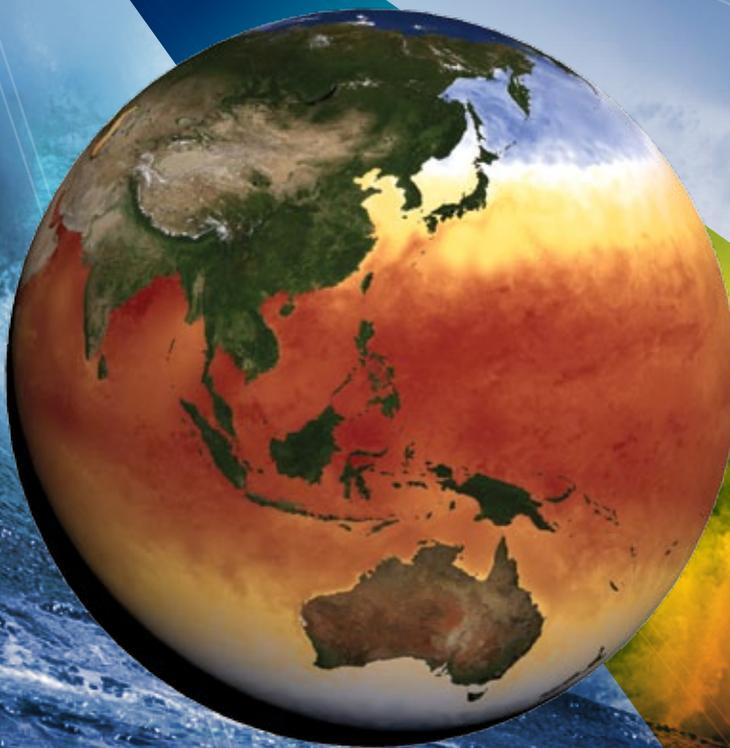
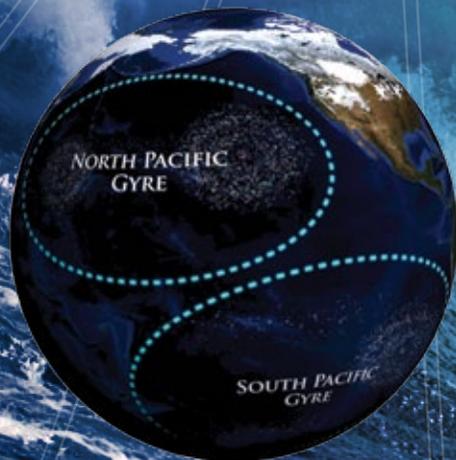


PACIFIC CURRENTS

MEMBER MAGAZINE OF THE AQUARIUM OF THE PACIFIC

SCIENCE ON A SPHERE: USING TECHNOLOGY TO TELL OCEAN STORIES





EVENING TALKS AT THE AQUARIUM

Visit the Aquarium after hours, then hear talks with experts about food sustainability.

THE TWO HUMAN ACTIVITIES that contribute the most to climate change and other environmental impacts are the kinds and amounts of energy we use and the ways we grow and harvest our food. With the global human population slated to reach 10 billion by the end of the century, developing sustainable food systems is one of the main ways we can mitigate human impact on our planet.

To explore this subject, the Aquarium has launched a series of talks called The Future of Food hosted by *Los Angeles Times* Food Editor Russ Parsons. This series features discussions with experts from different sectors of the American food system, as well as the opportunity to explore the Aquarium after hours.

Parsons is the author of the cookbooks *How to Read a French Fry* and *How to Pick a Peach*, a winner of multiple James Beard Awards for his journalism, and the recipient of the International Association of Culinary Professionals Bert Greene Award for distinguished writing. He was inducted into the James Beard Foundation's Who's Who of Food and Beverage in 2008.

On November 10 author Paul Greenberg discussed ways to reestablish sustainable local fisheries and connect them with consumers. While the U.S. controls more ocean than any other country, 85 percent of the seafood Americans eat is imported. Greenberg is the author of *American Catch: The Fight for Our Local Seafood* and *Four Fish: The Future of the Last Wild Food*. You can view archived video of this talk at aquariumofpacific.org/agreenberg.

On February 4, 2015, Belcampo Inc. CEO Anya Fernald, an expert on the slow food movement and agritourism, will discuss humanely raised organic meat, from organic meat farming to butcher shops. Belcampo Inc. includes Belcampo Farms, Belcampo Butchery, Belcampo Meat Co., and six restaurants. Fernald's career experience includes launching a cooperative of cheesemakers in rural Sicily, directing international microinvestments for the Italian Slow Food Foundation, launching Slow Food Nation and Eat Real, and starting her own company, Live Culture. She has been a regular judge on the Food Network's *Iron Chef America* since 2009 and also serves as the founding board chair of the Food Craft Institute.

On May 7, 2015, organic farmer David "Mas" Masumoto will discuss organic farming and its connections to the humanities. Masumoto is the author of *Four Seasons in Five Senses* and *Wisdom of the Last Farmer*. A third generation farmer, Masumoto grows peaches, nectarines, and grapes on an organic 80-acre farm south of Fresno, California. He is a columnist for *The Fresno Bee* and a regular contributor to the *Sacramento Bee*. His writing awards include the Commonwealth Club Silver medal, Julia Child Cookbook award, and James Clavell Literacy Award. He is currently a board member of the James Irvine Foundation and serves on the Statewide Leadership Council to the Public Policy Institute of California. In 2013 Masumoto joined the National Council on the Arts after being appointed by President Obama.

Speakers include Anya Fernald, an expert on humanely raised organic meat, organic fruit farmer David "Mas" Masumoto, and chef Michael Cimarusti.

On October 7, 2015, chef Michael Cimarusti will discuss how the fine dining industry can get involved with sustainable food. Cimarusti, owner and chef of Providence Restaurant in Los Angeles, has appeared on Bravo TV's *Top Chef Masters* and Food Network's *Iron Chef America*. Providence has been named the best restaurant in Southern California by the *Los Angeles Times* for two years running.

Additional talks will be scheduled. Tickets for this series are available by phone or online. Events will also be streamed live on the Aquarium's website at aquariumofpacific.org/aquariumlive.



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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, Bethanie Hestermann, and Lindsay Yates.

AQUARIUM HOURS | Open daily from 9:00 a.m. - 6:00 p.m. except December 25 and during the Grand Prix of Long Beach.

MEMBERSHIP OFFICE HOURS
8:00 a.m. - 5:30 p.m. daily



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.



Aquarium Founding Sponsor

LETTER FROM THE CEO

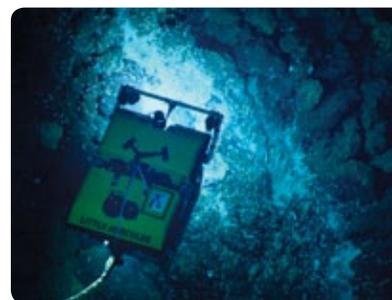
DEAR MEMBERS,

THE UNITED STATES has made great strides in exploring space and other planets, but plenty remains unexplored here on Earth.



The world's vast ocean is Earth's final frontier for exploration. While significant ocean discoveries have been made over the last two centuries, experts estimate that as much as 95 percent of the volume of the World Ocean and 99 percent of its seafloor remain unexplored.

Ocean exploration would yield untold benefits, not only to the scientific community, but also to all humans. It could lead the way to new sources of renewable energy and food, as well as potential new pharmaceuticals or other resources. It would also benefit our understanding of marine life and biological science. For example, as recently as the 1970s, hydrothermal vents were discovered on the ocean floor, proving that life on Earth did not require the sun as its source of energy. Exploration of the ocean will also guide our conservation practices as we continue to progress into the twenty-first century; we cannot protect what we don't know exists.



An ROV shines its lights on a group of shrimp at a hydrothermal vent site. Image courtesy of NOAA Okeanos Explorer Program, MCR Expedition 2011.

In a series of evening courses for adults this spring, learn what remains to be discovered in the ocean, from new life forms to natural resources, and which technologies might play a role in helping us better understand our World Ocean and life on our planet. This session of the Aquarium's Aquatic Academy, The Case for Ocean Exploration, will be held March 3, 10, 24, and 31, from 7:00 p.m. to 9:00 p.m.

The Aquatic Academy is one of the Aquarium's informal education programs for adults. In a series of four weekly evening classes, attendees will see presentations from scientists and other experts to learn the latest findings and analysis straight from the source. Hear from modern day ocean explorers and experts from agencies like the National Oceanic and Atmospheric Administration, NASA's Jet Propulsion Laboratory, and the United States Geological Survey. Ask questions and gain a deeper understanding of the environmental issues currently at play and how humans can make a difference.

To attend this session of Aquatic Academy, contact Adina Metz at ametz@lbaop.org.

Thank you for your ongoing support.

Sincerely,

Jerry R. Schubel



ROBIN REIGS

MEET ELVIS THE MAGELLANIC PENGUIN

TO ENSURE the genetic diversity of Magellanic Penguins, the Aquarium recently exchanged one of its male penguins, Jeremy, for another male at a fellow Association of Zoos and Aquariums (AZA) institution. The newly added penguin, Elvis, is fourteen years old and weighs just over eleven pounds. Elvis has fathered chicks in the past and could breed with the Aquarium's female penguins in coming years. This would ensure genetic diversity in the Aquarium's flock, as laid out in the AZA Species Survival Plan for Magellanic Penguins. The same is true for Jeremy, who will be helping ensure the genetic strength of these threatened animals at another facility.

Elvis came to the Aquarium with special medical needs. He sometimes experiences seizures. He receives daily medication and is under careful observation by the Aquarium's animal care team. Thanks to advancements in veterinary care for penguins, Elvis is able to live a comfortable life.

A temperate species, these penguins are native to the coasts of Chile and Argentina, where they spend much of the year at sea hunting for food like sardines and squid and come to shore to breed.



PENGUIN CHICKS RECEIVE NAMES

THE FOUR MAGELLANIC PENGUINS that hatched at the Aquarium last summer, two males and two females, have all received names and ID tags. Skipper, a male, was named after the main character in the movie *Penguins of Madagascar*, which debuted in November. Mattson, the other male, was named by donors Henry and Paulette Matson. Paulette selected the name to honor her husband's college nickname, Matt. Jayde, a female, was named by Aquarium donor and volunteer, Jayde Nicole. Paddles' name is a combination of her parents' names, Patsy and Noodles, and was selected from names submitted by Adopt an Animal donors. Each of the young penguins wears a name band on one flipper and a color-coded band on the other.



Jayde

SARDINES ADDED TO HONDA BLUE CAVERN

IN OCTOBER a school of Pacific sardines was added to the Aquarium's Honda Blue Cavern exhibit. Pacific sardines are found from southeastern Alaska to the Gulf of California, Mexico. The sardines give Aquarium visitors the opportunity to observe the visually striking schooling behaviors of these fish. Schooling is a survival strategy exhibited by fish that makes it harder for predators to single out and catch an individual in the larger group.



ROBIN BIGGS



Mattson

Paddles

Skipper

ROBIN BIGGS

NEW RAYS IN SHARK LAGOON

CLAIRE ATKINSON

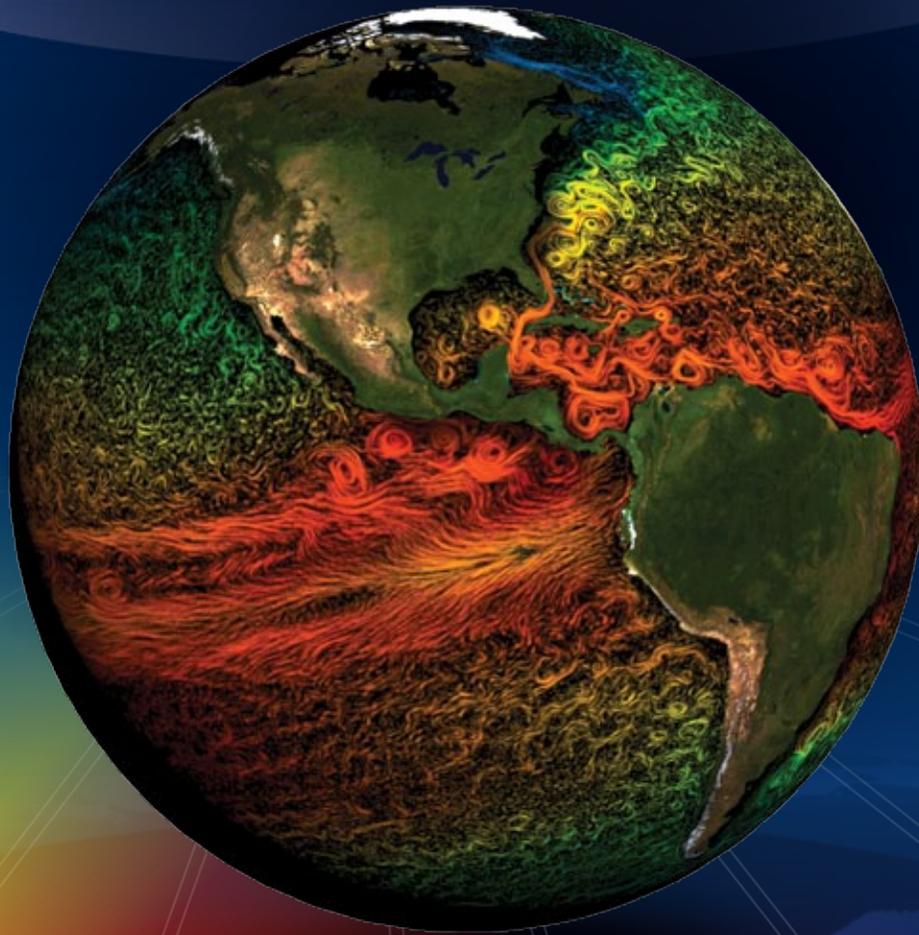


A LONG WITH the bonnethead sharks and cownose rays, there are now three blue-spotted rays (*Taeniura lymma*) on exhibit in the large touch pool in Shark Lagoon. In the wild, these rays live in shallow sandy areas near coral reefs in the Indo-West Pacific along the coasts of Africa, southern Japan, and northern Australia. Their bright blue spots warn other ocean animals to stay away because these rays are venomous. The blue-spotted ray's tail has two sharp venomous spines at the tip, which are used to keep predators away. They feed on worms, shrimp, clams, mollusks, and small fish. They will often stop at "cleaning stations" on the reef, where small fish or shrimp remove dead skin and parasites.

ADOPTABLE ANIMAL



aquariumofpacific.org/adopt



SCIENCE ON A SPHERE: USING TECHNOLOGY TO TELL OCEAN STORIES

Zoos, aquariums, planetariums, and other institutions now have a tool to help their visitors learn more about our planet and how changes to the environment affect life on Earth.



LIMB INTO A SPACESHIP and journey into orbit above our planet. Look back at Earth

to watch hurricanes form, grow, and make land-fall. Put on heat-sensing goggles and watch sea surface temperatures rise and fall. See cities light up as the shadow of night crosses the planet as it rotates. While very few humans on Earth today will ever have the chance to journey into space, those who visit science centers or other institutions to learn about our planet can experience a similar view with Science on a Sphere®.

Science on a Sphere (SOS) is a display system created by the National Oceanic and Atmospheric Administration (NOAA). It helps people understand global ocean and climate phenomena through visualizations built on near-real-time data and images collected by satellites and other instruments around the world.

Being able to see our planet from this perspective allows us to understand how weather systems affect a broad area, how the ocean and climate are linked, and how changes to our climate affect the entire planet.

INVENTING SOS

Alexander “Sandy” MacDonald, chief science advisor for NOAA’s Office of Atmospheric Research and director of the Earth System Research Laboratory, came up with the idea to create the SOS during his drive home from work one evening in 1995. He wanted to find a way to display ocean and atmospheric phenomena on a sphere to match our spherical Earth. When he got home, he covered a beach ball with white paint and set up a couple of video projectors to get a sense of what it would take to project sharp, synchronized images on a spherical surface. This crude prototype was the first step in a long journey to develop SOS and install systems in more than 100 institutions across the United States and the rest of the world. The idea was to create beautiful visualizations of our planet to help people better understand Earth, its climate, and its environment.

MacDonald took his idea to his team of software developers, meteorologists, and engineers at NOAA to help make SOS a reality. They began building additional prototypes to figure out what materials, dimensions, and projection systems would work best.



Alexander “Sandy” MacDonald



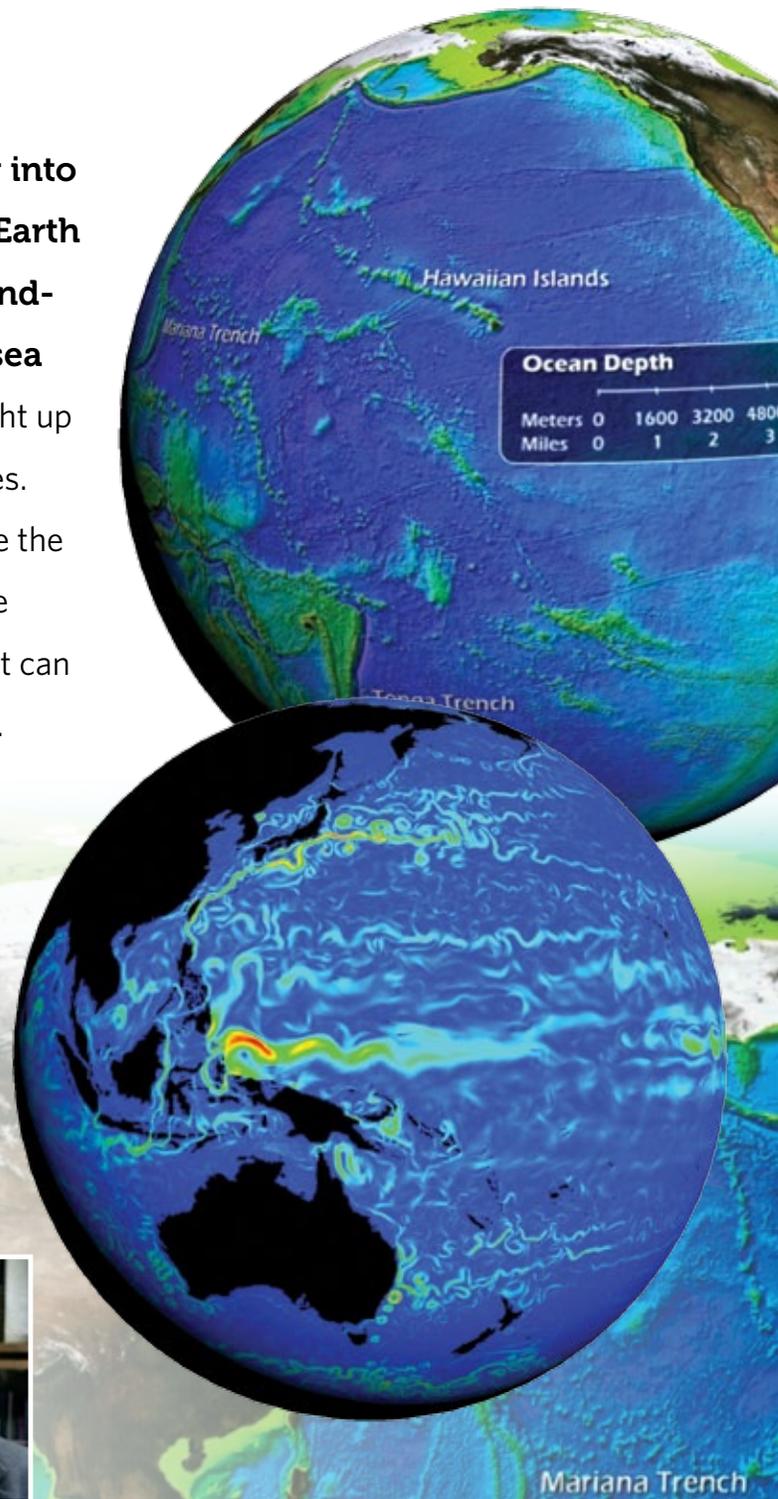
WILL VON DAUSTER (NOAA)

In this photo, the early “soccer ball” version of the sphere is nearing completion. It was 72 inches in diameter, spherical in shape, but required well over one hundred screws to assemble and was not practical for traveling exhibits.



WILL VON DAUSTER (NOAA)

Dr. MacDonald looks at an early version of the “soccer ball” sphere after assembly. The SOS development team tested many different designs and projectors before settling on the current configuration.





HOW IT WORKS

The SOS system NOAA eventually perfected includes a stationary six-foot-diameter carbon fiber sphere, which weighs less than 50 pounds, and four projectors set up in the four corners of the room, facing the sphere. The projectors are calibrated to display the correct depth of field, so that images are in focus both at the point of the sphere that's closest to each projector as well as the point farthest away, about three feet. For standard video projectors, that means the projectors are set up about 20 feet from the sphere. They must also be perfectly aligned to give the illusion of a single continuous image covering the sphere, with the same amount of light reflecting off the sphere all the way around. The system is connected to a server containing a library of more than 200 datasets and programs. This server is equipped with a high-end graphics card that also handles the geometry correction for the sphere.

Over time, the physical format of the SOS system can remain the same, but the quality of the images will only improve as technology advances, MacDonald says. This format also allows the SOS to serve as a tool for telling any number of stories that science interpreters want to communicate to the public about Earth science and beyond.

SOS CONTENT

Once the SOS system was finalized, NOAA needed to develop software that would translate the agency's satellite images and other data into the visualizations to be projected on the SOS. The software takes in the raw data and remaps it to fit the SOS format and lighting needs. Data from NOAA as well as other agencies like NASA can be formatted for SOS.

The catalog of data available for SOS is continually growing. Datasets representing atmospheric phenomena, maps of land and ocean, astronomy, models, simulations, and real-time data are available to all institutions that have an SOS. In addition, shows have been created for the SOS that combine sound, video, and dataset projections to illustrate various topics, such as deep sea vents, changes to the ozone layer, and historical maps of the globe, among many others. These shows are similar to short movies that visitors can see throughout the day at SOS institutions.

AQUARIUM SHOWS

The Aquarium has developed a library of eleven original shows for the SOS and releases new shows regularly. Most of the shows play daily on rotation in the Ocean Science Center, and all are available to the rest of the more than 100 institutions with an SOS around the world. The Oregon Museum of Science and Industry in Portland and NOAA National Weather Service Headquarters in Silver Spring, Maryland, are among the institutions that regularly play the Aquarium's shows.

To learn more about SOS and the content available to institutions that house an SOS, visit sos.noaa.gov.

EDUCATION PROGRAMS

Students in third to twelfth grade visiting the Aquarium on a field trip can experience an SOS program with an Aquarium educator. These programs challenge students to ask questions, make observations, and gain experience with the science and engineering practices outlined in the Common Core Standards and Next Generation Science Standards.

The *Discover Earth* program for SOS allows students to understand how water, continents, currents, tsunamis, and hurricanes make our planet a dynamic system. The program includes visualizations of these concepts and teaches viewers about the satellites and other instruments that collect information about our planet. *Frozen* focuses on the Arctic and Antarctic, highlighting the freezing temperatures and icy environments of the North and South Poles. Funding for *Frozen* was provided by the Kenneth T. and Eileen L. Norris Foundation. With both of these programs, an Aquarium educator leads the discussion and prompts students to ask questions about the visualizations, engaging them in discovery and encouraging them to learn about Earth science on a global scale.

LIVE WEBCASTS

The Aquarium also uses the SOS as a tool in live web broadcasts. When a major storm hits the U.S. or other weather or climate topics are making headlines, the Aquarium invites experts to present their analysis using real-time data on the SOS to illustrate their talk. They also answer questions from the public submitted via Twitter. Global temperatures, wind speed, precipitation, and other phenomena can be displayed in real time on the sphere.

In 2014 the Aquarium hosted live webcasts on the California drought, extreme weather events, and the El Niño phenomenon with experts from NOAA's National Weather Service, NASA's Jet Propulsion Laboratory, and the Long Beach Water Department. Archived video of these webcasts can be viewed on the Aquarium's website and YouTube channel.

CAMPUS MASTER PLAN

The Aquarium's Ocean Science Center housing the SOS opened to the public in 2011 as part of a multi-phase campus master plan adopted by the Board of Directors in 2005. Under this plan, the Aquarium has added new facilities and exhibits that demonstrate environmental concepts, from climate change to watershed education. These exhibits, including the Ocean Science Center and the programs created for the SOS, promote climate literacy and serve as a model for other aquariums and science centers to address climate change. Funding for the SOS installation at the Aquarium was provided by the NOAA Office of Education, Port of Long Beach, Port of Los Angeles, The Roddenberry Foundation, and Economic Development Initiative. ■

SOS Shows

The Aquarium's SOS shows aim to teach visitors about various ocean phenomena, human activity affecting the planet, and how the ocean and atmospheric systems are connected. Learn more at aquariumofpacific.org/exhibits/ocean_science_center.

Rising Sea

Learn about rising sea levels and the creative ways communities are adapting.

Funding provided by NOAA.

A Working Waterfront: Seaports of the San Pedro Bay

Explore the Long Beach and Los Angeles Ports and how human activity intersects with wild-life in the Southern California urban ocean.

Funding provided by the Port of Long Beach and Port of Los Angeles.

Ocean in Motion

Discover how ocean health is connected to human health. From migrations to changing sea levels, the ocean is constantly in motion.

Funding provided by NOAA.

Our Instrumented Earth

Learn how satellites and observing systems are telling us about our changing planet.

Funding provided by NASA.

Exploring the Depths

Survey the history of ocean exploration and learn about major discoveries.

Funding provided by The Roddenberry Foundation.

Ocean Aquaculture: Farming Seafood for People and the Planet

Aquaculture, or the farming of fish and shellfish for seafood, could sustainably help meet the demand for food for our planet's growing population.

Funding provided by The Miller Foundation.

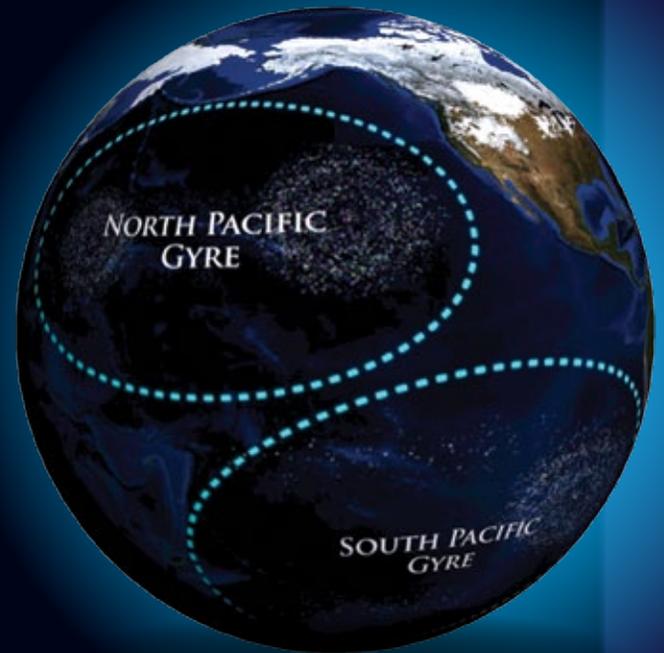
The Urban Ocean

Find out how humans and nature share this unique segment of the World Ocean.

Funding provided by The Miller Foundation.

Cities Through Time

Learn how innovation, efficiency, and sustainable solutions implemented in large cities can reduce human impact on the environment.



Marine Debris: Our Coast, Our Ocean

Marine debris is man-made material that ends up in the ocean or Great Lakes. This show describes the problems associated with marine debris and the impacts it has on marine life.

Funding provided by The Miller Foundation.

Extreme Weather

A changing climate will mean that hurricanes, droughts, wildfires, and other extreme weather events will increase in frequency and intensity. New forecasting systems will help people adapt and prepare.

Funding provided by The Miller Foundation.

The Story of El Niño

The El Niño phenomenon occurs when seasonal trade winds change direction and warm water remains at the surface of the Pacific Ocean along the coasts of North and South America, rather than being blown east. This often brings rain to Southern California. Learn about this phenomenon and its impacts.

Fukushima and Ocean Radioactivity

How much radioactivity is naturally occurring in the ocean and environment? Did the Fukushima disaster raise these levels significantly? Learn about the ocean and marine life impacts of the Fukushima Daiichi nuclear power plant disaster in Japan in 2011. This show will debut on March 11, 2015.

Funding provided by the Gordon and Betty Moore Foundation.

The Aquarium of the Pacific offers programs and events for all ages and interests. With exclusive events for our members, cultural festivals, a guest speaker series, and educational classes for families and children, there is something for everyone.

GREAT AQUARIUM ACTIVITIES!

MEMBER EVENTS

Please join us for one of these select events just for our members and their guests.

SENIOR MEMBER AFTERNOON

WEDNESDAY, JANUARY 28 | 1:30 p.m.-2:30 p.m.

Join us for a special edition of Senior Member Afternoon, and learn how the Aquarium is about to make history by expanding its footprint. The new Pacific Visions wing will be the first of its kind and will communicate the challenges our ocean faces and the opportunities it holds. It will embolden the Aquarium's message, empower our visitors to do more for our planet, and redefine what an aquarium can and should do. You won't want to miss this presentation in the Ocean Theater. Reservations are required as space is limited.

COST | Free for members. Member guests receive 20% off general admission.

RSVP | (562) 437-FISH (3474) by January 25

PACIFIC CIRCLE MEMBER MORNING

SATURDAY, FEBRUARY 7 | 9:00 a.m.-11:00 a.m.

Pacific Circle members are invited to explore the wide variety of species and ecosystems off the California coast during this exclusive morning. Learn the history of the Southern California steelhead fish species and its relationship to our local waterways at our newest exhibit, *Southern California Steelhead Story*. Get your hands wet while investigating a sampling of small organisms in the "Critter in a Crate" activity. And discover why the spiny lobster sheds its exoskeleton—all while noshing on a continental breakfast. This event is by invitation only. To attend, upgrade your membership to the Pacific Circle level today.

RSVP | (562) 951-5387 or nmalina@lbaop.org

MEMBER EVENTS

MEMBER KIDS ACTIVITY NIGHT

THU. & FRI., FEB. 19 & 20 | 6:30 p.m.-9:30 p.m.

The ever-popular Member Kids Activity Night is back for another installment of fun and exploration. The little ones will get a chance to meet our very special guest, the Cat in the Hat, and discover the many red fish and blue fish throughout the Aquarium. Other activities include storytelling in the classrooms, making hands-on crafts, dancing to the tunes of DJ EZ, strolling through the galleries, and much more.

COST | Free for members. Member guests receive 20% off general admission.

RSVP | (562) 437-FISH (3474) by February 16

CITY OF HOPE PRESENTS BLUE CAVERN LOUNGE

THURSDAY, MARCH 19 | 7:00 p.m.-10:00 p.m.

Did you know that some marine animals have biologically active compounds that can be converted into medicines and drugs? The Aquarium, in partnership with City of Hope, invites steward-level members to attend the annual Blue Cavern Lounge and learn all about the medicinal properties of corals, sponges, and other ocean species. Dr. John Williams (City of Hope) and Aquarium President and CEO Jerry Schubel will discuss the institutions' collaboration and ways that we can protect the sensitive marine environments these organisms call home. Attendees will also enjoy food and live music. This event is by invitation only. To attend, upgrade your membership to one of the steward levels today.

RSVP | (562) 951-5387 or nmalina@lbaop.org



Sea otters play with toys as an enrichment activity.

MEMBER EVENTS

MEMBER PROM

THURSDAY, MARCH 26 | 7:00 p.m.-10:00 p.m.

Relive the glory days of high school at the first-ever Member Prom. Dance to the hit songs of the past as you sip on a drink from the cash bars, get your prom photo taken with your date (unless you go stag!), and learn more about the prom "king and queen" nominees (a.k.a. your favorite Aquarium animals). If you need a break from the party, feel free to wander through the crowd-free galleries and enjoy the tranquility of the exhibits.

COST | Free for members. Member guests receive 20% off general admission.

AGES | 21+ only

RSVP | (562) 437-FISH (3474) by March 23

SPECIAL EVENTS

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

SHARK LAGOON NIGHTS

FRIDAYS, JANUARY 2-JUNE 12 (visit website for exceptions)

Shark Lagoon is open for everyone for free after 6:00 p.m. Guests can touch and learn about sharks, purchase snacks and drinks, shop, and enjoy live music on select nights.

COST | Free for everyone

INFO | (562) 590-3100, ext. 0

SPECIAL EVENTS
NIGHT DIVE
FRIDAY, FEBRUARY 13 | 7:00 p.m.-11:00 p.m.

Take in the Aquarium at night, when the lights go down and the bubble curtain goes up in Honda Blue Cavern. In the usual Night Dive tradition, enjoy cocktails, food trucks, music from local bands, DJs spinning in the Aquarium's galleries, and works of art. This Night Dive event will celebrate the LGBT community with drag performances and special guest speakers.

COST | \$14.95 per person; free for members.

AGES | 18+

INFO | (562) 590-3100, ext. 0

VALENTINE'S DAY LATE NIGHT & DINNER
SATURDAY, FEBRUARY 14 | 6:00 p.m.-9:00 p.m.

Celebrate Valentine's Day with someone special or the whole family at the Aquarium of the Pacific. The Aquarium will be open until 9:00 p.m. on Valentine's Day and will feature a unique, one-stop Valentine's Day experience. The Pacific Collections gift store will feature a selection of plush baby seals, polar bears, penguins, and other stuffed animals and jewelry for that perfect gift. Visit the Aquarium's website or call for details on the Valentine's Dinner.

COST | \$14.95 after 6:00 p.m., free for members.

Additional cost for dinner.

INFO | (562) 590-3100, ext. 0

AUTISM FAMILIES NIGHT
SUNDAY, MARCH 8 | 6:00 p.m.-9:00 p.m.

Join us for a special evening at the Aquarium for families with adults or children with autism. The entire Aquarium, except Lorikeet Forest, will be open until 9:00 p.m. This will be a peaceful evening when guests can enjoy the tranquility of our exhibits and meet 11,000 animals from the world's largest ocean.

COST | \$7 per person after 6:00 p.m.; free for members.

INFO | (562) 590-3100, ext. 0

AQUARIUM CLOSED
FRIDAY THROUGH SUNDAY, APRIL 17-19

Please note that the Aquarium will be closed due to the Grand Prix of Long Beach street closures.

MOTHER'S DAY BRUNCH
SUNDAY, MAY 10 | 10:30 a.m.-1:00 p.m.

This Mother's Day join the Aquarium for its annual brunch celebrating moms. Attendees can delight in a decadent brunch and explore the wonders of the Pacific Ocean during their visit at the Aquarium. Visit aquariumofpacific.org/events/info/mothers_day for the brunch menu. Tickets on sale April 1.

COST | Pricing to be available online.

INFO | (562) 590-3100, ext. 0

FESTIVALS
FESTIVAL OF HUMAN ABILITIES
SAT. & SUN., JAN. 24-25 | 9:00 a.m.-8:30 p.m.

Join the Aquarium of the Pacific for its twelfth annual Festival of Human Abilities, a celebration highlighting the creative talents and abilities of people with disabilities. This event will feature wheelchair dance, live music, signing choirs, art demonstrations, accessible SCUBA diving demonstrations, storytelling, interactive workshops, and other creative performances by people who have disabilities. Sign language interpreters will be present at all major shows and an audio tour is available for those who are blind.

COST | Free for members; members' guests receive 20% off regular admission

INFO | (562) 590-3100, ext. 0

AFRICAN-AMERICAN FESTIVAL
SAT. & SUN., FEB. 21-22 | 9:00 a.m.-5:00 p.m.

Join the Aquarium of the Pacific as it hosts its thirteenth annual African-American Festival, celebrating the rich diversity of African-American and African cultures. The weekend will feature live entertainment, arts and crafts, ethnic food, and more. Festival performers include Mardi Gras second line dancers, hip hop and break dancers, tap dancers, jazz musicians, interactive drum circles, West African dancers, and storytellers.

COST | Free for members; members' guests receive 20% off regular admission

INFO | (562) 590-3100, ext. 0

DIVERS DAY
SATURDAY, MARCH 7 | 9:00 a.m.-5:00 p.m.

Learn about the history and recent advancements in diving during the Aquarium's annual Divers Day. Check out educational presentations and dive demonstrations in exhibits. The diving community is invited to learn more about volunteer diving and other opportunities for involvement with dive-related organizations in Southern California. Divers who present valid proof of certification with their photo I.D. will receive free admission.

COST | Free for members; members' guests receive 20% off admission.

INFO | (562) 590-3100, ext. 0

FESTIVALS


Enjoy live performances of music and dance at the Aquarium's cultural festivals.

INTERNATIONAL CHILDREN'S DAY FESTIVAL
SAT. & SUN., MARCH 14-15 | 9:00 a.m.-5:00 p.m.

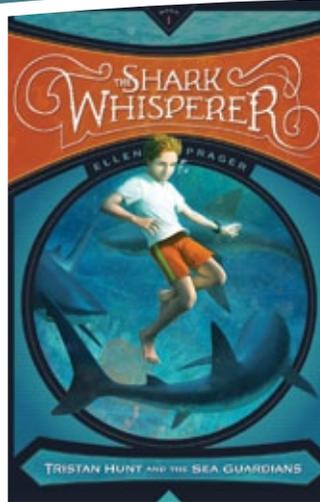
The Aquarium of the Pacific's tenth annual International Children's Day is a special festival for kids. Celebrating the talents of children of all cultures, this festival features West African, Mexican, Pacific Islander, Cambodian, Chinese, Korean, Japanese, and Persian dance performances. Enjoy performances by a children's choir and martial arts demonstrations. Kids of all ages can partake in an international percussion circle, face painting, and Native American and Pacific Islander traditional children's crafts and games. The Aquarium will also honor a local youth with its annual Young Hero Award in recognition of his or her efforts to make our planet a better place. Throughout the weekend a musical theater show for all ages called *Honu by the Sea* will be presented in the Ocean Theater. This Hawai'i-originated musical is about a young Hawaiian surfer who finds a magical sea star that makes his wish to spend a day underwater come true. He meets ocean friends while discovering the need to protect the ocean. Original songs, dances, and colorful costumes inspire viewers to become guardians of the ocean.

COST | Free for members; members' guests receive 20% off admission.

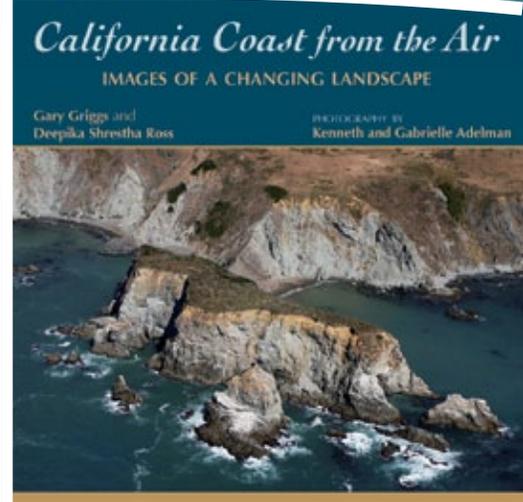
INFO | (562) 590-3100, ext. 0



Noche de Estrellas will be held on March 27.



Feb. 10: Meet the author, Ellen Prager.



Feb. 18: Gary Griggs will sign copies of his book.

FESTIVALS

NOCHE DE ESTRELLAS

FRIDAY, MARCH 27 | 6:30 p.m.-10:30 p.m.

Noche de Estrellas (Night of the Stars), the Aquarium's Latin-themed night, will feature live bands, DJs, underwater dive shows, and more. The Aquarium will remain open until 10:30 p.m., so you can dance under the stars to the sounds of cumbia, salsa, cha cha, rumba, and more. Mexican cuisine, beers, and drinks will be available for purchase.

COST | \$14.95 after 6:30 p.m., free for members.

INFO | (562) 590-3100, ext. 0

EARTH DAY FESTIVAL

SAT. & SUN., APRIL 25-26 | 9:00 a.m.-5:00 p.m.

Learn what you can do to help our ocean planet at the Aquarium's fifteenth annual Earth Day festival. Join us for a weekend of family fun celebrating Earth while learning easy, everyday tips to protect the environment. Visit booths from various Earth-friendly organizations and participate in hands-on learning demonstrations for people of all ages.

COST | Free for members; members' guests receive 20% off admission.

INFO | (562) 590-3100, ext. 0

URBAN OCEAN FESTIVAL

SAT. & SUN., MAY 2-3 | 9:00 a.m.-5:00 p.m.

Explore and celebrate Southern California's coast during the Aquarium's sixth annual Urban Ocean Festival. The event will include art exhibitions, a fashion show and contest for designs using recycled materials, mural painting, poetry readings, booths, and educational activities.

COST | Free for members; members' guests receive 20% off admission.

INFO | (562) 590-3100, ext. 0

GUEST SPEAKERS

The Aquarium hosts guest lectures on a variety of topics presented by experts from across the country. Lectures are held in the Ocean Theater.

RAY BAN | *The United States Weather and Climate Enterprise*

TUESDAY, JANUARY 13 | 7:00 p.m.

Ray Ban, formerly the executive vice president of programming, operations, and meteorology at The Weather Channel Inc., will discuss the unique relationship between the government, academic, and private sectors that allows our nation to receive weather and climate forecasts. This is known in meteorology as the weather and climate enterprise. Ban is the managing director of Ban & Associates, providing consultative services to the weather and climate enterprise. He is also a lecturer in the meteorology department at Penn State University and an American Meteorological Society fellow and member for more than forty years.

EMILY YAM | *Data Are Everywhere: Understanding Our Planet Through Exploration and Observation*

THURSDAY, JANUARY 22 | 7:00 p.m.

The Aquarium's Science Interpretation Supervisor Emily Yam spent several weeks aboard the *Research Vessel Thomas G. Thompson* supporting the ship's science mission during an expedition in the Northeast Pacific Ocean. She will discuss her experiences on the ship, the importance of data in ocean exploration, and the potential for discovery.

ELLEN PRAGER | *The Shark Whisperer*

TUESDAY, FEBRUARY 10 | 7:00 p.m.

Marine scientist Ellen Prager will discuss and sign copies of her latest book, *The Shark Whisperer*, the first in a five-part series of adventure novels for young adults. She will explain how some of her own adventures in

GUEST SPEAKERS

marine science were incorporated into the book and provide a sneak peek at what's to come in the next books in the series. Dr. Prager has made many television appearances, including on *The Today Show*, NBC News, and *Good Morning America*.

GARY GRIGGS | *California Coast from the Air: Images of a Changing Landscape*

WEDNESDAY, FEBRUARY 18 | 7:00 p.m.

In a state identified with change, California's 1,100-mile coastline lives up to the reputation. Storm waves attack sea cliffs, earthquakes trigger landslides, and ocean waves relentlessly move sand along the shoreline, bringing it and taking it away. Gary Griggs will discuss how over the past century, humans have changed the coast in significant ways, particularly in Southern California, where extensive stretches of coast have been completely altered. Yet there are areas along the north and central coast where you may not see another person for an entire day, and the shoreline looks like it did a hundred years ago. Griggs, professor of Earth and planetary sciences at University of California, Santa Cruz, is the author of *California Coast from the Air*, a collection of aerial photographs with captions by Griggs and architect Deepika Shrestha Ross. He will sign copies of his book after the lecture.

PAUL DIMEO | *The Aquarium's Scientific Diving Program*

THURSDAY, MARCH 5 | 7:00 p.m.

The Aquarium of the Pacific boasts one of the largest, most active dive programs in the country, with more than 230 divers working both inside the exhibits and out in the open ocean. Learn what it takes to operate and maintain a program conducting over 20,000 dives annually, including the scientific diving program and the Dive Immersion program for Aquarium visitors. See what it's like to dive



March 5: Get the inside scoop on our dive program.

GUEST SPEAKERS

inside the exhibits with our volunteer divers, and learn all about the underwater conservation, research, and collection projects the Aquarium has been involved in.

KEN BUESSELER | *Fukushima and its Impacts*

WEDNESDAY, MARCH 11 | 7:00 p.m.

On the fourth anniversary of the Fukushima I Nuclear Power Plant meltdown triggered by the magnitude 9.0 Tohoku earthquake, Ken Buesseler will discuss the impacts of the accident on marine life. Buesseler is a senior scientist in marine chemistry and geochemistry at the Woods Hole Oceanographic Institution.

HEATHER LYNCH | *Antarctic Penguins*

TUESDAY, MARCH 17 | 7:00 p.m.

Penguins are playing an increasingly important role as sentinels of ocean health. In this talk, Heather Lynch will give a brief overview of penguin biogeography and biology, discuss the threats currently facing many of the world's penguin species, and introduce some of the methods used by scientists to map, monitor, and study these charismatic seabirds. Lynch is a member of the faculty in ecology and evolution at the State University of New York at Stony Brook. She currently manages a project in partnership with non-profit research organization Oceanites called the Antarctic Site Inventory, which studies Antarctic penguins and their response to climate change.

MEL NUTTER | *Saving California's Coast (One Local Coastal Program at a Time)*

THURSDAY, APRIL 30 | 7:00 p.m.

Mel Nutter, a former chair of the California Coastal Commission, will discuss how cities and counties work with the Coastal Commission to prepare Local Coastal Programs designed to protect California's coast. Nutter has practiced law since 1965.



March 17: Heather Lynch shares penguin stories.

GUEST SPEAKERS

His positions included chair of the League for Coastal Protection, a statewide citizen's organization that engages in lobbying, advocacy, and litigation, as well as vice chair of the California Environmental Law Project. He has also previously served as Conservation Chair of the Long Beach Group of the Sierra Club, the Sierra Club's Angeles Chapter Coastal Committee, and City of Long Beach Citizens Advisory Environmental Committee. He was a member of the California Coastal Commission and served as its chair during the last three years of his tenure. As the Commission's chair, he also was on the Board of the State Coastal Conservancy.

PERRY HAMPTON | *Reproduction at the Aquarium: The Husbandry Department Tells All*

MONDAY, MAY 12 | 7:00 p.m.-9:00 p.m.

Aquarium Vice President of Husbandry Perry Hampton will discuss animal reproduction at the Aquarium. Many species of marine life reproduce at the Aquarium, from Shelby the harbor seal, who gave birth to pups in 2012 and 2013, to sea jellies, which are cultured behind the scenes by the Aquarium's aquarists. Hampton has been on staff at the Aquarium since before the institution opened its doors to the public in 1998.

COST | Free for members, teachers, seniors 62+, and students with valid I.D. and advanced reservations. \$5/non-members.

INFO | (562) 590-3100, ext. 0

WEB | All lectures are streamed live on the Aquarium's website at aquariumofpacific.org/aquariumlive

Sponsor:



Feb. 4 & May 7: LA Times Food Editor Russ Parsons hosts talks.

GUEST SPEAKERS

THE FUTURE OF FOOD

These events are part of an ongoing series hosted by *Los Angeles Times* Food Editor Russ Parsons. Learn about food sustainability and explore the Aquarium after hours.

RUSS PARSONS AND ANYA FERNALD | *The Future of Food: Reinventing American Meat*

WED., FEBRUARY 4 | 6:30 p.m.-9:00 p.m.

Anya Fernald is the co-founder and CEO of Belcampo Inc., a family of companies that includes Belcampo Farms, Belcampo Butchery, Belcampo Meat Co., and six restaurants. Together Parsons and Fernald will discuss humane organic meat farming and butcher shops, the slow food movement, and agritourism.

RUSS PARSONS AND DAVID "MAS" MASUMOTO | *The Future of Food: The Farmer as Artist*

THU., MAY 7 | 6:30 p.m.-9:00 p.m.

In this session farmer and author David "Mas" Masumoto will discuss organic farming. Masumoto is an organic farmer and the author of seven books, including *Four Seasons in Five Senses*, *Epitaph for a Peach*, and *Wisdom of the Last Farmer*. A third generation farmer, Masumoto grows peaches, nectarines, and grapes on an organic 80-acre farm south of Fresno, California. In 2013 Masumoto joined the National Council on the Arts after being appointed by President Obama.

COST | \$10 for the public, \$8 for Aquarium members (includes parking).

INFO | (562) 590-3100, ext. 0.

AQUARIUM TOURS

These programs are opportunities to see the Aquarium and its animals in a different light.

BEHIND-THE-SCENES TOURS

DAILY | times vary

Venture behind the scenes and go above Tropical Reef, our largest exhibit, to feed the fish. This tour provides a sneak peek into the Aquarium's daily operations. Guests will enter the "wet side" of the Aquarium, a section not normally open to the public. See what it takes to maintain a world-class aquarium, from water filtration to animal care and feeding.

COST | \$15/member | \$19/non-member; does not include Aquarium admission.

AGES | 7+ years

LENGTH | one hour

GROUP SIZE | maximum 10 participants

RSVP | (562) 590-3100, ext. 0, online, or sign up on day of visit

ANIMAL ENCOUNTERS

THURSDAYS-SUNDAYS | see times below

Join us for a very special experience to learn about feeding and caring for some of our marine animals. Roll up your sleeves, prepare some food, and get ready to be up close and personal for a feeding with a seal, sea lion, sea otter, shark, or penguin. There are lots of surprises along the way, so be prepared to get your hands wet!

THURS. & FRI. | *Penguins* 8:00-10:00 a.m.

SAT. & SUN. | *Seals & Sea Lions* 9:30-11:30 a.m. | *Sharks* 12:30-2:30 p.m. | *Sea Otters* 2:45-4:45 p.m.

COST | \$99/member | \$109/non-member, includes Aquarium admission

AGES | *Seals & Sea Lions, Sea Otters, Penguins*: 10+ years | *Sharks*: 13+ years

Some height restrictions apply. Participants under 16 years must be accompanied by an adult.

RSVP | (562) 590-3100, ext. 0

AQUARIUM TOURS

HARBOR TOUR

DAILY | times vary

Tour the Long Beach and Los Angeles Harbors with Harbor Breeze Cruises for a 45-minute narrated cruise around one of the most active ports in the world. See the downtown shoreline, ocean vistas, ships from around the world, and even sea lions. Tours are offered throughout the day on a daily basis. Tickets may be purchased in advance or at the ticket window upon arrival. Meet 15 minutes prior to departure at Dock 2. This program is led and staffed by Harbor Breeze Cruises.

COST | Members: \$12/adult, \$10/senior (62+), \$6/child (3-11) | Non-members: \$39.95/adult, \$34.95/senior, \$19.95/child includes Aquarium admission

RSVP | (562) 590-3100, ext. 0

DIVE IMMERSION

DAILY | 3:00 p.m.-5:30 p.m.

Certified SCUBA divers can dive in our warm 350,000-gallon Tropical Reef Habitat with more than 1,000 animals. Tour the dive program facilities, dive in the exhibit, and receive a certificate of completion, souvenir towel, use of an underwater camera, and a memory card of your photos. All equipment is provided. Requires advance reservations.

COST | \$279/member | \$299/non-member

AGES | 15+ years | ages 15-17 require participating adult chaperone

RSVP | (562) 590-3100, ext. 0



Sleep with the fishes on birthday or youth sleepovers.

AQUARIUM SLEEPOVERS

Pack your sleeping bag and toothbrush for a night of adventure at the Aquarium. These programs include a pizza dinner, snack, craft, cereal breakfast, and T-shirt.

BIRTHDAY PARTY SLEEPOVER

BASED ON AVAILABILITY | 5:00 p.m.-7:00 a.m.

Join us for an all-night celebration with a special birthday party sleepover featuring animal touch time, a feeding opportunity, presentations, an educator-led tour, and crafts. Please bring your own birthday cake.

COST | \$90/member | \$100/non-member

AGES | 5+ years | one adult required per 10 children

GROUP SIZE | 15-40 participants

RSVP | (562) 590-3100, ext. 0

YOUTH GROUP SLEEPOVERS

MONDAY OR WEDNESDAY EVENINGS, BASED ON AVAILABILITY | 5:00 p.m.-7:00 a.m.

Anchors aweigh as we become sailors in search of the missing treasures of the sea. Investigate the fascinating aquatic food web, and follow a treasure map in search of ocean knowledge!

COST | \$80/member | \$90/non-member

AGES | 5+ years, plus adult chaperone

GROUP SIZE | 20-60 participants

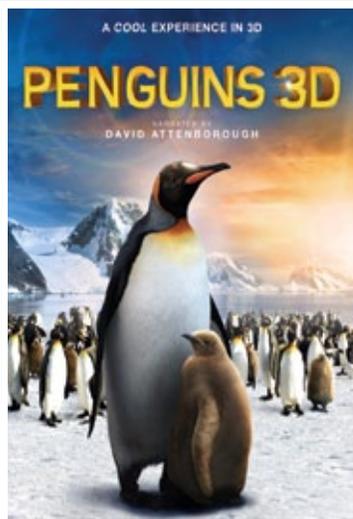
RSVP | (562) 590-3100, ext. 0

NEW FILM IN OCEAN THEATER

Penguins 3D is now playing in the Aquarium's Ocean Theater. Narrated by David Attenborough, the film follows the story of a King Penguin in Antarctica. Visit the Ocean Theater kiosk for tickets and showtimes.

AN EPIC JOURNEY. ONE SPECIAL PENGUIN. A FAMILY TALE.

WWW.PENGUINSTHEFILM.COM



Pre-registration and pre-payment required on all programs unless noted. Call (562) 590-3100, ext. 0. All prices subject to change.

SPECIAL PROGRAMS

BIRTHDAY PARTIES

AVAILABLE BY RESERVATION ONLY

Let us make your child's next birthday celebration special. The Aquarium will supply all the ingredients for an unforgettable party, including a one-hour classroom program featuring animal touch time, biofact discovery, and a take-home souvenir craft project. The party concludes with an additional half-hour in the classroom for the birthday celebration. Please bring your own birthday cake. Aquarium admission is included. All you need to do is call us at least two weeks prior to reserve a date (subject to availability), and then invite your guests.

COST | \$33/member | \$39/non-member, includes Aquarium admission

AGES | All ages, one adult required per 10 children

GROUP SIZE | 15-40 participants

INFO | (562) 590-3100, ext. 0

AQUARIUM ON WHEELS

AVAILABLE BY RESERVATION ONLY

The Aquarium on Wheels is dedicated to developing children's appreciation for the wonders of the ocean environment. Along with an educational presentation, hands-on activities, and environmental message, our outreach educational program provides children the chance to touch sharks, sea stars, anemones, urchins, and other marine inhabitants. This mobile tidepool exhibit is not just for schools—it is also great for display at festivals, fairs, and even birthday parties. Aquarium on Wheels will deliver a memorable experience for all!

INFO | (562) 951-1630

OUTDOOR ADVENTURES

Go beyond the Aquarium to participate in offsite experiences in the great outdoors.

DOLPHIN AND SEA LIFE 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 Dolphin and Sea Life Cruise. This is an experience you and your family will not soon forget!

COST | Members: \$25/adult, \$20/senior (ages 62+), \$15/child (ages 3-11)

Non-members (includes Aquarium admission): \$48.95/adult, \$44.95/senior, \$30.95/child

WHEN | Spring and fall season

LENGTH | 2-2.5 hours

AGES | Children under 16 must be accompanied by an adult.

RSVP | (562) 590-3100, ext. 0

OUTDOOR ADVENTURES

GRAY WHALE WATCHING TRIPS

SEASONAL

Enjoy a voyage out in the open Pacific Ocean in search of one of the world's longest-migrating mammals. These gentle giants make their way past Long Beach each year between the months of November and April. Learn new, exciting information about gray whales and other local marine life from an on-board Aquarium educator.

COST | Members: \$25/adult, \$20/senior (ages 62+), \$15/child (ages 3-11)

Non-members (includes Aquarium admission): \$48.95/adult, \$44.95/senior, \$30.95/child

AGES | Children under 16 must be accompanied by an adult.

LENGTH | 2-2.5 hours

RSVP | (562) 590-3100, ext. 0

#AquariumMember Photos



Jay Tayag captured one of our California sea lions gliding underwater.



Mariah Hernandez enjoys a special moment with an Aquarium diver.



The five children from the Hoynes Family visit their finned friends at Tropical Reef.

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



HUGH RYONG

Sea otters Ollie, Chloe, Brook, and Maggie enjoy an ice patch.



ROBIN RIGGS

Explore the Aquarium's exhibits to get up-close views of marine life.

YOUTH PROGRAMS

JUNIOR BIOLOGIST PROGRAM

SATURDAYS | 9:30 a.m.-11:30 a.m.
topics vary, see below

Participants will independently investigate marine life during this exploratory program. This class offers hands-on animal touch time, Aquarium animal observation, and activities relating to each topic. Select the topic that is most interesting to you, or take all the classes to learn about the variety of animals found at the Aquarium.

TOPIC Mammals.....	Feb. 14
Invertebrates.....	March 14
Fish.....	April 11
Birds & Reptiles.....	May 9

COST | \$25/member | \$29/non-member
 (does not include Aquarium admission)

AGES | 7-12

RSVP | (562) 951-1630

JOB SHADOW

WEDNESDAYS | 3:30 p.m.-6:30 p.m.
SATURDAYS | 9:00 a.m.-12:00 noon
topics vary, see below

This program is for students who are interested in animal husbandry or marine biology careers. Students will learn what it takes to run a world-class aquarium and get a hands-on opportunity to participate in everyday activities that help maintain the Aquarium. Students will go behind the scenes, shadowing education and husbandry staff members.

TOPIC Veterinarian.....	Feb. 4 & 7
Bird Biologist.....	March 4 & 7
Mammalogist.....	April 1, 4 & 29, May 2

COST | \$35/member | \$39/non-member
 (does not include Aquarium admission)

AGES | Grades 7-12

RSVP | (562) 951-1630

SATURDAY FAMILY FUN PROGRAMS

Children, along with a parent or adult chaperone, will investigate the ocean world in a structured classroom program that includes interactive and hands-on activities. These programs foster the students' discovery as well as interaction with adults and peers.

TOTALLY TURTLES

SATURDAY, FEB. 28 | 10:00 a.m.-11:30 a.m.

You may enjoy a sweet treat of Jelly Bellies, but a sea turtle prefers having a belly full of jellies! Discover fun facts and turtle trivia as we explore these reptiles.

SHARK SLEUTHS

SATURDAY, MARCH 28 | 10:00 a.m.-11:30 a.m.

Discover how sharks' amazing adaptations make them excellent predators. Get an up-close view of these creatures and others as we learn all about sharks!

COST | ADULT-CHILD PAIR: \$36/member; \$49/non-member; EXTRA PERSON: \$15/member; \$20/non-member
 (includes Aquarium admission)

AGES | 4-6 years, plus adult chaperone

RSVP | (562) 951-1630

MAGNIFICENT MARINE MAMMALS

SAT., APRIL 25 | 10:00 a.m.-11:30 a.m.

Who are warm-blooded and hairy, breathe air, and live in the ocean? Marine mammals! Join us as we learn the special ways sea otters, seals, sea lions, whales, and other marine mammals survive in the sea.

SEA JELLIES AND OTHER INCREDIBLE INVERTEBRATES

SAT., JAN. 24 & MAY 23 | 10:00 a.m.-11:30 a.m.

They may be spineless, but they are the backbone of nature. Join us as we learn all about jellies and their invertebrate relatives that inhabit the ocean.

Mother's Day Brunch

AT THE AQUARIUM OF THE PACIFIC



SUNDAY, MAY 10
10:30 A.M. - 1:30 P.M.

Treat Mom and the rest of the family to a Mother's Day brunch at the Aquarium. Call (562) 590-3100 for details.



ROBIN RIGGS

Visit the brightly colored fishes that change sex depending on certain factors in the Aquarium's Tropical Pacific Gallery.

AQUA TOTS

Toddlers team up with their parent or chaperone for a first look into ocean life. Each of the Aqua Tots programs focuses and expands on a particular concept while encouraging adult and child interaction.

SOUNDS OF THE SEA

SATURDAY, JAN. 17 | 10:00 a.m.-11:30 a.m.

Do you love the calming sound of the waves on the shore? Did you know that there is a commotion of noise just under those waves? Immerse yourself in the wonder and discovery of this interactive program.

SUPER SENSES OF THE SEA

SATURDAY, FEB. 21 | 10:00 a.m.-11:30 a.m.

Explore your five senses while discovering how ocean animals use their senses of sight, smell, hearing, touch, and taste to survive.

COLORS OF THE OCEAN

SATURDAY, MARCH 21 | 10:00 a.m.-11:30 a.m.

What's your favorite color? Discover which animal in the ocean shares your passion for purple or your glee at the sight of green.

MOVIN' & GROOVIN' BENEATH THE SEA

SATURDAY, APRIL 25 | 10:00 a.m.-11:30 a.m.

Roll like an otter and slide like a snail as we discover animals through movement. Explore the world of sea creatures by taking a closer look at the way they move. Join us as we move and groove like the animals beneath the sea!



Participants in the Aquarium's education programs get many hands-on opportunities to learn.

SLIPPERY TO PRICKLY

SATURDAY, MAY 16 | 10:00 a.m.-11:30 a.m.

Whether it's a slippery sea cucumber, soft and velvety bat ray, prickly sea urchin, or simply the smooth shell of a hermit crab, discover the many lovable and touchable creatures that live in the ocean. Learn what can be explored safely as we use our sense of touch on a journey through the Pacific Ocean.

COST | ADULT-CHILD PAIR: \$36/member, \$49/non-member
EXTRA PERSON: \$15/member, \$20/non-member (includes Aquarium admission)

AGES | 2-3 years, plus adult chaperone

RSVP | (562) 951-1630

AQUATIC ACADEMY

In a series of evening courses for adults, learn about complex issues related to the environment from experts in the field.

THE CASE FOR OCEAN EXPLORATION

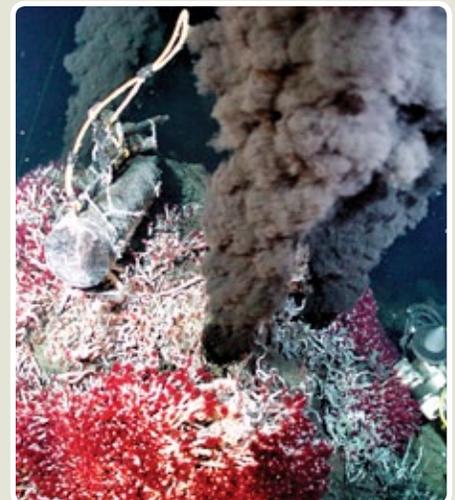
TUES., MAR. 3, 10, 24 & 31 | 7:00 p.m.-9:00 p.m.

Learn what remains to be discovered in the ocean, from new life forms to natural resources, and which technologies might play a role in helping us better understand our World Ocean and life on our planet. Hear from modern day ocean explorers and experts from agencies like the National Oceanic and Atmospheric Administration and NASA's Jet Propulsion Laboratory.

COST | \$35/member, \$45/non-member, \$10 extra for CEU credit with California State University, Long Beach

INFO | ametz@lbaop.org

RSVP | 562-590-3100 ext. 0 or aquariumofpacific.org



Hydrothermal vents are among the more recent discoveries made in the ocean.

NOAA/PIWLEI PROGRAM

KIDS CORNER

Kids Can Help the Environment

Kids can make a difference by saving water during the drought in California, keeping trash out of the ocean, and saving energy. Check out these ideas, and share them with your friends. Some you can do on your own, and some you can do with an adult helping you.

THINGS YOU CAN DO WITH AN ADULT:

1. **Plant drought-resistant plants native to Southern California in your yard.**
2. **Install low-flow filters on the faucets and showerheads in your house.**
3. **Use energy-saving light bulbs.**
4. **Start a compost pile or compost bin at home to collect fruit and vegetable waste. These will eventually break down and can be used to fertilize your garden.**
5. **For short trips, try to walk, ride a bike, or take the bus instead of taking a car.**



REDUCE WASTE:

1. **Find out how many things you can recycle instead of throwing them in the trash. Encourage everyone in your house to recycle.**
2. **Challenge yourself to pick up three pieces of trash every day when you're outside.**
3. **Use a reusable lunchbox and food containers when you pack your lunch each day instead of a paper lunch bag, plastic sandwich bags, and paper napkins.**
4. **When cleaning up a spill, try to use towels and rags rather than paper towels or napkins.**
5. **Use recycled paper and use both sides when you do homework, arts and crafts, or print from your computer.**



SAVE ENERGY:

1. **Turn off the lights when you leave the room.**
2. **Set a timer to limit the amount of time spent playing video games or using your computer, tablet, or phone. When you're done, be sure to unplug your device and turn it off.**
3. **Do you have a nightlight? Try unplugging it and putting up glow-in-the-dark stickers instead.**



SAVE WATER:

1. Turn off the faucet while you lather your hands with soap and brush your teeth.
2. Set a timer to see if you can shower in less than five minutes. A shower uses 2.5 gallons a minute!
3. Keep a bucket in your shower to save the water that runs while it heats up. Use this water for houseplants or your yard.

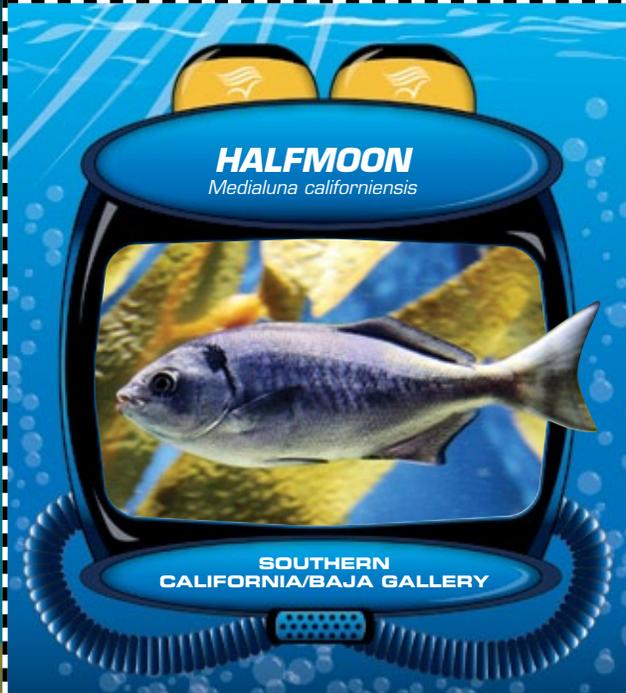
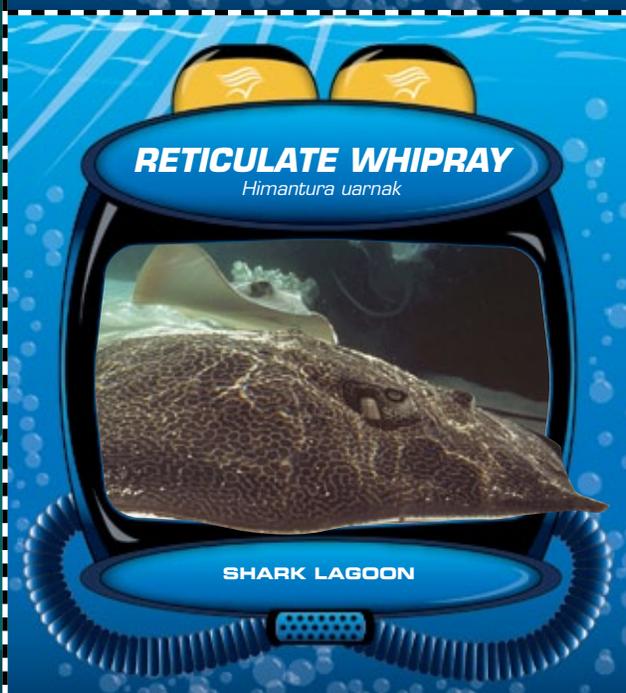


Fishing for KNOWLEDGE!

1. In the wild, blue-spotted rays stop at _____ stations where small fish and shrimp remove dead skin, bacteria, and parasites.
2. Magellanic Penguins are native to the coasts of _____ and Argentina. They are a temperate penguin species and never see snow or ice.
3. The _____-spotted ray's bright markings warn other animals to stay away because these rays are venomous.

Last Issue's Questions and Answers:

1. Southern California steelhead begin their lives in freshwater rivers and streams as **rainbow** trout.
2. Fish species that spend part of their lives in the ocean and return to freshwater rivers and streams to reproduce are **anadromous**.
3. **Dams** and flood-control structures can be modified to allow steelhead to pass through on their way upstream.



SPOT PRAWN

Pandalus platyceros



PHYSICAL CHARACTERISTICS

Spot prawns grow to about 10 inches long. They are reddish in color with white stripes and spots. They have five pairs of swimming legs and five pairs of walking legs.

DIET

These crustaceans feed on worms, algae, small mollusks, sponges, and other shrimp. They also scavenge on dead and decaying animals on the sea floor.

HABITAT

Spot prawns live at depths of around 1,600 feet or deeper in rocky or sandy bottom areas. They migrate to shallower areas at night to feed and mate, returning to deeper water during the day.

FUN FACT

Most marine life living in the deep ocean cannot see red, making spot prawns invisible to many of their predators.

RETICULATE WHIPRAY

Himantura uarnak



PHYSICAL CHARACTERISTICS

This ray species varies greatly in size, but the largest reported was 6.6 feet wide and 14.8 feet long, including the tail. It gets its name from the pattern of black and brown spots on its dorsal side.

DIET

Reticulate whiprays are bottom feeders that hunt for small fish, crabs, worms, shrimp, and sea jellies. They use their wings to uncover prey hidden in the sand at the sea floor.

HABITAT

These rays live in tropical and subtropical shallow waters up to about 164 feet. They are generally an ocean species, but have been seen in freshwater, as well.

FUN FACT

Reticulate whiprays bury themselves in sand at the sea floor. When buried, the ray can breathe through openings on the top of its head to avoid inhaling mud or sand through the gills.

HALFMOON

Medialuna californiensis



PHYSICAL CHARACTERISTICS

Reaching 8 to 14 inches in length, halfmoons are football-shaped and silvery-blue in color. They get their name from the curved shape of their tail fin.

DIET

Halfmoons typically feed on kelp and red and green algae, but will also eat small invertebrates like sponges, crustaceans, and anemones.

HABITAT

These fish live in depths of 9 to 130 feet in areas with rocky reefs, kelp beds, and sometimes oil rig structures. They can be found in waters along the western coast of North America.

FUN FACT

Halfmoons have a distinctive dark spot above the gills that may function as a false eye spot to distract or confuse predators.

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IN CELEBRATION of our environment and the individuals and organizations making important contributions to conserving Earth's resources, the Aquarium of the Pacific will host the annual Blue Whale Gala on Saturday, June 13, 2015. Aquarium Trustee of the Pacific Michelle Molina will chair this black-tie, must-attend event of the year.

We hope you will save the date and join us for an elegant evening of gourmet dining, education, and inspiration. For more information and sponsorship opportunities, please contact Linda Glasco at (562) 951-1606.

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THE AQUARIUM OF THE PACIFIC is proud to recognize its leading society of supporters—the Pacific Circle. These committed individuals and corporations provide critical support for the Aquarium's annual operations and mission-driven programs. The Aquarium sends its sincerest thanks to each Pacific Circle member in appreciation of his or her inspiring dedication and generosity. This listing does not include donations to our Ocean Science Education Program, Scholarship Fund, Ocean Conservation Awards Gala, Capital Campaign, or other special projects.

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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.

■ HCP Renews its Support of Seniors Day

The Aquarium held its Seniors Day event this past September, offering free admission to those over the age of fifty. HCP, Inc., a real estate investment trust serving the healthcare industry, provided a \$25,000 sponsorship. Over 5,500 attendees participated in a variety of booth displays, a safety presentation, and a sustainable seafood cooking demonstration and tasting. Additionally, HCP employees donated their time by volunteering at the event, staffing booths and assisting Aquarium visitors and staff members throughout the day.

■ John W. Carson Foundation Supports Pacific Visions

The John W. Carson Foundation has pledged \$100,000 to the Aquarium's Pacific Visions expansion campaign. The foundation has been a longtime Aquarium partner and has supported the Aquarium's education programming since 2004. With this additional capital campaign support, the Aquarium will educate and inspire hundreds of thousands of additional schoolchildren and other visitors using new technology and advanced programming.

■ The Ralph M. Parsons Foundation Supports Scholarship

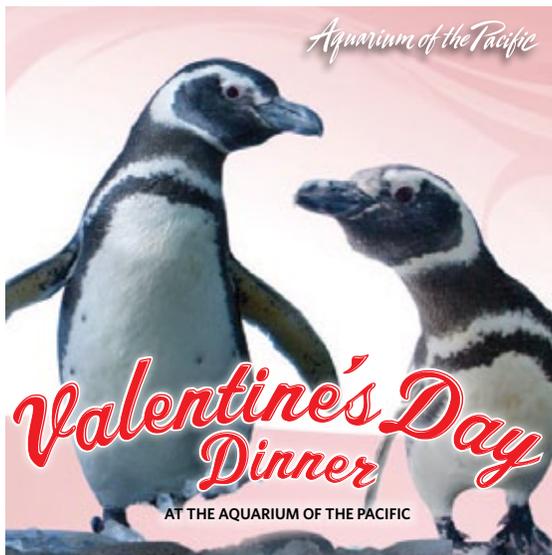
The Ralph M. Parsons Foundation recently awarded a grant of \$100,000 that provides support for the Aquarium Scholarship Fund. Underserved children from Title I schools in Los Angeles County will be given the opportunity to visit the Aquarium, participate in a variety of educational programs, and explore the Aquarium's exhibits and touch labs. These hands-on experiences leave a lasting impression on students who might not otherwise have the opportunity to visit the Aquarium.

■ Los Angeles Dodgers Foundation Provides Youth Scholarships

A gift of \$25,000 from the Los Angeles Dodgers Foundation will support Aquarium visits and interactive classroom and theater education programs for 2,000 students and teachers from the Greater Los Angeles area. The Aquarium Scholarship Fund brings science and environmental education to life for children with limited access to high-quality science education to complement what they are learning in the classroom.

■ Boeing Contributes to Teacher Training

The Boeing Company granted \$35,000 to the Aquarium's suite of professional development trainings and activities for local teachers. Thirty K-12 educators participate in the Aquarium's Boeing Teacher Institute (BTI) every summer. Participants snorkel, collect plankton, learn about research conducted at the University of Southern California's Wrigley Institute, engage with highly trained Aquarium educators, and collaborate with fellow teachers. After the workshop local scientists are paired with several BTI teachers in what is called the "Meet a Scientist" program, in which scientists deliver lessons and present their research to students. Reflecting on the value of this program, one teacher stated, "It made me realize how important marine research is and how accessible it is for my students, some of whom have never even had one visit to an ocean or beach...I am wrapping my curriculum around everything I have because of this experience."



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FEBRUARY 14

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AQUARIUM ACCOLADES



Tony Cerda
| Heritage Award

The Aquarium presented the Heritage Award to Tony Cerda during its annual Moompetam Native American Festival for his

efforts to preserve and celebrate the cultural heritage of the Costanoan Rumsen Carmel Tribe. Cerda is the tribal chairman of the Costanoan Rumsen Carmel Tribal Council and the Elder of the Ohlone Bear Clan. In this role, he coordinates and oversees all of the activities of the council and organizes events to preserve and celebrate traditional cultural practices, including outreach to schools and universities, Rumsen language classes, weekly drum circles, annual tribal gatherings, and a program to reduce youth gang involvement.

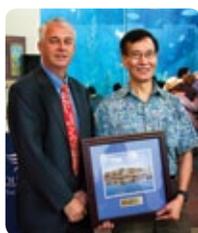
Pictured: Tony Cerda, Heritage Award honoree, and Cecile Fisher, vice president of marketing and communications, Aquarium of the Pacific.



Mayor Robert Garcia
| Heritage Award

The Aquarium presented the Heritage Award to Dr. Robert Garcia, the twenty-eighth Mayor of Long Beach, during its annual Baja Splash cultural festival in September. Mayor Garcia was born in Lima, Peru, and emigrated to the United States at age five. When he was elected in 2009 Garcia was the youngest person and the first Latino male to serve on the Long Beach City Council. He was elected vice mayor in 2012. During his five years as councilmember for the First District Garcia increased park and community garden space. He also served on the California Coastal Commission. As mayor, he has prioritized improving education, neighborhoods, and sustainability.

Pictured: Jerry Schubel, president and CEO, Aquarium of the Pacific; Long Beach Mayor Robert Garcia, Heritage Award honoree; and Dr. Tino Bernadett, trustee, Aquarium of the Pacific.



Cambodian Health Professionals Association of America
| Heritage Award

The Aquarium presented the Heritage Award to the Cambodian Health Professionals Association

of America (CHPAA) at the annual Southeast Asia Day festival in October. CHPAA is an all-volunteer non-profit organization founded in 1998 by a group of Cambodian-American physicians to promote the health of the Cambodian-American community through advocacy, education, and services. CHPAA hosts health fairs, conducts annual medical missions in Cambodia to provide free care and medications, and provides scholarships for medical students in both the U.S. and Cambodia. Dr. Song Tan, the organization's founder and board president, accepted the Award on behalf of CHPAA.

Pictured: Perry Hampton, vice president of husbandry, Aquarium of the Pacific, and Dr. Song Tan, founder and board president, CHPAA.



Cold Tofu | Heritage Award

During the annual Autumn Festival held in November the Aquarium presented the Heritage Award to Cold Tofu, the nation's longest-running Asian-American comedy improv troupe. Founded in 1981, Cold Tofu is dedicated to promoting diverse images of Asian Pacific Americans through comedy and developing multiethnic talent through education and performance. Cold Tofu's members perform improv shows in Little Tokyo in Downtown Los Angeles and throughout the community. The organization has also developed youth workshops with a focus on leadership and team building. Artistic Director Jully Lee accepted the award on behalf of Cold Tofu.

Pictured: Jully Lee, artistic director, Cold Tofu, and David Bader, director of education, Aquarium of the Pacific.



CILC Pinnacle Award

The Aquarium received the 2013-2014 Pinnacle Award from the Center for Interactive Learning and Collaboration (CILC) for its educational videoconferencing programs. The Pinnacle Award is given to institutions that receive top scores on program evaluations from teachers based on educational content and program delivery. The Aquarium previously received the Pinnacle Award for videoconferencing in 2011-2012.

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Dives were performed in the 50-degree waters of Puget Sound.



The aquarists were able to see the species they care for in their natural environments.



Right: Aquarists Nate Jaros, Angelina Komatovich, and Chris Plante went on the collection trip.

AQUARISTS COLLECT SEA LIFE IN WASHINGTON

IN SEPTEMBER aquarists from the Aquarium visited Tacoma, Washington, to collect fish and invertebrates for exhibits in the Northern Pacific gallery. Assistant Curator Nate Jaros, Aquarist Angelina Komatovich, and Assistant Curator Chris Plante were hosted and assisted by the Point Defiance Zoo and Aquarium staff, who served as safety officers and advisors during collection dives and provided a boat for the expeditions. Jaros, Komatovich, and Plante used dry suits to protect them during multiple daily dives in 50-degree ocean waters. While wetsuits allow water to form an insulating layer between the diver's skin and the wetsuit's neoprene, dry suits are sealed at the neck, wrists, and ankles to keep the body dry. Dives were conducted near Tacoma and Anacortes. The Aquarium's staff benefited in particular from the expertise of the Tacoma aquarium's staff in navigating the tidal activity and narrow passageways characteristic of Puget Sound.

The aquarists collected plume, painted, and crimson anemones, Pacific spiny lumpsuckers, grunt sculpins, orange sea pens, and other fish and invertebrate species. These new animals are on view in the Northern Pacific Preview, Jewels of the Northern Pacific, Rocky Reef, and Sandy Bottom exhibits, among others.

Not only did the trip allow aquarists to collect new animals, but also it afforded them the opportunity to see these animals in their natural habitats so aquarists will be able to make their exhibits more true to life.

Blogger Julien Christopher shows a sea lion skull to whale watchers on a recent cruise.



Blogger Hugh Ryono is a good friend to the Magellanic Penguins.

MEET THE AQUARIUM'S BLOGGERS

THE AQUARIUM has several bloggers who regularly post updates, interesting facts, and photos and video featuring our animals and programs.

Hugh Ryono has been a volunteer in the Aquarium's husbandry department for as long as the Aquarium has been in operation. He works with the marine mammals and birds, including the seals, sea lions, otters, and penguins. In his blog posts, he has shared many behind-the-scenes stories, photos, and videos with readers, giving special insight into daily life at the Aquarium and the personalities of the animals he works with. He has even helped the sea lions become videographers by attaching an underwater camera to rings they can carry or wear.

Get the inside scoop from Aquarium staff members who interact with our animals regularly and keep tabs on local wildlife, as well.

Julien Christopher is a member of the Aquarium's education staff and blogs about whale watching. She reports on what species of whales, dolphins, and other marine life are spotted on the Aquarium's daily, year-round whale watch cruises. She also includes close-up photos captured by the Aquarium's whale photo ID interns, explanations of whale and dolphin behaviors and migrations, and details of any out-of-the-ordinary sightings.

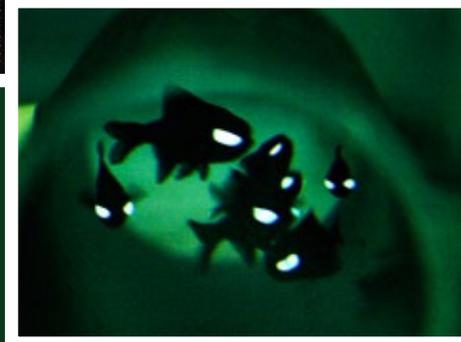
To follow these blogs, subscribe to the Aquarium's RSS feed at <http://feeds.feedburner.com/AquariumWebFeed/> or visit aquariumofpacific.org/blogs.



Caroline Edmonds describes her flashlight fish project to attendees at the Broadcom MASTERS competition in Washington, D.C.



Broadcom MASTERS science competition finalists met with President Obama.



Edmonds recorded video footage of the Aquarium's flashlight fish to study their bioluminescence.



Edmonds was assisted by Aquarium Aquarist Dee Ann Auten (left).

TEEN VOLUNTEER STUDIES AQUARIUM'S FLASHLIGHT FISH

IN 2014 Aquarium volunteer Caroline Edmonds, age thirteen, conducted a study of the Aquarium's flashlight fish (*Anomalops katoptron*) to learn more about how often they cover and uncover the bioluminescent patches under their eyes.

She defended her project at the Orange County Science and Engineering Fair last April and, as one of the top zoology projects at the fair, she qualified for the California State Science Fair held later that month. She was also selected for the Broadcom MASTERS (Math, Applied Science, Technology and Engineering Rising Stars) competition, where she was one of thirty finalists to win a trip to Washington, D.C., to present her project and receive \$1,000 to go toward her school's science program. She also met President Obama at the White House with the other finalists.

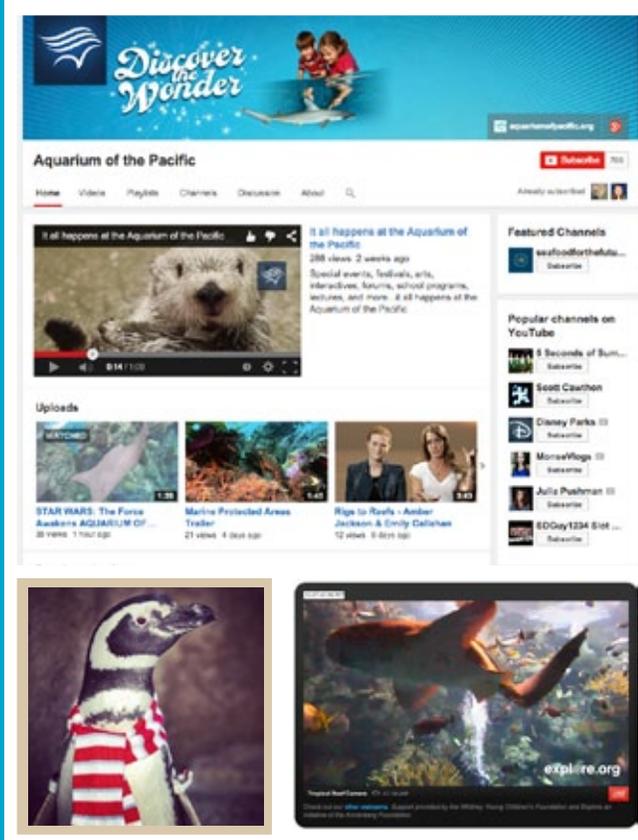
Caroline Edmond's research on flashlight fish behavior earned her the opportunity to meet President Obama at the White House.

Edmonds began volunteering in the Aquarium's education department with her mother and younger sister in 2011. Her project was inspired in part by her experiences at the Ocean Exploration 2020 forum held at the Aquarium in 2013. She attended many of the sessions, including presentations by explorers Sylvia Earle, Bob Ballard, and Don Walsh. Their discussions inspired Edmonds to do an ocean-themed project for the science fair. Aquarist Dee Ann Auten, who maintains the exhibits in the *Wonders of the Deep* gallery, offered to help Edmonds with

a project based on the animals in the gallery. Edmonds chose to investigate when flashlight fish light up the most and what may cause it. She did some research to learn about the species' habitat and diet, but found that not as much was documented about flashlight fish behaviors.

For her project, Edmonds devised a sampling method to count the number of light-ups. It is estimated that flashlight fish can light up fifty times per minute and can vary how long their light stays uncovered. Edmonds used a video camera to capture five-minute intervals during rest periods, feedings, and other activity, such as exhibit cleaning or other distractions. Then she modified the footage with a reverse lighting effect to count the number of light-ups. She narrated her observations on video and wrote notes in her journal documenting any behaviors she observed. She also compared data over different times of the day and with different foods. Qualitatively, she documented any behavior she saw during feedings and cleanings, noting the time of day and distractions.

From her observations, Edmonds found that the Aquarium's flashlight fish showed the most light-up activity during feeding time. She also noticed a hierarchy of scouts, as well as changes in the position of the group of fish within the exhibit and that the fish seemed to seek out the darkest part of the tank depending on gallery lighting.



From YouTube and Instagram to live feeds from exhibit webcams, the Aquarium is offering many ways to visit virtually, learn more online, and share photos and video via social media networks.

GO SOCIAL WITH THE AQUARIUM

THERE ARE MANY WAYS to keep up with the latest happenings at the Aquarium, from videos posted weekly to the Aquarium's YouTube channel to live online broadcasts of the year-round Guest Speaker Series.

In addition to Facebook, Twitter, and Google+, the Aquarium maintains an account on Instagram to share interesting photos of animals and events and to see the photos taken by visitors. Be sure to tag the Aquarium in your Instagram posts. On YouTube, the Aquarium regularly posts new videos, from interviews with visiting experts to performances from cultural festivals. Subscribe to the channel to get the latest video updates.

The Aquarium's website is home to many live web streams, from webcams installed in several exhibits (including the June Keyes Penguin Habitat, Shark Lagoon, and the Honda Blue Cavern), to live broadcasts of the Guest Speaker Series, a monthly series on environmental issues called Coastal Conversations, and live web events to discuss current ocean, weather, and climate science topics with scientists from agencies like the National Oceanic and Atmospheric Administration and NASA. To see what live web broadcasts are coming up, visit aquariumofpacific.org/aquariumlive. To view the live exhibit webcams, visit aquariumofpacific.org/exhibits/webcams.

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Right: Stephen and Marlene Young pose with the otter mascot at Sea Fare.



ELEVENTH ANNUAL SEA FARE A SUCCESS

THE 2014 SEA FARE EVENT entertained over 650 guests and raised over \$167,000. This annual "foodie" fundraiser, which includes unique items in the live and silent auctions, benefits the Aquarium's education, ocean conservation, and animal care programs. A new VIP on the Veranda opportunity sold out. This experience offered early access, a private table, special animal visits, and more. The twelfth annual Sea Fare event will take place on Saturday, October 17, 2015.



The Aquarium's volunteer staff includes people of all ages. Jade, Xenia, and Tyde Ocean, pictured above, are participants in the Aquarium's Family Volunteer program.

AQUARIUM VOLUNTEERS DONATE 2 MILLION HOURS

ON DECEMBER 15, 2014, Aquarium volunteers reached a significant milestone. Total hours of service donated by volunteers reached 2 million since the Aquarium first opened in 1998.

The 1 million hours mark was reached in 2009 after eleven years. Aquarium volunteers work in nearly all departments, from animal husbandry and guest services to marketing and education.



The Aquarium's VolunTEENS receive ongoing training and gain hands-on experience interacting with Aquarium visitors.

TEEN CONSERVATION VOLUNTEERS MAKE AN IMPACT

BY BECOMING VOLUNTEERS and participating in conservation efforts, teens can help the environment while gaining valuable experience and developing key life skills.

For teens who are passionate about the ocean, coasts, and marine wildlife, there are many organizations that offer opportunities to make a difference right here in Southern California.

At the Aquarium, teens can get involved by joining a spring, summer, or fall session of the VolunTEENS program. To qualify, teens must be between fourteen and sixteen years old and have a GPA of 2.5 or higher. The program is competitive, but the students who are selected have the opportunity to gain career-building skills as they apply, interview, and train to become important members of the Aquarium's staff.

As VolunTEENS, students dive head first into Aquarium life. They receive ongoing training and instruction, and they get hands-on experience as teachers and interpreters educating Aquarium visitors at exhibits throughout the facility. They also get to hone their public speaking and research skills. After their session has ended, many VolunTEENS become Aquarium volunteers in departments such as education or guest services.

The Aquarium offers several other ways for teens to get involved. Each year as part of statewide events such as California Coastal Clean-Up Day held every September, Aquarium volunteers of all ages can participate in cleaning up Alamitos Beach in Long Beach. Teens can also take part in restoring the Los Cerritos Wetlands habitat, which spans the cities of Long Beach and Seal Beach, by joining the Aquarium in native plant conservation on the first Saturday of each month. Activities include removing non-native plants, collecting seeds, and picking up trash. Learn more about all of the Aquarium's volunteering opportunities, including how to apply for the VolunTEENS program, at aquariumofpacific.org/volunteer.

Other opportunities for teens to get involved are available throughout Southern California. The Surfrider Foundation, a California-based nonprofit organization focused on protecting coastal resources, offers its QUAD youth service program, which engages students through project-based learning. Teens can get involved with the foundation by volunteering for an existing service project, organizing a new project, joining a local chapter, or even starting a new Surfrider Foundation Club at their school. For more information, visit surfrider.org.

Teens can check out volunteer corps such as the Conservation Corps of Long Beach or another one of the more than a dozen California chapters of the Corps Network, as well as groups such as the Environmental Nature Center in Newport Beach, the Seal Beach National Wildlife Refuge run by the U.S. Fish and Wildlife Service, and the Puente Hills Habitat Preservation Authority further inland near Whittier. Each organization offers ways to serve the environment by contributing to conservation—from picking up litter and planting trees to mulching trails and participating in general habitat maintenance and restoration.

Any contribution—however small—can make a world of difference.

Other local nonprofits, such as The Bay Foundation and Heal the Bay, are dedicated to creating a healthy marine ecosystem in and around the Santa Monica Bay. Opportunities to get involved include regularly scheduled beach clean-ups, wetlands monitoring, and kelp forest restoration, among other activities that help minimize humans' impact on fragile coastal ecosystems. Teens can also spearhead their own conservation efforts by starting conservation clubs at school, dedicating one morning each weekend to walking along the beach and cleaning up, or even sharing the message of conservation on social media.

There is no age requirement for instilling a sense of wonder, respect, and stewardship for the Pacific Ocean, its inhabitants, and ecosystems. Teens can become engaged citizens and stewards of the planet's natural resources by supporting conservation efforts with their time, their passion, and their talents. Any contribution—however small—can make a world of difference.

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