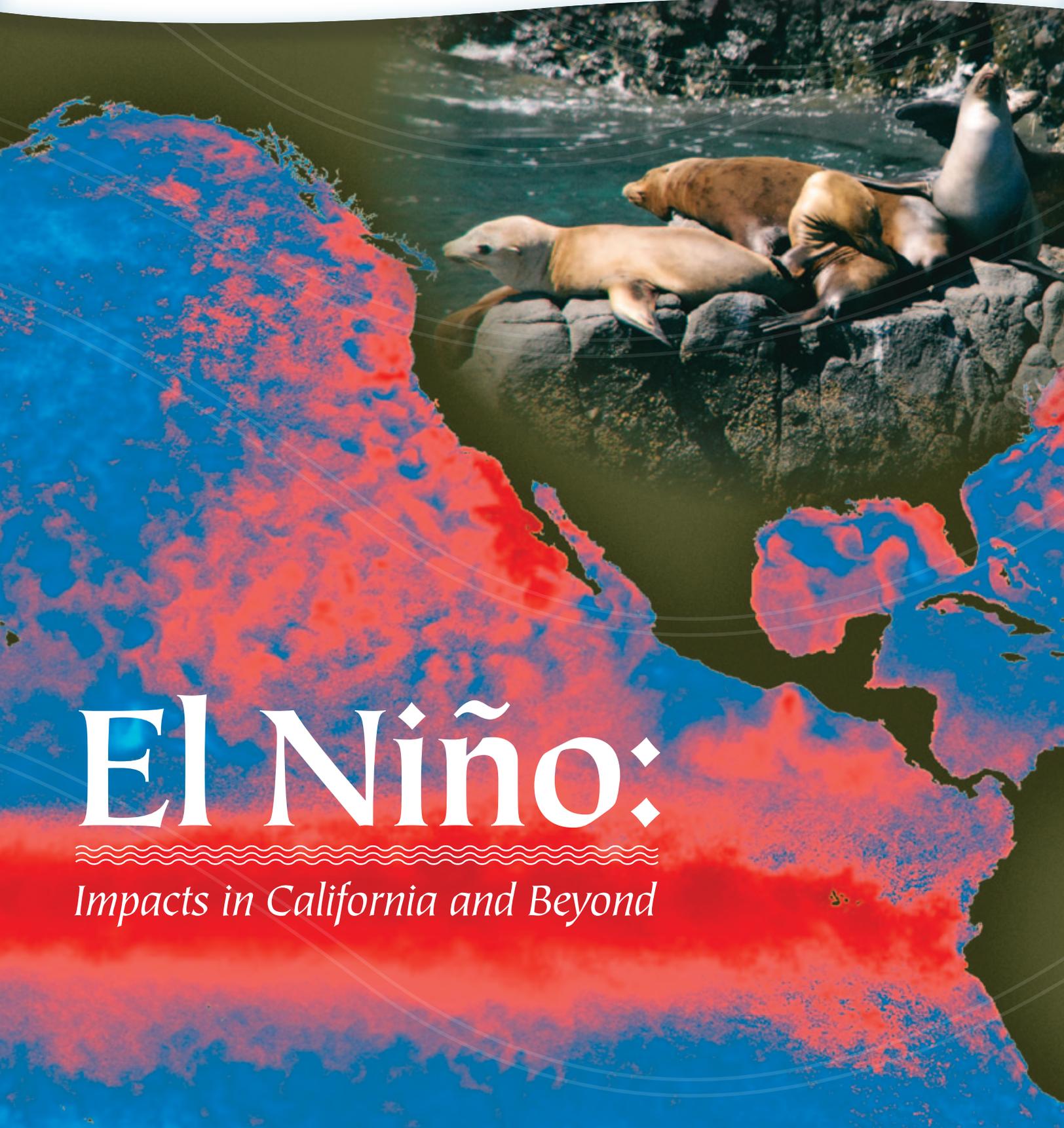


PACIFIC CURRENTS

MEMBER MAGAZINE OF THE AQUARIUM OF THE PACIFIC



El Niño:

Impacts in California and Beyond

SAVING THE VAQUITA



With fewer than 100 individuals left, the vaquita is the most endangered marine mammal, but has the potential for a hopeful future.

THE AQUARIUM together with its Seafood for the Future (SFF) program recently launched public outreach efforts to raise awareness of the vaquita, an endangered small porpoise native to the Gulf of California.

These efforts included hosting a panel of experts at the Aquarium as part of its Guest Speaker Series and creating a public service announcement about the vaquita in partnership with government agencies and other organizations.

The vaquita has a very limited range, living only in the northern portion of the Gulf of California. Within these Mexican waters, the vaquita is often unintentionally caught in gillnets set to harvest shrimp and other species. This “incidental take” of vaquita is the primary threat to its survival.

The vaquita’s future is directly tied to one fish species in particular—the totoaba. An endangered species in the croaker family, the totoaba, like the vaquita, only lives in the upper Gulf. The gillnets set for this large fish often catch vaquitas as well, killing them faster than they can reproduce. The totoaba is targeted to meet the growing demand for its swim bladder in Asia, where it is thought to be a remedy for skin conditions, infertility, and poor circulation. Mexican cartels are purported to control this illegal and lucrative trade of totoaba swim bladders, paying fishermen and sneaking the contraband into California to be shipped to China, where the swim bladders are reportedly sold at a price of around \$4,000 or more per pound.

In 2015 the Mexican government instituted a two-year ban on all gillnet fishing within the vaquita’s range. Additionally, the government provided increased enforcement through military presence aided by drones and satellites to monitor the protected area. Despite these efforts, illegal totoaba fishing continues. There is still hope, however. If the gillnet ban is successful, it is likely the vaquita

population will recover, as research indicates that the species is not susceptible to issues associated with inbreeding and their habitat appears to be healthy. Two other species found off the coast of Baja California, the northern elephant seal and gray whale, have recovered from low population numbers as a result of successful protections enforced by the Mexican government.

Additionally, vaquita-safe technology may be on the rise. The gillnet ban has given researchers an opportunity to inform conservation efforts and the development of vaquita-safe alternative gear types to ensure fishermen are able to generate sufficient income while simultaneously reducing their impact on the vaquita population. The Mexican government is providing financial compensation to fishermen for losses incurred from this ban, helping fishermen in the region change their practices to produce “vaquita-friendly” seafood through the use of alternative gear.

The vaquita provides a message for consumers—it is important to choose responsibly sourced seafood and support fishermen working hard to provide sustainable seafood. A vaquita-safe logo for fish caught by fishermen using alternative gear may hit the market in the near future. You can also support groups working to protect the vaquita. The Aquarium is working with a growing number of supporting institutions in the U.S. and Mexico to share the vaquita’s story with the public. San Diego Zoo Global, World Wildlife Fund Mexico, and Pronatura are three groups working in the communities in Mexico that surround the vaquita habitat.

LEARN MORE:

View the archived video of the Aquarium’s panel of vaquita experts: aquariumofpacific.org/avaquitapanel

View the vaquita PSA: [youtube/aquariumofthepacific](https://www.youtube.com/watch?v=...)



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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: Ryan Ashton, Jillian Koehring, Kim Thompson, 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

PHONE NUMBERS (562 area code)
 General Information.....590-3100
 FAX.....951-1629
 Membership.....437-FISH (3474)
 Development.....951-1605
 Pacific Circle.....951-5387
 Lost & Found.....951-1733
 Private Event Info.....951-1663
 Education Programs.....590-1300
 Gift Store.....951-1SEA (1732)
 Advanced Ticket Sales...590-3100, ext. 0
 (Note: \$2 service charge per ticket, up to \$10.)
 Group Reservations.....590-3100

COVER:
California sea lions.
 PHOTO BY J. KAYE-CARR

Fall 2015 sea surface temperature anomaly data visualization.
 NOAA VIEW DATA EXPLORATION TOOL



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 ARTS help us make an emotional connection to the world we live in. At the Aquarium, art exhibitions and live performances that take marine life or the ocean as inspiration help us fulfill our mission to instill a sense of wonder for the natural world.



That emotional connection often creates a spark that can lead to taking action to become environmental stewards. If we are going to make the kind of changes that lead to a desirable future for our planet, we need a collective effort that develops out of an ever-increasing pool of environmental stewards.

Two projects at the Aquarium this winter interpret science through artistic expression. First, we have added a new dimension to two of our sea jelly exhibits translating the movements of these animals into music. Marty Quinn, founder of the Design Rhythms Sonification Research Lab, developed software and hardware to capture movements with digital video footage and translate them into sounds through a process he calls MoveMusic sonification. We recruited Marty to apply this technology to our jellies. Composer Eddie Freeman of Icarus Music used those sounds to create musical motifs and orchestration. Aquarium Trustee Dennis Poulsen served as an advisor and partner on the project. New exhibit components that demonstrate the MoveMusic sonification software have been installed in the moon jellies exhibit in the Southern California/Baja Gallery and in the lagoon jellies exhibit in the Tropical Gallery. They broadcast images onto a screen next to the exhibit and play the translated sounds of the jelly movements. I invite you to come visit these installations and see the algorithm in action. Copies of the *Symphony of Jellies* are available for sale in the Pacific Collections gift store for \$9.99.

In February the Aquarium is inviting young Los Angeles County music students in collaboration with music education team WE ARE LIKE MUSIC to present a performance called *Ocean's Orchestra*. Live music will be performed before an audience as the inhabitants of the Aquarium's Honda Blue Cavern exhibit swim past musical staff lines placed on the two-story-tall exhibit window. A group of twenty students playing stringed instruments will translate the movements of the fish into music. Then, the audience members can visit smaller exhibits throughout the Aquarium and hear small groups of musicians interpreting other marine life. For tickets, visit aquariumofpacific.org/events.

We hope that these performances and all the visual and performing arts programming offered at the Aquarium throughout the year help to inspire you and develop your deeper understanding and appreciation of the ocean.

Thank you for your ongoing support.

Sincerely,

Jerry R. Schubel



These white abalone are numbered to identify each individual.

AQUARIUM RAISING WHITE ABALONE AFTER SUCCESSFUL SPAWNING

WHITE ABALONE (*Haliotis sorenseni*) that were the result of a successful spawning in 2014 are being raised behind the scenes at the Aquarium. Averaging about 1 to 2 inches long, these abalone have reddish-colored shells because of the red algae called *Dulse* that they are fed by the aquarists. Each abalone has a numbered tag on its shell to identify the individual. Their relatives, red abalone (*Haliotis rufescens*), are on display in the Southern California/Baja Gallery.

The Aquarium is a partner in the white abalone breeding program, part of the National Oceanic and Atmospheric Administration's (NOAA) National Marine Fisheries Service (NMFS) abalone restoration efforts. The aim is to re-establish healthy populations of white abalone along California's coast. Because wild white abalone populations are low in abundance and density, natural reproduction and recovery rates are likely to be slow. Scientists are testing methods for distributing the aquarium-bred abalone in the wild. Once individuals are introduced back into the wild through this program, it is hoped they will reproduce on their own and develop into self-sustaining populations. Because of the abalone's endangered status, researchers are developing methods to improve survival in the wild, such as modules made of cinderblock and netting to protect the abalone in the open ocean.

Now that these abalone are over a year old, they are considered adults and ready to participate in future spawning events. Some were involved with the 2015 spawning event. White abalone appear to be reproductively mature only once a year in the spring between March and May. This period seems to be triggered by seasonal changes, like water temperature, photo period (the length of the day), and nutrient upwelling, when nutrient-rich waters from the deep ocean are forced to the surface. They undergo broadcast spawning, meaning they release eggs and sperm into the water, and the resulting fertilized eggs become larvae.

NOAA recently provided funding to the Aquarium for improving the settlement system, where the new abalone larvae settle to the bottom and begin to grow after metamorphosing into their adult form. What is currently a large trough-like tank will be replaced with a series of smaller tanks to better track the abalone's growth and development. Funding was also provided for an algae culture system to experiment with the abalone's food preferences and the nutritional content of different algae. Read about the grant program that funds this project on page 25.

Aquarists study an abalone as part of a NOAA National Marine Fisheries Service-funded project to breed abalone at the Aquarium and other partner institutions.



CHRIS COPPUS

Sea Otter Selfie

Aquarium husbandry volunteer Hugh Ryono helped Charlie the sea otter capture this "selfie" using a GoPro camera attached to a target pole. For the story behind the photo and more of Ryono's behind-the-scenes animal anecdotes, visit his blog at aquariumofpacific.org/blogs/category/Hugh.



HUGH RYONO

AQUARIUM MOURNS THE LOSS OF NOODLES AND ELVIS

THE AQUARIUM WAS SADDENED by the sudden loss of Noodles the Magellanic Penguin on October 14. Staff members discovered his body in his burrow after observing no immediate or obvious signs of illness. A necropsy determined the cause of death to be malaria. The Aquarium's penguins are treated with medication to suppress the infection, which is endemic in the United States, but when the penguins are stressed or not eating during their annual molt, the medication is less effective. The strain of malaria that affects birds does not infect humans.

Noodles was born in 2002 in a zoo accredited by the Association of Zoos and Aquariums and came to the Aquarium of the Pacific in 2011. He is survived by his mate, Patsy, and his two offspring Paddles and Mattson.

Noodles' death came at an extremely difficult time for the Aquarium's staff, as they were also preparing for the euthanasia of Elvis the penguin, who was suffering from a long-term neurological condition. His health had deteriorated to a point that it was drastically impacting his quality of life, despite the great lengths staff members went to test and treat his rare condition. Elvis passed away on October 16.

"Dealing with both of these losses during the same time period saddened all of us. We will greatly miss Noodles and Elvis," said Perry Hampton, Aquarium of the Pacific vice president of animal husbandry.

Pictured: Elvis (top) the Magellanic Penguin arrived at the Aquarium in 2013. Noodles (bottom) came to the Aquarium in 2011, where he became the father of two chicks.



ROBIN BREGS



A ANDREW REITSMAN

LARGETOOTH SAWFISH MOVES TO JOIN BREEDING PROGRAM

THE AQUARIUM'S FEMALE LARGETOOTH SAWFISH (*Pristis pristis*) moved to another aquarium in December to become part of a breeding program. She was a resident since 2005 of Shark Lagoon, where she lived with the Aquarium's larger sharks, including sand tiger, zebra, and blacktip reef sharks. The move is considered a breeding loan, allowing the Aquarium to retain access to any resulting offspring.

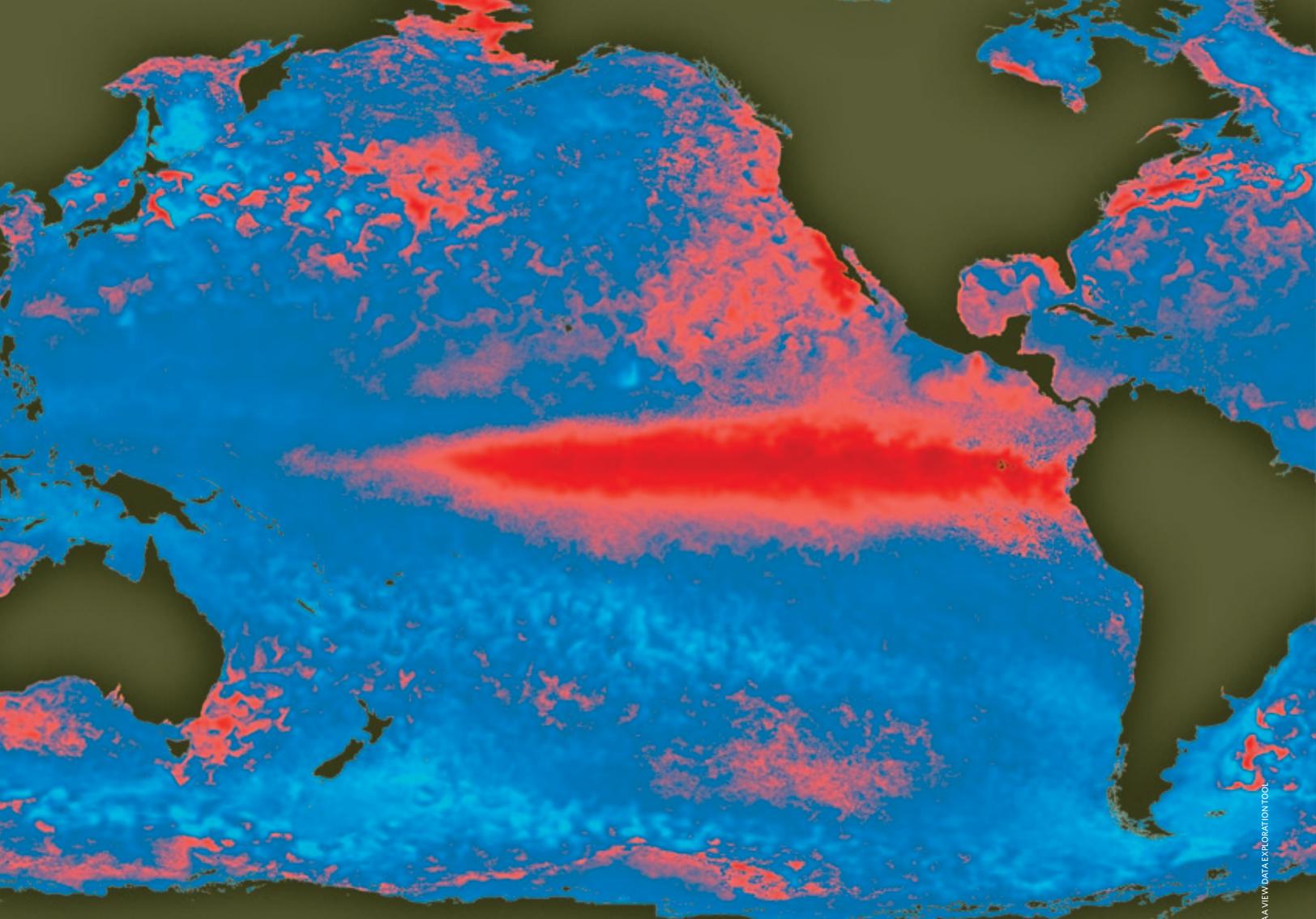
In preparation for the move, the Aquarium's shark keepers worked with the sawfish to train her to swim into a stretcher. Unlike our sharks that are trained in this behavior, including Fern the zebra shark, the sawfish cannot be rewarded with food during the training because sawfishes thrash at their prey with their saw during feeding. Instead, the keepers offered a tactile reward when the sawfish performed behaviors successfully, giving her a quick scratch or massage for swimming into the stretcher.

Sawfishes are listed as critically endangered by U.S. and international organizations, and it is no longer possible for zoos or aquariums to acquire any from the wild. These animals are part of a Species Survival Plan (SSP) managed by the Association of Zoos and Aquariums (AZA). The SSP provides guidelines to ensure genetic diversity within the population living at AZA member institutions.

Largetooth sawfishes can weigh up to 1,300 pounds and grow up to 23 feet long. They can live as long as eighty years and feed mostly on fish, as well as crustaceans and mollusks. Related to sharks and rays, sawfishes get their name from their rostrum, the long, flat snout edged with pairs of teeth used to locate, stun, and kill their prey.

The female sawfish came to the Aquarium in 2005 and was transported to her new home in early December 2015.





NOAA VIEW DATA EXPLORATION TOOL

El Niño:

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## *Impacts in California and Beyond*

Strong El Niños bring warmer ocean waters and rainstorms to Southern California, impacting people and marine life. The phenomenon is a natural part of our climate cycle.

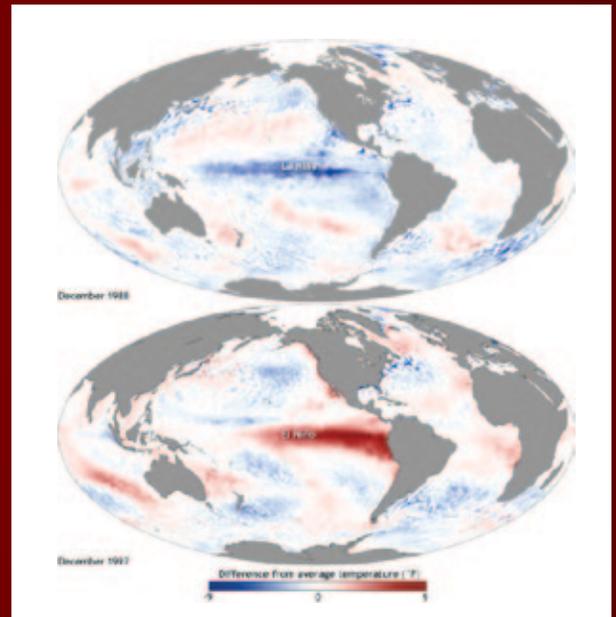
## WHAT IS EL NIÑO?

**El Niño is a global climate event impacting weather around the world.**

The phenomenon gets its name, which is Spanish for “the Christ child,” from the time of year it occurs, usually in December around Christmas.

An El Niño event is identified when trade winds that normally blow from east to west slow or reverse, and the sea surface temperature along the Equator in the eastern Pacific is at least 0.5 degrees Celsius above normal. When these conditions have been present for an established period of time—usually about six months—National Oceanic and Atmospheric Administration (NOAA) meteorologists then officially identify it as an El Niño. This warming of the Pacific Ocean along the Equator shifts the path of the jet stream, which drives storms along a track across the southern United States during El Niño, typically producing above-average precipitation over Southern California.

Meteorologists describe the cycle that is defined by the opposite extremes of El Niño and La Niña as the El Niño Southern Oscillation (ENSO). El Niño represents the warm phase of the ENSO cycle, when above-average sea surface temperatures develop across the equatorial Pacific. During La Niña, the cold phase, sea surface temperatures across the equatorial Pacific are below-average, and Southern California typically sees below-average rainfall.



Maps of sea surface temperature anomaly in the Pacific Ocean during a strong La Niña (top, December 1988) and El Niño (bottom, December 1997). Maps by NOAA Climate.gov, based on data provided by NOAA View

## HISTORY OF EL NIÑO

**The El Niño phenomenon was first mentioned in scholarly literature in 1891 as a change in currents observed by South American fishermen.**

Although their occurrence is unpredictable, El Niños usually develop every two to seven years.

There have been six strong El Niños since 1950, and all six brought higher-than-average precipitation to Southern California. But Northern California experienced drier-than-average conditions during two of those six El Niños. Since Northern California is the location of several of the state’s largest reservoirs (including Shasta, Oroville, and Folsom), rainfall in that part of the state is important to California’s water supplies. While the current El Niño will very likely not end the drought occurring across California, some climate scientists theorize that El Niño can signal the end to the streak of dry years experienced in the western United States.

The last record-breaking El Niño occurred in the winter of 1997 and 1998. Many remember the severe storms that pummeled Southern California, triggering coastal landslides and flooding. In 1998 Los Angeles experienced its wettest February on record. By the time the rainy season ended, seventeen people had lost their lives during heavy storms, and California had seen more than half a billion dollars in damage, according to the *Los Angeles Times*.

Most recently, a moderate El Niño occurred in the winter of 2009 and spring of 2010, followed by a La Niña in 2010 and 2011.

## MONITORING AND FORECASTING

**NOAA is the federal agency in charge of monitoring the oceans, weather, and climate.** Its National Weather Service operates the Climate Prediction Center (CPC), where meteorologists use several tools to monitor the ENSO cycle, including temperature readings from ocean buoys and ocean height measured by satellites. These data are fed into models that forecast the length and strength of El Niño. No model is ever perfect, but meteorologists are able to forecast with greater precision as technology advances. Meteorologists also use historical information about past El Niños, although there is a relatively short record of El Niño events. The record has shown that no two El Niños are alike, with varying degrees of strength, duration, and timing of peak conditions.

Since the El Niño of 1997 and 1998, more observational equipment has come online to help meteorologists monitor and predict these phenomena. This includes the Argo buoy system, comprising more than 3,000 free-drifting floats that measure temperature and salinity of the upper 2,000 meters of the ocean. Also, climate models have continued to advance, providing higher-resolution versions.

## THE 2015-16 EL NIÑO

El Niño conditions began to develop in March 2015 with above-average sea surface temperatures in the Pacific Ocean. As of fall, scientists were calling it one of the strongest El Niño events on record since 1950. The outlook provided by CPC in November predicted a 95 percent chance of the ongoing strong El Niño conditions lasting into spring 2016, before ocean temperatures are predicted to cool into the summer. This is a very typical behavior of El Niño, where the warming peaks around December and January, then cools.

## IMPACTS ON PEOPLE

**El Niño is typically associated with higher-than-average rainfall in Southern California, but it is just one of many factors that affect seasonal precipitation and temperature in the United States.** Thus, heavy rainfall is not guaranteed each time an El Niño develops, but it is more likely during a strong El Niño. Generally, wetter-than-average conditions are seen across the southern tier of the United States, and warmer and drier conditions are seen across the northern tier during El Niño.

Local governments must prepare for the risks associated with El Niño's potentially heavy storms. Storms that pass through an area in six to twelve hours may cause traffic problems and require swift-water rescues if rivers rise rapidly. Storms lasting multiple days in a row or occurring back-to-back can cause even more damage. Long periods of rain saturate the ground, leading to flooded rivers and streams, overtopping dams, and causing debris flows. The winter storms also produce dangerous rip currents, severe erosion, coastal flooding, and large wave action along the coast. The coastal impacts are exacerbated by the unusually high sea levels that result from the warmer ocean.

An intense wildfire season, as was seen in 2015, can subsequently lead to problems during heavy storms associated with El Niño. Areas burned by wildfires are at risk of mudslides and debris flows during the following winter rainy season, which pose a higher threat during a strong El Niño year. Wildfires leave behind burn scars, where soils become hydrophobic and repel water, causing it to run off instead of soaking in. As it runs off, the water carries with it any debris left behind by the fire, like timber. Mudslides and debris flows can be extremely damaging—even deadly—in residential areas, particularly those adjacent to undeveloped wildlands. Heavy storms can also lead to main transportation arteries being cut off, contamination of water supplies, and power outages. Emergency preparedness is of particular importance during this time.

El Niño also causes unusually wet or dry weather in places around the globe, the most reliable of which include low rainfall in Indonesia and northern South America and excess rainfall in

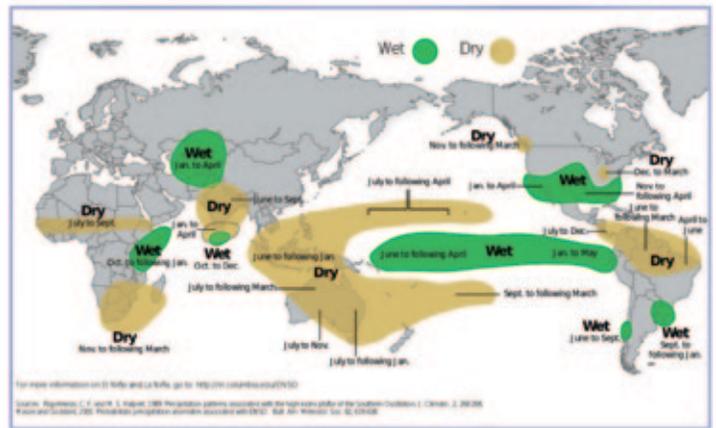


CALIFORNIA DEPARTMENT OF WATER RESOURCES

The El Niño of 1997-98 brought severe storms and flooding to California. The flood of January 1997 devastated Northern and Central California with 300 square miles of flooding and forced 48 counties to be declared disaster areas with eight deaths. Floodwaters overtook Paradise trailer park near the San Joaquin River as a rescue team searched for victims.

### El Niño and Rainfall

El Niño conditions in the tropical Pacific are known to shift rainfall patterns in many different parts of the world. Although they vary somewhat from one El Niño to the next, the strongest shifts remain fairly consistent in the regions and seasons shown on the map below.



INTERNATIONAL RESEARCH INSTITUTE FOR CLIMATE AND SOCIETY

southeastern South America and eastern equatorial Africa, according to the CPC. The 1997-98 El Niño led to a food crisis in Indonesia attributed to drought, and the 2015-16 El Niño has resulted in one of Indonesia's most severe fire seasons since 1997. El Niño also causes the Peruvian anchovy fishery, the world's largest, to collapse.

## IMPACTS ON MARINE LIFE

**In their normal pattern, trade winds drag warm surface waters across the Pacific Ocean and pile them up in the western Pacific, allowing nutrient-rich waters from the deep ocean to move up to the surface along the west coast of South America.** This process is called upwelling. The nutrients stimulate the ocean food web creating a bustling fishery off the coast. But an El Niño prevents the colder, nutrient-rich water from reaching the surface. Without the nutrients provided by upwelling, coastal plankton populations can decline by 90 percent or more. Since plankton is the root of the ocean food web, its decline impacts virtually every species in coastal ecosystems. Filter-feeding fish and other plankton-eating animals may starve or flee to richer habitats, a pattern closely followed by higher level predators, like sea lions.

During El Niño, there are higher numbers of stranded marine mammals like sea lions and sea otters, as warmer waters cause food scarcity and the stormy seas cause mothers to lose track of their young. As a result, large numbers of sea lion pups are stranded along California's coast and found starving and dehydrated. According to NOAA, an average year might see 160 sea lion strandings in the first quarter. As of March 2015, the California Stranding Network reported an intake of 2,250 stranded sea lions.

El Niño is also highly associated with coral reef bleaching events. The 1997-98 El Niño caused the largest coral bleaching events on record. This is thought to be due to corals' poor ability to adapt to the higher temperatures that define an El Niño event and is an example of how habitats already stressed by human activity may have difficulty recovering even from natural challenges in the future.



DAVID BURDICK/NOAA PHOTO LIBRARY



CLAIRE FACKLER, CIMMS, NOAA/NOAA PHOTO LIBRARY

Nutrients normally brought to the surface of the ocean by upwelling along the western coasts of North and South America stimulate the ocean food web, feeding marine life from tiny plankton to sea lions and whales.

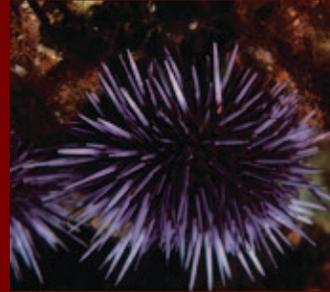
Warmer water associated with El Niño also brings tropical ocean animals not typically seen in this region to Southern California. Stephanie Mutz, an urchin diver in Santa Barbara, reported seeing unusual animals during her dives in 2015, including warm-water species like marlin, turtles, bonito, and tuna. Unusual animals in the area that could have been attracted by El Niño's warmer water include the pelagic red crabs that were seen washing up on California beaches in early 2015, as well as sea jellies called by-the-wind sailors. Venomous yellow-bellied sea snakes usually found in warmer waters of the Pacific and Indian Oceans were spotted in California as a result of El Niño. A variety of recreational fish are also present both nearshore and further north than they are normally found, including bluefin tuna, yellowfin tuna, yellowtail, dorado, and pompano. Increasing numbers of shark and ray sightings have been reported, including hammerheads, great whites, manta rays, and even a whale shark spotted off Dana Point. These animals are likely following their prey into warmer waters.

The warmer ocean water associated with El Niño also affects the urchin supply. It changes their metabolism, so they don't eat as much, meaning there are fewer urchins of legal size available for harvest. Warm water also inhibits growth of kelp, the urchins' main source of food. So while the number of urchins is the same, these individuals are generally smaller. While Mutz says she can't predict exactly what will happen during this El Niño season, she does expect her business to be on hold until the colder, nutrient-rich water typical of the California coast returns. However, in the long term Mutz expects the turbulent surf associated with storms coming through during El Niño to prompt an active reproductive year for urchins. "I like to compare it to a wildfire," she says. "The fire comes through and it's pretty detrimental short term. But long term, it gives the opportunity for more diversity, to start all over. It's cyclical. Seafood just like produce is seasonal, and El Niño is part of it."



CLAIRE FACKLER, CINMS, NOAA

Warmer ocean water associated with El Niño inhibits kelp forest growth and sea urchin metabolism.



DR. DWAYNE MEADOWS, NOAA/NMFS/OPR

West Coast salmon species are impacted by El Niño conditions in two ways. Because they rely on flowing rivers and streams to help them migrate annually to spawn, higher-than-average rainfall is beneficial. However, warmer rain associated with El Niño may inhibit their survival and growth. Restricted upwelling also means that when salmon arrive in ocean waters after their downstream migration, there may be limited amounts of food available to them.

David Checkley, an oceanographer and director of California Cooperative Oceanic Fisheries Investigations (CalCOFI) at the Scripps Institution of Oceanography, reports that populations of squid off the California coast tend to decrease precipitously following an El Niño, as was seen in 1997 and 1998, but rebound within two years. While the cause is not known, theories include lack of food or spawning habitat. Anchovies seeking the colder water they prefer tend to amass closer to shore, particularly in bays. Checkley notes that El Niño is not an unnatural phenomenon, and fisheries will recover, particularly for species with longer lifespans. Once El Niño ends, conditions should return to normal and once again support abundant marine life off the California coast.

The Aquarium's animals also have ties to El Niño. Two of the sea otters that live at the Aquarium originally arrived here after being stranded during the 1997-98 El Niño. A storm that struck in 1997 left otters Charlie and Brook stranded separately in two locations along the Central Coast. Because the Aquarium was still under construction at the time, the otters were taken to another institution where they were cared for before their final placement at the Aquarium after it was completed in 1998.

## RESOURCES FOR THE PUBLIC

**To keep up with the latest news about El Niño, meteorologists encourage the public to look for information and updates posted online, namely the CPC's weekly ENSO evolution update, as well as their monthly expert diagnostic discussion issued the second Thursday of each month. Visit <http://www.cpc.noaa.gov> and click on the "El Niño/La Niña" link on the left-side menu to find the latest ENSO information, including predictions. CPC's long-lead forecasts for temperature and precipitation can also be found on the CPC website.**

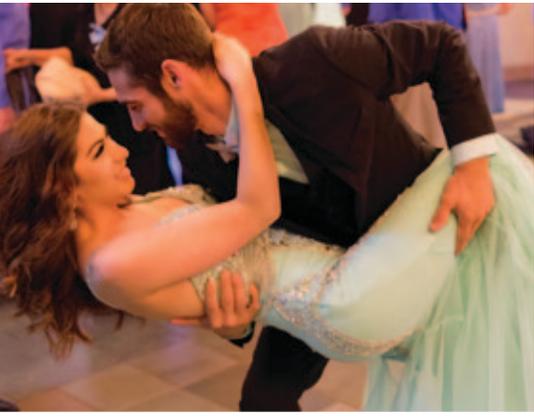
People can learn more about the El Niño phenomenon and find answers to frequently asked questions at [elnino.noaa.gov](http://elnino.noaa.gov). CPC meteorologists also post regular updates to the ENSO blog at [climate.gov](http://climate.gov), which addresses recent news. They also answer questions from the public in the comments section. To easily access the website, search "ENSO blog" in your internet browser.

As El Niño continues into the spring, local National Weather Service offices will be able to provide the latest seven-day forecasts as storms arrive. The NWS offices covering Southern California offer regular updates on Twitter, Facebook, and their websites, [weather.gov/losangeles](http://weather.gov/losangeles) and [weather.gov/sandiego](http://weather.gov/sandiego). The NWS staff members at these offices are working with local emergency managers, fire agencies, and water management agencies to spread information about El Niño and rainfall projections. They are also participating in community meetings to help educate the public on weather safety and steps they can take to be better prepared.

It is important for Californians to continue to practice water conservation while the state recovers from the four-year drought. Even a stronger than average El Niño will not reverse the water shortage from the drought. For more on water conservation at home, read the Conservation Corner column on page 27.

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

# AQUARIUM EVENTS



## MEMBER EVENTS

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

### ADULT MEMBER PROM

**THURSDAY, FEBRUARY 11 | 7:00 p.m.-10:00 p.m.**

Join us for our second annual Adult Member Prom on Thursday, February 11, just in time for Valentine's Day! Don your prom apparel (including poufy dresses in pastel colors and fancy tuxes), pin on a corsage, and arrive at the Aquarium in style for a night of dancing and fun. When your twinkle toes need a break, enjoy a drink from the cash bar as you wander through the crowd-free galleries.

**COST** | Free for members.

**INFO** | (562) 437-3474 (FISH)

### PACIFIC CIRCLE MEMBER MORNING

**SATURDAY, FEBRUARY 20 | 9:00 a.m.-10:30 a.m.**

Pacific Circle members are invited to explore the many ways touch can enhance our connection to the ocean. Feel the firm yet fragile bell of a sea jelly. Experience the tickle of a cleaner shrimp as it grooms your fingers. And get your hands wet while investigating small organisms in the "Critter in a Crate" activity—all while enjoying a relaxing continental breakfast. This event is by invitation only. To attend, upgrade your membership to the Pacific Circle level today.

**COST** | Free for Pacific Circle members.

**RSVP** | (562) 951-5387 or nmalina@lbaop.org by February 15

## MEMBER EVENTS

### MEMBER KIDS ACTIVITY NIGHTS

**THU. & FRI., MARCH 10-11 | 6:30 p.m.-9:30 p.m.**

Mark your calendar for our most popular event of the year! You and your little ones will get a chance to "camp out" at the Aquarium for the evening with campfire stories, games like Gone Fishin', and more camp-themed activities. Please note that this event books up every year. We encourage you to keep an eye out for your invitation and make your reservation as soon as possible.

**COST** | Free for members.

**INFO** | (562) 437-3474 (FISH)

### BLUE CAVERN LOUNGE

**THURSDAY, MARCH 24 | 7:00 p.m.-9:30 p.m.**

The Aquarium's annual Blue Cavern Lounge is an evening designed exclusively for our Pacific Circle and Steward level members. Enjoy live music and delectable tastes in front of the Honda Blue Cavern, then stroll the quiet galleries at night. 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 by March 18

**COST** | Free for Pacific Circle and Steward Level members.

### ADULT MEMBER DIVE-IN MATINEE MOVIE

**WEDNESDAY, APRIL 27 | 1:30 p.m.-3:30 p.m.**

Remember drive-in movie theaters? Well, we're turning our Ocean Theater into a "dive-in" movie theater, where you will be able to sit back, relax, and enjoy a film—all for free! Light refreshments will be provided. Look for more information in our member e-newsletter or on the Aquarium website in spring 2016.

**COST** | Free for members.

**INFO** | (562) 437-3474 (FISH)

## SPECIAL EVENTS

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

### SHARK LAGOON NIGHTS

**FRIDAY EVENINGS, JAN. 8-JUN. 10 (EXCEPT FEB. 12, MAR. 11 & 18, APR. 15) | 6:00 p.m.-9:00 p.m.**

Get up close with the ocean's ultimate predators for free during Shark Lagoon Nights. Touch bonnethead and bamboo sharks, and see large sharks like the sand tiger and zebra sharks at the Shark Lagoon exhibit on select Friday evenings. Drinks and snacks will be available for purchase. Live music will be featured during select Shark Lagoon Nights.

**COST** | Free for everyone.

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



### NIGHT DIVE

**FRIDAY, FEBRUARY 12 | 7:00 p.m.-11:00 p.m.**

Night Dive is an adults-only event featuring food and drink, live performances, and other special programming for an 18-and-over crowd. Discover the Aquarium at night, and explore our galleries in a new way, with DJs and local artists creating an eclectic ambiance. Live bands take the stage in front of Honda Blue Cavern, turning the Great Hall into Long Beach's unique music venue.

**COST** | Free for members. \$14.95 for non-members, open to ages 18+ only.

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

## SPECIAL EVENTS


**VALENTINE'S DAY DINNER & LATE NIGHT**  
**SUNDAY, FEBRUARY 14 | 5:00 p.m.-10:00 p.m.**

Celebrate Valentine's Day with someone special or the whole family at the Aquarium. The Aquarium will be open until 10:00 p.m. on Valentine's Day and will feature a unique, one-stop Valentine's Day experience. All exhibits will be open for viewing, except Lorikeet Forest. The Pacific Collections gift store will feature a selection of plush baby seals, penguins, and other stuffed animals and jewelry for that perfect gift. Food and beverages will be available for purchase. Valentine's Dinner is available for an additional cost (see ad on page 23).

**COST** | Late Night: Free for members, \$14.95 after 6:00 p.m. for non-members. Dinner: \$64 per member; \$74 per non-member.

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

**DIVERS DAY**
**SATURDAY, MARCH 12 | 9:00 a.m.-5:00 p.m.**

Learn all about recent advancements in diving at the Aquarium's annual Divers Day, featuring educational presentations and live dive demonstrations. The Aquarium will also host several organizations that are related to the sport and science of diving. The diving community is invited to find out 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 and SCUBA divers with valid proof of certification and photo I.D.

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

**AUTISM FAMILIES NIGHT**
**SUNDAY, MARCH 13 | 6:00 p.m.-9:00 p.m.**

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

**COST** | Free for members, \$7 per non-member.

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

## SPECIAL EVENTS

**NOCHE DE ESTRELLAS LATIN-THEMED LATE NIGHT**
**FRIDAY, MARCH 18 | 6:30 p.m.-10:30 p.m.**

Noche de Estrellas (Night of the Stars) will feature live bands, DJs, underwater dive shows, scavenger hunts with prizes, and ocean activities. Mexican cuisine, beers, and drinks will be available for purchase. The Aquarium will remain open until 10:30 p.m., so you can dance under the sea stars to the sounds of cumbia, rock en español, salsa, cha cha, and other Latin rhythms.

**COST** | Free for members, \$14.95 for non-members after 6:30 p.m.

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

**EASTER BREAKFAST**
**SUNDAY, MARCH 27 | 8:30 a.m.-10:30 a.m.**

Enjoy an elegant Easter breakfast and a day at the Aquarium. Your whole family can delight in sitting down to a delicious breakfast buffet on our rooftop Veranda, taking in the waterfront view, and then meeting over 11,000 animals during your Aquarium visit. Tickets will go on sale on February 16.

**COST** | Members: \$35 per adult, \$15 per child. Non-members: \$45 per adult, \$25 per child.

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

**AQUARIUM CLOSED**
**FRIDAY THROUGH SUNDAY, APRIL 15, 16 & 17**

The Aquarium will be closed because of the Long Beach Grand Prix street closures. The Aquarium will reopen, resuming regular hours of operation, on Monday, April 18.

**ABILITIES NIGHT**
**SUNDAY, APRIL 24 | 6:00 p.m.-9:00 p.m.**

This event is hosted in partnership with Long Beach Mayor Robert Garcia and is exclusively for people with disabilities and their families. This will be a tranquil evening when visitors can explore the exhibits and enjoy the nighttime lighting of the Aquarium. All animal exhibits will be open with the exception of Lorikeet Forest.

**COST** | Free with RSVP.

**RSVP** | Reserve online at [aquariumofpacific.org/abilitiesnight](http://aquariumofpacific.org/abilitiesnight). For groups of seven or more, call 562-590-3100, ext. 0 to reserve.

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

**MOTHER'S DAY BRUNCH**
**SUNDAY, MAY 8 | 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. Tickets will go on sale March 21.

**COST** | Members: \$49 per adult, \$15 per child. Non-members: \$59 per adult, \$25 per child.

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

## FESTIVALS

**FESTIVAL OF HUMAN ABILITIES**
**SAT. & SUN., JAN. 30-31 | 9:00 a.m.-5:00 p.m.**

Join the Aquarium for its thirteenth 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, sign language choirs, art demonstrations, accessible SCUBA diving demonstrations, 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 percent off admission.

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

**AFRICAN-AMERICAN FESTIVAL**
**SAT. & SUN., FEB. 27-28 | 9:00 a.m.-5:00 p.m.**

Join the Aquarium as it hosts its fourteenth annual African-American Festival, celebrating the rich diversity of African-American and African cultures. The weekend will feature live entertainment, arts and crafts, and ethnic food. 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 percent off admission.

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

**INTERNATIONAL CHILDREN'S DAY**
**SAT. & SUN., APRIL 9-10 | 9:00 a.m.-5:00 p.m.**

The Aquarium's eleventh annual International Children's Day is a special festival for kids. Celebrating the amazing 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 Young Hero Award in recognition of his or her efforts to make our planet a better place.

**COST** | Free for members, members' guests receive 20 percent off admission.

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



In the Guest Speaker Series this winter and spring, learn about Southern California's offshore maritime history with Patrick Smith on April 28, the warm-blooded opah with Nick Wegner on March 3, and the science of shipwrecks on January 28 with Derek Smith.

## FESTIVALS

### EARTH DAY CELEBRATION

SAT. & SUN., APRIL 23-24 | 9:00 a.m.-5:00 p.m.

Learn what you can do to help our ocean planet at the Aquarium's sixteenth annual Earth Day Celebration. Join the Aquarium for a weekend of family fun celebrating Earth Day while learning simple, everyday tips to protect our 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 percent off admission.

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



### URBAN OCEAN FESTIVAL

SAT. & SUN., APR. 30-MAY 1 | 9:00 a.m.-5:00 p.m.

Explore and celebrate Southern California's coast during the Aquarium's 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. Urban Ocean boat cruises exploring the local coast and port complex will be available during the weekend at an additional cost.

**COST** | Free for members, members' guests receive 20 percent 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. Presentations are held in the Ocean Theater.

### ROB MORTENSEN | *Island Hopping: Creating Safety Populations of Island Animals*

WEDNESDAY, JANUARY 13 | 7:00 p.m.-8:30 p.m.

Rob Mortensen, the Aquarium's assistant curator of marine mammals and birds, will discuss the unique species of animals found on islands, how single events can decimate their populations, and how scientists are working to create safety populations of these species to avoid their extinction. Mortensen will also talk about his work with the Pacific Bird Conservation organization and its Marianas Avifauna Conservation trips to the field aimed at re-establishing bird populations in the Mariana Archipelago.

### DEREK SMITH | *The Science of Shipwrecks*

THURSDAY, JANUARY 28 | 7:00 p.m.-8:30 p.m.

Shipwrecks and other submerged structures act as natural laboratories where researchers can study ecological processes and community interactions. When manmade materials enter the ocean, a wide variety of organisms begin to aggregate and new communities form around them. But there are very few studies investigating these community-wide interactions, and currently there are no quantitative, predictive capabilities when designing submerged structures such as piers, breakwater walls, or artificial reefs. Derek Smith, a researcher in the University of Washington's department of biology and a former diving safety officer for the Aquarium, will discuss how studying the effects of existing submerged structures will help inform engineers and managers how to bio-construct and monitor new structures to enhance ecosystems.

## GUEST SPEAKERS

### CHRIS WELSH | *Deep Sub & the Five Dives Expedition*

TUESDAY, FEBRUARY 2 | 7:00 p.m.-8:30 p.m.

Chris Welsh, owner and chief pilot of Deep Sub, will discuss the Five Dives Expedition, which aims to dive to the deepest point in each of the five ocean basins. Beyond the primary mission, Deep Sub's goals are to bring back video and sonar imagery and sensor data for university and general human knowledge. Deep Sub has partnered with the Nekton Foundation to share the mission results, create curriculum for teachers, and convey inspiration on ocean topics. Outside of deep diving, the operators of Deep Sub hope to use their resources to illuminate pressing issues like chemical munitions dumping and the undersea evidence of both manmade and natural disasters.

### MARAH HARDT | *Sex in the Sea*

TUESDAY, FEBRUARY 9 | 7:00 p.m.-8:30 p.m.

Author and marine scientist Marah Hardt will discuss her new book *Sex in the Sea* with tales of sex-changing fish, romantic lobsters, and other salty stories from the deep. Her interactive talk will examine how overfishing, climate change, and ocean pollution are disrupting the procreation that drives the ocean's abundance upon which we all depend. Hardt is research co-director at Future of Fish, a non-profit sustainable seafood organization and founder of OceanInk, providing creative consulting for ocean conservation.

## GUEST SPEAKERS

**DAVID NEIWER** | *Of Orcas and Men*  
THURSDAY, FEBRUARY 18 | 7:00 p.m.-8:30 p.m.

Author David Neiwert will discuss and sign copies of his book, *Of Orcas and Men: What Killer Whales Can Teach Us*. In his book he mixes cultural history, environmental reporting, and scientific research to examine the issue of orca whales in captivity, orca behavior, and the relationships between humans and orcas. Neiwert is an investigative journalist based in Seattle. He is the author of *And Hell Followed With Her: Crossing the Dark Side of the American Border* and *Strawberry Days: How Internment Destroyed a Japanese American Community*.

**KARL HUGGINS** | *The USC Catalina Hyperbaric Chamber*  
TUESDAY, FEBRUARY 23 | 7:00 p.m.-8:30 p.m.

Since 1974 the University of Southern California's Catalina Hyperbaric Chamber has provided emergency recompression treatment to divers suffering from decompression sickness (the bends) and air embolisms. This presentation will discuss the unique volunteer operational structure of the chamber, present an overview of the cases that are seen at the chamber, and recommend practices that divers can follow to reduce their risk of ending up at the chamber as a patient. Karl Huggins has been the director of the Catalina Hyperbaric Chamber Facility at the USC Wrigley Marine Science Center on Catalina Island since 1992.

**NICK WEGNER** | *Meet the Opah, the First Warm-Blooded Fish*  
THURSDAY, MARCH 3 | 7:00 p.m.-8:30 p.m.

Most people have been taught since grade school that birds and mammals are warm-blooded and that fish, amphibians, and reptiles are cold blooded. In reality, there is a bit of a sliding scale in which some animals other than mammals and birds are able to produce and retain some internal body heat, a process called endothermy. Researchers have recently discovered that the opah (*Lampris guttatus*), a large fish, warms up nearly its entire body through the constant flapping of large pectoral fins that it uses for continuous swimming. Learn about the adaptations that allow for this unique ability and what it means for this fish. Nick Wegner is a research fisheries biologist working for NOAA Fisheries at the Southwest Fisheries Science Center in La Jolla, California, and a lecturer at the Scripps Institution of Oceanography.

## GUEST SPEAKERS

**JUDITH WEIS** | *Marine Pollution*  
TUESDAY, MARCH 8 | 7:00 p.m.-8:30 p.m.

In her latest book, *Marine Pollution: What Everyone Needs to Know*, Judith Weis covers marine pollution from chemical, industrial, and agricultural sources, including oil spills, untreated sewage, eutrophication, heavy metals, acidification, radioactive substances, and marine litter. Beginning with its sources and history, she discusses common pollutants, why they are harmful, why they cause controversy, and how we can prevent them from destroying our aquatic ecosystems. She explains how pollutants progress up the food chain to emerge in human bodies. She also discusses effects of climate change and acidification of the oceans, as well as steps that can be taken by citizens and governments to reduce pollutants of all kinds. Weis is professor of biological sciences at Rutgers University.

**MARC ZIMMER** | *Bioluminescence and Illuminating Disease*  
THURSDAY, MARCH 17 | 7:00 p.m.-8:30 p.m.

Scientist Marc Zimmer will discuss and sign copies of his book, *Illuminating Disease: An Introduction to Green Fluorescent Proteins*. The book presents an overview of green fluorescent proteins sourced from jellyfish, their discovery, and their wide use by scientists and doctors. These proteins literally illuminate microscopic interactions in living cells. Applications in modern medicine and biology include tracking HIV, breeding bird flu-resistant chickens, and confirming the existence of cancerous stem cells. Zimmer is a professor of chemistry at Connecticut College in New London, Connecticut.

**JASON KELLER** | *Exploring "Blue Carbon" in Southern California Salt Marshes*

THURSDAY, APRIL 21 | 7:00 p.m.-8:30 p.m.

The term "blue carbon" refers to the massive amount of carbon stored in the vegetation and soils of many coastal ecosystems, including the salt marshes of Southern California. Jason Keller will discuss the need to better understand and quantify this coastal blue carbon, which may have value in emerging carbon markets and could be used to support wetland restoration and conservation efforts. He will share results from projects exploring the ecology of blue carbon in Southern California salt marsh ecosystems. Keller is an associate professor of life and environmental sciences in Chapman University's Schmid College of Science and Technology.



## GUEST SPEAKERS

**PATRICK SMITH** | *History at our Doorstep: Images of California Submerged Shipwrecks*  
THURSDAY, APRIL 28 | 7:00 p.m.-8:30 p.m.

Captain Patrick Smith will share his experiences documenting the many time capsules of maritime history hidden just offshore. These shipwrecks were brought about by storms, accidents, or just bad luck. Smith will discuss some of the history that lies just offshore and provide a virtual visit to those sites through images, both historic and current. Smith is a U.S. Coast Guard-licensed captain, commercial and scientific diver, and co-author of *Shipwrecks of Southern California*.

**MELISSA NEUMAN** | *Status of White and Pinto Abalone in Southern California*  
THURSDAY, MAY 5 | 7:00 p.m.-8:30 p.m.

Overfishing and other impacts have caused white and pinto abalone populations in the Southern California Bight to fall to alarmingly low levels. Melissa Neuman, fisheries abalone recovery coordinator for the National Oceanic and Atmospheric Administration, will discuss her work with these abalone populations and the potential for a monitoring program to track wild abalone long-term and captive breeding programs to supplement populations.

**SCOTT MALONI** | *Seawater Desalination: Fact vs. Fiction*  
WEDNESDAY, MAY 11 | 7:00 p.m.-8:30 p.m.

Cyclical drought cycles exacerbated by the future impacts of climate change have California looking to the Pacific Ocean for a new, drought-proof drinking water supply. With the 50 million gallon per day Carlsbad Desalination Plant now operating, and new facilities planned to be built along the coast of California, is seawater desalination a sustainable source of new water for the state's growing population? Scott Maloni will discuss the technical, environmental, and economic issues surrounding seawater desalination and why it will or will not help California persevere through drought. Maloni is vice president of development for Poseidon Water and is responsible for managing development of the company's Huntington Beach Desalination Project, including legal, engineering, and government relations aspects.

**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

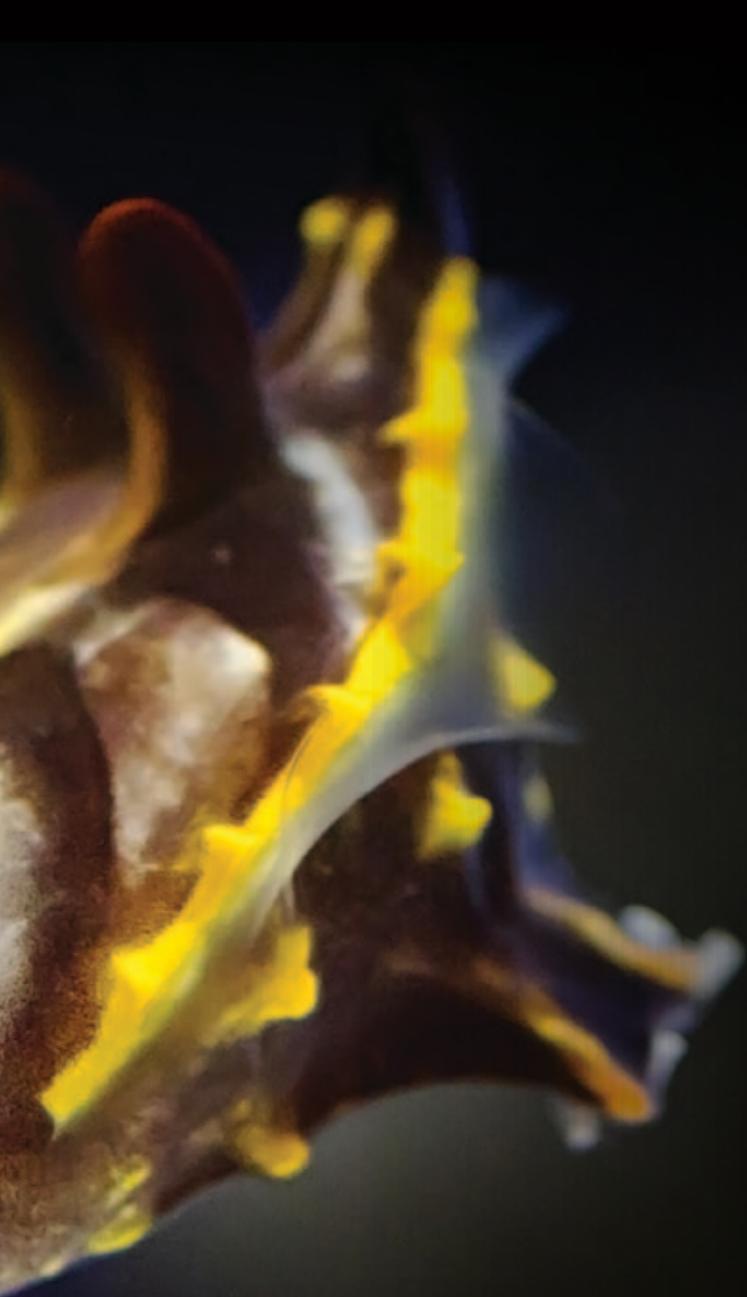
**WEB** | All lectures are streamed live on the Aquarium's website at [aquariumofpacific.org/aquariumlive](http://aquariumofpacific.org/aquariumlive)

Sponsor:



*Aquarium  
of the Pacific*





**Flamboyant Cuttlefish**  
*Metasepia pfefferi*



## 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 feed the fish! Children must be age seven or older.

**COST:** \$15 per member, \$19 per non-member

**AGES:** Children must be age seven or older.

### ANIMAL ENCOUNTERS

Experience the ultimate behind-the-scenes tour. Animal encounters offer a chance to feed a sea otter, train a seal or sea lion, or waddle up to a penguin. For available dates and times, visit [aquariumofpacific.org](http://aquariumofpacific.org) or call (562) 590-3100, ext. 0.

**COST:** \$99 per member, \$109 per non-member (Aquarium admission included)

\*Pre-registration required at least 24 hours in advance.

### DIVE IMMERSION

Certified SCUBA divers can dive in our warm 350,000-gallon Tropical Reef Habitat with more than 1,000 animals.

**WHEN:** 3:00 p.m.-5:00 p.m. daily with reservation.

**COST:** \$279 per member, \$299 per non-member



## Whale Watching CRUISES

### GRAY WHALE WATCHING TRIPS *Winter Season*

Enjoy a voyage out in the open Pacific Ocean in search of gray whales, which make their migration each year between the months of November and April. Gray whales spend summer in the Arctic, feeding on plankton, then migrate along the west coast of North America to their destination in Baja California, where they mate and raise their young. Learn new, exciting information about 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): \$49.95/adult, \$45.95/senior, \$33.95/child

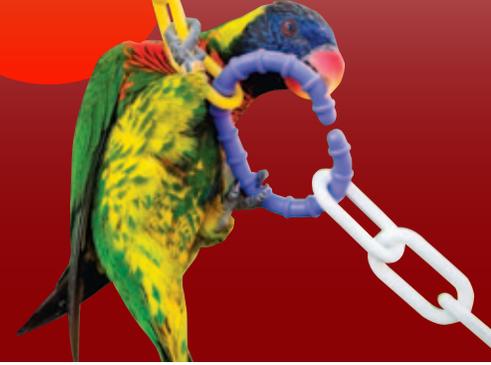
**AGES:** Children under 16 must be accompanied by an adult.

**LENGTH:** 2 to 3 hours

**RSVP:** (562) 590-3100, ext. 0



# EDUCATIONAL OPPORTUNITIES



ROBIN REIGS



ROBIN REIGS

## Family Programs AT THE AQUARIUM

Public 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

Four rotating themed programs.

WHEN: **First Saturday and third Sunday of every month | 9:00 a.m.-12:00 p.m.**

AGES: 13 to 17 years old

COST: **\$35 per member, \$39 per non-member (Aquarium admission not included)**

### JUNIOR BIOLOGIST

Six rotating themed programs.

WHEN: **Second Saturday of every month | 9:30 a.m.-11:30 a.m.**

AGES: 7 to 12 years old

COST: **\$25.00 per member, \$29.00 per non-member (Aquarium admission not included)**

### AQUATOTS

Six rotating themed programs.

WHEN: **Third Saturday of every month | 10:00 a.m.-11:30 a.m.**

AGES: 2- and 3-year-olds with an adult

COST: **\$36.00 for Aquarium member pairs; \$15.00 per additional guest. Non-members: \$49.00 per adult/child pair; \$20.00 per additional guest (Aquarium admission included).**

### SATURDAY FAMILY FUN

Four rotating themed programs.

WHEN: **Fourth Saturday of every month | 10:00-11:30 a.m.**

AGES: 4- to 6-year-olds with an adult

COST: **\$36.00 for Aquarium member pairs; \$15.00 per additional guest. Non-members: \$49.00 per adult/child pair; \$20.00 per additional guest (Aquarium admission included).**

## PARENTS & KIDS

**Learn about ocean animals and science with hands-on activities in Aquatots and Saturday Family Fun classes.**

Toddler and preschool programs supported by:



**SCHOLARSHARE**

CALIFORNIA'S 529 COLLEGE SAVINGS PLAN

*ScholarShare and the Aquarium are partnering to inspire our youngest explorers to pursue a lifetime of discovery and learning.*



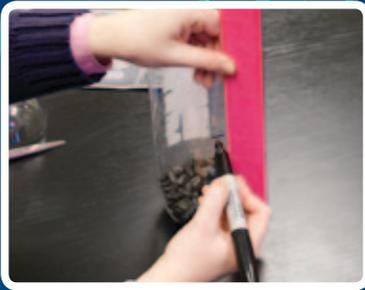
## WHAT YOU NEED:

- 2 liter bottle
- scissors
- sand or small pebbles
- tape
- permanent marker
- ruler

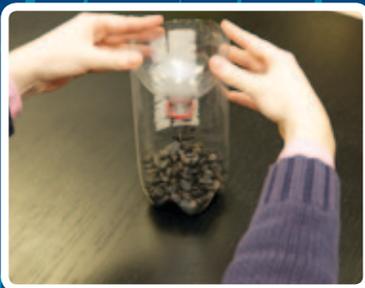
## STEPS:



1. Cut off the top third of the bottle. Fill the bottom portion of the bottle with sand or small pebbles. This helps create a level base for the gauge and provides stability.



2. Use a ruler and permanent marker to write a scale (in inches) on your bottle. Use the top of the layer of sand or pebbles as your starting point.



3. Place the top third of the bottle inverted inside the bottom piece. Having this funnel in place helps prevent evaporation. If needed, tape the funnel to the rim to hold it in place.



4. Find the perfect location for your rain gauge. It should be outside, but not under a building or tree. Consider using rocks or dirt to hold it in place if it is windy.

5. After it rains, fill in the chart on the left. Then, empty your rain gauge and be ready to collect the next time it rains!

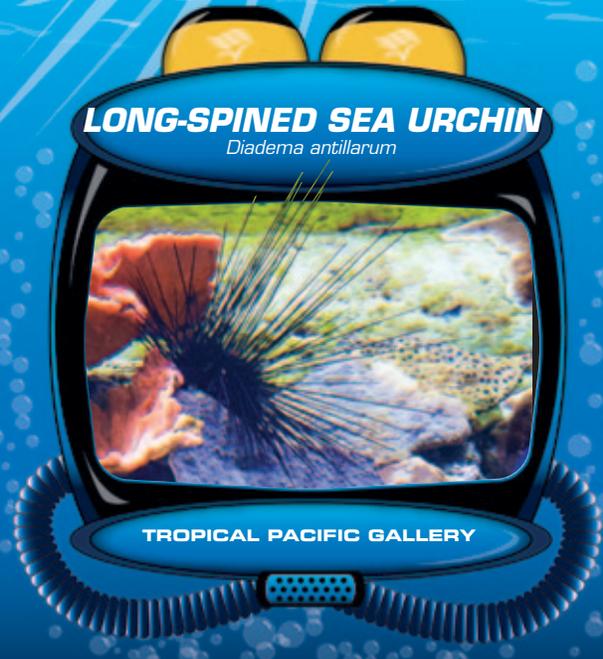
## WHITE-BANDED TRIGGERFISH

*Rhinecanthus aculeatus*



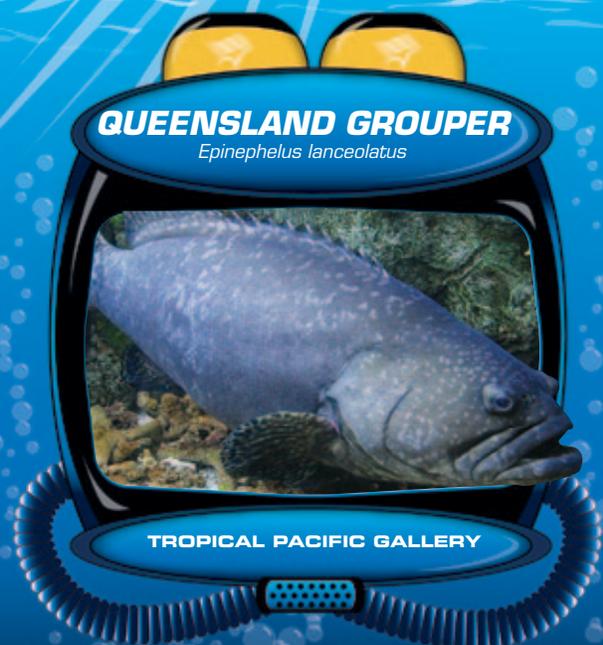
## LONG-SPINED SEA URCHIN

*Diadema antillarum*



## QUEENSLAND GROUPER

*Epinephelus lanceolatus*



## WEDGE-TAIL TRIGGERFISH

*Rhinecanthus rectangulus*



### PHYSICAL CHARACTERISTICS

Like other triggerfish, the white-banded triggerfish has an oval-shaped body. It has brilliant yellow, blue, red, and black markings, bright stripes, and a triangular tail fin.

### FUN FACT

The white-banded triggerfish has been reported to make a whirring noise when alarmed.

### DIET

These fish feed on algae, snails, and other small mollusks, sea urchins, corals, worms, and small crustaceans.

### HABITAT

These fish prefer coral reef areas and shallow, protected lagoons. For this reason, they are also known as lagoon triggerfish.

## LONG-SPINED SEA URCHIN

*Diadema antillarum*



### PHYSICAL CHARACTERISTICS

The long-spined sea urchin has a striking appearance, with black spines up to 15 inches long (three or four times its body width) and a pale-colored, pea-sized eyespot.

### FUN FACT

Long-spined urchins are highly sensitive to light. They prefer to remain in darker areas like reef crevices and come out at night to feed.

### DIET

These urchins feed on algae, young corals, worms, and other small invertebrates.

### HABITAT

This species prefers quiet waters surrounding coral reefs up to 1,300 feet deep. Long-spined sea urchins can also be found on rock bottoms or in turtle grass beds.

## QUEENSLAND GROUPEL

*Epinephelus lanceolatus*



### PHYSICAL CHARACTERISTICS

The Queensland grouper is the largest bony fish found in coral reefs. Averaging more than six feet in length, these fish are typically dark grey in color with pale spots and blotches.

### FUN FACT

The heaviest Queensland grouper ever recorded weighed over 880 pounds.

### DIET

Queensland groupers feed on spiny lobsters, fishes, small sharks, juvenile sea turtles, and crustaceans.

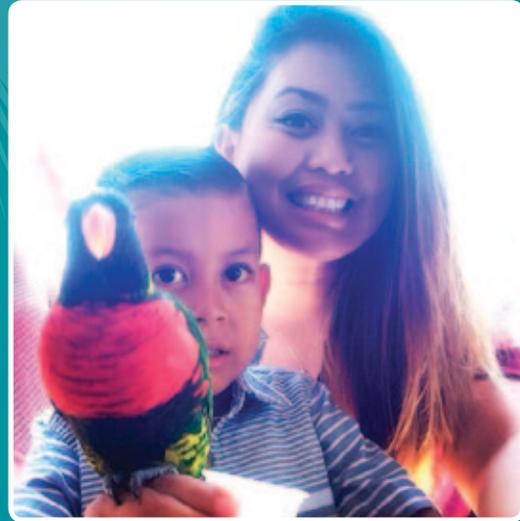
### HABITAT

The Queensland grouper lives in shallow waters around coral reefs. They are often found in caves or shipwrecks and estuaries.

# #AquariumMemberPhotos



@something\_about\_mary



@amieserena



@allirwilbourn

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



Participants will travel to the rainforests of Ecuador to study ecology and conservation.

## AQUARIUM OFFERS FIRST STUDY ABROAD OPPORTUNITY FOR TEENS

**T**HE AQUARIUM is offering its first study abroad program for teenagers, allowing participants to volunteer as Aquarium interpreters and then travel to the rainforests of Ecuador to study ecology and conservation in that region.

Created in partnership with nonprofit organization Me to We, the Aquarium's Student Eco Ambassadors (S.E.A.) program is a travel abroad opportunity and volunteer program that blends science and leadership curriculum to help students become globally conscious citizens, gain workplace and leadership skills, and work with the Amazonian community to become ocean stewards. Participants will volunteer on a community project in the Amazon and conduct an investigation and record observations in the rainforest.

*The deadline to enroll in this conservation-focused study abroad program for high school students is February 19.*

Participants must be enrolled in high school during the 2015-16 school year and dedicate five hours to the program on the first and third Saturday of each month from March through August of 2016. The portion of the program in Ecuador is scheduled for June 21 to July 4. The cost of the program is \$5,500, which includes the six-month educational program at the Aquarium, airfare to and travel within Ecuador, all meals, and lodging. The cost does not cover passports, vaccinations, travel insurance, or additional trips and programs offered in Ecuador during students' stay. The enrollment deadline is February 19. An informational meeting will be held at the Aquarium on February 10 at 5:00 p.m. For more information, call (562) 590-3100, ext. 0.



Assistant Curator of Fish and Invertebrates Nate Jaros worked with colleagues at other institutions to design and build a chamber to acclimate fish to nonpressurized habitats.

## AQUARIUM CURATOR BUILDS HYPERBARIC CHAMBER FOR FISH

**A**SSISTANT CURATOR of Fish and Invertebrates Nate Jaros has built a hyperbaric decompression chamber for fish. This device is used during collection trips. The Aquarium holds a scientific collection permit from the California Department of Fish and Wildlife, allowing staff members to collect algae, invertebrate animals, and fish for the Aquarium's exhibits. In accordance with the permit, Aquarium staff members adhere to fishing regulations for the species they collect.

Animals that live in deep water live in a high-pressure environment, but some are able to thrive in a range of pressures and acclimate well to the unpressurized environment of the Aquarium's exhibits. The hyperbaric chamber allows staff members to collect fish from deeper water while preventing barotrauma, or the bends. Fish released in a state of barotrauma will float helplessly at the surface until they die or are eaten by a predator.

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Jaros collaborated with colleagues at other institutions that have been using hyperbaric chambers for fish. These devices are able to rapidly compress the fish to the high pressure they are used to at depth after they are brought to the surface, then gradually decompress them over a period of several days.

The hyperbaric chamber is comprised of a 12-inch PVC fitting that serves as a primary chamber. A smaller secondary chamber, or lock, can be pressurized independently to add new specimens without disturbing the pressure of the primary chamber. Both chambers have sight glasses to allow the person operating the chamber to observe the fish as it is pressurized and then decompressed. Once the two chambers are equalized, a plunger fitted to the device can be gently pushed to guide the fish downward into the primary chamber. A high-pressure pump and a specialized valve are used to create and maintain the pressure inside the chamber.

Several simple devices are available for recreational fishermen to return fish to depth and safely release them if caught accidentally. A group of scientists has created educational videos about these devices and how to use them. Visit the RockfishRecompress channel on YouTube to learn more.



David Rosenheim, executive director, The Climate Registry; Michael Kajdasz, account manager, Southern California Edison; John Rouse, Aquarium vice president of operations; Jerry Schubel, Aquarium president and CEO; and Kimberly Rodriguez, manager of Market Segment Programs and Contracts, Southern California Edison.

## AQUARIUM RECEIVES COOL PLANET AWARD FOR "GREEN" EFFORTS

**O** N OCTOBER 16, 2015, the Aquarium was awarded a 2015 Cool Planet Award in the education sector from The Climate Registry and Southern California Edison (SCE) for its efforts in energy and carbon management. The Aquarium also hosted the awards ceremony.

The Cool Planet Award recognizes Southern California Edison business customers for demonstrating exemplary leadership in energy and carbon management within their business size category and industry sector. The Cool Planet Award Ceremony celebrates the outstanding commitment of these SCE business customers to implement energy efficiency projects, participate in demand response programs, and establish environmental and greenhouse gas emissions management systems.

Nominated businesses were evaluated by representatives from The Climate Registry and SCE using a point-based system focusing on an organization's participation in a variety of SCE integrated demand-side management strategies. These included energy management and demand response programs and conducting energy audits. Also evaluated are the organization's carbon management strategies, such as publicly available energy management and climate action plans and the measuring and reporting of greenhouse gas emissions and carbon footprint.

Over the years the Aquarium has increased the size of the institution and its attendance from 1.1 million to 1.5 million, yet it has kept its environmental footprint in check. Through a series of efforts to curb energy needs, save water, and reduce greenhouse gas emissions, the Aquarium has kept energy usage at a constant level, reduced water usage by a third, and cut its carbon footprint by 25 percent.



Trustee Robert Stanton, Trustee Mark Bertrand, Marc Paradis, Melissa Ramirez, Trustee and Sea Fare Chair Ronald Rulison, and Trustee and Co-Chair Jeanne Sleeper enjoy Sea Fare.

## SEA FARE FEATURES FOOD AND FUN

**T** HE TWELFTH ANNUAL Sea Fare fundraiser raised over \$146,000 with 650 attendees on Saturday, October 17. The Sea Fare Committee that planned the event was chaired by Trustee Ron Rulison. Those who attended the VIP on the Veranda area before the event start time experienced a view of Rainbow Harbor, enjoyed hors d'oeuvres and a premium bar, and were visited by one of the Aquarium's animal ambassadors. They also received early entry into the Great Hall.

Sea Fare featured the Go Fish opportunity game, silent and live auctions, and samplings of tastes from twenty-eight local restaurants and food and beverage providers. To see photos from the event, visit [bit.ly/SeaFare2015](http://bit.ly/SeaFare2015).



*Mark your calendar! The next Sea Fare event will be held on October 22, 2016.*



Innovation will be needed to provide water for Earth's growing human population, which is expected to reach between 9 and 10 billion by the end of this century.

## NEW AQUARIUM SHOW HIGHLIGHTS GLOBAL WATER SCARCITY

**T**HE AQUARIUM debuted its thirteenth show for the National Oceanic and Atmospheric Administration's (NOAA) Science on a Sphere® (SOS) at its annual NOAA and Our Planet Day on November 14.

The show examines water as a precious resource and how people around the world, in both developing and developed countries, face water shortages. In some places, shortage of freshwater is a looming crisis exacerbated by climate change and a growing population. Viewers of the show will learn how science and technology can help meet these challenges and provide everyone with safe drinking water and enough water for agriculture.

The show plays daily in the Ocean Science Center. Show times are posted on the screens outside the Ocean Science Center. The Aquarium has created more original content for the SOS than any other institution in the SOS network.

## GENETICALLY MODIFIED ORGANISMS: SEPARATING FACTS FROM FICTION

**A**CCORDING to the United Nations, we will need 70 percent more food by 2050. Currently we devote more than half of Earth's ice-free land surface and 70 percent of Earth's available freshwater to grow our crops, and the nutrient-rich run off produces dead zones in the ocean. Can GMOs help solve this dilemma? The Aquarium is offering an informal adult education course on four Wednesday evenings in March on genetically modified organisms, or GMOs. Learn about what GMOs are, the advantages and disadvantages of using GMO crops and animals in our food system, the potential health implications of GMOs, and issues surrounding labeling of products that use GMOs. Participants will have the opportunity to participate in lively discussions about the science of GMOS with experts in the fields of agriculture, biotechnology, environmental science, and sustainability.

**DATES** | March 2, 9, 16 & 23 | 7:00 p.m.-9:30 p.m.

**COST** | \$35 for members, \$40 for non-members. CEU credit through CSULB available for additional \$10. Parking will be validated for course participants.

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

**INFO** | Adina Metz, ametz@lbaop.org



Celebrate Easter at the Aquarium of the Pacific in Long Beach and join us for a buffet-style breakfast. \$5 gift certificate to Pacific Collections Gift Store included with breakfast ticket purchase.

**MARCH 27 • 8:30AM - 10:30AM**

**PRICING:**

Includes Aquarium admission

**General Public:**  
Adults: \$45  
Child 3-11: \$25

**Members:**  
Adults: \$35  
Child 3-11: \$15



[AQUARIUMOFPACIFIC.ORG](http://AQUARIUMOFPACIFIC.ORG) 562-590-3100 100 AQUARIUM WAY, LONG BEACH, CA 90802



**AT THE AQUARIUM OF THE PACIFIC**

Spoil your loved one with a one-of-a-kind Valentine's Day at the Aquarium of the Pacific. Arrive early and enjoy beverages with a harbor view at the Roof Top Veranda cash bar. It will be a memorable evening showcasing a unique culinary experience, a romantic setting surrounded by marine life, and stellar ambiance.



**FEBRUARY 14**

Cocktails 6:30PM  
Dinner 7:30PM

**PRICING:**

Includes all day Aquarium admission

**General Public:**  
Adults: \$74

**Members:**  
Adults: \$64



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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.

## ■ Tesoro Sponsors Aquarium on Wheels Renovation

The Aquarium recently celebrated its latest donation from the Tesoro Foundation at the fourteenth annual Baja Splash Cultural Festival. The \$200,000 grant will support the Aquarium's efforts to revitalize its mobile tidepool exhibit, Aquarium on Wheels. Tesoro supports the Aquarium's quest to instill in students a passion for science to help them understand and help sustain vibrant ecosystems and prepare for promising science careers.



Tesoro representatives Olga Chavez (left) and Ken Dami (right) presented a grant of \$200,000 to Theresa Duncan, vice president of development for the Aquarium (middle).

## ■ The Roddenberry Foundation Supports Ocean Science Education

A key Aquarium education partner, the Roddenberry Foundation recently gave a grant of \$100,000 in support of the Ocean Science Education Program. These funds will aid the Aquarium in bringing the wonders of the ocean to thousands of students throughout Southern California in the 2015-16 school year. The Roddenberry Foundation has supported many education projects at the Aquarium, including the establishment of the Aquarium's Roddenberry Education Videoconferencing Studio, which has served more than 10,200 students throughout the country since it was launched in 2011.

## ■ HCP, Inc. Partners with the Aquarium to Serve Local Seniors

HCP, Inc., a real estate investment trust serving the healthcare industry, provided a \$25,000 sponsorship for the Aquarium's Seniors Day event this past October, which offered free admission to those attendees over the age of fifty. HCP employees also donated their time by volunteering at the event and assisting Aquarium visitors and staff members throughout the day. Nearly 4,500 visitors came to the Aquarium during the event and enjoyed booth displays, a special safety presentation, and a sustainable seafood cooking demonstration and tasting.

## ■ Earl B. and Loraine H. Miller Foundation Continues its Commitment to Education

Since 2001 the Aquarium and the Earl B. and Loraine H. Miller Foundation have partnered to provide programs that enrich the lives of and promote health for children and families in Long Beach. The Miller Foundation recently continued its support with a \$50,000 grant to the Aquarium's Ocean Science Education Program. Support for this program will provide an engaging and impactful education experience to the thousands of Long Beach students and families that visit the Aquarium every year.

DONORS SHARE



*Our love for the ocean and its many wonders made becoming Charter Pacific Circle members a natural. The Aquarium's commitment to the preservation of this wonderful natural resource deserves all the support we can give. Our grandchildren are huge fans!*

— DR. JIM AND BARBARA GHORMLEY, CHARTER PACIFIC CIRCLE MEMBERS



## ■ Edison International Underwrites Middle and High School STEM Education

For the second year Edison International is providing support for the Aquarium's education initiatives focused on middle and high school students. A \$50,000 contribution will underwrite the Aquarium's Science on a Sphere® classes for third through twelfth graders, the Advanced Placement Biology class for high school students, and the Aquarium's VolunTEEN program available to fourteen- to sixteen-year-old students. Collectively these programs transform students into science explorers and inspire them to pursue careers in the STEM (science, technology, engineering, and math) fields by giving them the opportunity to learn in an active and responsive environment.

## ■ BCM Foundation Supports Science Education

A partner and supporter of the Aquarium since 2004, the BCM Foundation recently awarded a grant of \$50,000 to the Aquarium's scholarship program. With these funds, more than 3,000 underserved Whittier students will visit the Aquarium on a field trip, and the Aquarium on Wheels mobile tidepool exhibit will visit eighteen Whittier schools. Using the wonder and magnetism of the ocean as a learning platform to promote science and environmental literacy, the Aquarium will offer the students unique opportunities to see, touch, and explore.

## DONOR HIGHLIGHT

## ■ NOAA Partnership Addresses Abalone Conservation

For centuries abalone have played an important ecological and cultural role along the California coast. Severe fishing pressure, shifts in Southern California's nearshore habitat, and the disease known as withering syndrome have drastically reduced the populations of some abalone species. White abalone (*Haliotis sorenseni*) were officially designated as endangered under the federal Endangered Species Act in 2001.

Since 2008 the Aquarium has partnered with the National Oceanic and Atmospheric Administration's (NOAA) National Marine Fisheries Service (NMFS), playing an active role in captive propagation of abalone and implementing public education and outreach programs. Most recently NMFS awarded the Aquarium a \$48,000 grant over two years to further these efforts. Focused on successful propagation of white abalone, the Aquarium will continue to properly condition the animals

in its care so that they are ready for spawning attempts every year. In addition, the Aquarium's abalone team will use the funds to construct a larger holding space to be used to settle newly hatched white abalone. The additional settlement space will also be utilized by other white abalone recovery program partners.

Education and outreach continue to be key components of the current grant, which provides funding for 750 underserved high schools students to experience a field trip at the Aquarium and participate in an abalone education program. The program, *Fishing for Change*, will introduce marine fisheries, endangered species management, and conservation concepts while aligning with Common Core and Next Generation Science Standards.

## Demystifying Planned Giving



**P**LANNED GIVING, sometimes referred to as gift planning, is a method of supporting nonprofits and charities that enables philanthropic individuals or donors to make larger gifts than they could make from their income. Whether a donor uses cash,

appreciated securities or stocks, real estate, artwork, personal property, life insurance, or a retirement plan, the benefits of funding a planned gift can make this type of charitable giving very attractive to both the donor and the Aquarium. Making a simple bequest is one of the most popular planned gifts.

Donors can give the Aquarium either a specific amount of money or item of property (a specific bequest) or a percentage of the balance remaining in their estate after taxes, expenses, and specific bequests have been paid (a residual bequest). The Nautilus Society is the Aquarium's way of recognizing and celebrating planned giving donors. Sarah Kaleel, a longtime Aquarium volunteer and supporter, recently joined our Nautilus Society with a planned gift to the Aquarium. As a volunteer, she takes time out of her Saturday mornings to interact with our guests and help take care of the animals she is most passionate about. We interviewed Kaleel to ask her a few questions about her involvement with the Aquarium and what inspires her to give.

### Aquarium: How does the Aquarium of the Pacific inspire you as a donor and volunteer staff member?

*The Aquarium of the Pacific inspires me by bringing me into a world I would otherwise never know. I'm extremely passionate about marine invertebrates, and the Aquarium has some beautiful examples that I can see up close and in detail, just inches away. One of my favorite tanks is the deep reef, as I know what a technical achievement it is to keep those animals alive.*

### What made you think of the Aquarium when you were planning your living will/trust?

*Several factors led up to my decision. I received some information from the Aquarium about planned gifts that included details of the Nautilus Society. I also happened to be doing some financial planning at the time. As the daughter of a life insurance and life planning expert, I've been raised to think about how*

*to ensure the care of the people (and things) I feel strongly about, even after my passing.*

*Although I am a donor and volunteer my time, I still feel like there is more I can do. I believe in the vision of the Aquarium and what this type of resource means for the future of our planet. It brings me peace to know that when that inevitable day comes, a positive, future-forward result will occur.*

### What do you wish for all visitors to take away with them after their trip to the Aquarium?

*The ocean and its inhabitants need us to be their advocates! The coral and sharks and sea jellies are not able to represent themselves on Facebook, in court, or in environmental treaties. They need us to do so. It is my deepest hope that after being able to see what is under the water, people walk away more cognizant of and sensitive to how their actions impact the ocean.*

**To learn more about making a donation to the Aquarium or if you have any questions about our Nautilus Society and planned giving, please contact Ryan Ashton at [rashton@lbaop.org](mailto:rashton@lbaop.org).**

# AQUARIUM ACCOLADES

The Aquarium presents the Heritage Award in recognition of individuals and organizations and their service to the community.

## Senator Ricardo Lara | Hispanic Heritage Award



The Aquarium presented the Hispanic Heritage Award to California State Senator Ricardo Lara during the Baja Splash Cultural Festival in September for his commitment to the community, social justice, and the environment. Senator Lara represents the thirty-third district, which includes Bell Gardens, portions of Lakewood, and Long Beach. He has supported measures to benefit the environment and ethnic communities. Senator Lara created the California Clean Bus, Truck and Freight Program to encourage clean energy and authored legislation to create a state plan to address short-lived climate pollutants such as diesel soot, which are known to cause climate warming and negatively impact public health. He has also authored several laws that recognize and invest in immigrant communities.

Pictured: Senator Ricardo Lara, Heritage Award honoree, and Jerry Schubel, Aquarium president and CEO.

## Jacque Tahuka-Nuñez | Heritage Award



The Aquarium presented the Heritage Award to Jacque Tahuka-Nuñez during the Moompetam Native American Festival in September. A member of and “culture bearer” for the Juaneño Band of Mission Indians, Acjachemen Nation, Nuñez has served as a storyteller and educator for forty years, sharing the history and heritage of her tribe with people across Southern California. She takes her educational program *Journeys to the Past* to performing arts centers, schools, libraries, and other venues throughout California. She has also worked with the California Indian Museum and Cultural Center to develop an interactive website to supplement California’s Mission Unit requirement for fourth grade public school students. Located at [californiamissionsnativehistory.org](http://californiamissionsnativehistory.org), the site tells the story of California’s missions from a Native American perspective.

Pictured: Jacque Tahuka-Nunez, Heritage Award honoree, and Ryan Ashton, Aquarium director of development.

## Thakin Bwor | Heritage Award



The Aquarium presented Thakin Bwor with the Heritage Award during the Southeast Asia Day festival in October. Bwor left Myanmar, formerly known as Burma, in 2001 and settled in California. Upon his arrival, Bwor determined that his community needed more information about the duties of U.S. citizenship and American culture, so he created the *Myanmar Gazette*, where he serves as publisher and editor in chief on a volunteer basis. He is also the cofounder and vice president of the Network of Myanmar American Association. The organization supports and promotes education, social issues, and arts and culture of Myanmar. It also provides outreach to the younger generation of people from Myanmar as a resource for cultural information and networking.

Pictured: Perry Hampton, Aquarium vice president of animal husbandry, and Thakin Bwor, Heritage Award honoree.

## Asians and Pacific Islanders with Dis- abilities of California | Heritage Award



The Aquarium presented the Heritage Award to Asians and Pacific Islanders with Disabilities of California (APIDC) during the Autumn Festival in November. APIDC is dedicated to giving a voice and face to Asians and Pacific Islanders with mental, physical, and developmental disabilities. Since 1999 APIDC has served as a bridge between Asian and Pacific Islander communities and mainstream organizations serving people with disabilities. Among its services, APIDC conducts original research to identify the challenges facing Asians and Pacific Islanders with disabilities and provides disability awareness training for community-based organizations on disability rights, communication skills, and disability advocacy resources. Johnna Cho and Patricia Kinaga, vice chair and chair of the APIDC Board of Directors, accepted the award.

Pictured: Patricia Kinaga and Johnna Cho, Heritage Award recipients, and Cecile Fisher, Aquarium vice president of marketing and communications.

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# CONTINUING WATER CONSERVATION

LEFT TWO PHOTOS: CALIFORNIA DEPARTMENT OF WATER RESOURCES; RIGHT PHOTO: LONG BEACH WATER DEPARTMENT

It is important for Californians to continue to save water. Rainfall associated with El Niño is unlikely to end the drought.

**W**HILE WINTER RAINSTORMS will help put a dent in California's water deficit brought on by the drought, it will take six or seven years of above-average rainfall to refill groundwater basins and reservoirs and recover from the current drought, according to NASA.

In the meantime, it is important for Californians to continue the successful water conservation measures that have achieved record-setting water savings in recent years. By removing lawns and replacing them with drought-tolerant landscaping, harvesting rainwater, and using less water for day-to-day activities, Californians can adapt to ongoing water scarcity in the state.

Homeowners can effectively save water with one simple practice: shutting irrigation systems off during and after rainstorms. For additional water savings, install rain barrels to collect rainwater from rain gutters for later use. Residents of Long Beach, Orange County, and Los Angeles can apply for rebates for installing rain barrels at their homes. From time to time, free barrels are also offered. Contact your local water agency or city and county officials for more information.

If it's time to replace your washer and dryer, toilet, or dishwasher, consider purchasing energy-efficient, low-water-usage appliances. Many water agencies provide rebates for approved appliances or for installing soil moisture sensors in your garden. These sensors indicate when the soil has retained enough moisture to keep

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*Measures taken at home and in your community can help our state continue to achieve high levels of water savings.*

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plants hydrated without sprinklers.

Another important element of improving California's water future is keeping waterways free of trash and debris. You can help by participating in local neighborhood or beach clean-ups. For coastal communities, picking up trash on the beach prevents animals from accidentally ingesting garbage and keeps beaches clean for recreation. For inland communities, picking up trash from streets and

parks prevents it from washing into storm drains, rivers, and streams, then eventually traveling to the ocean. Several nonprofit organizations organize regular trash pickups, but you can also help by collecting trash you find when you go to the beach or park on your own. The Aquarium hosts a beach clean-up each September for California Coastal Clean-Up Day and leads monthly volunteer days at the Los Cerritos Wetlands. These habitat restoration sessions are held on every first Saturday of the month from 10:30 a.m. to 12:30 p.m. Volunteers help to remove non-native plants, collect seeds from native plants for later use, and remove trash. For details, visit [aquariumofpacific.org/events](http://aquariumofpacific.org/events).

Keep pollution out of the water system by properly disposing of any household hazardous waste, such as motor oil, paint, and pesticides. When these substances enter storm drains after washing off of lawns or driveways as runoff, they can make their way into the ocean or groundwater basins that feed municipal water systems.

For more tips on water conservation and other ways to be an ocean steward, visit the Aquarium's website at [aquariumofpacific.org](http://aquariumofpacific.org) and click on Conservation.

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Free for members | \$3.95 for non-members



**free plush**

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level or higher**

**Will you  
be my  
Valentine?**

Adopt an animal for your significant other this Valentine's Day!

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