Peter Whybrow will discuss his book, *A Well-Tuned Brain: The Remedy for a Manic Society*. Whybrow is the director of the Semel Institute for Neuroscience and Human Behavior at the University of California, Los Angeles. He is also the Judson Braun Distinguished Professor and Executive Chair of the Department of Psychiatry and Biobehavioral Sciences at the David Geffen School of Medicine and CEO of the Resnick Neuropsychiatric Hospital at UCLA.

Rebecca Tarvin | Why Don't Frogs Poison Themselves?

■ **Thursday, October 12**
7:00 P.M.-8:30 P.M.

From bacteria to mammals, many organisms have evolved toxic defenses to ward off potential predators. Poison dart frogs are well known for their showy coloration, and they have just as many toxins as they do unique color patterns. Learn how animals evolve genetic resistance to toxins and how this can affect whether they become toxic. Rebecca Tarvin is a Ph.D. student in the Evolution, Ecology, and Behavior program at the University of Texas at Austin. She has studied frogs in Ecuador and Colombia and studies the evolution of toxicity in poison frogs.



Blue poison dart frog

*Aquarium
of the Pacific*







Track recent sightings on Twitter @ OceanWatchLB or our blog aquariumofpacific.org/blogs/category/whale_watching



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.

- **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

The Urban Ocean: World Port and Sea Life Cruise

■ **June 17, July 15, August 19 & Sept. 16 4:00 P.M.**

The waters off Long Beach and San Pedro host a variety of industrial and recreational activities and also provide habitat for a diverse array of animals. Embark on a journey to visit one of the most distinctive sections of the local coastline and experience the wonders of Southern California's urban ocean. During this 2 to 2.5 hour voyage you can explore the port complex and see where wildlife thrives among bustling human activity.

- **\$26.95 per adult member, \$8 per child member; \$39.95 per adult non-member; \$15 per child non-member (includes Aquarium admission).**

AQUARIUM 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 seven or older.**

Animal Encounters

Animal encounters offer a chance to feed a sea otter, train a sea lion, feed a shark, or hang out with a penguin. Age restrictions apply.

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

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.

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

VIP Experiences

■ **By reservation.**

Get even closer to our animals in this all-new experience! Tour the Aquarium and meet two separate animals. Choose from Otters and Octopus or Sharks and Rays. Participants must be 10 years old for VIP experiences, except for Sharks and Rays (minimum age: 13).

- **\$330 per member, \$350 per non-member (Aquarium admission included).**
- **Pre-registration required at least twenty-four hours in advance.**

EDUCATIONAL OPPORTUNITIES



Family Programs AT THE AQUARIUM



Public family programs at the Aquarium give children of all ages the chance to participate in fun classes with an Aquarium educator. Every class brings another opportunity for learning more about the ocean, discovering new things about the Aquarium, and exploring marine life. Pre-registration is required.

Job Shadow Class

Four rotating themed programs.

■ First Saturday and third Sunday of every month

9:00 A.M.-12:00 P.M.

- Ages 13 to 17
- \$35 per member, \$39 per non-member (Aquarium admission not included)

Junior Biologist

Six rotating themed programs.

■ Second Saturday of every month 9:30 A.M.-11:30 A.M.

- Ages 7 to 12
- \$25 per member, \$29 per non-member (Aquarium admission not included)

Aquatots

Six rotating themed programs.

■ Third Saturday of every month 10:00 A.M.-11:30 A.M.

- Ages 2 and 3 with an adult
- \$36 for adult/child member pairs; \$15 per additional guest. Non-members: \$49 per adult/child pair; \$20 per additional guest (Aquarium admission included).

Saturday Family Fun

Four rotating themed programs.

■ Fourth Saturday of every month 10:00 A.M.-11:30 A.M.

- Ages 4 to 6 with an adult
- \$36 for adult/child member pairs; \$15 per additional guest. Non-members: \$49 per adult/child pair; \$20 per additional guest (Aquarium admission included).

Teen Overnight

■ Wednesday, August 2, at 5:00 p.m.-Thursday, August 3, at 7:30 a.m.

Enjoy a night sleeping with the fishes in this teens-only event. Explore our galleries while observing fish movements, and touch invertebrates found in our local waterways. Become an ocean explorer discovering the mysteries of the deep through group collaboration. This overnight camp program includes Aquarium exploration, hands-on activities, pizza party, light snack, cereal breakfast, and a souvenir T-shirt.

- Ages 13 to 15
- \$80 for members, \$90 for non-members

Summer Day Camps AT THE AQUARIUM



Dive into fun this summer! Whether your child is three years old or entering high school, we have a camp experience perfect for him or her. Our camps feature exciting animal interactions, tours, crafts, games, and experiments. Sessions for the camps listed below are held June through August. For dates, visit aquariumofpacific.org/camps.

Fish Fry

■ 8:30 a.m.-10:30 a.m. for 3 days

- Ages 3-4 with adult
- \$100 per member pair, \$130 per non-member pair (Aquarium admission included)

Ocean Adventure

■ 8:00 a.m.-5:00 p.m. for 5 days

- Ages 7-9
- \$299 for members, \$329 for non-members

Sea Squirts

■ 8:30 a.m.-11:30 a.m. for 3 days

- Ages 5-6
- \$95 for members, \$120 for non-members

Junior Biologist

■ 8:00 a.m.-5:00 p.m. for 5 days

- Ages 10-12
- \$299 for members, \$329 for non-members

For scheduling and to reserve spaces, visit the Aquarium's website or call (562) 590-3100, ext. 0.

Make a FLYCATCHER

Frog Toy

Most frogs eat insects, often catching flies. See how many times in a row you can catch a fly with this fun frog toy.

Materials:

- cardboard toilet paper tube
- paint or markers
- 12- to 14-inch string
- stapler
- coin (penny or dime)
- scissors
- tape

Instructions:



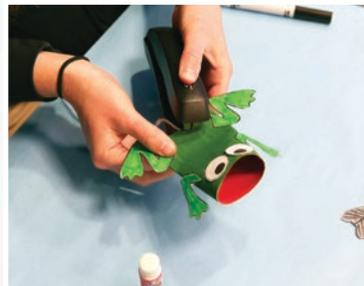
1. Paint or color the toilet paper roll green. Paint the inside of one end red for the mouth. Allow to dry.



4. Glue googly eyes or paint eyes on the toilet paper tube.



2. Cut out and color the frog legs and the fly.



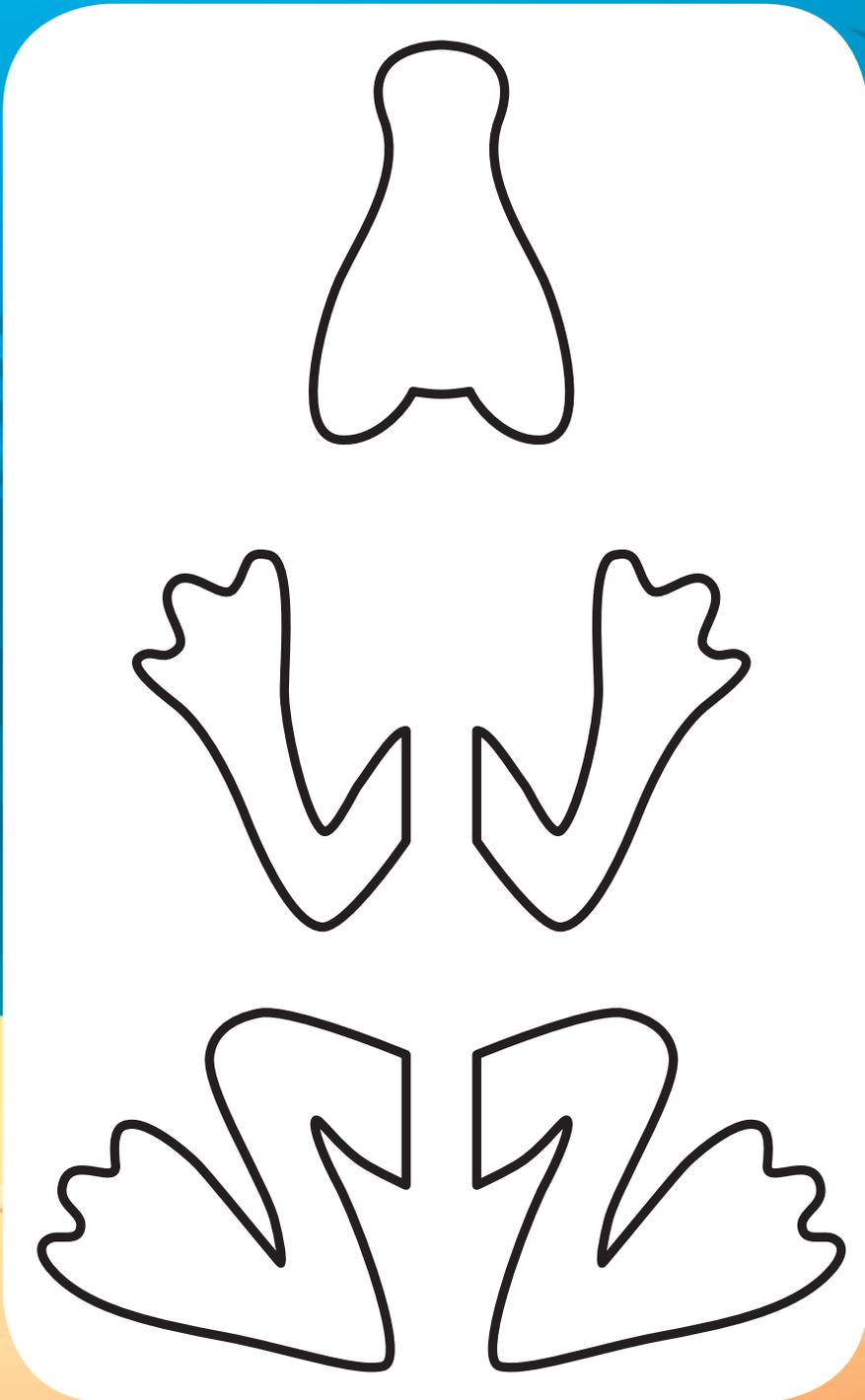
5. Staple the string to the flattened end.



3. Flatten the back end of the tube. Attach the legs to the toilet paper roll.



6. Cut out the fly and tape it to a coin. Tape the coin to the other end of the string.



Eastern Hellbender

Cryptobranchus alleganiensis alleganiensis



*Aquarium
of the Pacific*

TROPICAL PACIFIC GALLERY

Mossy Frog

Theleiderma corticale



*Aquarium
of the Pacific*

TROPICAL PACIFIC GALLERY

Rio Cauca Caecilian

Typhlonectes natans



*Aquarium
of the Pacific*

TROPICAL PACIFIC GALLERY

Eastern Hellbender

Cryptobranchus alleganiensis alleganiensis

PHYSICAL CHARACTERISTICS

The eastern hellbender is a giant salamander that grows up to 9 to 15 inches long. It has short legs and a flat head and body. It ranges from brown to reddish-brown in color.

DIET

This species feeds mostly on crayfish and small fish.

HABITAT

The hellbender lives in large streams and rivers in the southeastern U.S. It rarely leaves the water.

FUN FACT

Hellbenders have light-sensitive cells all over their bodies that might help them keep hidden under rocks and logs.

JACQUEM HUTTON

Mossy Frog

Thelederma corticale

PHYSICAL CHARACTERISTICS

This frog grows up to 3.5 inches long and gets its common name from the appearance of its skin, which acts as camouflage.

DIET

Mossy frogs feed on insects.

HABITAT

Native to Vietnam, Laos, and parts of China, these frogs live in evergreen rainforests and prefer caves and steep rocky cliffs.

FUN FACT

When frightened, mossy frogs will curl up and play dead.

BRIAN GRAY

Rio Cauca Caecilian

Typhlonectes natans

PHYSICAL CHARACTERISTICS

This legless amphibian grows to 18 to 22 inches long. They are dark grey in color.

DIET

Caecilians eat worms, caterpillars, termites, and small burrowing snakes.

HABITAT

This species lives in rivers, marshes, and lakes in Colombia, Venezuela, and Brazil.

FUN FACT

These caecilians are nearly blind and find their food by taste and smell.

SEBOWICK COUNTY ZOO

#AquariumMemberPhotos



@thaithefather



@nikkats



@andreaandrea

For a chance to be featured, tag your public photos with #AquariumMember on Instagram, or email your favorite photos to MemberServices@lbaop.org.



Long Beach and San Pedro

Keeping Seawater Out

If people use too much groundwater in coastal cities, salty seawater can seep in and pollute the aquifer. Near Long Beach and San Pedro, fresh and reclaimed water are pumped back underground to keep the seawater out.



Explore the New Our Water Future Exhibit Area

THE AQUARIUM'S OUR WATERSHEDS: PATHWAY TO THE PACIFIC EXHIBIT AREA HAS BEEN RENOVATED AND UPDATED. It will open on May 26 as *Our Water Future*, an interactive space to help visitors understand where our water comes from and what conservation issues our supply faces now and in the future. Find out what you can do to conserve water and which actions are most effective. The exhibit redesign is funded by a grant from the San Gabriel and Lower Los Angeles Rivers and Mountains Conservancy (RMC).

Our Water Future will include up-to-date information, new signage and digital displays, a new Monarch Butterfly Garden, and upgrades to the PREMIER Watershed Classroom, Long Beach's first LEED Platinum building. The classroom upgrades include the installation of new projectors and screens and better acoustics and shading.

As visitors enter *Our Water Future* from the Shark Lagoon area, they will see a map with lighted pathways showing where California's water comes from and how it is allocated. On the back side of that panel, a flatscreen will display real-time California water data.

Next, visitors encounter an interactive water map table. Visitors can still push buttons to turn on "rain" over the map and see how water flows over land to the ocean. Signs around the map detail groundwater storage, regional rainfall,

and flooding. Moving counter-clockwise, there are exhibit features demonstrating how to transform lawns into California-friendly landscapes and how water gets to our tap at home. Visitors can also learn about water use at home, both indoors and outdoors, and what they can do to conserve. An interactive station demonstrates the amount of water used by devices and appliances in a home. Finally, visitors can learn about our future water supply via digital video screen and the impact of plastic pollution at the exhibit stop near the classroom.

The *Our Water Future* exhibit area will also feature new landscaping and trees, as well as additional bench seating to enhance the surrounding garden area. The section designated as a Monarch Butterfly Garden will include plants the butterflies rely on for food and signage explaining their life cycle.



Aquarium News



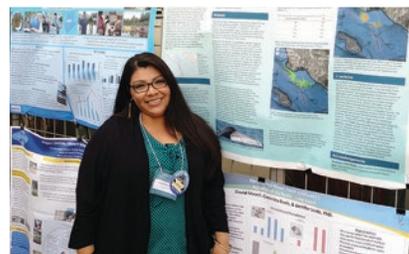
See the newly remodeled exhibit in the Northern Pacific Gallery across from the BP Sea Otter Habitat.

Bays and Sounds Exhibit Remodeled

THE AQUARIUM RECENTLY COMPLETED A REMODEL of the Bays and Sounds exhibit in the Northern Pacific Gallery. The renovation improves visibility of the exhibit's animals and efficiency of the filtration and life support system. This small exhibit is located across from the BP Sea Otter Habitat and features several fish species, including sticklebacks, northern spearnose poachers, bay pipefish, painted greenlings, tubesnouts, longfin sculpins, gunnels, a monkeyface prickleback, and sailfin sculpins raised on site in the Aquarium's larval fish rearing area.



Lauren Harper (left) worked with sea turtles in Costa Rica, and Erin English (right) worked with sharks in Belize.



The symposium gathered volunteers and scientists interested or working in citizen science.

Aquarium Donor Funds International Conservation Trips for Staff

EARLY IN 2017 TWO AQUARIUM STAFF MEMBERS TRAVELED ON EXPEDITIONS to conduct conservation work in Central America. Aquarium donor Muriel Horacek funded the trips. Horacek is also a longtime advocate of conservation organization Earthwatch Institute.

Aquarium Education Coordinator Erin English traveled to Belize in January as part of an Earthwatch expedition focused on shark conservation. English traveled to Glover’s Reef to assist Dr. Demian Chapman of Florida International University with research on Caribbean reef sharks.

Dr. Chapman studies the movements of shark species and how different species interact with marine reserves. The team caught and tagged juvenile Caribbean reef sharks inside the atoll. These sharks will be tracked for the next ten years to determine whether they stay inside the protected area or travel outside of the reserve. Findings from this study will help to inform conservation policy in Belize.

While there, the team also deployed baited remote underwater videos (BRUVs), which are essentially underwater cameras connected to a bait box. These BRUVs record video for ninety minutes as a part of a project called Global FinPrint, which works with local communities to survey over 200 reefs around the world.

After this expedition, the Aquarium started a new partnership with Global FinPrint. Aquarium staff members will create a processing hub to annotate the video footage collected by Global FinPrint.

Also in January Senior Aquarist Lauren Harper went on an Earthwatch expedition to Playa Grande, Guanacaste, Costa Rica. This expedition partnered with The

Leatherback Trust to help with a long-term monitoring project on critically endangered leatherback sea turtles.

Playa Grande has the largest population of nesting leatherback sea turtles in the world, but their eggs were heavily poached there until 1991, when the Las Baulas National Marine Park was established. However, sea turtles still face threats from climate change and plastic pollution. The population has fallen from 1,500 females coming onto Playa Grande in the 1988/1989 nesting season to just eleven females in the 2016/2017 nesting season.

Harper and the other Earthwatch volunteers patrolled the beach to look for female leatherback, olive Ridley, and black sea turtles coming up to nest. They counted eggs and inserted temperature probes into the nests, scanned for electronic tags to identify the turtles, took measurements, and collected barnacles from the turtles’ carapaces. These barnacles can be an indicator of where the turtles travel between nesting seasons at Playa Grande. The volunteers also protected the nests from predators, watched for signs of hatching, and weighed, measured, and released hatchlings.

These expeditions allowed English and Harper to gain hands-on conservation experience in the field, experiences and knowledge they can then share with other staff members and Aquarium visitors.

Aquarium Hosts Second Annual Citizen Science Symposium

IN MARCH THE AQUARIUM HOSTED its second Citizen Science Symposium, bringing together practitioners who design citizen science programs, volunteers currently participating in these programs, students, and educators to share best practices. The symposium focused on conservation work in Southern California and was held in partnership with the Aquarium’s Marine Conservation Research Institute.

Mary Ellen Hannibal, author of *Citizen Scientist: Searching for Heroes and Hope in an Age of Extinction*, presented the keynote address. The symposium also featured lightning talks, panel discussions, and a poster reception.

Aquarium Publishes Videos on STEM Careers With PBS

THE AQUARIUM HAS CREATED A SERIES OF VIDEOS to help teachers connect their students to careers in science, technology, engineering, and mathematics (STEM) fields. The videos are available to the public at no cost from PBS Learning Media, and they feature interviews, views of animals and the Aquarium's behind-the-scenes areas, and details on what it takes to follow these career paths. The videos, part of the Aquarium's Career Connections program, were made possible with funding from the Tesoro Foundation. They were recorded at the Aquarium and produced by the Aquarium's in-house audio-visual team.

The Career Connections program has recently produced two new video series, focusing on the jobs of a whale naturalist and aquarist. More video series are being developed and planned for release, including plankton scientist. The videos feature interviews with Aquarium staff members who hold these positions as they talk about their responsibilities, daily activities, and the educational requirements their positions require.

In addition to the series of videos on each career, the Aquarium has created teacher materials to accompany the videos and details on the National Standards and Next Generation Science Standards that the materials comply with. Visit pbslearningmedia.org to access these materials and videos.



July 4th BBQ and Late Night

TUESDAY, JULY 4 • 6:00PM

PRICING:

Includes Aquarium admission. VIP seating on the roof-top Veranda is an additional \$15 per adult and \$10 per child.

General Public:

Adults: \$64 (12+)
Child: \$28 (3-11)

Members:

Adults: \$54
Child: \$18 (3-11)



Mother's Day Brunch

SUNDAY, MAY 14

PRICING:

Includes Aquarium admission

General Public:

Adults: \$64 (12+)
Child: \$28 (3-11)

Members:

Adults: \$54
Child: \$18 (3-11)



Seahorse dads give birth to their babies.

Father's Day BBQ

SUNDAY, JUNE 18 • 11:30 AM - 1:30 PM

PRICING:

Includes Aquarium admission

General Public:

Adults: \$59 (12+)
Child: \$28 (3-11)

Members:

Adults: \$49
Child: \$18 (3-11)

Fundraising Highlights

The Aquarium of the Pacific relies on individuals, corporations, foundations, and government partners to support its mission and vision with contributions to the operating budget and a diverse range of projects.

Johnny Carson Foundation Funds Education Program

The Johnny Carson Foundation provided a \$25,000 grant for the Aquarium's Ocean Science Education Program in December 2016. Through this program, students are exposed to ocean science concepts and teachers learn about the many Aquarium resources that they can utilize back in the classroom. A donor to the Aquarium's education programs since 2004, the foundation continues the philanthropic spirit of Johnny Carson with a mission to support institutions and community groups that are integral to the well-being of local communities.

Tesoro Foundation Support Connects Students with Science

The Tesoro Foundation has been a corporate donor to the Aquarium for the last several years. In late 2016 the foundation provided a \$50,000 grant in support of the Aquarium's videoconferencing program. The goal of the project is to extend the Aquarium's reach into the Gateway Cities and the Inland Empire through two primary methods. The first connects students to Aquarium educators who present exhibit webcams, images, and videos via live videoconferencing. The second is an Aquarium Career Connections series with short video segments and supporting materials that are accessible to teachers to download and incorporate into their lesson plans.

The Robert and Lisa Margolis Family Foundation Contributes to Aquarium Education

A partner of the Aquarium for the past two years, The Robert and Lisa Margolis Family Foundation contributed grant funds to the Aquarium's Ocean Science Education Program to promote academic achievement in underserved students and provide high quality training and resources for teachers. Led by an educator, specific initiatives include science programs aligned with the Next Generation Science Standards; videoconferencing programs that connect students to science professionals; online resource kits that promote inquiry and engagement in the classroom; and professional development workshops that provide insights on how to integrate marine science and data into curricula.

Windsong Trust Grant Boosts Science Literacy

With a mission to educate youth, Windsong Trust has renewed its support of the Aquarium's education initiatives that directly serve local students. The \$100,000 grant will allow for continued integration of environmental and science literacy into the Aquarium's school programs and the expansion of teacher resources. With the trust's support, the Aquarium aims to reach more than 165,000 students and teachers in 2017.

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www.aquariumofpacific.org

Education Donors

We wish to extend a special thanks to the following donors for their support of the Aquarium of the Pacific's education initiatives in 2016.

\$100,000+

Windsong Trust

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Donor Highlight

Union Pacific Railroad Foundation grant program supports ocean science education.



Andy Perez and Ryan Ashton, Aquarium director of development

Giving Profile

The Union Pacific Foundation recently provided a grant of \$25,000 benefitting the Aquarium's education programs. An Aquarium supporter since 2007, Union Pacific has helped the Aquarium spark an interest in science for students and families of all backgrounds and circumstances throughout Southern California.

Andy Perez, director of port affairs for Union Pacific, has served as a Trustee of the Pacific at the Aquarium for seven years. In his role with Union Pacific, Perez coordinates communication between Union Pacific and port management in California and Arizona. He is also responsible for managing the company's local grant and philanthropic programs that benefit youth and families. In addition to serving as an Aquarium ambassador, Perez is involved in numerous local community organizations. In 2014 Long Beach Mayor Robert Garcia appointed Perez to the city's Planning Commission.

Aquarium Accolades

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



Pictured: Andrew Skinner, Heritage Award honoree, and Kathie Nirschl, Aquarium vice president of human resources.



Pictured: Anthony Brown, Aquarium chief financial officer, and Eric Cyrs, Heritage Award honoree.



Pictured: Stephanie Bauer, Iliff Infectious Enthusiasm Award honoree.

Andrew Skinner

Glenn McIntyre Heritage Award

The Aquarium presented the Glenn McIntyre Heritage Award to Andrew Skinner at the Festival of Human Abilities in January. Skinner suffered a spinal cord injury that left him paralyzed with quadriplegia. As he recovered, Skinner wanted to give back to others who had suffered an injury like his. In 2008 he and his wife Kirstin started Triumph Foundation, a non-profit organization whose mission is to help individuals with spinal cord injury (SCI). Triumph Foundation provides resources, hope, and security as a lifelong support network for people living with paralysis. The cornerstone of the foundation's outreach is giving newly injured people care baskets that serve as toolkits, providing information about SCI support organizations, assistance programs, and activities. Care baskets are distributed at hospitals and rehabilitation centers throughout Southern California. The foundation also offers financial assistance for medical equipment and sports and fitness programs to provide recreational opportunities. Plus, it works to educate the general public about people living with disabilities, inclusiveness, and guidance on dealing with life challenges.

Eric Cyrs

Heritage Award

The Aquarium presented the Heritage Award to Eric Cyrs at the African-American Festival in February. For more than twenty-five years Cyrs has been actively engaged in Southern California as a community volunteer, organizer, activist, and artist. He has partnered with community organizations to promote the "Stop the Violence" campaign and was integral in helping to create several afterschool programs in Compton and Long Beach. For more than ten years, Cyrs volunteered with the African Cultural Center of Long Beach, leading a Rites of Passage Program that provided cultural enrichment and educational resources for inner city youth. He also worked as a volunteer in the City of Pacoima, mentoring teen fathers and helping them to attain employment. Employing music and the art of storytelling as Baba the Storyteller, Cyrs works with children all over the world as a cultural ambassador, teaching and spreading the importance of cultural identity and self-awareness. He has been involved with the Aquarium's African-American Festival since its inception, and through his firsthand experiences learning from teachers in Africa, he serves as a primary ambassador of cultural authenticity.

Stephanie Bauer

2016 Iliff Infectious Enthusiasm Award

Teacher Stephanie Bauer from Lakewood High School was the recipient of the Aquarium's 2016 Iliff Infectious Enthusiasm Award in recognition of her work with the school's Odyssey Academy program and the growing relationship she is helping to build between Lakewood High and the Aquarium. The award is named to honor Warren Iliff, the Aquarium's founding president and CEO, for his passion in education and conservation. The award comes with incentive tickets, which Bauer will use to support her work with Odyssey students and families. She plans to distribute tickets to families in her school who have never visited the Aquarium, provide tickets for parents who are donating time to the school, reward those teachers who go above and beyond, and honor top achieving students.

"This award really means a lot to me because of the namesake, Glenn McIntyre. I will be a careful steward of his legacy and try to empower others and try to live up to what this award means." — Andrew Skinner



Curbing the Amphibian Conservation Crisis

What can we do to prevent the mass extinction of amphibians? Facing habitat destruction, climate change, pollution, and a devastating fungal disease, frogs and other amphibians around the world need our help to survive.



COURTESY OF THE SAINT LOUIS ZOO

A Success Story

The Ozark hellbender is a large aquatic salamander found only in parts of Missouri and Arkansas. Surveys in the early 1990s indicated that populations had declined by 70 percent and that fewer than 600 individuals remained.

In 2002 the Saint Louis Zoo began a propagation program for this species in collaboration with the Missouri Department of Conservation and U.S. Fish & Wildlife Service. The zoo constructed special facilities for and dedicated staff members to the breeding efforts. Fertile egg clutches were discovered in 2011, and successive years' efforts resulted in nearly 5,000 larval hellbenders. The Saint Louis Zoo has also been head-starting juveniles hatched from eggs collected in the wild for future release. Since 2008 more than 3,000 juvenile Ozark hellbenders reared at the Saint Louis Zoo have been released into the wild. This program has helped this salamander avoid extinction.

Visitors will have the opportunity to see relatives of this species, eastern hellbenders, at the Aquarium starting May 26.

HABITAT DESTRUCTION

Habitat destruction is thought to be the biggest threat to amphibians. They are particularly sensitive to habitat changes because they rely on both aquatic and terrestrial environments during their life cycle. You can help by advocating for the protection of ponds, streams, and wetlands in your area. Contact local government officials when new construction projects are proposed near these habitats.

POLLUTION

Trash, fertilizers, pesticides and other pollutants are damaging to ecosystems where amphibians live, and amphibians are particularly vulnerable because of their sensitive, porous skin. You can help prevent pollution from entering these ecosystems by participating in clean-ups, avoiding the use of chemical pesticides or fertilizers in your home garden, supporting strict environmental regulations that protect clean air and water, and supporting local conservation organizations that work to protect these habitats.

INTRODUCED AND INVASIVE SPECIES

Non-native animals that are introduced into amphibian habitats can out-compete native amphibians for resources and habitat. It is also possible for introduced species to breed with native species creating hybrids that force out the native species.

This has occurred in California, where the non-native eastern tiger salamander is interbreeding with the native California tiger salamander, creating what scientists call a super hybrid. To protect amphibians in your area, never release an animal into the wild, and support local nonprofit organizations or wildlife agencies that work to remove non-native species from the environment.

CHYTRIDIOMYCOSIS

Chytridiomycosis is a fungal disease that within thirty years has caused the catastrophic decline or extinction of at least 200 species of amphibians. The source of the virus has not been determined definitively, and scientists are searching for ways to treat chytridiomycosis. These include antifungal baths and thermal treatments for tadpoles. Providing more funding and support for scientific research can help experts determine the cause of the disease and eliminate it.

CLIMATE CHANGE AND DROUGHT

Amphibians have evolved over millions of years to survive in their local climate and habitat. As our global climate changes, frogs and other amphibians that have adapted to their habitats may not be able to survive. One of the results of climate change is drought, which severely impacts amphibians. Some can withstand a drier climate, but others cannot. To curb the impacts of climate change, we need to limit our consumption of fossil fuels.



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&
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