

# PACIFIC CURRENTS

MEMBER MAGAZINE OF THE AQUARIUM OF THE PACIFIC



## CALIFORNIA'S DROUGHT



LONG BEACH, CA

# AQUARIUM GATHERS EXPERTS TO HELP MAKE LONG BEACH A CLIMATE RESILIENT CITY

Long Beach is home to significant coastal infrastructure, including the port complex, residential areas, marinas, offshore oil islands, and more.

With the impacts of climate change threatening coastal ecosystems and infrastructure, finding solutions and ways to adapt is critical.

**L**ONG BEACH is home not only to the Aquarium, but also to important local infrastructure that connects California and the rest of the country to global commerce. This includes the Port of Long Beach and its network of cargo ships, trains, and trucks. This infrastructure is vulnerable to extreme weather events and sea level rise resulting from climate change, as are residential homes, wetlands habitats, and recreational areas along the coast. Preparing the City for climate change is both a necessity and an opportunity to use innovation and technology to make Long Beach the model of a climate resilient city.

At his State of the City address in January 2015, Long Beach Mayor Robert Garcia announced a plan to partner with the Aquarium to develop a Climate Resiliency Action Plan to be presented to the city council later this year. Under the leadership of Aquarium President and CEO

Jerry Schubel, the Aquarium is taking a lead role in identifying those aspects of climate change to which Long Beach is most vulnerable, assessing the extent of the vulnerabilities and evaluating ways of mitigating and adapting to them. Based upon this analysis, the City will translate the findings into specific strategies and incorporate them into its plan. The Mayor has asked the Aquarium to complete the analysis by the end of the calendar year.

Sea level rise driven by climate change is a particular concern in Long Beach and all coastal cities in California. The Peninsula and Alamitos Bay areas in Long Beach are most vulnerable and already face serious challenges of flooding from coastal storms.

Many scientists believe that with continued climate change, coastal storms will increase in frequency and intensity. This vulnerability will only increase in the future as sea level continues to rise, even if the frequency and intensity of coastal storms remain the same, since they will be superimposed upon a higher-standing sea. Other climate change impacts that are being examined are increases in the number of days when temperatures exceed 95 degrees and drought.

The Aquarium convened a meeting in June that brought together coastal scientists from the Scripps Institution of Oceanography,

University of Southern California Sea Grant, the Port of Long Beach, and the U.S. Geological Survey, as well as City officials and residents, to continue their exploration of these issues. Their goal was to map out all the past and ongoing efforts and to identify critical areas where additional research is needed. Participants looked at these

issues within the framework of both a relatively short-term horizon of the year 2025 and a longer-term horizon of 2050. This project is a collaboration of lead scientists, researchers, and policymakers in the state on different aspects of climate change and how to adapt. Partners include the Long Beach Water Department, the National Oceanic and Atmospheric Administration's National Weather Service, and other agencies and institutions.

The Aquarium will continue in its role as a gathering place for scientists, policymakers, industry representatives, and the public in the search for sustainable solutions.

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*The Aquarium is taking a lead role in advising the Mayor's Office on climate change and sea level rise vulnerabilities and potential strategies for Long Beach.*

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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](mailto:pacificcurrents@lbaop.org).

**OUR MISSION** | To instill a sense of wonder, respect, and stewardship for the Pacific Ocean, its inhabitants, and ecosystems.

**OUR VISION** | To create an aquarium dedicated to conserving and building natural capital (nature and nature's services) by building social capital (the interactions between and among peoples).

**PACIFIC CURRENTS STAFF** | Editor/Writer: Claire Atkinson | Copy Editor: Cecile Fisher | Designer: Andrew Reitsma | Contributing Writers: Erin English, Alana Garibaldi, Marlene Heyning, 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.....951-1630  
 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

**Aerial view showing recreational boats by the Bidwell Marina at Lake Oroville during low-water (drought) conditions on March 2, 2015.**

CALIFORNIA DEPARTMENT OF WATER RESOURCES



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,

**R**ECENTLY the Aquarium convened a forum of experts to examine the development of an offshore aquaculture industry in the Southern California Bight, the area of ocean off the coast stretching from Santa Barbara to San Diego. Aquaculture is the



farming of fish or shellfish in contained environments. While regulatory constraints and public opinion have posed barriers to the development of this industry, responsibly conducted, aquaculture can provide an important source of local seafood that takes the pressure off of wild species while meeting the demand of a growing human population.

With the world population expected to exceed 9 billion by 2050, the U.N. Food and Agriculture Organization estimates that food production will have to increase by 70 percent to meet the growing demand. And it will need to be accomplished while adapting to climate change and combatting global hunger and poverty. Seafood supplied by responsibly managed aquaculture operations could help meet that demand.

The outcome of the forum at the Aquarium was a report listing the major findings and recommendations of the participants, who included scientists, federal and state agency regulators, and industry practitioners. To download the report, *Offshore Aquaculture in the Southern California Bight*, visit [aquariumofpacific.org/mcri](http://aquariumofpacific.org/mcri).

It is our goal at the Aquarium to educate the public about issues affecting the ocean and the environment to promote conservation and develop momentum for ideas that address current and future challenges. We will be offering the opportunity to learn more about aquaculture during our fall session of Aquatic Academy, a series of evening courses for adults. This is your chance to hear current information straight from the experts working in this field. The first class will be held on October 15 at 7:00 p.m., with three additional class sessions on October 22, November 5, and November 12. For more information on the course, contact Adina Metz at [amet@lbaop.org](mailto:amet@lbaop.org).

Finally, if you have enjoyed seeing the photographs from the Annenberg Space for Photography's *Sink or Swim: Designing for a Sea Change* exhibition on recent visits, I'm pleased to announce that the Aquarium will host another collection of photographs from Annenberg this fall. Opening in October, *Water: Our Thirsty World* features images captured around the world by photographers for *National Geographic* magazine. The photos capture water as a precious natural resource and document how water scarcity affects threatened and endangered species, agriculture, and people living in developing nations. It also focuses on the spiritual relationship with water in cultures around the world.

As summer winds down and our slate of fall programming begins, I hope you enjoy your visits to the Aquarium this season.

Thank you for your ongoing support.

Sincerely,

Jerry R. Schobel

## NEW PENGUIN CHICK BORN

**A** **MAGELLANIC PENGUIN CHICK** was born at the Aquarium this past breeding season and went on public display with the rest of the penguins in the June Keyes Penguin Habitat on August 18. The female chick, named Lily by an Aquarium donor, hatched on June 5 and represents the third generation of Aquarium-born penguins. Four penguins hatched in 2014 (Paddles, Jayde, Mattson, and Skipper) and two in 2013 (Heidi and Anderson).

Penguins Roxy and Floyd are Lily's parents, and Heidi and Anderson are her siblings. Because Roxy has experienced recurring medical problems when raising a chick, it was decided early on to have another penguin pair, Kate and Avery, act as surrogates and incubate her egg.

Magellanic Penguin chicks are born with a downy layer of plumage that is not watertight. For safety reasons, the Aquarium's penguin chicks are removed from their parents' nests after twenty-five days to a behind-the-scenes facility until their down is replaced by watertight feathers, a process called fledging.



REBBA PAGES



## ROXY THE MAGELLANIC PENGUIN UNDERGOES CT SCAN

**R** **OXY**, a five-year-old female Magellanic Penguin, received a CT scan at Animal Specialty Emergency Center in Los Angeles earlier this year to determine the cause of a limp.

Roxy arrived at the Aquarium in 2011 with a group of rescued Magellanic Penguins found stranded in Brazil outside their normal territory. The species is native to the coasts of Chile and Argentina. At that time, Roxy had a severe case of bumblefoot, an infection found in birds. With medical treatment the Aquarium's veterinary staff resolved the infection, but Roxy is still limping on her left foot. During the CT scan Aquarium Veterinarian Dr. Lance Adams and his team discovered that Roxy has a bone spur on one of her feet.

Roxy was anesthetized for the procedure, during which the staff obtained images of both her feet and determined that bone spurs (periosteal osteophytes) are causing arthritis-like symptoms in her foot. While the veterinary staff weighs the potential pros and cons of surgery to treat the bone spurs, Roxy is back on exhibit with the other penguins.



Images obtained during the CT scan showed bone spurs to be the cause of Roxy's limp.

## AQUARIUM SHARES HARBOR SEALS WITH OTHER INSTITUTIONS

**H**ARBOR SEALS Bixby and Toby have been moved to other institutions for breeding purposes. Bixby, a female seal born at the Aquarium in 2012, will be loaned to a zoo in the United States. Toby, a male born at the Aquarium in 2013, will be given to a zoo in Canada. Bixby and Toby were the first seals to be born at the Aquarium. Their parents are Shelby and Troy.

The Aquarium's husbandry staff wanted to find new homes for the two seals as they reached breeding age. This ensures genetic diversity among animals of this species living in zoos and aquariums.

Bixby (left) was the first harbor seal born at the Aquarium in 2012. Her brother Toby (right) was born in 2013.



ROBIN BIGGS

## BABY FLAMBOYANT CUTTLEFISH ON DISPLAY

**A**QUARISTS have added baby flamboyant cuttlefish (*Metasepia pfefferi*) to the Aquarium's Jewels of the Tropical Pacific exhibits. These babies were raised behind the scenes from eggs laid by adult cuttlefish at the Aquarium. Flamboyant cuttlefish are cephalopods and are related to octopuses and squid. They can be found in the Philippines, Indonesia, Northern Australia, and Papua New Guinea. They feed on mollusks, crustaceans like shrimp and crabs, and small fish.

Flamboyant cuttlefish are fast-growing animals that live approximately one year. Adult females are larger than males, reaching up to 3.5 inches and 2.5 inches in length, respectively. They have eight arms with two rows of suckers along each arm and two feeding tentacles. The tentacles capture prey and pull it back to the animal's beak-like mouth. Flamboyant cuttlefish generally "walk" along the sea floor as their primary mode of locomotion.

These animals have organelles in their skin cells called chromatophores that control rapid color changes. These

are thought to aid in communication, hunting, and camouflage. Flamboyant cuttlefish can also change the texture of their skin to look smooth or bumpy, which can also help with camouflage. Visit [youtube.com/aquariumof-thepacific](http://youtube.com/aquariumof-thepacific) to see recent videos of the flamboyant cuttlefish displaying their color-changing abilities and tending to their eggs.



ROBIN BIGGS



Low-water levels at Lake Shasta in 2014 and a dry irrigation ditch in Suisun City reflect the impacts of the drought.

# CALIFORNIA'S DROUGHT

SERIOUS DROUGHT  
HELP SAVE WATER



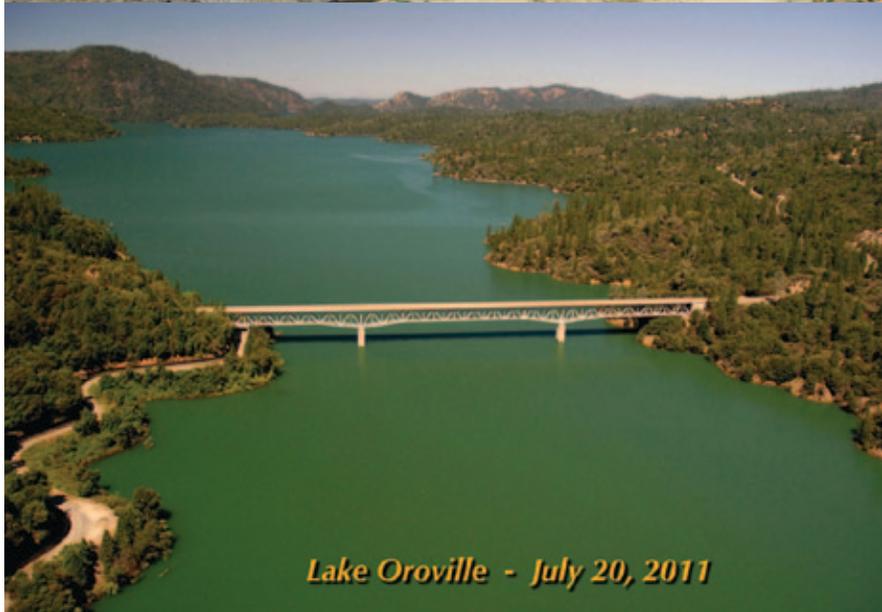
Experts say water scarcity and a culture of conservation will be the new normal—and research and technology can help us evolve and prepare.

## OUR DROUGHT HISTORY

Drought is a regular, natural occurrence in California. Based on tree ring records for the last 1,300 years, scientists know that two mega-droughts much longer and more severe than the current one occurred in what is now the American West between 800 and 1300 A.D. Within the past century, measurements of temperature and rainfall show that drought conditions have waxed and waned in concert with heat indexes. Major droughts have occurred in 1928 to 1935, 1976 to 1983, and 1987 to 1993. Each of these droughts caused the state to implement new water conservation measures and build new infrastructure to improve water supply. Since 2000 wet and dry periods have alternated, with the most recent dry period previous to the current drought lasting from 2007 to 2009.



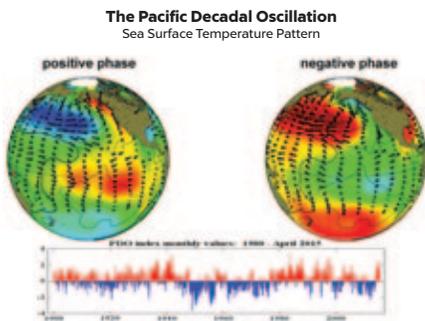
*Lake Oroville - September 5, 2014*



*Lake Oroville - July 20, 2011*

## THE OCEAN-ATMOSPHERE CONNECTION

Climate conditions in California are tied to the Pacific Decadal Oscillation (PDO), a large pattern of sea surface temperature that switches between two modes. In one mode, sea surface temperatures in a vast area of the tropical Pacific are unusually warm, surrounded by a horseshoe-shaped mass of cooler water. In the other mode, the pattern is reversed.



In the warm or positive phase, California sees increased rainfall. When it's cool, or a negative PDO, it's dry in California. Sea surface temperatures drive the jet stream patterns in the Northern Hemisphere, delivering or depriving precipitation. During the cool phase, the PDO redirects storms approaching the West Coast north to Alaska and Canada, then down into the Midwest and Northeast, leaving the Southwest warm and dry. This past winter and spring this phenomenon was dubbed the "polar vortex."

Climatologists theorize that an El Niño can initiate the PDO switch, giving some hope for an end to the current drought as El Niño conditions have developed in the Pacific Ocean. The National Oceanic and Atmospheric Administration's Climate Prediction Center currently predicts a greater than 90 percent chance that El Niño will continue through the Northern Hemisphere in winter 2015 and 2016 and around an 80 percent chance it will last into early spring 2016.

## OUR WATER SUPPLY

The California Department of Water Resources (DWR) is the state's agency for managing its water supply and infrastructure, including the State Water Project, a system that delivers water throughout the state to two-thirds of the population. The hub of California's water system is the network of channels within the Sacramento-San Joaquin Delta. Water being conveyed to Northern and Southern California via the State Water Project, Central Valley Project, and other systems goes through the Delta.

Normally, Southern California gets about half of its water from local supplies, mostly groundwater, and about half from imported supplies, including water from Northern California, the State Water Project, and the Colorado River. However, in recent years the balance has shifted. Due to the drought, less water is being imported, and some experts believe those imported sources are not sustainable in the long term.

With less imported water, people are turning to groundwater pumped from wells. Pumping groundwater faster than it can be naturally replenished can have several negative impacts. In some areas it is causing land to sink, damaging infrastructure like roads and bridges. In 2014 Governor Jerry Brown signed California's first legislation regulating groundwater extraction, the Sustainable Groundwater Management Act. The legislation will take a while to roll out, with agencies tasked with developing management plans within five to seven years and implementation under way by 2040.

## WATER USERS

In California, water use is divided into three main categories: agricultural, environmental, and urban (urban use includes both industrial and residential water use). Water allocated to the environment maintains water levels in rivers and streams to protect ecosystems and endangered species and to preserve tourism and recreation sites. When water allocated to the environment is removed from the equation, the breakdown of human use of water is about 80 percent to agriculture and 20 percent to urban users.

This ratio has become the subject of some controversy during the drought. Much of the water conservation measures discussed in the media and promoted by water agencies have been aimed at urban users, but some argue that they should not be targeted for cutbacks when farmers use the vast majority of water in the state. Others counter that agricultural water use is justified, given that California produces about half of the fruits, vegetables, and nuts grown in the United States and is the nation's leading agricultural exporter and producer of dairy products.

Another characterization of the struggle over water during the drought is "fish vs. farmer," pitting agricultural users against the water held from diversion by the state for the benefit of the environment. The Delta smelt is a small species of fish found only in the Sacramento-San Joaquin Delta. It has a low reproductive rate and a one-year lifespan, making it vulnerable to changes to its habitat. These fish rely on flowing rivers to migrate upstream to spawn in spring and to return downstream in the fall. Low water levels due to the drought have brought the Delta

smelt close to extinction, putting pressure on government policymakers to ensure that not too much water is diverted from the Delta. The smelt is an important food source for other species and therefore a building block for the health of the ecosystem. It is not the only species affected by drought—its absence signals the potential collapse of the Delta ecosystem, scientists say.



Waterways and sloughs meander through the Delta in California.



Frank Gehrke (DWR Chief of Snow Surveys), Governor Edmund G. Brown Jr., and Mark Cowin (DWR Director) address the media during a snow survey at Phillips Station on April 1, 2015. The black tag on the pole represents the snow level in the drought year of 1977, the yellow tag represents last year's snow level, and the green tag shows where the snow is on an average year. Measurements in Phillips began in 1942, and 2015 was the first time there was zero snow for an April 1 measurement.



Secret Service agents stand watch during President Obama's visit to the farm of Joe and Maria Del Bosque in Los Banos, Calif., in February 2014.



The image on the left, captured via satellite in January 2013, contrasts with the image on the right from January 2014, when the Sierra snowpack was 10 to 30 percent of normal levels. NASA images courtesy LANCE/EOSDIS MODIS Rapid Response Team at NASA GSFC.

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## CURRENT DROUGHT

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The current drought, now in its fourth year, is more intense than previous recent droughts because of the compounding influences of climate change and California's growing human population. An estimated 38.8 million people live in California today, more than double the population of 1960. The growing demand for energy and water, plus growth in the agriculture sector, has created a much higher demand for water in California.

The impacts of climate change related to the drought have been evidenced in a few major ways. Warmer temperatures mean that precipitation falls as rain instead of snow in the winter, washing out to sea, rather than being stored as snow in the mountains for a slow release as it melts later in the year. The snowpack in California's mountains usually provides 30 percent of our drinking water during summer and fall. Last year was the driest year on record in California in terms of precipitation. This past winter and spring the snowpack level was one of the three lowest on record. In addition, average temperature recorded this past winter was the warmest on record, surpassing that last record set in 1934 during another punishing drought. Climate change also alters weather patterns, affecting trade winds and the jet stream, which govern the arrival of storms.

When California became the thirty-first state in 1850, there was little oversight of water use as miners and farmers began diverting water from rivers and streams and drilling wells for their operations. Today some agricultural users hold water rights dating back to before 1914, when the state established its water rights system.

Some growers received less than a tenth of their full water allotment from the state in recent years, prompting lawsuits, the idling of farmland, and farmers pumping more groundwater if it's available. On top of diminishing imported water, in May the State

Water Board announced curtailment orders for farmers, including those holding senior water rights usually off-limits to regulators, and junior rights holders were ordered to stop diverting water from rivers. Many growers in the state now have little or no access to their normal water sources.



Orange County Water District's Groundwater Replenishment System makes use of reverse osmosis trains.

California's Central Valley, the epicenter of the state's agriculture industry, has been hit particularly hard by the drought. Some towns have run out of water for both farms and residents, impacting entire regional economies. In Porterville, California, private wells have dried up and residents are relying on bottled water and water delivered in tanks by state and county officials.

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## RESEARCH AND MONITORING

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In a partnership that began in early 2014, NASA is working with DWR to use data collected by satellites to monitor the drought and factors that intensify the drought's impacts. The agencies will use remote sensing to track snowpack, idled farmland, sinking land, and weather impacting water resources.

Using the Gravity Recovery and Climate Experiment (GRACE) satellite to measure Earth's gravity, surface height, and changing shape, NASA scientists determined that water in the San Joaquin and Sacramento River basins was 11 trillion gallons below normal in December 2014 and decreasing rapidly. About two-thirds of the loss is due to depletion of groundwater beneath California's Central Valley. About six or seven years of heavy rain are needed to refill groundwater basins and reservoirs and recover from the current drought, according to scientists.

NASA is also testing technology to provide near real-time crop water requirements to growers via web and mobile platforms. In 2012 and 2013 results showed sustained yields for crops tested in trials in Salinas, California, grown with up to a 33 percent reduction in water.

California's academic institutions are playing an important role, connecting researchers across the state and across disciplines (including science, law, business, technology, and policy) and delivering new findings to policymakers to guide their decisions. The University of California, Los Angeles, created its Water Resources Working Group in 2011 to address water sustainability. The group tracks water supplies in Los Angeles and is working to develop ways for the region to become less dependent on imported water.

Researchers at the University of California, Irvine, are working with DWR to develop advance drought prediction methods based on an algorithm that takes into account both historical statistics and models based on the physics of the land, ocean, and atmosphere. Working with NASA to use satellite datasets, these researchers are also applying measurements of relative humidity and water vapor in the atmosphere to predict droughts earlier and monitor droughts in progress.

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## GOVERNMENT RESPONSE

DWR, the U.S. Bureau of Reclamation, and State Water Resources Control Board have formed a



Real-Time Drought Operations Management Team to conserve and store water during the drought. Primary concerns include providing enough water to communities for drinking water, sanitation, and firefighting, as well as ensuring adequate flow to prevent saltwater intrusion into the Delta, which supplies freshwater for human and agricultural use. The team can adjust timing and volume of water deliveries from various sources to react to drought impacts.

At the federal level, various agencies are providing emergency loans to farmers, funding conservation efforts on impacted lands, and providing grants to communities experiencing water shortages, among other measures.

Governor Brown has taken several steps to respond to the drought. In January he declared a State of Emergency and directed state officials to take all necessary actions to prepare for drought conditions. In March the governor signed legislation providing \$1 billion in emergency relief and infrastructure improvements. In April for the first time in the state's history the governor issued mandatory 25 percent water-use reductions for urban users. To comply with the restrictions the State Water Board calculated a percentage reduction requirement for the top 400 water agencies in California to begin in June.

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## POTENTIAL SOLUTIONS

While the drought situation in California is certainly very serious, the technology and science are available to begin implementing solutions to ease drought pressures, increase water conservation, and better prepare the state for ongoing water scarcity.

Governor Brown has spoken in support of cutting greenhouse gas emissions to slow climate change, containing and capturing stormwater runoff, recycling water, and implementing his proposed Bay Delta Conservation Plan currently under review. This \$25 billion project involves construction of two tunnels to convey water to Southern California and reconstruction of levees in the Delta vulnerable to extreme events.

Locally, reducing or eliminating lawns is one step both commercial and residential properties can take to conserve water. The California Water Commission passed an ordinance in July mandating that any new

residential yards and commercial landscaping installed after December 1, 2015, must limit lawn space and use efficient sprinklers. The ordinance also bans turf in street medians and parkways. Golf courses, cemeteries, parks, road medians, and other places with large lawns may cut back or seek alternatives, especially in particularly hot and dry areas that need more water to support turf. Installing landscapes that require less water and fertilizer to thrive in our climate will also reduce the amount of pollution that enters groundwater. Cleaning up groundwater basins and keeping them clean by monitoring industry, farming, or other processes that could create pollution will help provide additional future sources of drinking water.

Local water agencies have also begun to identify the biggest water consumers in their jurisdiction and work with them to reduce their usage. In Santa Cruz, facing its second year of heavy restrictions on water use, users who exceed rations of about 60 gallons per person per day are fined by the water department. However, the fine is forgiven if the users attend the department's Water School, which educates people on where their water comes from, the impacts of the drought, and how to find leaks and reuse water at home. Another option is higher water prices for those who consume the most. Some research shows that social pressure is more effective at getting people to conserve than financial incentives or higher fees. However, funds collected through a tiered pricing system could protect low-income residents and be put toward infrastructure improvement projects.

In Long Beach, Glendale, Burbank, and other cities, water overusers are identified using smart water meters. These devices collect statistics on water usage throughout the day and upload them wirelessly to the web, allowing the water department to identify those violating water restrictions and residents to track their usage and find ways to conserve.

Water-use technology is also available in the agricultural sector, such as soil moisture sensors, groundwater sensors, and irrigation system leak detectors. State and local governments as well as universities can help farmers learn about these new resources and how to implement them to reduce water usage. Researchers are also working with farmers to identify crops that will perform the best on their land with water conservation in mind or identify land that has become too salty to grow crops without flood irrigation.

One of the biggest hurdles the state faces in terms of managing water as a common resource is the sheer number of water service providers. The State Water Resources Control Board estimates 3,000 water service providers, 1,100 wastewater entities, 600 irrigation districts, and 140 reclamation

districts operating in California, as reported by the *Los Angeles Times*. Smaller agencies have faced barriers to sharing information and changing management practices as conditions change. Modern water agencies need to be able to invest in updated infrastructure, recycle and reuse water, and capture more stormwater. Consolidating smaller agencies or providing additional resources at the state level could address some of these shortfalls.

In the future many water agencies in California may begin using recycled water as drinking water. The Orange County Water District (OCWD) was an early adopter of recycling wastewater, allowing the district to replenish their underground aquifer and provide pure drinking water to 2.4 million residents at a cost that's 30 percent cheaper than importing water. Many people are averse to the idea of "toilet to tap," as it's been dubbed, but after an extensive purification process, what was once sewage comes out as distilled water, which officials say is purer than any other source of water that enters the groundwater basin. Water that enters groundwater basins from rivers sometimes contains pollutions such as agricultural runoff, fertilizers, garbage, or untreated wastewater.

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Ultimately, developing a permanent culture of water conservation in California will require the public to adopt conservation practices at home, urge reforms of industrial and commercial water-use limits, and vote for officials and measures to further conservation statewide. Developing a culture of water conservation among the general public will help contribute to changing attitudes at all levels, including among policymakers who will create legislation governing water use. Drought will always be a factor of life in California, but if climate change, population growth, and economic growth trends continue, water sustainability will be an issue of increasing importance.

*This article was written with the assistance of Amir AghaKouchak, assistant professor, Center for Hydrology and Remote Sensing, University of California, Irvine; Madelyn Glickfield, assistant director for Outreach and Strategic Initiatives and director, Institute of Environment and Sustainability Water Resources Group, University of California, Los Angeles; William Patzert, climatologist, NASA's Jet Propulsion Laboratory; and Kevin Wattier, general manager, Long Beach Water Department.*

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.

# FALL AQUARIUM EVENTS

## MEMBER EVENTS

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

### MEMBER SUNDAY FUNDAYS

SUNDAYS, NOVEMBER 1-29 | 10:00 a.m.-1:00 p.m.

Bring the kids to explore interactive learning stations while Aquarium educators guide activities and provide special learning experiences. From touching tidepool animals and investigating shark jaws to pretending to be an octopus or sea star and watching plankton, your kids will be having so much fun—they won't even realize they're learning! Members will also be introduced to the Aquarium's programs and learn more about the ocean and the animals that live in it. To attend, simply show your active membership card at the entrance of the classroom. Best suited for children ages 2 to 12, however all ages are welcome, as long as you are an active member.

**COST** | Free

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

### PACIFIC CIRCLE AND STEWARD LEVEL MEMBER FLASHLIGHT TOUR

FRIDAY, NOVEMBER 6 | 7:00 p.m.-9:30 p.m.

Pacific Circle and Steward Level members are invited to a Flashlight Tour of the Aquarium at dusk. A scavenger hunt will illuminate the mysterious world of sea jellies. Enjoy desserts as you marvel at the surprising wealth of life in the dark ocean. To upgrade your membership to the Pacific Circle or Steward Level and receive a special invitation to this event and many others, please call (562) 951-5387.

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

**RSVP** | (562) 951-5387 by November 4

### MEMBER APPRECIATION NEON NIGHT

WEDNESDAY, NOVEMBER 18 | 6:30 p.m.-9:30 p.m.

We love our members! To show our appreciation, we're throwing a special neon-themed celebration just for you. Come dressed in your neon-colored clothes and learn all about the neon fish in our Tropical Pacific Gallery. Plus, enjoy special activities such as getting your hands wet touching the sharks and rays, watching a dive show, and visiting with animals like Lola the Sulfur-Crested Cockatoo.

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

**RSVP** | [aquariumofpacific.org/events](http://aquariumofpacific.org/events)



## SPECIAL EVENTS

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

### NIGHT DIVE

FRIDAY, OCTOBER 2 | 7:00 p.m.-11:00 p.m.

Night Dive features live bands, DJs, art displays, food trucks, cocktails, and fun mini-lectures. This adults-only event gives you the chance to have a fun night out with friends and the opportunity to visit the Aquarium's exhibits.

**COST** | Free for members; \$14.95 for non-members.

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

### PHOTOGRAPHERS NIGHT

SUNDAY, OCTOBER 4 | 5:30 p.m.-10:00 p.m.

Professional and amateur photographers are invited to capture the Aquarium's wildlife during exclusive "photographers only" hours. Meet vendors, test new equipment, attend workshops, and meet other wildlife photo enthusiasts.

**COST** | \$28.95

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

### SENIORS DAY

MONDAY, OCTOBER 5 | 8:00 a.m.-1:00 p.m.

The Aquarium will open its doors for free to people ages fifty and above. Special exhibits for seniors will include booth displays by the Aquarium's volunteer services and education staff.

Event sponsored by:



**COST** | FREE for members and visitors ages 50 and over with a valid photo ID.

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

### SHARK LAGOON NIGHTS

FRIDAYS, OCT. 9-DEC. 18 | 6:00 p.m.-9:00 p.m.

Get up close with the ocean's ultimate predators for FREE during Shark Lagoon Nights. Guests will have the opportunity to touch bamboo and bonnethead sharks as well as cownose rays and see large sharks such as sandtiger and zebra sharks in the Aquarium's Shark Lagoon. Coffee, hot cocoa, beer, wine, desserts, and snacks are available for purchase. Live music will be featured on select Shark Lagoon Nights.

**COST** | Free for everyone.

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

## SPECIAL EVENTS

## THANKSGIVING LUNCH

THURSDAY, NOVEMBER 26 | 11:00 a.m.-5:00 p.m.

This Thanksgiving treat yourself and your family to a day at the Aquarium. Visit the Aquarium's exhibits and savor a traditional Thanksgiving buffet in Café Scuba. The Aquarium is open for normal operation from 9:00 a.m. to 6:00 p.m. on Thanksgiving Day.

**COST** | \$26/member adult (12+), \$17/member child; \$36/non-member adult, \$27/non-member child.

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

## HOLIDAYS AT THE AQUARIUM

DECEMBER 5-24 | 9:00 a.m.-6:00 p.m.

Celebrate the holiday season at the Aquarium this December. Starting December 5 snow will fall daily in the Great Hall, the Aquarium will be decked with festive décor, and the Aquarium's costumed characters will appear in their holiday outfits. On weekends in December choirs will perform carols, and a snow play area will be set up on the front lawn. On December 5 and 6 the Aquarium will host its annual Holiday Treats for the Animals festival. On December 12 and 13 the Aquarium will be collecting toys for the annual Spark of Love Toy Drive. On December 5, 6, 19, and 20 kids can take photos with Santa.

**COST** | Free with admission.

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

## AQUARIUM CLOSED ON CHRISTMAS DAY

FRIDAY, DECEMBER 25

## UNDERWATER PARKS DAY

SATURDAY, JANUARY 9 | 9:00 a.m.-5:00 p.m.

Learn more about Southern California's network of Marine Protected Areas (MPAs). Visitors will learn about the commercial and recreational activities permitted in MPAs. MPA stories will be told using film, lectures, and interactive exhibits. The event will also feature educational booths and activities in the Great Hall.

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

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

## SPECIAL EVENTS

## AQUARIUM 5K

SATURDAY, OCTOBER 10 | 7:30 a.m.-9:00 a.m.

The Aquarium will partner with the Long Beach Marathon events team to host their 5K this year. The scenic course will loop through Rainbow Harbor, Queensway Bridge, Catalina Landing, and the Aquarium itself! Participants will receive a race t-shirt, finisher's medal, and \$5 Aquarium admission.

**COST** | \$38.78

**REGISTER** | [runlongbeach.com/long-beach-5k-run-walk](http://runlongbeach.com/long-beach-5k-run-walk)

## SEA FARE FUNDRAISER

SATURDAY, OCTOBER 17 | 7:00 p.m.-11:00 p.m.

Save the date for the Aquarium's twelfth annual Sea Fare fundraiser featuring a silent and live auction, tastes from local restaurants and food and beverage providers, and dancing with the fish. Proceeds will benefit the Aquarium's education, conservation, and animal care programs.

**COST** | \$125 per person, includes an open bar and food and beverage samples.

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

## AUTISM FAMILIES NIGHT

SUNDAY, NOVEMBER 1 | 6:00 p.m.-9:00 p.m.

Join us for a special evening at the Aquarium exclusively for families with adults or children with autism. Guests can enjoy the tranquility of our exhibits during the evening and meet 11,000 animals from the world's largest ocean. The Aquarium closes to the general public at 6:00 p.m.

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

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

## SPECIAL EVENTS

## VETERANS DAY

WED., NOVEMBER 11 | 9:00 a.m.-6:00 p.m.

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

**COST** | Free with valid service ID. Free for members, members' guests receive 20 percent off admission.

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

## NOAA AND OUR PLANET DAY

SATURDAY, NOVEMBER 14 | 9:00 a.m.-5:00 p.m.

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

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

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

## SCOUT DAY

SATURDAY, NOVEMBER 21 | 9:00 a.m.-6:00 p.m.

This self-guided event offers Girl and Boy Scouts the opportunity to work toward stewardship-related scout badges. Troop leaders or parents will facilitate the scouts' learning experience and guide them through the steps for badge requirements. Aquarium of the Pacific patches will be on sale in the gift store, and scouts in uniform will receive a 20% off their total purchase.

**COST** | Free for members with reservations, \$7/child and \$14/adult for non-members.

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



The Aquarium's cultural festivals feature live music and dance performances, ethnic food, crafts, and more.



Russ Parsons hosts talks about food sustainability.

**FESTIVALS**

**SOUTHEAST ASIA DAY**

SATURDAY, OCTOBER 3 | 9:00 a.m.-5:00 p.m.

On the Aquarium's eleventh annual Southeast Asia Day, experience the beauty and diversity of the cultures of Cambodia, Thailand, Vietnam, Myanmar, Laos, and Indonesia. Guests will enjoy live performances, including music, dance, and cultural craft demonstrations. Ethnic dishes will be available for purchase, and children will have the opportunity to partake in arts and crafts.

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

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

**SCARIUM OF THE PACIFIC**

SAT. & SUN., OCT. 24-25 | 9:00 a.m.-5:00 p.m.

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

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

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

Event sponsored by:



**AUTUMN FESTIVAL**

SAT. & SUN., NOV. 7-8 | 9:00 a.m.-5:00 p.m.

Delve into the arts, cuisines, and cultures of Asia during the Aquarium's fourteenth annual Autumn Festival. The Autumn Festival highlights the traditions and cultures of Japan, China, Korea, and the Philippines through a weekend of learning opportunities and family entertainment celebrating the rich diversity of Asian and Asian-American cultures. The festival features traditional crafts, music,

**FESTIVALS**

dance, cultural arts exhibits, ethnic cuisine, and storytelling. Experience the sounds of taiko drumming, watch dancers, acrobats, and martial arts demonstrations. Try your hand at origami, and purchase handmade crafts.

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

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

**HOLIDAY TREATS FOR THE ANIMALS**

SAT. & SUN., DEC. 5-6 | 9:00 a.m.-5:00 p.m.

In celebration of the holiday season, Santa Diver will be delivering gifts to the Aquarium for its animals, including penguins, sea otters, seals, sea lions, lorikeets, and fish. Visitors can watch the Aquarium's animals receive their special treats and enrichment gifts during the Holiday Treats for the Animals weekend. Families can enjoy holiday music, crafts, special presentations, unique photo opportunities, shopping, and more. Exhibits will be decked out for the "sea"son with special holiday decorations. And new this year, kids can take photos with Santa!

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

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

**FESTIVAL OF HUMAN ABILITIES**

SAT. & SUN., JAN. 30-31 | 9:00 a.m.-5:00 p.m.

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

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

**PANEL DISCUSSION | California's Working Waterfronts and the Future of Seafood**

WEDNESDAY, OCTOBER 14 | 7:00 p.m.-8:30 p.m.

Vibrant fisheries and working waterfronts have long been integral parts of California's coastal communities—attracting and serving visitors, driving local and regional economies, and forming an iconic part of each community's heritage. These communities support local, well-managed fisheries and environmentally responsible aquaculture production. Jerry Schubel, Aquarium president and CEO, will host a panel discussion on the status of working waterfronts in California and how they contribute to a safe, secure, and responsible food supply.

**RUSS PARSONS & MICHAEL CIMARUSTI | The Future of Food: Eating Well and Doing Good**

WEDNESDAY, OCTOBER 19 | 7:00 p.m.-8:30 p.m.

Chef Michael Cimarusti will discuss how the fine dining industry can get involved with sustainable food. After graduating with honors in 1991 from the Culinary Institute of America, Cimarusti got his start in New York City. He went on to become chef de cuisine at the original Spago in Hollywood and executive chef of Water Grill. He is currently owner and chef at Providence Restaurant in Los Angeles. This event is part of a series hosted by *Los Angeles Times* Food Columnist Russ Parsons.

**COST** | \$8/member; \$10/non-member (includes parking).

**ELIZABETH HADLY | End Game: Tipping Point for Planet Earth**

WEDNESDAY, OCTOBER 21 | 7:00 p.m.-8:30 p.m.

Human impacts, including climate change, pollution, and resource consumption, are causing alarming levels of harm to our planet, according to Elizabeth Hadly. By the time today's children reach middle age, it



PHOTO CREDIT



PHOTO CREDIT

October 27: Learn about women scientists who studied marine life in San Pedro Bay at the turn of the last century.

October 14: Panelists discuss California's working waterfronts and sustainable seafood.

**GUEST SPEAKERS**

is extremely likely that Earth's life-support systems, critical for human prosperity and existence, will be irretrievably damaged by these human-caused environmental stressors, unless we take concrete, immediate actions, she says. In her lecture, Hadly will identify those actions and how can we contribute to make our End Game the one we all want. Hadly is the Paul S. and Billie Achilles Chair of Environmental Biology at Stanford University, where she also holds the positions of professor of biology and senior associate vice provost for Undergraduate Education, among others.

**GERALDINE KNATZ | *The Marine Biological Laboratory at Terminal Island and its Women Scientists***  
**WEDNESDAY, OCTOBER 27 | 7:00 p.m.-8:30 p.m.**

In the 1890s the zoological department of the University of California led field expeditions to study the marine resources in Southern California. In 1901 a more permanent field location was established on Terminal Island and became the Marine Biological Laboratory, complete with laboratories and classrooms. When the laboratory moved to Coronado Island in 1903, two women researchers stayed in Los Angeles harbor, occupying squatter shacks where they continued to study the marine life of San Pedro Bay. Sarah P. Monks and Martha Burton Williamson lived and studied in the "rough and tumble" world of the seaport, from a building of dubious physical integrity and without the comfort that most highly educated Victorian women were accustomed to. What drove them to this lifestyle? How did they manage to pursue their passion for science? Dr. Geraldine Knatz, former executive director of the Port of Los Angeles, will discuss their lives and their little-known contributions to the history of scientific research in San Pedro Bay.

**GUEST SPEAKERS**

**DR. MILTON LOVE | *One Fish, Two Fish, Three Fish, Rockfish***  
**TUESDAY, NOVEMBER 3 | 7:00 p.m.-8:30 p.m.**

There are more than 100 species of rockfish around the world, with at least forty-five in Southern California. Dr. Milton Love will discuss rockfish and their biology, habitat, and behaviors. Dr. Love is a research biologist at the Marine Science Institute, University of California, Santa Barbara. During his decades of research on the marine fishes of California, he has carried out surveys of the fish populations living around natural reefs and oil and gas platforms throughout the Southern California Bight.

**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.

**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:



*Experience!*



The Aquarium of the Pacific in Long Beach provides both a beautiful and unique atmosphere for events, from intimate gatherings to large groups. Dine under our blue whale, enjoy harbor views from our new rooftop Veranda, and explore breathtaking exhibits. Let the Aquarium provide the most memorable location for your event. And let Premier serve California-inspired, chef-crafted cuisine designed to compliment your event and offer the highest level of hospitality.

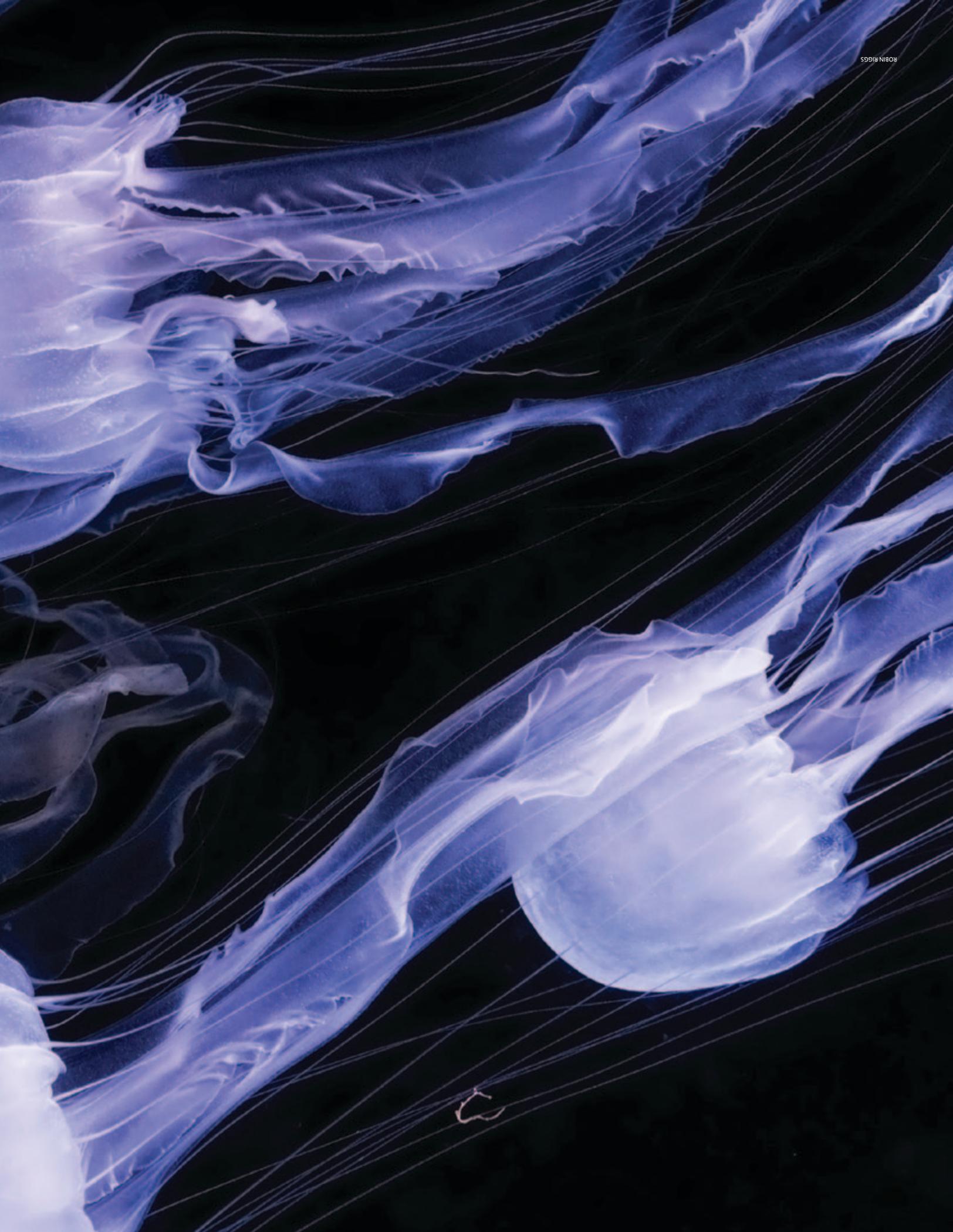


*Aquarium of the Pacific*

100 AQUARIUM WAY  
 LONG BEACH, CA 90802  
[youevent.aquariumofpacific.org](http://youevent.aquariumofpacific.org)  
 562-951-1663

*Aquarium  
of the Pacific*







ROBIN FIGGS



## Winter Day Camps AT THE AQUARIUM

### WINTER SEA SQUIRTS: AGES 5 & 6

Campers will discover an underwater world filled with wiggly fish, furry mammals, and fluffy birds. Through hands-on activities, stories, games, crafts, and tours, your child will prove that little learners can learn big things.

WHEN: **December 21-23 | 8:30 a.m.-11:30 a.m.**  
COST: **\$90 per member child, \$115 per non-member child**  
AGES: 5 & 6-year-olds (children only)  
RSVP: (562) 590-3100 ext. 0  
*Pre-registration and pre-payment required.*

### WINTER DAY CAMP: AGES 7-12

Spend time at the Aquarium during winter break! Discover what goes on behind-the-scenes, meet some of our animal care staff, learn more about fish, birds, and mammals through fun hands-on activities, and help us take care of the animals that call the Aquarium their home.

WHEN: **December 28-30 | 8:00 a.m.-12:00 p.m.**  
COST: **\$125 per member child, \$150 per non-member child**  
AGES: 7 to 12-year-olds  
RSVP: (562) 590-3100 ext. 0  
*Pre-registration and pre-payment required.*



## AQUARIUM Tours & Encounters

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

### BEHIND THE SCENES TOURS

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

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 sea lion, wade with sharks, or waddle up to a penguin.

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

### WHALE WATCHING TRIPS *Seasonal*

Enjoy a voyage out in the open Pacific Ocean in search of blue whales, gray whales, and other marine life. Blue whales generally appear in our local waters in the summer months, while gray whales make their migration each year between the months of November and April. 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): \$48.95/adult, \$44.95/senior, \$30.95/child**

AGES: Children under 16 must be accompanied by an adult.  
LENGTH: 2-3 hours  
RSVP: (562) 590-3100, ext. 0

# EDUCATIONAL OPPORTUNITIES



ROBIN RIGGS



## HALLOWEEN Family Sleepover

Put on a costume and prepare for an adventure at the Aquarium with your family. Have fun exploring and discovering treats as you complete a scavenger hunt through the exhibits. Touch animals like sharks, sea stars, and sea jellies; discover bioluminescence; participate in a fish feeding; and paint your own souvenir T-shirt in the art of Gyotaku. Pizza dinner is included, as well as a light snack and cereal breakfast. Space is limited so sign up today for our Halloween-themed overnight.

**WHEN: Friday, October 30, 2015**

*Check-in is at 5:00 p.m. and the sleepover ends at 7:00 a.m. the next morning.*

**COST: \$60 per member, \$70 per non-member**

**RSVP:** Call (562) 590-3100, ext. 0 to confirm your spot. *Pre-registration and pre-payment are required.*

## 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.



ROBIN RIGGS

### JOB SHADOW

Four rotating themed programs.

**WHEN: First Wednesday of every month | 3:30 p.m.-6:30 p.m.  
First Saturday of every month | 9:00 a.m.-12:00 p.m.**

**AGES:** 13 to 17 years old

**COST: \$35.00 per member, \$39.00 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).**

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.*

**KIDS CORNER**

# How Much Water Do You Use?

You may have heard by now that California is facing a severe drought. By monitoring our personal water use, we can save water! Answer the following questions to figure out how much water you use each day.

Activity	Number of times per day		How much water the activity uses:	Total water use for this activity
How many times do you flush the toilet each day?	_____ flushes	<b>X</b>	<b>4</b> gallons/flush	= _____ gallons
How long do you use the faucet for brushing your teeth, washing hands, etc.?	_____ minutes	<b>X</b>	<b>1.3</b> gallons/minute	= _____ gallons
How many baths do you take each day?	_____ baths	<b>X</b>	<b>24</b> gallons/bath	= _____ gallons
How long is your shower?	_____ minutes	<b>X</b>	<b>7.5</b> gallons/minute	= _____ gallons
How many times do you use the dishwasher each day?	_____ washes	<b>X</b>	<b>9.3</b> gallons/wash	= _____ gallons
How many times do you use a washing machine each day?	_____ washes	<b>X</b>	<b>41</b> gallons/wash	= _____ gallons
How many ounces of water do you drink? An average glass is 8 ounces.	_____ ounces	<b>X</b>	<b>.04</b> gallons/ounce	= _____ gallons
<b>Total gallons of water used each day</b>				= _____ <b>daily</b> gallons
_____ <b>daily gallons</b>		<b>X</b>	<b>365 days</b>	= _____ <b>gallons used per year</b>

Here are some additional questions to help you think about how you use water. Talk these over with your family members to see if there are more ways you can help conserve water.

1. What can you do to reduce your daily water use?
2. Do you use water for any other activities?

# Where Does Our Water Go?

Coloring Activity

We need water for growing our food,



...for our rivers and streams,

...and at home, for cooking, drinking, watering plants, and cleaning up!



## MOON JELLY

*Aurelia aurita*



SOUTHERN CALIFORNIA/BAJA GALLERY

## FLAMBOYANT CUTLEFISH

*Metasepia pfefferi*



TROPICAL PACIFIC GALLERY

## SEXY SHRIMP

*Thor ambainensis*



TROPICAL PACIFIC GALLERY

## MOON JELLY

*Aurelia aurita*



### PHYSICAL CHARACTERISTICS

Moon jellies are transparent with short, fine tentacles. They can reach 16 inches in diameter and have four fringed oral arms for transporting food.

### DIET

These jellies feed on tiny free-floating animals called plankton, as well as fish eggs and other small jellies.

### HABITAT

Moon jellies live in most of the world's oceans and sometimes form enormous swarms in shallow bays and harbors.

### FUN FACT

Moon jellies are recognizable by the four horseshoe-shaped reproductive organs in the middle of their bells.

## FLAMBOYANT CUTTLEFISH

*Metasepia pfefferi*



### PHYSICAL CHARACTERISTICS

Flamboyant cuttlefish are between 2.5 and 3.5 inches long. They have eight arms and two feeding tentacles.

### DIET

They feed on mollusks, crustaceans like shrimp and crabs, and small fish.

### HABITAT

Flamboyant cuttlefish can be found in the Philippines, Indonesia, Northern Australia, and Papua New Guinea. They spend their time on the seafloor.

### FUN FACT

In addition to changing color, flamboyant cuttlefish can also change the texture of their skin to look smooth or bumpy.

## SEXY SHRIMP

*Thor amboinensis*



### PHYSICAL CHARACTERISTICS

Sexy shrimp grow to about a half-inch in length. They are brown with white patches.

### DIET

Sexy shrimp feed on the mucus excreted by the corals and anemones they live amongst.

### HABITAT

These shrimp live on corals and sea anemones on shallow reefs in the Indo-West Pacific and Atlantic Ocean.

### FUN FACT

Sexy shrimp get their name from their movements that resemble dancing.

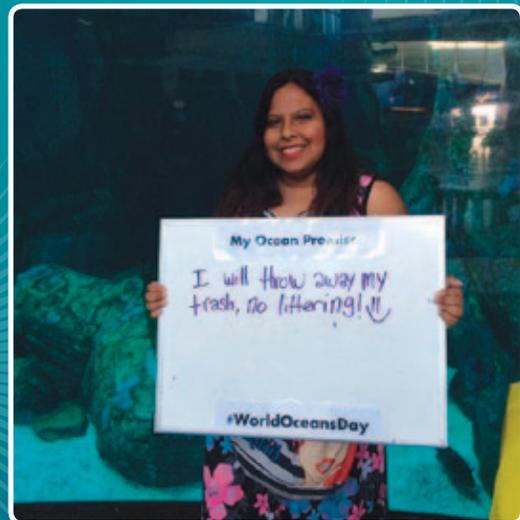
# #AquariumMember Photos



@hidef7



@jaytayag



@luv2dance93

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).



RALPH PACE

This recently released juvenile loggerhead turtle will supply data providing scientists with information about the species' habitat and how best to protect it.

## LOGGERHEAD TURTLE REHABILITATED AT AQUARIUM WILL PROVIDE NEW DATA

**A** **JUVENILE LOGGERHEAD TURTLE** rehabilitated at the Aquarium was released by National Oceanic and Atmospheric Administration (NOAA) Fisheries scientists off the coast of San Diego in April. The turtle, a male, was the first loggerhead to be fitted with a satellite tag to track its movements.

The location data provided by the transmitter will help answer questions about loggerhead habitat and conservation.

The juvenile loggerhead was first picked up by a U.S. Coast Guard vessel early in spring. After receiving medical attention at the Aquarium, the turtle was deemed healthy and fit for release. The turtle has traveled more than 120 miles since its release, first heading north between the Channel Islands toward the coast of Santa Barbara before heading south to the waters off Baja California, Mexico. To learn more about tracking the movements of sea turtles, visit [seaturtle.org](http://seaturtle.org).



The Aquarium's collection site is one of many along the West Coast providing samples of ocean water to measure levels of radiation after the Fukushima accident.

## AQUARIUM HELPS COLLECT SEAWATER SAMPLES FOR WOODS HOLE PROJECT

**A** **FTER A WEBCAST** and lecture by Dr. Ken Buesseler, scientist at the Woods Hole Oceanographic Institution (WHOI), Aquarium staff members and supporters came together to participate in Buesseler's citizen science project to document levels of radiation in the ocean. Val and Bob Hoffman, Aquarium volunteers and supporters, offered to fund the sampling site in Long Beach, and Aquarium staff members volunteered to conduct the sampling.

The collection is conducted offshore, where staff members fill a container fitted with a temperature sensor and take a GPS reading and photo as documentation. The sample is mailed back to WHOI for analysis. The Aquarium's collection point is one of the few offshore collection sites in the project. To learn more about the project, visit [OurRadioactiveOcean.org](http://OurRadioactiveOcean.org).

## AQUARIUM PRESIDENT NAMED BOLSA CHICA CONSERVANCY'S CONSERVATOR OF THE YEAR

**A** **QUARIUM PRESIDENT** and CEO Dr. Jerry R. Schubel was named Conservator of the Year by the Bolsa Chica Conservancy. Each



year the Bolsa Chica Conservancy presents this award to an individual, business, or organization that promotes conservation through innovative ideas, scientific discovery, conservation projects, education, technological improvements, or sponsorship of any of the above. The conservancy selected Schubel for the award in recognition of his visionary leadership in ocean conservation through exploration, research, and education. The award was presented at the conservancy's annual gala on June 6, 2015, by the 2014 Conservator of the Year winner, Wyland.

Pictured: Jerry Schubel, Aquarium of the Pacific president and CEO, and 2014 Conservator of the Year Wyland.

## TRY THE AQUARIUM'S NEW JELLIES APP



ROBIN RIGGS

**T** **HE AQUARIUM** has released a new app called Jelly Lab for iPhone and Android devices that features a sea jelly-themed game. Become a jelly keeper and complete tasks like cleaning tanks, feeding jellies, and ensuring proper water flow. Visit the Apple Store or Android Marketplace to download the app.



Since 2003 SAVOR...Long Beach has funded field trips for more than 12,000 students.

## SAVOR...LONG BEACH FUNDS STUDENT VISITS DURING GRAND PRIX

**H**UNDREDS OF STUDENTS from area schools visited the Aquarium in April thanks to a donation from SAVOR... Long Beach (now named Premier), which provides food and beverage services as well as catering and special event management at the Aquarium. The corporation donated to the Aquarium's scholarship program for the twelfth consecutive year, allowing children to visit during the Grand Prix of Long Beach, when the Aquarium is closed to the general public. Over 1,000 students from Polytechnic High School, Rancho Dominguez Prep, King Elementary, Mann Elementary, New City School, and Hamilton Middle School had the opportunity to visit the Aquarium with the scholarship. Since 2003 SAVOR...Long Beach has donated more than \$140,000 in scholarship funds, providing Aquarium visits for more than 12,000 students.



Accreditation includes strict reviews of animal care, veterinary, conservation, education, and safety programs and practices.

## AQUARIUM EARNS ACCREDITATION

**I**N MARCH the Association of Zoos and Aquariums (AZA) announced that the Aquarium was granted accreditation by AZA's independent Accreditation Commission. The Aquarium first received AZA accreditation in 2000 and renewed in 2005, 2010, and 2015.

To be accredited, the Aquarium underwent a thorough review to ensure it meets standards for animal care, veterinary programs, conservation, education, and safety. The accreditation process includes a detailed application and on-site inspection by a team of trained zoo and aquarium professionals and interviews of top officials at a formal hearing of AZA's independent Accreditation Commission.



Sea jellies' delicate bells, thread-like tentacles, frilly oral arms, and often brilliant coloration make sought-after subjects for photographers.

## SEA JELLY PHOTO EXHIBIT ON DISPLAY THIS WINTER

**S**EA JELLIES are among the most popular subjects for photographers at the Aquarium. Winners of the Aquarium's annual Photographers Night contest and a Member Photo Contest will have their photographs of sea jellies on display from November 1, 2015, to January 4, 2016. To enter, visit <http://bit.ly/jellycontest>.



New water stations are replacing the Aquarium's water fountains, allowing visitors to refill reusable water bottles and avoid purchasing bottled water. This reduces the amount of plastic waste generated at the Aquarium.

## VISITORS CAN NOW REFILL WATER BOTTLES AT NEW WATER STATIONS

**N**EW WATER STATIONS at the Aquarium allow visitors to refill reusable water bottles. These redesigned water stations have replaced water fountains at the Watershed Classroom, outdoors near the Ray Touchpool on the second floor, and in staff areas. Since their installation, the water stations have refilled the equivalent of 126,925 bottles.



Selecting local, certified seafood helps support a sustainable U.S. seafood industry.

## CELEBRATE NATIONAL SEAFOOD MONTH THIS OCTOBER

**I** N CELEBRATION of National Seafood Month, the Aquarium's sustainable seafood program, **Seafood for the Future (SFF)**, is asking consumers to become part of the solution to ensure that we have access to healthy seafood from environmentally responsible sources. A balanced supply of seafood from well-managed wild-capture fisheries and environmentally responsible aquaculture sources is essential for the health of the fish, our planet, and people.

Here are some general guidelines provided by SFF:

1. Buy U.S. seafood! U.S. seafood is among the best-managed in the world. Buying local supports environmentally responsible harvesting and farming practices and local coastal communities. It also reduces the risk of seafood fraud, as it is much easier to trace local seafood products.
2. Look for certified seafood products. Can't find a U.S. product to meet your needs? Look for certifications like the Marine Stewardship Council, Aquaculture Stewardship Council, and Best Aquaculture Practices. These certifications are meant to make responsible purchasing easier, but keep in mind that they do not cover all seafood. Just because something isn't certified, it doesn't mean it is not a responsible seafood choice.
3. Support businesses working with seafood advisory programs like Seafood for the Future. There are many businesses and restaurants working with Seafood for the Future and programs like it to improve the seafood supply chain on multiple levels.

Go to [seafoodforthefuture.org](http://seafoodforthefuture.org) for a complete list of program partners and more information on responsible seafood choices.



More than \$378,000 was raised at this year's gala. Next year's will be held June 11.

## BLUE WHALE GALA A SUCCESS

**O** N JUNE 13 the Aquarium hosted its annual Blue Whale Gala, entertaining 380 guests and raising more than \$378,000. Attendees of the black-tie fundraiser enjoyed an elegant cocktail and hors d'oeuvre reception on the front plaza, gourmet dinner in the Great Hall, and after-dinner drinks and dancing under the stars on the outdoor Harbor Terrace and Veranda.

Vice Admiral Paul G. Gaffney II, U.S. Navy (Ret.) and Margaret S. Leinen, Ph.D., were the recipients of the Aquarium's 2015 Ocean Conservation Award. To read about the honorees and their contributions to ocean conservation, see page 26.

The Blue Whale Gala premier sponsors included The John W. Carson Foundation, Esther S.M. Chui Chao, David and Kathy Cohen, and Mario and Therese Molina. Next year's Blue Whale Gala will be held on June 11, 2016.

Aquarium Educator Dr. Jennifer Lentz poses with the SAG Award.

## AQUARIUM TEACHES OCEAN ISSUES USING GIS



**T** HE AQUARIUM has partnered with GIS (geographic information systems) mapping firm Esri to help translate current ocean science to the public. The

Aquarium has on its website several interactive story maps using ArcGIS, a GIS software platform created by Esri to manage geographic information. Story maps gather data, images, and map locations to tell a story. Maps on the Aquarium's site cover the backstory on our Magellanic Penguins, the Southern California steelhead, frequency and type of extreme weather events by coastal region, sea level rise, and whale research, among other topics. To view the story maps visit [aquariumofpacific.org/exhibits/interactives/storymaps](http://aquariumofpacific.org/exhibits/interactives/storymaps).

In July Esri presented its Special Achievement in GIS (SAG) Award to the Aquarium in recognition of its innovative use of Esri's GIS technology. Also, Esri published a book presenting ocean science research from its inaugural Esri Ocean GIS Forum and included a chapter submitted by the Aquarium. To learn more about the book, *Ocean Solutions, Earth Solutions*, visit [esripress.esri.com/bookresources/](http://esripress.esri.com/bookresources/).

# 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.

## ■ The Robert and Lisa Margolis Family Foundation Supports STEM Education

A new Aquarium supporter, The Robert and Lisa Margolis Family Foundation awarded a \$50,000 grant to the Aquarium's science, technology, education, and mathematics (STEM)-related education programs. With the foundation's support, the Aquarium's programs will help inspire thousands of students to pursue careers in STEM-related fields. These programs will give them the opportunity to make their own discoveries and to experience learning in an exciting environment. Students will be exposed to science and scientists, have hands-on access to marine life, and learn about oceanic phenomena through innovative technology. Students of all ages and backgrounds can become more engaged and inspired through this exposure and unique access to Aquarium resources.

## ■ Munzer Foundation Dedicated to Long Beach Students

A foundation that is dedicated to the betterment of Long Beach and providing opportunities to the underserved, The Rudolph J. and Daphne A. Munzer Foundation has committed \$30,000 to the Aquarium's scholarship program again this year. Those grant funds will support field trips for third grade students from throughout the more than fifty elementary schools in the Long Beach Unified School District. Over the past four years the Munzer Foundation has partnered with the Aquarium to inspire and educate Long Beach students about science and the ocean.

## ■ Green Foundation Supports Scholarship Programs

The Green Foundation awarded a grant of \$25,000 to support the Aquarium's Scholarship Fund. A funder of the Aquarium's education programs since 2006, The Green Foundation's most recent gift will provide Aquarium field trips to underserved children from Title I schools in Los Angeles County. During their visit students have the opportunity to explore the Aquarium and its variety of exhibits and habitats, touch and interact with marine animals, and participate in a standards-aligned school program.

## ■ ScholarShare Commits to Inspiring a Lifetime of Learning

ScholarShare is expanding its partnership with the Aquarium to inspire a lifetime of curiosity, discovery, and learning. ScholarShare sponsored the Aquarium's twelfth annual Pacific Islander festival, a popular cultural event in June that hosted more than 14,000 visitors. In addition, ScholarShare is sponsoring the Aquarium's Toddler and Preschool Programs, Scarium of the Pacific festival, and a Library Pass Program that will provide discounted Aquarium passes at local libraries. ScholarShare, California's official 529 college savings plan, is a tax-advantaged way for families to save for their children's education.



**SCHOLARSHARE**

CALIFORNIA'S 529 COLLEGE SAVINGS PLAN

DONORS SHARE



*Our mother had a great respect and love for the ocean. She believed in educating us in the preservation of this precious resource. Giving to the Aquarium is our way of continuing her legacy.*

— SUSAN SADOWSKI, CAROL MCCALLUM, AND PATRICIA DEMERS OF THE VIRGINIA MCCALLUM CHARITABLE TRUST, PACIFIC CIRCLE MEMBERS SINCE 2007



## Include the Aquarium in your will or trust.

**A simple but meaningful way to give.**

**W**HEN YOU INCLUDE the Aquarium in your will or trust, you help provide future financial support for the Aquarium, ensuring that we can educate and inspire generations to come. You will be honored as a Nautilus Society member and receive benefits today, including invitations to special events, as our way of thanking you for your generosity.

There are many tax-smart donation ideas and gift planning possibilities. Simply visit [aquariumofpacific.org/legacy](http://aquariumofpacific.org/legacy) or call (562) 951-3153.

DONOR HIGHLIGHT



**Bank of America Expands Its Support**

A long-time Aquarium donor, Bank of America Charitable Foundation has continued its support with a gift of \$25,000. Bank of America has been an Aquarium funder since our opening in 1998. It has provided support for the Aquarium Scholarship Fund and the Ocean Science Education Program, as well as actively participating in Aquarium leadership committees. Its most recent contribution will support the Aquarium's student internship programs and trainings. These provide middle, high school, and college students with skills development and inspiration for pursuing science, technology, engineering, and mathematics (STEM) careers.

In April the Aquarium welcomed James Suh, director and regional sales executive for the Los Angeles East region, Consumer Banking and Merrill Edge, to the Trustees of the Pacific. In his career with Merrill Edge and Bank of America, Suh has been a champion of associate connectivity and business integration. Through leading roles in various local organizations, Suh has become a respected community member, and he is looking forward to becoming an active Aquarium advocate. As an Aquarium Trustee, Suh will act as an Aquarium ambassador in the community and further Bank of America's support of the Aquarium's mission.



*Aquarium of the Pacific*

# THANKSGIVING LUNCH

GOBBLE GOBBLE WITH US!





Come gobble gobble with our penguins and other Aquarium favorites this Thanksgiving. Delight your family with over 11,000 animals from the world's largest ocean, and SAVOR a traditional Thanksgiving buffet in the Aquarium's Cafe Scuba.

**CAFE SCUBA**  
THURSDAY NOVEMBER 26, 2015 • 11:00AM - 5:00PM

**PRICING:**  
Includes Aquarium admission

General Public:	Members:
Adults: \$36	Adults: \$26
Child 3-11: \$27	Child 3-11: \$17



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# DESSERTS WITH SANTA

Celebrate the holidays at the Aquarium of the Pacific. Discover more than 11,000 animals as you tour the Aquarium, visit with Santa, and enjoy festive desserts, hot chocolate, and coffee.

**GREAT HALL**  
MONDAY DECEMBER 21, 2015 • 6:30PM - 9:30PM

**PRICING:**  
Includes Aquarium admission

General Public:	Members:
Adults: \$29.50	Adults: \$19.50
Child 3-11: \$19.50	Child 3-11: \$9.50



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# AQUARIUM ACCOLADES

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

## Aquarium Receives Toastmasters District One Corporate Recognition Award



The Aquarium of the Pacific was one of two recipients of the 2015 Toastmasters District One Corporate Recognition Award. The Aquarium's Toastmasters club, known as the Wavemakers, has a five-year history and has achieved President's Distinguished status each year. In addition, the Aquarium has hosted area speech contests and visiting Toastmasters dignitaries.

Pictured: Erica Perez, Debbie Quihuis, Raelene Child, Kathie Nirschl, and Sean Devereaux of the Aquarium Wavemakers club; Aquarium President and CEO Jerry Schubel; and Lori Perkins, Wavemaker; and Region 10 International Director Ede Ferrari-D'Angelo and District One Governor Marlow Wilkerson, Toastmasters officers.

## Caroline Edmonds | Young Hero Award



The Aquarium presented the Young Hero award to Caroline Edmonds at the International Children's Day Festival. Edmonds is a student at Talbert Middle School in Huntington Beach and an Aquarium volunteer. In 2014 she worked with Aquarium staff member Dee Ann Auten to investigate flashlight fish behavior for her school science project. After earning recognition at the county and state levels, her project was also selected for the Broadcom MASTERS competition, organized by the Society for Science and the Public, where she was one of thirty finalists to win a trip to Washington, D.C., and meet President Obama at the White House with the other finalists.

Pictured: Caroline Edmonds, Young Hero Award honoree, and Theresa Duncan, vice president of development, Aquarium of the Pacific.

## Lincoln and Sissy Kaio

| Heritage Award



Lincoln and Sissy Kaio were presented with the Heritage Award at the Aquarium's Pacific Islander Festival in June. The Kaios are dedicated to passing along the cultural traditions of their ancestors to future generations of Hawaiians as well as sharing these traditions with others. In 1981 they founded Hula Halau O Lilinoe ame Na Pua Me Kealoha. *Halau* is the Hawaiian word for school or group. In addition to hula classes, the halau also hosts workshops in Hawaiian language, arts and crafts, hula implement making, weaponry, lei making, textile weaving and dyeing, and *lomilomi*, or Hawaiian massage.

Pictured: Lincoln and Sissy Kaio, Heritage Award honorees, and Katie Farrell, director of development, Aquarium of the Pacific.

## Paul Gaffney and Margaret Leinen

| Ocean Conservation Award



Margaret S. Leinen, Ph.D., and Vice Admiral Paul G. Gaffney, U.S. Navy (Ret.), received the Ocean Conservation Award at the Aquarium's Blue Whale Gala on June 13, 2015. Leinen is an award-winning oceanographer with extensive knowledge in the fields of global climate and environmental issues. Currently she serves as the director of Scripps Institution of Oceanography. An expert in ocean policy, Gaffney served over three decades in the Navy's research and oceanography programs to support efforts to increase the safety and security of our global ocean. He is a fellow in Monmouth University's Urban Coast Institute and chairman of the federal Ocean Exploration Advisory Board.

Pictured: Aquarium President and CEO Jerry Schubel, Margaret Schubel, Margaret Leinen, Paul Gaffney, Linda Gaffney, Gala Committee Chair Michelle Molina, and Aquarium Board Chairman John Molina.

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# CONSERVING WATER AT HOME

ANDREW REITSMA

Irrigating your landscaping and gardens is often the biggest use of water at home. Removing your lawn and other conservation measures can help lower your bill and save water.

**T** **HERE ARE MANY ways to reduce the amount of water you use at home, from taking shorter showers to turning off the faucet while you brush your teeth.**

The biggest savings, however, may be in your backyard. In the summer the amount of water homeowners use outdoors can exceed the amount used for all other purposes in the entire year, according to the Environmental Protection Agency. This is especially true in hot, dry climates. And in Southern California, where weather can be warm and dry during most of the year, keeping lawns and home gardens irrigated requires a lot of water.

Many Southern California water agencies have developed public awareness and incentive programs to help residents conserve water. Programs offering rebates to residents who replace their lawns with drought-tolerant landscaping have become much more popular in recent years due to increasing awareness of the drought and its impacts.

Los Angeles' Metropolitan Water District (MWD) added \$350 million to its lawn removal program in May. The largest of its kind in the nation, this

program allowed residents to apply for rebates after removing their lawns and replacing them with drought-tolerant plants. The funds in this program ran out in July because of overwhelming demand, but some of MWD's twenty-eight local water agencies, including the Long Beach Water Department (LBWD), have opted to continue to fund this program in their communities.

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*Replacing lawns with drought-tolerant native plants helps reduce water consumption and provide habitat and food for local birds and beneficial insects.*

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In 2010 LBWD launched its Lawn-to-Garden turf replacement incentive program, which offers rebates to people who remove lawns and replace them with drought-tolerant landscaping. The program is a long-term water conservation program that addresses scarcity beyond the current drought. It also has stringent requirements to help residents avoid merely replacing lawns with gravel, which increases stormwater runoff and creates a heat-island effect, further

contributing to warming. The program's requirement of 65 percent live plant material avoids these negative impacts and also contributes to local beautification. Planting native, drought-tolerant plants also benefits local birds and insects that rely on these plant species as a source of food or habitat. Visit [lblawntogarden.com](http://lblawntogarden.com) for more information on this program.

Covering soil in your garden with mulch holds in moisture, reducing the necessity for frequent watering. Cities like Santa Barbara, Long Beach, and Los Angeles provide free mulch to residents derived from municipal tree trimming.

In addition to turf replacement, water agencies may also offer rebates for purchasing water efficient appliances and irrigation systems and other devices. Check with your local water provider for more information.

For more water-saving tips, follow the hashtag #SaveWaterLB on Facebook and Twitter or visit [bewaterwise.com](http://bewaterwise.com) and [saveourwater.com](http://saveourwater.com).

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# SEA FARE

**SATURDAY, OCTOBER 17, 2015**

7:00-11:00 P.M.

- ✦ OPEN BAR
- ✦ TASTES FROM OVER 25 LOCAL RESTAURANTS AND FOOD & BEVERAGE PROVIDERS
- ✦ GO FISH OPPORTUNITY GAME
- ✦ UNIQUE SILENT AND LIVE AUCTION ITEMS FOR BIDDING
- ✦ VISITING WITH ALL THE ANIMALS THAT CALL THE AQUARIUM HOME
- ✦ AND MORE!

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- |                             |                               |
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| The Attic                   | L'Opera                       |
| The Auld Dubliner Irish Pub | Parkers' Lighthouse           |
| Bluewater Grill             | Premier                       |
| Bubba Gump Shrimp Co.       | Primal Alchemy Catering       |
| Buono's Authentic Pizzeria  | simply sweet cakery           |
| Deb's Kitchen featuring     | SIP Lounge at the Renaissance |
| Melissa's Produce           | Long Beach                    |
| Delius Restaurant           | The Sky Room                  |
| EJ Malloy's Pub & Grill     | SlapFish                      |
| Europa Village Winery       | Steamed Vegetarian Cuisine    |
| The Federal Bar             | SWEET! Hollywood              |
| Gladstone's Long Beach      | Taco Beach Cantina            |
| Karl Strauss Brewery        | Temecula Olive Oil Company    |
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