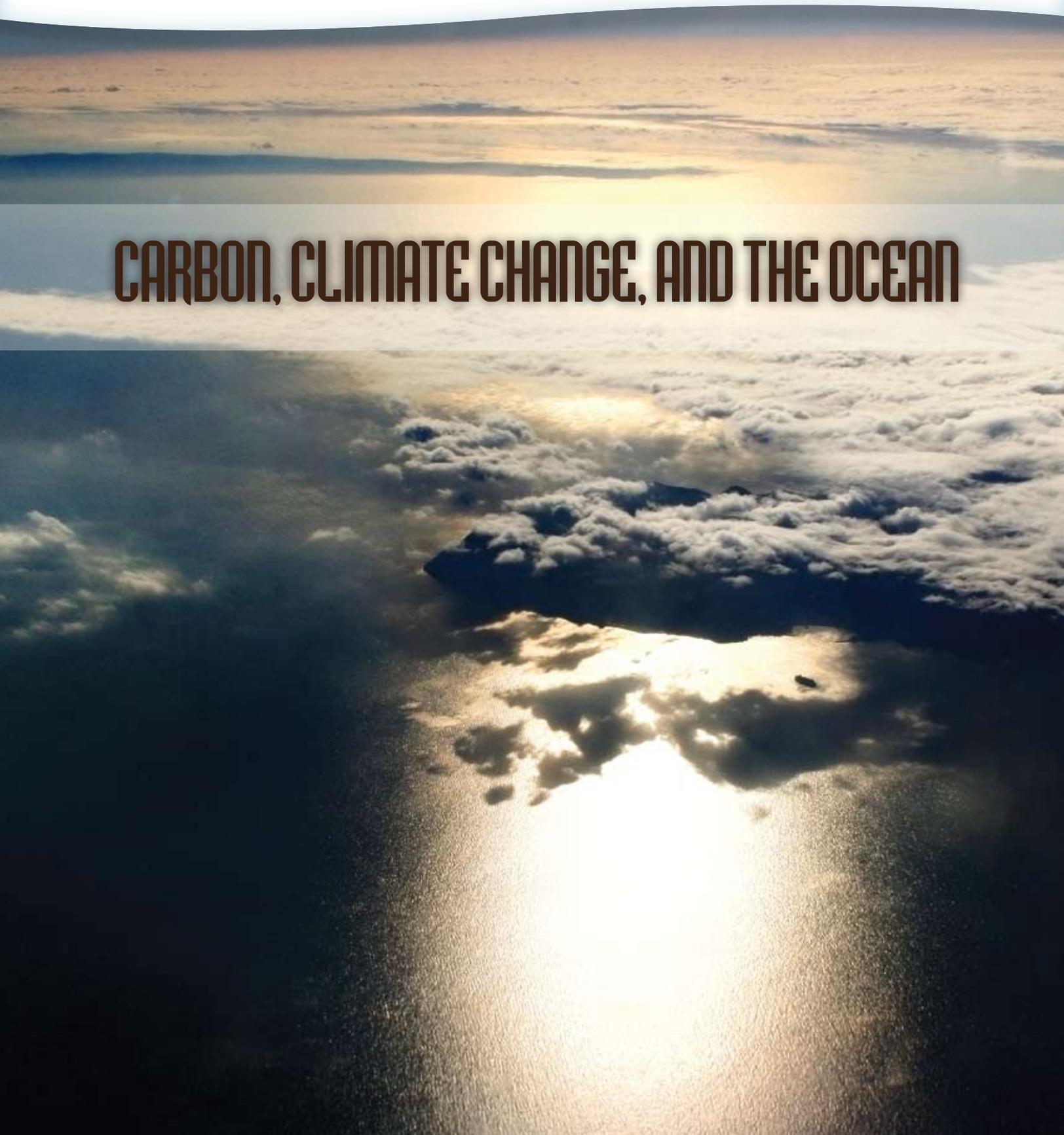
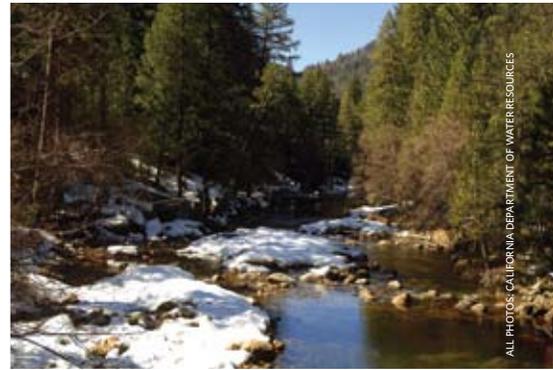


PACIFIC CURRENTS

MEMBER MAGAZINE OF THE AQUARIUM OF THE PACIFIC

CARBON, CLIMATE CHANGE, AND THE OCEAN





HOW CLIMATE CHANGE WILL AFFECT CALIFORNIA'S WATER

While California will have enough water for the future, the state will need to be more efficient in its use of water resources, and officials urge flood preparedness.

CALIFORNIA'S WATER SYSTEM PLAYS MANY IMPORTANT ROLES IN THE STATE, from providing drinking water for residents, to irrigation for agriculture and landscaping, to habitat for wildlife, to a source of energy production.

Unfortunately, the infrastructure that makes up the state's water management system—including dams, aqueducts, and water treatment plants—was built under the assumption that California's climate history would be a good guide for the future. As climate change trends continue, our use of water will have to adjust.

Warmer temperatures brought on by climate change are causing the accumulated snow pack in the Sierra Nevada Mountains to melt earlier in the year, sending run-off to reservoirs sooner. Also, more precipitation is falling as rain rather than snow. Both of these factors are causing fresh water to flow more heavily during the winter rather than flowing steadily into the spring. Currently about 65 percent of California's water supply comes from this source. If the timing of its availability changes, the state will need to use water more efficiently and expand its portfolio of water sources to fill in the gap. Those other sources include

desalinated ocean water, groundwater, and recycled wastewater.

The Sacramento-San Joaquin Delta is one of the areas in the state predicted to be hardest hit by climate change. The impact would be significant. Not only do 25 million Californians in the Central Valley, Bay Area, and Southern California depend on the Delta region for some portion of their drinking water, but also about 7 million acres of agricultural land are irrigated with water that passes through the Delta. The region also serves as a hub for infrastructure, including interstate freeways, railroads, high-voltage electric lines, underground natural gas storage, and two deepwater shipping ports. Climate change will bring early snow melt to the Delta as well as incoming sea water due to sea level rise, literally hitting the Delta from all sides with higher water flow levels.

While the California Department of Water Resources (DWR) believes the state has options to secure the water supply as climate change impacts are felt, the agency urges residents to be better prepared for flooding. It suggests that cities and counties in California should partner with water agencies to coordinate land use and flood preparedness plans.

WHAT CAN INDIVIDUALS DO TO HELP CONSERVE WATER?

Take control of water use at home by turning the faucet off while brushing your teeth, taking shorter showers, using appliances like dishwashers and washing machines more efficiently, and using less water to irrigate your home landscaping. Not only do these measures help save money on your water bill, but they also help California conserve its water resources. And if you live in an area prone to flooding, create a flood preparedness plan similar to an earthquake plan for your family. Set aside supplies to last around three days and learn what to do if you are required to evacuate. Visit water.ca.gov for more information.

LETTER FROM THE CEO

DEAR MEMBERS,

SUMMER IS ALWAYS A BUSY TIME FOR US HERE AT THE AQUARIUM OF THE PACIFIC. But this fall looks to be an equally exciting and engaging season. We hope you will be visiting us often to see a variety of events and new exhibits. On October 15 join



us for Sea Fare, our annual celebration of sustainable and local cuisine. You'll have the opportunity to taste gourmet specialties from more than twenty-five local restaurants and see sustainable seafood cooking demonstrations. All funds raised at this event help to support the education, conservation, and animal care programs at the Aquarium. Also, experience one of our many cultural and family festivals, including Southeast Asia Day and the Autumn Festival.

This fall also will bring two distinctive exhibits to the Aquarium. One highlights the effects that climate change is predicted to have on California's water supply. Developed and funded by the California Department of Water Resources, this exhibit will debut on October 24.

Also in October sixteen aerial photographs by conservation photographer Daniel Beltrá will be featured in a new exhibit. The photos, capturing the aftermath of the April 2010 Gulf of Mexico oil spill, use striking images to convey the impact of human dependence on fossil fuels. To open this exhibit, we are bringing back Dr. Larry McKinney, who presented a lecture on the Gulf oil spill last year, to give us an update on the situation. Beltrá and McKinney, executive director of the Harte Research Institute for Gulf of Mexico Studies, will present a joint lecture on October 13 at the photography exhibit's opening event.

These are just some of the highlights of the coming months' happenings at the Aquarium of the Pacific. In our mission to instill a sense of wonder, respect, and stewardship for the Pacific Ocean, its inhabitants, and ecosystems, we make it a priority to present a wide variety of educational opportunities and events at the Aquarium. We also maintain an established presence in the scientific community so the Aquarium can serve as a venue for the most relevant scientific discussions facing our planet. As an institution we have worked to redefine the roles that an aquarium of the twenty-first century can play in engaging the public in the exploration of major environmental and societal issues.

Thank you for your support.

Sincerely,

Jerry R. Schubel

IN THIS ISSUE



4

4 ANIMAL UPDATES | Read about a recent animal collection trip in Alaska, and meet the new Arctic fox pups.



6

6 CARBON, CLIMATE CHANGE, AND THE OCEAN | Learn how changes to climate and ocean chemistry are affecting animals and habitats.



18

18 MARINE SCIENCE ACADEMY | See how high school students are learning about ocean science and teaching others at the Aquarium.



26

27 GREEN HOME IMPROVEMENT | Find out what's available to consumers for improving energy efficiency at home, including solar technology.

- 2 FOCUS ON SUSTAINABILITY
- 3 LETTER FROM THE CEO
- 10 AQUARIUM PROGRAMS & EVENTS
- 19 DONOR HIGHLIGHTS
- 20 KIDS CORNER

- 23 NEW FALL EXHIBITS
- 24 FUNDRAISING HIGHLIGHTS
- 25 AQUARIUM ACCOLADES
- 27 CONSERVATION CORNER

PACIFIC CURRENTS is published for members of the Aquarium of the Pacific. If you have comments about this magazine, please send an email 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.

PACIFIC CURRENTS STAFF | Editor/Writer: Claire Atkinson | Copy Editor: Cecile Fisher | Designer: Andrew Reitsma | Contributing Writers: Raelene Bautista and Lindsay Yates

HOURS | Open daily from 9:00 a.m.-6:00 p.m. except Dec. 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)
 - Development951-1605
 - Pacific Circle.....951-1664
 - Lost & Found.....951-1733
 - Private Event Info951-1663
 - Education Programs951-1630
 - Gift Store.....951-ISEA (1732)
 - Job Hotline.....951-1674
 - Volunteer Hotline.....951-1659
 - Advanced Ticket Sales...590-3100, ext. 0
(Note: \$2 service charge per ticket, up to \$10.)
 - Group Reservations951-1695

COVER: ANDREW REITSMAN



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

ARCTIC FOX PUPS JOIN POLAR PROGRAM



THE AQUARIUM has welcomed two male Arctic fox pups as new program animals. The two brothers are part of the Aquarium of the Pacific's Arctic & Antarctic: Our Polar Regions in Peril program. Similar to the Aquarium's other program animals, trainers will bring the

kits out on harnesses for view by the public on a regular basis. A young Arctic fox is called either a pup or a kit. A litter usually has about seven kits but may contain up to fifteen.

ROBIN RIGGS



Invertebrate animals were carefully packed and shipped to the Aquarium.

AQUARIUM DISPLAYS ANIMALS FROM ALASKA

IN MAY Aquarium biologists traveled to Seward, Alaska to collect new animals in one of the institution's largest single acquisition efforts since the Aquarium's opening. Assistant Curator Steve Blair, Curator Sandy Trautwein, Aquarist Jennifer O'Quin, and Assistant Curator Nate Jaros (pictured below) conducted daily dives in Resurrection Bay, where water temperatures were between 36 and 42 degrees Fahrenheit.



About 20 percent of the animals collected were fish and the remainder invertebrates, including sea pens, sea stars, several crab species, tube worms, anemones, different types of algae, soft corals, and sea cucumbers. Colleagues at the Alaska SeaLife Center in Seward partnered with the Aquarium of the Pacific biologists, assisting them in planning their collecting trips (permitted by the Alaska Department of Fish and Game) and loaning them a boat, diving and collection equipment, and holding tanks. Animals were carefully packed and shipped by cargo plane to Long Beach, where biologists worked to help them acclimate to the Aquarium's facilities. The animals are now on display in the Arctic & Antarctic: Our Polar Regions in Peril exhibit and Northern Pacific Gallery.



PENGUINS STRANDED IN BRAZIL FIND A NEW HOME

I N APRIL THE AQUARIUM OF THE PACIFIC WELCOMED FIVE RESCUED MAGELLANIC PENGUINS that were found stranded on a beach in Brazil. Magellanic Penguins are typically found near the southern tip of South America in Chile and Argentina, where they feed on small fish such as sardines and anchovies. The hundreds of stranded penguins, most of

which were in their first year, were believed to have traveled out of their normal range in search of food. After their rescue, some of these birds were strong enough to return to the wild, while others were deemed non-releasable because of health issues. The Aquarium's penguins will be cared for behind the scenes until May 2012 when the Aquarium debuts its new June Keyes Penguin Habitat.



AQUARIUM SEA OTTER PARTICIPATES IN STUDY

I N APRIL, CHARLIE, one of the Aquarium of the Pacific's five southern sea otters, traveled north to Santa Cruz, California to participate in an auditory study. The research is being conducted by the Pinniped Cognition & Sensory Systems Laboratory based at the Long Marine Lab at the University of California, Santa Cruz. In exchange for Charlie's time in Santa Cruz, the lab's otter Odin was sent to the Aquarium.

Odin was originally slated to participate in the study, which is examining underwater hearing sensitivity in sea otters, but was found to have some hearing loss. The researchers contacted the Aquarium about the possibility of Charlie's participation in the study. Charlie was evaluated and determined to be a good candidate. The arrangement is temporary and Charlie will return home to the Aquarium in about a year.

Odin was rescued from the wild in 2003 when he was found stranded as a young pup at a few weeks of age. He was later released into the wild but was returned to rehabilitation in 2008 and was eventually deemed non-releasable. The United States Fish and Wildlife Service placed Odin at the Long Marine Lab.

A TRIBUTE TO ODIN THE SEA LION



A QUARIUM STAFF MOURNED THE LOSS OF ODIN the California sea lion when he passed away in May.

The Aquarium has received all the results from the necropsy and related tests to determine the cause of death for Odin the sea lion. He died of asphyxia while experiencing a seizure. Unfortunately, the pathology tests did not reveal a specific cause of the seizure, such as toxins, viruses, or tumors. It is believed he may have had an underlying seizure condition such as epilepsy.

Odin was found stranded and malnourished as a pup in 2006 on Zuma Beach in Malibu, California and was deemed non-releasable to the wild because he was completely blind and could not hunt for food. "When he joined our mammals in his new home, he was quickly adopted by our other

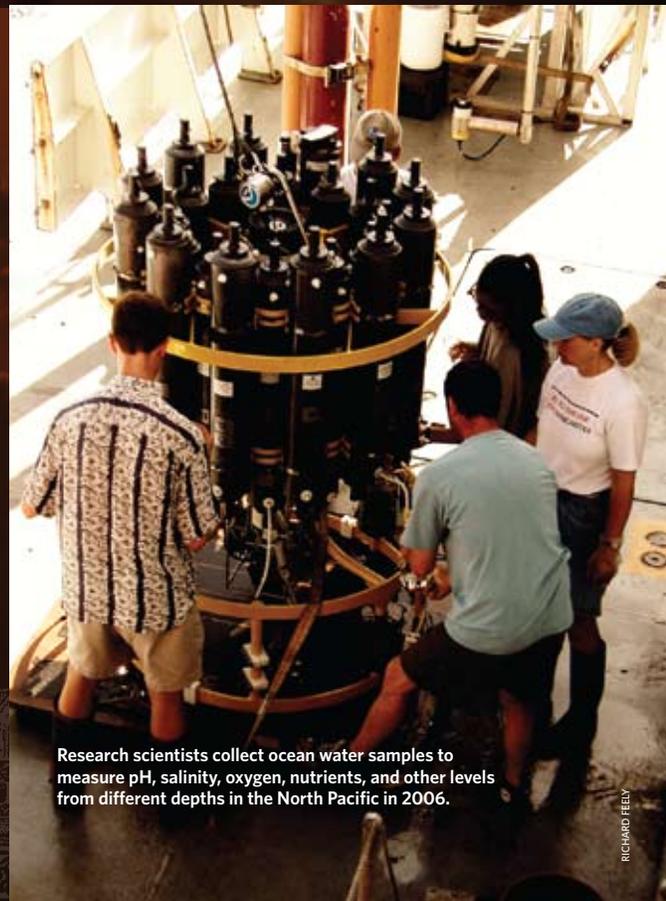
sea lions who accompanied him around the exhibit for the first time. After that, he could glide around the exhibit on his own," said Perry Hampton, Aquarium of the Pacific vice president of animal husbandry.

Odin was named after a Norse mythological character who had given up an eye to drink from the fountain of wisdom. His care and feeding was sponsored by Pacific Circle members Peri and Peg Urvek. "He was one of our smartest animals. Although he was blind and rescued from the wild, he would often learn things faster than other sea lions with full vision," Hampton said. The male sea lion had been a favorite among staff and visitors who were inspired by Odin. "He will be greatly missed," Hampton said.

Most of our energy use results in carbon dioxide emissions that contribute to climate change. Some of this carbon dioxide is also absorbed by the ocean and could cause lasting changes to ocean chemistry and biology.

CARBON, CLIMATE CHANGE, AND THE OCEAN

The upper ocean has become 30 percent more acidic since the Industrial Revolution.



Research scientists collect ocean water samples to measure pH, salinity, oxygen, nutrients, and other levels from different depths in the North Pacific in 2006.

THERE ARE TWO MAJOR WAYS our carbon emissions are affecting the ocean and the organisms that live there. First, carbon dioxide (CO₂) in the atmosphere is capturing heat, causing temperatures on land and in the ocean to rise. Second, the added carbon dioxide is causing chemical changes as the natural carbon cycle transfers more carbon dioxide into the ocean.

Scientists are studying ways these two phenomena—a warmer ocean and changing chemistry of sea water—could affect the physiology and behavior of marine life, availability of food resources, and entire ecosystems.

THE CARBON REVOLUTION

With the dawn of the Industrial Revolution man-made carbon dioxide emissions began to enter the atmosphere at a rapid rate near the end of the eighteenth century. The burning of coal, oil, and natural gas has been increasing exponentially since then, and this trend is now driven by the rapid industrialization of developing nations, like China and India. Carbon is cycled through Earth's environment naturally, but humans have added increasing amounts of carbon dioxide each year for nearly three centuries—more than 500 billion tons in total. The ocean absorbs about one quarter of the carbon dioxide we release into the atmosphere every year, according to the National Oceanic and Atmospheric Administration (NOAA).

Carbon dioxide is absorbed by the ocean because, on average, its concentration in the air is higher than in the surface layer of the ocean. Once there, carbon dioxide reacts with water to form

carbonic acid, which releases a hydrogen ion, lowering the pH of sea water. The pH scale ranges from 0 to 14; 7 is neutral. Anything above 7 is basic and anything below 7 is acidic. The scale is logarithmic, meaning each whole pH unit represents a tenfold change in value; thus a substance with a pH of 4 is ten times more acidic than one with a pH of 5.

The natural pH of sea water before the Industrial Revolution was about 8.1. Over the past 250 years or so, the pH of the upper ocean has decreased by more than 0.1 pH units. This means sea water has become 30 percent more acidic since the Industrial Revolution through a process scientists call ocean acidification. If carbon emission trends stay on course, by the end of this century the pH of sea water could fall to around 7.8. This would make it 150 percent more acidic than before the Industrial Revolution, according to NOAA.

OCEAN ACIDIFICATION

This change in ocean pH is measurable and has been recorded by scientists around the world. "From a purely biological perspective, the impacts of ocean acidification on ecosystem response and biodiversity in the oceans may be just as severe as the global warming impacts on land-based ecosystems," says Dr. Richard Feely, senior scientist at the NOAA Pacific Marine Environmental Laboratory in Seattle.

The concept of ocean acidification has been discussed in the scientific literature since the 1970s. It wasn't until the 1990s however, when impacts on ocean organisms were identified, that the issue gained significant attention from scientists. The underlying chemical changes were documented on a global scale in the early 2000s. The term "ocean acidification" was coined at that time by environmental scientist Ken Caldeira.

Since then, the subject has seen a great deal of attention from the scientific community. However, many members of the public are still largely unaware of ocean acidification and its implications.

To date, most of the impacts of ocean acidification on marine species have been documented in laboratory experiments, not in the ocean. While some impacts have been seen on shellfish larvae in aquaculture facilities, most of what scientists believe will occur in the ocean is based on lab studies. In these studies, organisms are exposed to high levels of carbon dioxide in controlled experiments. In the wild, many variables could delay or alter the effects of ocean acidification. Such factors as the availability of other nutrients, sunlight, and water temperature could affect what impacts are seen, when, and at what levels.



EFFECTS ON SHELLFISH

One of the most obvious and significant ways ocean acidification could affect a large number of animals is by inhibiting their ability to build calcium carbonate shells. This is because of the lower carbonate ion concentrations in more acidic sea water. Scientists have conducted studies in which the acidity of sea water is altered to resemble projections for the ocean at the end of this century. When calcifying organisms are introduced into these environments, they have a difficult time producing their shells and skeletons. In more acidic sea water, adult shellfish produce their shells more slowly and their shells can become pitted. Juveniles and larvae have a much harder time forming shells and suffer irreparable damage at a sensitive stage of life. From oysters and crabs to sea urchins, lobster, shrimp, and corals, organisms that form calcium carbonate as part of their skeletal material could suffer damage in sea water with a lower pH.





CARLSBAD AQUAFARM

CASE STUDY: OYSTER FARMS

Oysters in aquaculture operations have demonstrated the effects of ocean water with lower pH. Oyster larvae are planktonic in the first two or three weeks of life. As their shells grow, they sink to the sea floor where they grow to adulthood. The oyster industry in the Pacific Northwest suffered in the 2000s when low-pH ocean water kept oyster larvae from successfully forming shells. Oyster production fell sharply in the state of Washington between 2005 and 2008. Federal funds allowed farms to work with NOAA scientists to install equipment to test the chemistry of the water. Intake water at oyster farms included ocean water brought

in by natural upwelling. This water is colder, lower in pH, and nutrient-rich. But ocean acidification had brought pH levels low enough to reduce oyster larvae numbers. Scientists were able to determine that turning off intake valves at certain times of day to avoid the low-pH waters improved conditions, and the farms were able to recover. Wild fisheries in the United States—including lobster, crabs, and shrimp—could be impacted by ocean acidification as pH levels fall, since their environments cannot be manipulated in the same way as oyster aquaculture farms.

CLIMATE AND THE OCEAN FOOD WEB

Scientists are working to determine how climate change and ocean acidification will affect plankton and other organisms at the base of the ocean food web. Generally, plankton are tiny plants (phytoplankton) and animals (zooplankton) found in the ocean and freshwater lakes, although any free-floating organism can be called plankton, including sea jellies. Phytoplankton are most dense in the surface layer of the ocean, where light levels allow photosynthesis to occur. The rate of photosynthesis is also a function of the availability of nutrients such as nitrogen and phosphorous. In the open ocean these typically are supplied from the upwelling of deeper, nutrient-rich waters. Some scientists believe that climate change could affect the strength and frequency of upwelling events, which could change the structure of some marine food webs.

When the surface layer of the ocean warms, it becomes less dense and acts like a cap, making it harder for colder water to rise. This

phenomenon could, in some regions of the ocean, reduce productivity of the food web and limit food resources for a wide array of marine animals. Upwelling may also be enhanced or hindered by changing wind patterns that result from the warming climate.

Reports out of Antarctica are revealing a connection between climate change and reduced populations of krill, which rely on a certain type of phytoplankton for food. Krill are small, shrimp-like animals found in oceans all over the world. The Antarctic krill subspecies has seen substantial declines in population due in part to loss of sea ice cover and changes in the salinity of Antarctic sea water caused by melting continental glaciers. These factors have impacted the spawning habitat and food supply for the krill, lowering their numbers, which has larger implications for the animals that rely on krill for food. Krill serve as the main food source for many animals, including fish, penguins, seals and baleen whales. There has also been a growing fishery for krill.



IMPACTS ON CORAL REEF HABITAT AND ANIMALS



Reef-building corals may experience some of the most major losses from ocean acidification and warming water temperatures. Both contribute to coral bleaching, wherein corals cannot sustain the symbiotic algae that give them their color and provide nutrients.

Coastal development, which can introduce silt, fertilizers, and other pollution into rivers and streams that flow into the ocean, also poses a threat and reduces the resiliency of corals to deal with warming and acidification. Some scientists predict that these pressures combined could push coral reefs to extinction within the next two or three decades.

The process by which corals form their calcium carbonate skeleton is inhibited by ocean acidification. A study of corals in Papua New Guinea conducted by marine biologists Katharina Fabricius and Chris Langdon found that a low-pH environment around shallow volcanic carbon dioxide seeps—an environment that replicates expected ocean pH levels at the end of the

century—significantly reduced coral diversity and impacted structural complexity and resilience. “These examples clearly show us that what we see in the field is consistent with what we’re studying in the laboratory,” Feely says.

Coral reefs serve as nurseries and homes for many species of fish, including some that humans depend on for food. Clownfish live around coral reefs and select a sea anemone as a host. But high carbon dioxide concentrations have been shown to affect their ability to “smell” their way home. Clownfish use their olfactory senses to navigate their habitat and identify their host anemone, family members, and food. Changes to water composition appear to have a negative impact on this ability, as well as the fish’s avoidance mechanisms for steering clear of predators. While studies have not described exactly why this occurs, these observations indicate that changes in water composition brought on by ocean acidification may not bode well for many reef fish.



JELLIES AND ALGAE FLOURISH

Organisms that flourish in environments with an abundance of carbon dioxide and warmer temperatures include macroalgae, sea grasses, and sea jellies. Climate change and ocean acidification could lead to population explosions of these organisms. Large numbers of jellies could affect fisheries because they feed on larval fish and clog nets.

LASTING IMPACTS

The longer we delay in stopping wasteful and destructive practices, the longer the time scales for recovery and the greater the uncertainty in the outcome.

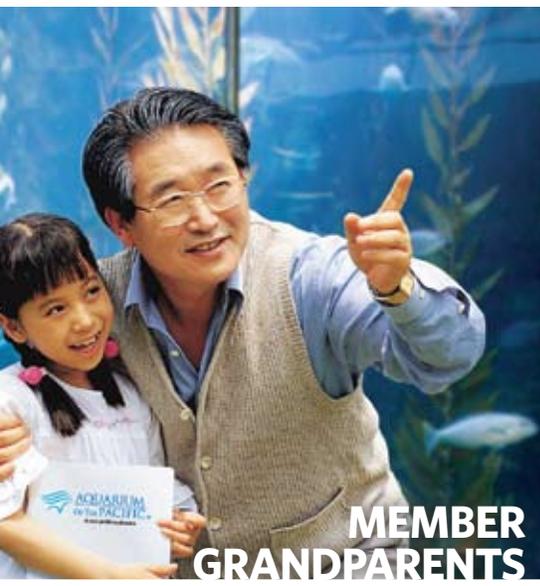
Ocean warming and acidification are both occurring as a result of increasing carbon dioxide emissions into Earth’s atmosphere from the burning of coal, oil, and natural gas. Their impacts on ocean life are compounded by other stresses, including overfishing and destructive fishing practices, habitat degradation, and pollution. Collectively these stresses have reduced the resiliency of coastal and ocean ecosystems to cope with natural and human-induced changes and have put these ecosystems at risk. Recovery times from overfishing and destructive fishing, habitat destruction, and pollution typically are much shorter than recovery from ocean warming and acidification. The former may be a few decades; the latter may take tens to hundreds of thousands of years. The longer

we delay in stopping these wasteful and destructive practices, the longer the time scales for recovery and the greater the uncertainty in the outcome. Humans, particularly our children and their children, have the most to lose.

The good news is that we can reverse these trends. We have the knowledge and the technology, and individuals can make a difference. Inform yourself and others about climate change and ocean acidification, take steps to reduce your carbon footprint, and encourage elected officials to take action. For ideas and resources, visit the Aquarium’s What You Can Do page on its website at http://www.aquariumofpacific.org/exhibits/arctic_antarctic/what_you_can_do/.

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

GREAT AQUARIUM ACTIVITIES!



MEMBER EVENTS

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

M MEMBER LATE NIGHT & SPARK OF LOVE TOY DRIVE

SUNDAY, NOVEMBER 13 | 6:30 p.m.–9:30 p.m.

Join us for a special Member Late Night as we collect toys for the Long Beach Fire Department's Annual Spark of Love Toy Drive benefiting local Long Beach families and children in need this holiday season. Each person bringing a new and unwrapped toy valued at \$15 or more will receive one complimentary Aquarium admission ticket. Then explore the Aquarium, enjoy live music, and watch the nightlife of our animals. Pacific Collections Gift Store will offer a 20 percent discount off all purchases and Café Scuba will be open until 8:00 p.m. The entire Aquarium will be open except for Lorikeet Forest. To ensure the animals get a good night's sleep, exhibit lighting will begin to dim at 8:30 p.m.

COST | Free for members; members may bring four guests at no charge.

RSVP | (562) 437-FISH (3474); required by November 10. Reservations are taken on a first-come, first-serve basis and are required as space is limited.

MEMBER EVENTS

M MEMBER GRANDPARENT GAME NIGHT THURSDAY, DEC. 29 | 6:30 p.m.–9:30 p.m.

The holiday season is a special time to spend with families and our first-ever Member Grandparent Game Night is a great way to use the brand new Grandparent Membership. The Aquarium's Great Hall will be transformed into a game room with arts and crafts, face painting, pie-eating contests, video games, relay races, and bingo for grandparents and grandchildren to enjoy together. Purchase a delicious dinner at Café Scuba, stroll through the Aquarium's galleries, and take advantage of a 20 percent discount off all purchases in the Pacific Collections Gift Store. The entire Aquarium will be open except for Lorikeet Forest. To ensure the animals get a good night's sleep, exhibit lighting will begin to dim at 8:30 p.m.

COST | Free for members; members may bring guests with their 20% off general admission.

RSVP | (562) 437-FISH (3474); required by December 26. Reservations are taken on a first-come, first-serve basis and are required as space is limited.

M SENIOR MEMBER AFTERNOON WEDNESDAY, JAN. 25 | 2:00 p.m.–3:00 p.m. & 3:30 p.m.–4:30 p.m.

Senior members will have the opportunity to spend the afternoon with Aquarium educators in our newest exhibit, the Ocean Science Center featuring the National Oceanic and Atmospheric Administration's Science on a Sphere®. Enjoy a snack of cheese, crackers, and a cool beverage while witnessing the effects of sea level rise and learning about ports and maritime trade in this immersive, multimedia experience. Then, exclusively for senior members, be one of the very few guests to witness some of the other capabilities of Science on a Sphere® not shown to the general public.

COST | Free for members.

RSVP | (562) 437-FISH (3474); required by January 22. Reservations are taken on a first-come, first-serve basis and are required as space is limited.

SPECIAL EVENTS

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

SE PHOTOGRAPHERS NIGHT SUNDAY, SEPTEMBER 25 | 5:30 p.m.–10:00 p.m.

Professional and amateur photographers alike are invited to attend Photo Night. Capture the Aquarium's stunning wildlife during exclusive "photographers-only" hours. Meet camera vendors like Canon and Nikon, test new equipment, attend workshops, and meet other wildlife photo enthusiasts.

COST | \$18.95/members, \$24.95/non-members
INFO | (562) 590-3100, ext. 0

SE SHARK LAGOON NIGHTS FRIDAYS, OCTOBER 7 THROUGH DECEMBER 30 EXCEPT OCTOBER 28

Shark Lagoon is open for everyone for free from 6:00 p.m. to 9:00 p.m. Guests can touch and learn about sharks, shop at Shark Shack, and enjoy live music on select nights.

COST | Free for everyone
INFO | (562) 590-3100, ext. 0

SE KIDS FUN RUN SATURDAY, OCTOBER 8 | 9:00 a.m.–12:00 p.m.

Kids ages 6 to 12 can race for FREE in the Aquarium Kids Fun Run. Participants will receive a commemorative octopus medal, a finisher certificate, and FREE Aquarium admission (applicable to child runners only). As part of a major emphasis on improving youth health and fitness as well as helping to counter the childhood obesity epidemic, the Aquarium of the Pacific has joined forces with RUN Racing and the Long Beach International City Bank Marathon & Half Marathon. Together we will host this free one-mile Kids Fun Run. Note that space is extremely limited.

RSVP | (562) 427-4606
INFO | www.runlongbeach.com

SPECIAL EVENTS



SE SEA FARE

SATURDAY, OCTOBER 15 | 7:00 p.m.-11:00 p.m.

Help support the Aquarium's education, conservation, and animal care programs. Enjoy food from more than twenty-five local restaurants as well as sustainable seafood cooking demonstrations, dancing, live music, and more.

INFO | See back cover.

SE VETERANS DAY

FRIDAY, NOVEMBER 11 | 9:00 a.m.-5:00 p.m.

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

COST | One free admission with valid service ID.

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

SE THANKSGIVING LUNCH

THURSDAY, NOVEMBER 24 | 11:00 a.m.-5:00 p.m.

Enjoy a traditional Thanksgiving buffet with all the trimmings in the Aquarium's Café Scuba. Then stroll through the galleries to meet over 11,000 animals from the world's largest ocean. Watch as the Aquarium's animals gobble up their food during the daily feeding shows at the Sea Otter Habitat, Tropical Reef Habitat, Seal & Sea Lion Habitat, Shark Lagoon, and the Blue Cavern Habitat.

COST | \$25/adult member and \$17/child member (3-11); \$35/guest adult and \$27/guest child (3-11). Aquarium admission is included.

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

FESTIVALS

To honor the rich diversity of Southern California, the Aquarium of the Pacific hosts cultural and family festivals throughout the year. Check our website for more details and additional family festivals.

GE SOUTHEAST ASIA DAY

SATURDAY, OCTOBER 8 | 9:00 a.m.-5:00 p.m.

Southeast Asia Day will highlight the beauty and diversity of Cambodia, Thailand, Vietnam, Myanmar, Laos, and Indonesia. Enjoy live performances, including music and dance. 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% off regular admission

INFO | (562) 437-FISH (3474)



FESTIVALS

GE SCARIUM OF THE PACIFIC

SAT. & SUN., OCTOBER 22 & 23 | 9:00 a.m.-5:00 p.m.

Discover the creatures lurking in the depths of the ocean at the Scarium of the Pacific—a spooktacular educational Halloween event for the whole family that's more fun than fright. Enjoy special Halloween programs, including the annual children's costume contest, the creepy coloring contest, a magic show, underwater pumpkin carving, spooky storytelling, kooky crafts, eerie animals in the Great Hall, and much more. L.A. Parent is sponsoring this event.

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

INFO | (562) 437-FISH (3474)



GE AUTUMN FESTIVAL

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

Delve into the arts, cuisines, cultures, and marine environments of Asia during the Aquarium of the Pacific's 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. The festival will feature traditional crafts, music, dance, demonstrations, cultural arts exhibits, ethnic cuisine, storytelling, and much more.

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

INFO | (562) 437-FISH (3474)

GE NOAA DAY

SATURDAY, NOVEMBER 19 | 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. Visit the Aquarium to learn how NOAA, a government agency, works to understand and predict changes in Earth's environment to conserve and manage coastal and marine resources.

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

INFO | (562) 437-FISH (3474)

FESTIVALS

GE HOLIDAY TREATS FOR THE ANIMALS

SAT. & SUN., DECEMBER 3 & 4 | 9:00 a.m.-5:00 p.m.

In celebration of the holiday season, guests can watch Diver Santa deliver gifts to the Aquarium of the Pacific's sea otters, seals, sea lions, birds, fish, and other animals. Families can enjoy holiday music, crafts, unique photo opportunities, shopping, and more. The Seal and Sea Lion Habitat will be decked out for the "sea"son with frozen "fishmas" treats. Guests can watch the sea otters enjoy candy cane-shaped ice treats, gourmet lobster tails, and their very own snowman.

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

INFO | (562) 437-FISH (3474)

GE UNDERWATER PARKS DAY

SATURDAY, JANUARY 21 | 9:00 a.m.-5:00 p.m.

Learn about the four networks of underwater parks called marine protected areas (MPAs) off the coast of Southern California. Share an underwater adventure with an Aquarium diver to learn how MPAs are monitored. Learn about different habitats along our coast and search for habitats modeled after MPAs in the Aquarium's exhibits.

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

INFO | (562) 437-FISH (3474)

GE FESTIVAL OF HUMAN ABILITIES

SAT. & SUN., JANUARY 28 & 29 | 9:00 a.m.-5:00 p.m.

Celebrate the creative talents and abilities of people with disabilities. Featured activities include wheelchair dance, live music, storytelling, signing choirs, art demonstrations, and accessible SCUBA diving demonstrations. Free interactive classes for people of all ages and abilities will also be offered. Sign language interpreters will be present at all major shows and an audio tour is available for those who are blind. Extra elevators and assistance dog relief areas will be available to the public.

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

INFO | (562) 437-FISH (3474)



GUEST SPEAKERS

The Aquarium hosts guest lectures on a variety of topics from experts across the country.

CS CRAIG HEBERER | *The Good, the Bad, and the Ugly: The State of Our Pacific Tuna Resources*
TUESDAY, OCTOBER 11 | 7:00 p.m.

Born and raised in San Pedro, California, Craig Heberer is part of the Croatian commercial tuna fishing tradition in the harbor area. Like most fishing communities in the United States, the Croatian fishermen have experienced tumultuous times of late based in part on the precarious state of Pacific tuna resources. In his presentation, Heberer will discuss the ecology and life history of tunas, status of the stocks, the polemic issue of bycatch, the expanding role of marine aquaculture, the health benefits and risks of eating tuna, sustainable seafood campaigns, and the impacts of our dependence on imports of foreign seafood.

Heberer currently works as a fisheries biologist with National Oceanic and Atmospheric Administration Fisheries, Southwest Region, Sustainable Fisheries Division. He serves as the lead biologist for the Fishery Management Plan for U.S. West Coast Fisheries for Highly Migratory Species.

GUEST SPEAKERS

CS DANIEL BELTRÁ AND DR. LARRY MCKINNEY | *The Deepwater Horizon Blowout: Two Perspectives—An Artist and a Scientist*
THURSDAY, OCTOBER 13 | 7:00 p.m.

Photographer Daniel Beltrá and researcher Dr. Larry McKinney will give a joint lecture to open the exhibition of Beltrá's aerial photographs that will be on view at the Aquarium October 13, 2011 through January 15, 2012. Beltrá's photographs depict the aftermath of the April 2010 Gulf of Mexico oil spill, which he shot off the coast of Louisiana. McKinney will give an update on the recovery of marine life in the Gulf of Mexico after the oil spill. The two speakers will discuss the world's dependency on oil and gas, the costs and consequences of this reliance, and what can be done to reduce this dependency and transition to non-fossil fuels.

Beltrá was born in Madrid, Spain and is currently based in Seattle. His photography covering the Gulf spill earned him an Award of Excellence from the Pictures of the Year International contest, the Special Prize for DAYS JAPAN International Photojournalism Award, and he was named one of the forty most influential nature photographers in 2010 by *Outdoor Photography* magazine. McKinney is the executive director of the Harte Research Institute for Gulf of Mexico Studies. Reservations are required for this lecture. Contact Linda Brown at (562) 951-1648 or lbrown@lbaop.org.

CS JUDITH WEIS | *Do Fish Sleep?*
TUESDAY, OCTOBER 18 | 7:00 p.m.

The diverse fish species of the world play important roles in our ecosystems and environment. They may appear to live a dull existence, but these animals can change color and sex, produce light and electricity, regenerate injured fins, and some can even walk on land. Dr. Judith Weis will discuss these and other remarkable facts from her recent book, *Do Fish Sleep? Fascinating Answers to Questions about Fishes*. Copies of Weis' book will be available for purchase and Weis will be signing copies after the lecture.



Weis is a professor of biological sciences at Rutgers University. Her research focuses on estuarine ecology, and her last book, *Salt Marshes: A Natural and Unnatural History*, was published in 2009. She is currently chair of the Science Advisory Board of the New Jersey Department of Environmental Protection.

GUEST SPEAKERS

CS ROB MORTENSEN | *Micronesian Kingfisher 101: A Conservation Success Story*
TUESDAY, OCTOBER 25 | 7:00 p.m.

Ninety-three percent of bird species that are now extinct were island endemics—those found only on their native island. Island species are particularly vulnerable to extinction. The Guam Micronesian Kingfisher was nearly wiped out by the invasive brown tree snake in the 1940s. The Association of Zoos and Aquariums (AZA) collected the remaining birds in Guam and established a breeding program and survival plan for the species in 1984. There are now 134 birds at about twenty-five AZA institutions. In this lecture, Rob Mortensen, the Aquarium's assistant curator of birds and mammals, will discuss the Micronesian Kingfisher and explain how the Aquarium is involved in its species survival plan.

Mortensen previously served as a zookeeper at the Santa Barbara Zoo, a senior aquarist at the John G. Shedd Aquarium in Chicago, and an attack helicopter crew chief for the U.S. Army. He earned his bachelor's degree in zoology and geology from Western Illinois University.

CS HENRY POLLACK | *The New Face of the Arctic*
WEDNESDAY, NOVEMBER 9 | 7:00 p.m.

No place on Earth is changing faster than the rapidly warming Arctic. Guest speaker Henry Pollack will explain how the thawing of Asian and North American permafrost, the destruction of Arctic Ocean sea ice, the thinning of the Greenland ice sheet, and the disruption of Arctic ecosystems are all proceeding at an extraordinary pace and will have consequences that extend well beyond the Arctic region. Copies of Pollack's book, *A World Without Ice*, will be available for purchase, and there will be a book signing after the lecture.

Pollack is a professor of geophysics (emeritus) at the University of Michigan, where he served as chairman of the department of geological sciences and associate dean for research in the College of Literature, Science, and the Arts. Pollack has served on many advisory panels for the National Science Foundation, provided briefings about climate change to Congress and the White House, is a science advisor to former Vice-President Al Gore's Climate Project, and was a contributing author to the Nobel Prize-winning Intergovernmental Panel on Climate Change Fourth Assessment Report.

GUEST SPEAKERS

GS JOHN CALAMBOKIDIS |
Blue Whales Off Southern California:
Insights from New Research Into
Their Status and Threats

THURSDAY, NOVEMBER 17 | 7:00 p.m.

Researchers are investigating recent changes in blue whale populations and distribution off the West Coast as well as new insights into their underwater behavior. Whale expert



John Calambokidis will discuss the threats to these populations and highlight the Aquarium of the Pacific's contribution to long-term photographic identification research on blue and fin whales.

Calambokidis is a research biologist and one of the founders of Cascadia Research, a non-profit research organization formed in 1979 based in Olympia, Washington. He periodically serves as an adjunct faculty member at the Evergreen State College, teaching a course on marine mammals.

Pacific Circle members are invited to a private reception to meet Calambokidis before the lecture. To join the Pacific Circle, visit our website or call (562) 951-1641.

GS WENDY WILLIAMS | *Kraken: Tales of*
Octopus Smarts and Super Cephalopods
THURSDAY, DECEMBER 1 | 7:00 p.m.

Centuries ago, Aristotle called the octopus "stupid." That sobriquet defined our attitude toward these highly developed cephalopods until only a few years ago, when scientists began to unravel the true nature of the octopus, the cuttlefish, and even the giant squid. In her presentation, Wendy Williams will tease out fact from fiction based on the findings in her new book, *Kraken: The Curious, Exciting, and Slightly Disturbing Science of Squid*. She will reveal some of the most recent findings about cephalopods and share her adventures with squid hunters, octopus aficionados, and some of the animals themselves. Williams will be on hand after the lecture to sign copies of her book, which will be available for purchase.

Author of five books, Williams has written about science for the last thirty years. For more than eight years, she has chronicled the developing story of Cape Wind, the nation's first offshore wind farm. Her writing has appeared in the *Wall Street Journal*, the *New York Times*, *Science*, *Scientific American*, and *Ladies Home Journal*.



MICRONESIAN KINGFISHER 101

ROBIN RIGGS

GUEST SPEAKERS

GS DR. ELLEN PRAGER | *Sex, Drugs,*
and Sea Slime: The Oceans' Oddest
Creatures and Why They Matter

THURSDAY, JANUARY 19 | 7:00 p.m.

Dr. Ellen Prager will present stories and images from her new book, *Sex, Drugs, and Sea Slime*, highlighting the strange cast of characters that inhabit the oceans' depths and how they are connected to our food supply, the economy, jobs, and in biomedical research and biotechnology. These sea creatures include the tiny voracious arrow worms, whose predatory ways may lead to death by overeating, the hagfish that ties itself into a knot to keep from suffocating in its own slime, and the sea slug, whose sexual encounters can truly turn into a dangerous liaison due to untimely cannibalism. Copies of Prager's book will be available for purchase, and there will be a book signing after the lecture.



Prager is formerly the chief scientist for the Aquarius Reef Base program in Key Largo, Florida. She also served as assistant dean at the University of Miami's Rosenstiel School of Marine and Atmospheric Science. She remains an adjunct faculty member at the school.

GUEST SPEAKERS

GS JOHN SEAGER | *Global Population: 6.9*
Billion and Growing. Are We There Yet?
TUESDAY, FEBRUARY 21 | 7:00 p.m.

With the Earth's population growing by one billion every dozen years, there is a clear connection between human population growth and virtually every global challenge, from poverty to climate change and from species extinction to the political instability of failed nation-states. Solutions to global population stabilization include access to affordable voluntary family planning together with the full empowerment of women, says John Seager, president of Population Connection. In his presentation, Seager will give a brief overview of the causes of rapid population growth, its impacts, and how to meet this challenge through voluntary approaches.

Seager has previously served with the U.S. Environmental Protection Agency and as chief of staff for former U.S. Representative Peter H. Kostmayer (D-PA). Seager joined Zero Population Growth in 1996 (the name of the organization was changed to Population Connection in 2002). He was appointed president and chief executive officer in 2005. Population Connection is the national grassroots population organization that educates young people and advocates progressive action to stabilize world population at a level that can be sustained by Earth's resources.

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

INFO | (562) 437-FISH (3474)

Guest speaker sponsor:





DIVE IMMERSION

AQUARIUM SLEEPOVERS

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

SL BIRTHDAY PARTY SLEEPOVER

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

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

COST | \$60/member | \$70/non-member

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

THEMES | *Sharks, Marine Mammals, or Turtles*

GROUP SIZE | 20-50 participants

RSVP | (562) 951-1630

SL ADULT SLEEPOVER

BASED ON AVAILABILITY | 6:00 p.m.-9:00 a.m.

Enjoy the tranquility and serenity of the Aquarium at night. Unwind with yoga and meditation before meeting an animal, hearing an informal lecture by a marine educator, taking guided tours, seeing special presentations, and sleeping next to one of our large exhibits. Included are a gourmet pizza dinner with wine, beer, or soda, and a continental breakfast.

COST | \$60/member | \$70/non-member

AGES | 18+ years

GROUP SIZE | 20-60 participants

RSVP | (562) 951-1630

SL YOUTH GROUP SLEEPOVERS

MONDAY OR WEDNESDAY EVENINGS

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

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

COST | \$50/member | \$60/non-member

AGES | 5+ years, plus adult chaperone

GROUP SIZE | 20-60 participants

RSVP | (562) 951-1630

SL FAMILY SLEEPOVER

HALLOWEEN FAMILY SLEEPOVER

FRIDAY, OCTOBER 21 | 5:00 p.m.-7:00 a.m.

Have a "spooktacular" evening at the Aquarium with creepy crawly critters, pumpkin painting, and a freaky flashlight tour. Included in your sleepover will be a pizza dinner, light snack, animal interactions, cereal breakfast, and more. Family friendly costumes welcome. Space is limited so sign up today.

COST | \$50/member | \$60/non-member

AGES | 5+ years, plus adult chaperone

RSVP | (562) 951-1630

AQUARIUM TOURS

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

AT BEHIND-THE-SCENES TOURS

DAILY | *times vary*

Guests will go above our largest exhibit to feed the fishes, get a glimpse of areas behind Shark Lagoon, and see our Molina Animal Care Center.

COST | \$11/member | \$15/non-member
does not include Aquarium admission

AGES | 7+ years

LENGTH | one hour

GROUP SIZE | maximum 10 participants

RSVP | (562) 951-1630, online, or sign up on day of visit

AT ANIMAL ENCOUNTERS

SATURDAYS & SUNDAYS | *see times below*

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

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

COST | \$80/member | \$90/non-member
includes Aquarium admission

AGES | 10+ years: *Seals & Sea Lions* and *Sea Otters*

13+ years: *Sharks*

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

RSVP | (562) 951-1630

AQUARIUM TOURS

AT HARBOR TOUR

DAILY | *times vary*

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

COST | Members: \$12/adult, \$10/senior (62+), \$6/child (3-11) | non-members: \$34.95/adult, \$29.95/senior, \$16.95/child

includes Aquarium admission

RSVP | (562) 951-1630

AT DIVE IMMERSION

BASED ON AVAILABILITY | 3:00 p.m.-5:30 p.m.

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

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

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

RSVP | (562) 590-3100



ANDREW REFSMA

SPECIAL PROGRAMS

SP BIRTHDAY PARTIES

AVAILABLE BY RESERVATION ONLY

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

COST | \$33/member | \$39/non-member | 15 person minimum, includes Aquarium admission

AGES | all ages, one adult required per 10 children

THEMES | Sharks, Marine Mammals, or Turtles

GROUP SIZE | 15-45 participants

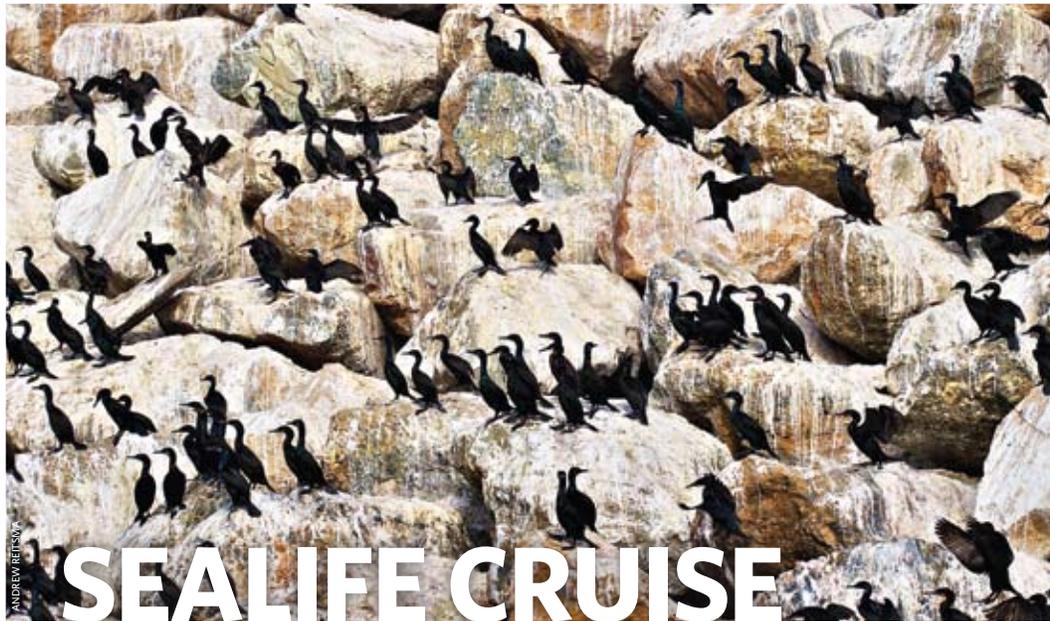
INFO | (562) 951-1630

SP AQUARIUM ON WHEELS

AVAILABLE BY RESERVATION ONLY

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

INFO | (562) 951-1630



ANDREW REFSMA

SEALIFE CRUISE

OUTDOOR ADVENTURES

Go beyond the Aquarium to participate in one of these offsite classes in the great outdoors.

QA DOLPHIN AND SEA LIFE CRUISE FALL SEASON

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

COST | Members: \$25/adult, \$20/senior (62+), \$15/child (3-11) | Non-members (includes Aquarium admission): \$43.95/adult, \$40.95/senior, \$29.95/child

LENGTH | 2-2.5 hours

AGES | Children under 16 must be accompanied by an adult

RSVP | (562) 951-1630

OUTDOOR ADVENTURES

QA GRAY WHALE WATCHING TRIPS SEASONAL

Take a voyage with Harbor Breeze Cruises in search of whales as they migrate along our coastline. Learn about these gentle giants from an Aquarium onboard educator.

COST | Members: \$25/adult, \$20/senior, \$15/child
Non-members (includes Aquarium admission): \$43.95/adult, \$40.95/senior (ages 62+), \$29.95/child (ages 3-11)

LENGTH | 2-2.5 hours

AGES | Children under 16 must be accompanied by an adult

RSVP | (562) 951-1630

WINTER PROGRAMS

WP 12 DAYS BY THE SEASHORE

SATURDAY, DECEMBER 10 | 9:30 a.m.-11:30 a.m.

Join us as we create a fun and educational holiday-inspired book in this two-hour workshop. Learn about twelve ocean creatures that live by the seashore, including sea stars, lobsters, sand dollars, and “five golden trevalies!” Not only will you discover fascinating facts about each of these animals as you tour through the galleries, but you will also take home a special keepsake book. Sign up now, as space is limited.

AGES | 7+ years; 3-6 years with adult chaperone

COST | \$30/member pair; \$14/member single or member add-on

\$42/non-member pair; \$20/non-member single or non-member add-on (includes Aquarium admission)

WP SEA SQUIRT WINTER CAMP

TUESDAY-THURSDAY, DECEMBER 20-22

This three-day camp offers an exciting introduction to marine biology for five- and six-year-olds. Campers will discover an underwater wonderland filled with wiggly fish, furry mammals, and fluffy birds. This camp encourages little ones to interact and explore independently from parents. Through hands-on activities, stories, crafts, and tours, your child will prove that little learners can learn big things.

AGES | 5-6 (children only)

COST | \$90/member; \$115/non-member

LENGTH | 8:30 a.m.-11:30 a.m.

RSVP | (562) 951-1630

WP WINTER DAY CAMP

TUESDAY-THURSDAY, DECEMBER 27-29

Join us as we explore the Pacific Ocean and its inhabitants during our three-day winter day camp adventure. Campers will learn about marine life through hands-on activities, games, and crafts. Participants will even get the chance to go behind the scenes at the Aquarium, meet our animal husbandry staff, and help us take care of some of the animals that make their home here at the Aquarium.

AGES | Grades 2-4 (children only, must be at least 7 to participate)

COST | \$100/member; \$125/non-member

LENGTH | 8:00 a.m.-12:00 noon

RSVP | (562) 951-1630



LEARN WHAT IT TAKES TO RUN A WORLD-CLASS AQUARIUM

YOUTH PROGRAMS

YP JUNIOR BIOLOGIST PROGRAM

SATURDAYS | 9:30 a.m.-11:30 a.m.

topics vary, see below

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

TOPIC Marine Mammals	October 8
Invertebrates	November 12
Fish	December 3
Birds & Reptiles	January 14

COST | \$19/member | \$24/non-member does not include Aquarium admission

AGES | 7-12

RSVP | (562) 951-1630

YOUTH PROGRAMS

YP JOB SHADOW

SATURDAYS | 9:00 a.m.-12:00 noon

topics vary, see below

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

TOPIC Veterinarian	October 1
Aquarist	November 5
Mammalogist.....	December 10
Aviculturist.....	January 7

COST | \$24/member | \$29/non-member does not include Aquarium admission

AGES | Grades 7-12

RSVP | (562) 951-1630



EXPLORE THE WORLD OF SEA CREATURES

SATURDAY FAMILY FUN PROGRAMS

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

FP TOTALLY TURTLES

SATURDAY, OCTOBER 22 | 10:00-11:30 a.m.

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

FP SHARK SLEUTHS

SATURDAY, NOVEMBER 19 | 10:00-11:30 a.m.

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

FP MAGNIFICENT MARINE MAMMALS

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

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

FP SEA JELLIES AND OTHER INCREDIBLE INVERTEBRATES

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

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

COST | ADULT-CHILD PAIR: \$24/member
\$36/non-member
EXTRA PERSON: \$10/person
(includes Aquarium admission)

AGES | 4-6 years, plus adult chaperone

RSVP | (562) 951-1630

AQUA TOTS

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

AQ MOVIN' & GROOVIN' BENEATH THE SEA

SATURDAY, OCTOBER 15 | 10:00-11:30 a.m.

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

AQ SLIPPERY TO PRICKLY

SATURDAY, NOVEMBER 12 | 10:00-11:30 a.m.

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

AQ SHORELINE SHAPES

SATURDAY, DECEMBER 3 | 10:00-11:30 a.m.

Did you know a sea jelly is shaped a lot like a bell or that some fishes are as flat as pancakes? In the Aquarium, there are eels so skinny they look like shoestrings! Explore the exciting shapes of ocean life through a craft, songs, and hands-on activities.

AQ SOUNDS OF THE SEA

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

Shake, rattle, and roll as we listen to the sounds of the ocean. Experience the wonderful world of sea sounds, from the songs of a big blue whale to the barking of a sea lion.

COST | ADULT-CHILD PAIR: \$24/member
\$30/non-member | ADDITIONAL PERSON:
\$10/person, includes Aquarium admission

AGES | 2-3 years, plus adult chaperone

RSVP | (562) 951-1630

OTHER CLASSES

CC UNDER THE SEA SHAPES

AVAILABLE BY RESERVATION ONLY

The ocean is full of incredible animals and vibrant colors. In this interactive educator- and video-led program, children will match ocean animals, such as sharks and sea anemones, to their shapes. This exciting program is designed especially for preschool and daycare groups.

COST | \$9/member or non-member (March-June)
\$7.50/member or non-member (July-February)

AGES | 4-5 years | plus one free adult chaperone per 10 children

LENGTH | 45 minutes

GROUP SIZE | 20-student minimum

RSVP | (562) 951-1630

AQUATIC ACADEMY

CALIFORNIA AND WATER: HOW WILL SOUTHERN CALIFORNIA GET ITS WATER IN THE FUTURE?

OCT. 20 & 27, NOV. 3 & 10 | 7:00 p.m.-9:30 p.m.

Join us on four consecutive Thursday evenings for the Aquarium's Fall 2011 Aquatic Academy. Experts from state agencies and universities will present sessions on California's water system. Attendees will learn about the role of climate change, droughts, floods, and what these things mean for the future of California's water.

COST | \$50/member | \$60/non-member | \$15 extra for CEU credit

LOCATION | Watershed Classroom

RSVP | (562) 951-1609 or ametz@lbaop.org



Students Cristina Valiente, Abcde Barrera, and Isabel Jauregui meet Aquarist Amy Adams and touch cleaner shrimp.

ACADEMY PROGRAM HELPS TURN TEENS INTO FUTURE SCIENTISTS

Local high school juniors and seniors in the program take college-level science classes during the school day and then receive training in marine biology topics at the Aquarium.

THE MARINE SCIENCE ACADEMY (MSA) is a unique partnership between the Aquarium of the Pacific and St. Anthony High School in Long Beach that allows students to further their education in marine biology at the Aquarium.

Each year a group of juniors from St. Anthony is selected based on a competitive process to participate in this two-year honors program.

MSA, which was developed five years ago, has grown in popularity. According to Education Technology and Media Coordinator Sarah Swain, "We recently had interviews with students for next year, and I was pleasantly surprised to hear how many students choose St. Anthony's as a high school because of the possibility of being accepted into MSA," she said.

Coursework at the high school includes college-level advanced placement classes in biology, chemistry, environmental science, and other topics. At the Aquarium, students are trained in marine science topics and taught how to communicate science information to visitors of all ages.

In the first year of the program students provide interpretation at stations on the floor at the Aquarium. Then in their second year students participate in the QuikScience Challenge, a science education competition hosted by the University of Southern California's (USC) Wrigley Institute for

Environmental Studies and Quiksilver, Inc. Students in the 2010-11 group had the opportunity to visit the USC Wrigley Institute at its facility on Catalina Island near Two Harbors.

Also in the second year, students design their own interpretation stations, choosing a particular ocean topic to teach to Aquarium visitors. The students then present their station projects to the incoming class of MSA students and education department staff, who pick the best station. The winning project becomes a station for the incoming class in their first year. A puffin interpretation station was selected as the winner for the 2010-11 school year, so visitors to the Aquarium can expect to see that station manned by 2011-12 students.

MSA students also get the chance to meet the Aquarium's husbandry staff, including members of the aviculture (bird biology) team, aquarists, and our mammalogy experts. The program is designed to prepare the students to pursue careers in marine or environmental science, and some alumni of the program have gone on to study science in college. About twenty students are enrolled in the Marine Science Academy in the 2011-12 school year. They spend about three hours on the floor at the Aquarium each week. Be sure to look for the friendly teens in purple shirts on your next Aquarium visit.

TRUSTEES OF THE PACIFIC

Mission Statement:

To cultivate and sustain community relationships and financial resources that enhance and support the Aquarium's mission of stewardship for the Pacific Ocean.

A special thanks to the following individuals who serve as Trustees of the Pacific. Trustees are generous donors who also volunteer their time and expertise in support of the Aquarium's mission and vision.

Mary Jane Adams	Supervisor Don and Julie Knabe
Travis Barr	John and Joan Knight
Martha and Faustino Bernadett	Andrew Maldonado and Lewis Shiro
Anna Brathwaite	Glen and Cabrini March
Doug and Holly Carpenter	Josephine Molina and Heather Rudy
Esther Chao	Michelle and John Molina
Donald and Sally Clark	Charles Moore and Sam Canon
Jose and Brigitte Collazo	William and Kathleen Mudd
Frank and Michelle Colonna	Frank and Margie Newell
Jim and Sandy Crenshaw	Dr. Beverly O'Neill and Dr. William O'Neill
Dominic and Margaret DeCristofaro	John Penny (co-chair) and Chris Kurimoto
Gary and Dawna DeLong	Andy Perez
John and Vickie Dupuy	Teresa Phillips
Bill and Gail Engvall	Gainer and Lynne Pillsbury
Walt and Linda Florie	Dennis and Suzanne Poulsen
Geof Garth	Veronica Quintero
Dan and Felicia Gilboa	Fred and Janet Riedman
Allen and Charlotte Ginsburg	Ronald Rulison and Robert McNeel
Robert and Sonia Gordon	Tony Sabatino
Jim and Gail Gray	Kurt Schulzman and Richard Neri
John and Elizabeth Hancock	John and Patricia Shadden
Jeff and Julia Headon	Bill and Melody Simmons
Corinne Heyning (co-chair)	Jeanne Sleeper
Nancy Higginson	Ken Walker
Matt Humphreys	Patricia and John Wang
Michael and Diane Jensen	Bill Waterhouse
James Kang	Charles Wilmot
Richard Katz	
Renee Handler-Klein and James Klein	

EMPLOYEES COMMUNITY FUND OF BOEING DONATES TO EDUCATION



Boeing employees also donate their time to volunteer with our dive team, educational programs, and animal care.

THE AQUARIUM HAS BEEN SELECTED as a grantee of the Employees Community Fund (ECF) of Boeing California for the past twelve years. As

a non-profit employee-giving foundation, ECF is fully administered and operated by employees of The Boeing Company who donate their time and payroll deductions to support the needs and improve the quality of their local communities. Boeing employees join in meaningful partnerships in support of community enrichment, education, health services, human service organizations, and youth programs.

ECF has donated a total of \$240,000 to the Aquarium's educational programs since 1999, and many of the Boeing employees involved also donate their time to volunteer with our dive team, educational programs, and animal care. Robin Riggs (pictured) is an active Aquarium volunteer and serves on the ECF board. "By improving the quality of learning for underserved students through creative science education and environmental stewardship programs, the Aquarium's education programs expose children of all backgrounds and circumstances to critical science learning experiences to assist them in becoming successful and contributing citizens of our community," ECF Executive Director Carrie Bollwinkle said.

THE AQUARIUM has received a donation of \$30,000 in support of our education initiatives from K¹², a provider of online curriculum for public and private schools. The donation will be used to develop programming for underserved students, teacher training, and new classroom curriculum.

K¹² recently participated in the Aquarium's annual Teacher Family Day. Local educators had the opportunity to learn more about K¹² programs, and online curriculum, which provides a flexible alternative for students and families. This method is characterized by customized individual pacing and learning techniques at all grade levels, from kindergarten through high school, with the support of teachers, administrators, and parents. K¹² courses and partner schools offer high quality instruction, hands-on activities, books, learning materials, and family support from experienced teachers.

"We are proud to partner with the Aquarium of the Pacific and further our complementary missions to bring learning alive and boost student achievement through interactive education programs," said Karen Spiegelthal, vice president of marketing for K¹². For more information about K¹² and their online courses and programs, visit www.K12.com.

NEW PARTNER K¹², INC. SUPPORTS AQUARIUM EDUCATION INITIATIVES



Ocean Chemistry at Home

Use this activity to see which common household items are more acidic than others!

D ID YOU KNOW THAT WATER IN THE OCEAN IS A CHEMICAL SOLUTION? Sea water is not just salt mixed into water. In fact, almost every element on the periodic table can be found somewhere in the ocean, and this unique mixture makes ocean life possible.

When we talk about chemical solutions, we can describe them in many ways. One way of describing some chemicals is to talk about how acidic or basic they are. Lemon juice is something that would be considered an acidic solution; you can observe this yourself because lemon juice is very sour, and many acidic solutions are sour. On the other hand, baking soda is an example of a basic substance. We determine how acidic or basic something is by measuring its pH. The pH scale ranges from 0 to 14, or very acidic to very basic. A solution would be

considered neutral if the pH is measured as 7.

Scientists spend a lot of effort keeping track of the pH of the ocean. As carbon dioxide is released into the atmosphere, it also is absorbed into the ocean. The increase of absorbed carbon dioxide is actually changing the chemistry of the ocean, making it more acidic. This can impact the growth and development of shell-bearing animals like lobsters and clams and animals with calcium carbonate-based skeletons, like corals.

You can use this activity to see which common household items are more acidic than others. Cabbage juice is an easy-to-make pH indicator. By mixing common household items with cabbage juice, like magic you can see differences in pH as the cabbage juice changes color.

HOW TO PREPARE THE CABBAGE JUICE PH INDICATOR:

1. Cut the red cabbage into small pieces.
2. Put them into a pot with enough water to cover the cabbage.
3. Bring the water and cabbage to a boil, remove from the heat and allow the mixture to cool.
4. Once cooled, pour the contents through a strainer to remove the cabbage pieces.
5. Use the cabbage juice for your experiment.

MATERIALS:

- one head of red cabbage
- water
- knife
- stove or hotplate
- cooking pot
- strainer

SAFETY:

When scientists conduct experiments, safety is a top priority. Please make sure that you take all necessary safety precautions and never use unknown or hazardous materials for this activity. Be sure to ask your parent's permission before using the knife and boiling the cabbage.

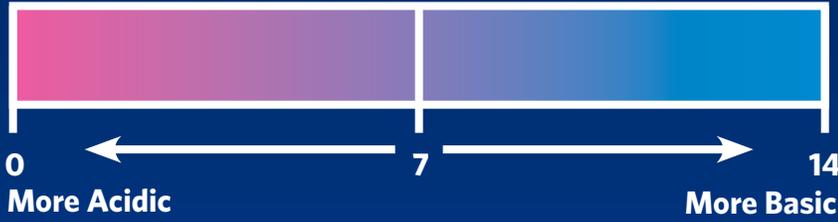
HOUSEHOLD ITEMS TO USE FOR MIXING

Before using the following items, see if you can predict whether they will be an acid or a base. After mixing them with your cabbage juice pH indicator use the pH scale provided on the next page to help determine your results.

- lemon juice
- vinegar
- milk
- dish soap
- water
- baking soda
- carbonated soda
(clear soda works best)

CABBAGE JUICE PH INDICATOR

Use this scale to see which household item is an acid or a base.



Kids QR

LEARN ABOUT OUR
GIANT PACIFIC
OCTOPUS



OCTOPUS Q&A VIDEO
youtu.be/YiADiu7g_X4

Meet Janet Monday,
our octopus expert.

Fishing for KNOWLEDGE!



1. _____ Penguins are typically found near the southern tip of South America.
2. The pH scale measures how acidic or _____ something is.
3. The ocean absorbs _____ and too much of it could make it hard for shellfish, like oysters and shrimp, to build their shells.

Last Issue's Questions and Answers:

1. **Albedo** measures the amount of light reflected off the surface of an object. Snow and ice at the North and South Poles use this property to help reflect sunlight back into space.
2. Arctic foxes dig **dens** to have their litters, which can include up to fifteen pups.
3. Feather stars are **filter** feeders, capturing plankton with their arms. The food then travels down the center of each arm to the feather star's mouth.

GIANT SPIDER CRAB

Macrocheira kaempferi



NORTHERN PACIFIC GALLERY

CLEANER WRASSE

Labroides dimidiatus



TROPICAL PACIFIC GALLERY

COWNOSE RAY

Rhinoptera steindachneri



SHARK LAGOON

GIANT SPIDER CRAB

Macrocheira kaempferi



PHYSICAL CHARACTERISTICS:

Giant spider crabs are orange with eight legs and two feeding arms distinguished by claws at each end. They have the greatest leg span of any arthropod, reaching 12 feet. They can weigh up to 41 pounds.

DIET

Giant spider crabs are omnivores and will often scavenge for food found on the ocean bottom.

HABITAT

Giant spider crabs can be found in the Pacific Ocean around the coast of Japan. They are bottom-dwelling crustaceans that can be found living at depths of up to 100 feet.

FUN FACT

Giant spider crabs can live up to 100 years.

CLEANER WRASSE

Labroides dimidiatus



PHYSICAL CHARACTERISTIC:

The cleaner wrasse is a small, thin fish with a blue body and a black band that runs along its length.

DIET

Cleaner wrasses eat parasites and other organic matter, such as dead skin, off of larger animals, forming a symbiotic relationship. The cleaner wrasses avoid predation by helping to rid these larger animals of parasites in exchange for a meal.

HABITAT

Commonly found in coral reefs of the Pacific and Indian Oceans, cleaner wrasses are found hanging around their individual cleaning stations.

FUN FACT

Cleaner wrasses are born female, but some will change into males later in life.

COWNOSE RAY

Rhinoptera steindachneri



PHYSICAL CHARACTERISTICS:

Cownose rays have diamond-shaped bodies and long, pointed, wing-like pectoral fins. Different from any other ray, the rostrum or nose area of the cownose ray is notched.

DIET:

Cownose rays feed on a variety of crustaceans and mollusks. Using their flattened teeth, they can crush the shells of these invertebrates with ease.

HABITAT:

This species can be found in a variety of coastal areas and in the open ocean, swimming in large schools.

FUN FACT:

If you look closely at these rays, you may notice a groove along the front of their rostrums. It is not a mouth but rather a flap that helps them forage through the sand.

Member Specials

Give the Gift of Membership!

Active Aquarium members save 20% off the purchase of gift memberships!

Take care of everyone on your holiday shopping list, save money, and help protect the ocean all at the same time!

To receive this special discount on gift memberships, purchase on-site at the GUEST INFORMATION DESK or call 562-437-FISH (3474).

GIFT LIST

- Parents
- Grandparent
- Aunt
- Uncle
- Brother
- Sister
- Niece



*Some restrictions apply. Must be an active Aquarium member in good standing to receive the discount. Discount not valid on Pacific Circle.

Look What's New!

SUPPORT THE AQUARIUM BY ADOPTING AN ANIMAL!

Now when you adopt at \$50 or above, you'll receive one of our new 11-inch plush animals of your adopted species. Why not adopt an animal for that special someone on your list this holiday season?

Introducing for a limited time only:

THE WYLAND BLUE WHALE Adoption Level

\$1,000

- ✦ Limited-edition signed Wyland Ocean Blues lithograph (15" x 26")
- ✦ Special-edition folder containing a certificate, photo, and fact sheet
- ✦ 11-inch blue whale plush animal
- ✦ Whale watch trip for two
- ✦ Two tickets to the Aquarium of the Pacific
- ✦ Two tickets to tour the Aquarium behind the scenes

www.aquariumofpacific.org/adopt
(562) 437-FISH (3474)



AQUARIUM OF THE PACIFIC

SAVE 20% this fall on all merchandise!

Present your membership card along with this coupon to receive an additional 10% discount in conjunction with your member discount, for a total of 20% off merchandise in Pacific Collections and the Shark Shack.

This coupon is valid through 2/28/12 inside Pacific Collections and the Shark Shack. Valid as a one-time offer. Cannot be combined with any other offer. No cash value. Restrictions may apply. N-0212-A

MEMBERS-ONLY SPECIAL

EXHIBIT TO EXAMINE CLIMATE CHANGE AND CALIFORNIA'S WATER SUPPLY



CALIFORNIA DEPARTMENT OF WATER RESOURCES

IN PARTNERSHIP with the California Department of Water Resources (DWR), the Aquarium of the Pacific will open an exhibit on October 24 that explores how climate change will affect California's water management system.

The exhibit—developed and funded by DWR—illustrates how California's landscape, climate, and water features have changed over millions of years of geologic time. This information is then translated into predictions for the future of California's water supply.

Examples of past natural variability in climate and water in California are compared with projections for human-induced climate change due to emissions of greenhouse gases in this century.

The exhibit details the state's current water management system, as well as what climate and weather trends impact that system. Extreme events like droughts and flooding are described, as are long-term trends to plan for, such as sea level rise. Visitors will leave with ideas for how to conserve water in their homes to help California prepare for drier conditions.

"Our response to climate change today will have a powerful impact on all of California's natural resources—particularly water—for generations to come. We must work diligently to balance protecting our environment, ensuring our future prosperity, and planning for a growing population with the reality of a changing climate. An abundant, reliable water supply is a key part of that balancing act," California's Secretary for Natural Resources John Laird said.



DANIEL BELTRÁ

PHOTOGRAPHY EXHIBIT DEPICTS GULF OIL SPILL

THE AQUARIUM OF THE PACIFIC will host an exhibit beginning on October 13, 2011 that features aerial photos capturing the aftermath of the April 2010 Gulf of Mexico oil spill. Photographer Daniel Beltrá shot the photos during May and June 2010 off the coast of Louisiana. The exhibit featuring Beltrá's work is titled *SPILL: Images from the Gulf* and will be on display at the Aquarium through January 15, 2012.

Over the course of three months approximately 4.9 million barrels of crude oil (205.8 million gallons) were released into the Gulf's waters. The Deepwater Horizon wellhead was eventually capped on July 15, 2010. Beltrá's aerial images depict the accident site, relief well drilling platforms, controlled burns, boats and skimmer ships that were brought in to monitor and assist in the containment efforts, planes dropping dispersant, and brown pelicans covered in oil.

"These photographs explore the tenseness of the situation in the Gulf of Mexico as the oil seeps into an already challenged and complex ocean ecosystem. Though tragic, it is a fitting example of the vast scale of transformation our world is under from man-made stresses," Beltrá said. "I hope to reawaken people to their connection to this world by challenging them to contemplate their relationship with nature and how their individual actions will contribute to the changing needs of our planet."

At the exhibit opening event on October 13 at 7:00 p.m., Beltra will participate in a joint lecture with Dr. Larry McKinney, director of the Harte Research Institute for Gulf of Mexico Studies at Texas A&M University. The two will explore what happened during the spill and the current situation in the Gulf. Reservations are required to attend the lecture. Contact Linda Brown at (562) 951-1648 or lbrown@lbaop.org.

SPILL premiered at the 212 Gallery in Aspen, Colorado during the 2010 Environment Forum held in July at the Aspen Institute and will continue to travel nationally and internationally through 2012. Images from the *SPILL* exhibit have been featured in *The New Yorker*, *TIME Magazine's* Year in Review, *Outdoor Photography*, and *Orion*.

Beltrá was born in Madrid, Spain and is currently based in Seattle. Beltra's photography covering the Gulf spill earned him an Award of Excellence from the Pictures of the Year International contest and the Special Prize for DAYS JAPAN International Photojournalism Award. He was named one of the forty most influential nature photographers in 2010 by *Outdoor Photography* magazine. He is a fellow of the International League of Conservation Photographers.

FUNDRAISING HIGHLIGHTS

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

■ Boeing Continues Core Expansion Support

The Boeing Company completed its initial \$500,000 gift in support of the Aquarium's expansion projects and extended that commitment with a pledge of \$200,000 over the next two years. "The Boeing Company is proud to be a part of the Aquarium's conservation and education programs and its commitment to a sustainable future for California and its citizens," says Craig Cooning, Aquarium of the Pacific board member and vice president and general manager, Boeing Space & Intelligence Systems.

■ Bank of America Foundation Grant Benefits Education at the Aquarium

The Bank of America Foundation granted \$20,000 toward the Aquarium's education programs, marking their fifth consecutive year of support. These funds help underwrite the work of the Aquarium's professional education staff and all the programming that is the basis of the Aquarium's mission—including on- and off-site classroom activities, Aquarium on Wheels visits, standards-based program development to complement new exhibits, teacher training, and other public outreach efforts. In addition, Bank of America continues to encourage their employees to donate by providing matching gifts, doubling the effect of individual donations.

■ Target Continues Education Support

Target granted \$50,000 in May 2011, funding Aquarium visits for underserved students throughout Greater Los Angeles and allowing them to participate in a standards-based classroom program. This introduces students to the wonders of the marine world, engages them in science and environmental concepts, and ultimately instills a greater sense of environmental stewardship. As one student wrote after her visit, "Ecology and the Aquarium both taught me a lot of things about life. 1) The world is too interesting and beautiful to destroy. 2) We should do whatever it takes to save animals and

biomes that are being harmed. 3) We should keep the planet clean." Target's funding is critical as schools continue to face significant budget cuts and would not otherwise be able to visit the Aquarium.

■ BCM Foundation Gives to Scholarship Fund

The BCM Foundation granted \$30,000 to the Aquarium Scholarship Fund to provide opportunities for students from the city of Whittier to visit the Aquarium, participate in hands-on science, and learn about ways to protect the ocean. As schools continue to face significant budget cuts, these funds are essential to providing valuable out-of-school time to underserved students. BCM Foundation funding will also support a formal evaluation of the scholarship program in order to assess the impacts of the program and better serve scholarship recipients in the future. During the 2010 evaluation nearly all scholarship students reported that they had fun with science and know more about the ocean and science and are more interested in science and the ocean's inhabitants than before their visit to the Aquarium.

■ Wells Fargo Foundation Gives to Core Programs

The Aquarium is honored to partner with the Wells Fargo Foundation, which will again provide \$60,000 in support of the Aquarium's core conservation and education programs. This funding will ensure that over 200,000 students, teachers, and community members can continue to participate in marine science programming. It will also ensure that our 11,000 animals receive the utmost in care, from the highest quality food to the most comfortable of habitats. Wells Fargo's funds are also directed to the sponsorship of the weedy sea dragon exhibit and the Aquarium's annual summer fundraising event.

■ The Earl B. and Loraine H. Miller Foundation Supports Innovative Education Programs

A new partnership between the Miller Foundation and the Aquarium will promote education and moral citizenship for children and families of Long Beach. With a grant of \$500,000 over two years, the Miller Foundation will provide crucial support for the design, development, and delivery of educational programs centered on the Aquarium's two newest learning platforms: the Molina Animal Care Center (MACC) and the Ocean Science Center featuring Science on a Sphere® (SOS).

Drawing on the unique connection between animals and humans, a new portal will be developed allowing children who are undergoing treatment at Miller Children's Hospital to see and communicate live with the Aquarium's veterinarian and his staff during animal exams and procedures at MACC. At the Ocean Science Center, new digital experiences featuring the changing relationship between humans and Earth will be created and distributed to all seventy of the other SOS facilities throughout the United States and abroad. The SOS programs will be supplemented with additional educational materials and programming. Lastly, Miller Foundation's funding will provide an educational field trip experience to approximately 4,500 underserved children in Long Beach. These students will participate in programming at MACC and the SOS exhibit and have the opportunity to learn about science while exploring the Aquarium's diverse array of animals and habitats.

AQUARIUM ACCOLADES

HERITAGE AWARDS

Chivas USA

| Noche de Estrellas



Major League Soccer's Los Angeles-based Deportivo Chivas USA was presented the Heritage Award at the Aquarium's annual Noches de Estrellas event. The organization promotes children's literacy campaigns and soccer sessions for underserved youth and children with disabilities. Through their 2011 Greener Goals campaign, Chivas USA has partnered with Heal the Bay, the Los Angeles Bureau of Sanitation, and the Aquarium of the Pacific to conduct a recycling contest for schools in the Los Angeles area. Also, the team organizes beach clean-ups and hosts Earth-friendly organizations and activities at their games.

Pictured: Sergio Arias, Chivas USA player; Luis Felipe Rivera, director of community outreach & business development, Chivas USA; John C. Molina, vice chairman, Board of Directors, Aquarium of the Pacific; and Tristan Bowen, Chivas USA player.

Wyatt Workman

| International Children's Day



Eight-year-old Wyatt Workman was presented the Aquarium's Young Hero Award at the International Children's Day event. Workman was inspired to help raise funds for the ocean after learning about marine debris and other environmental problems. He created seventy art objects to sell at a fundraiser for international ocean advocacy organization

Oceana. He also made a six-minute claymation movie and book, both titled *Save the Sea from the Trash Monster!*, and designed a T-shirt that says, "I am NOT a Trash Monster!" On his website and at events, Workman urges people to sign his pledge, which includes promises to pick up trash, select only sustainable seafood, and use reusable shopping bags and water bottles. To date, he has raised \$3,878 for Oceana.

Pictured: Cecile Fisher, vice president, communications and marketing, Aquarium of the Pacific, and Wyatt Workman, 2011 International Children's Day Young Hero Award honoree.

Colin and Zelda King

| Pacific Islander Festival



Colin and Zelda King were presented the Heritage Award at the Pacific Islander Festival. This husband-and-wife team represents Fiji at the festival each year. Colin King is the trade and marketing officer for the Fiji Trade Commission in Los Angeles. While serving in this distinguished post for the government of Fiji, he continues his volunteer work as a historian and teacher of Fijian culture. Zelda King has served on the board of the Pacific Islander Community Council since 1995. The Kings' countless hours of volunteer work in the preservation and teaching of Fijian culture, including event planning and grant writing, have made a major contribution to Pacific Islander communities locally and worldwide.

Pictured: Zelda King, 2011 Pacific Islander Festival Heritage Award honoree, and Nancy Weintraub, vice president, development, Aquarium of the Pacific.

The Molina Family

| Ocean Conservation Award



The Aquarium of the Pacific honored the Molina Family and Molina Healthcare, Inc. as the recipient of its 2011 Ocean Conservation Award during the Aquarium After Dark event on June 11. The Ocean Conservation Award is given annually to those who contribute significantly to ocean conservation and environmental education. The Molinas have a long history of dedication to the Aquarium and its mission. Molina Healthcare and the Molina Family contributed \$2 million to help establish the Molina Animal Care Center, which opened in 2010. Dr. J. Mario Molina served as chairman of the Aquarium's Board of Directors from 2008 through 2010 and John Molina currently serves as the Board's vice chairman. In addition, Therese Molina, Michelle Molina, Faustino and Martha Bernadett, Janet Watt, and Josephine Molina all serve as Trustees of the Pacific or support the Aquarium's fundraising events.

Photo Credit: Scott Smeltzer. Pictured: Aquarium of the Pacific President & CEO Jerry Schubel, Michelle and John Molina, Janet Watt, Faustino and Martha Bernadett, and Mario and Theresa Molina.

Seafood for the Future

| Best of L.A. 2011



The Aquarium of the Pacific's Seafood for the Future program was named in *Los Angeles Magazine's* annual Best of L.A. list in the Earth Changer category for 2011.

EXECUTIVE OFFICERS

DR. JERRY R. SCHUBEL
PRESIDENT AND CEO

MR. ANTHONY T. BROWN, MBA
VP OF FINANCE/CFO

MS. BARBARA LONG
CORPORATE SECRETARY

BOARD OF DIRECTORS

MR. JAMES M. BRESLAUER

MR. HOWARD CHAMBERS

MR. STEPHEN I. CHAZEN

MR. STEPHEN CONLEY

MR. CRAIG COONING

MR. EDWIN FEO

MR. JOHN FIELDER
CHAIRMAN

MS. JENNIFER HAGLE
BOARD SECRETARY

MR. JAMES C. HANKLA

MR. RUSSELL T. HILL

MR. SAMUEL KING

MR. BERT LEVY

DR. GLEN MARCH

MR. STEVEN MAYER

MS. JAN MAZYCK

MR. JOHN MOLINA
VICE CHAIRMAN

DR. J. MARIO MOLINA

MR. STEPHEN OLSON

MR. DOUGLAS OTTO

MR. SEAN PENCE

MS. LYNNE M. PRESLO

MR. EUGENE "ROD" RODDENBERRY

MR. CHRISTOPHER ROMMEL

DR. JERRY R. SCHUBEL

MR. MICHAEL SONDERMANN

MR. ARLO SORENSEN

MR. MARVIN J. SUOMI

MR. PETER TONG

MR. EISUKE TSUYUZAKI

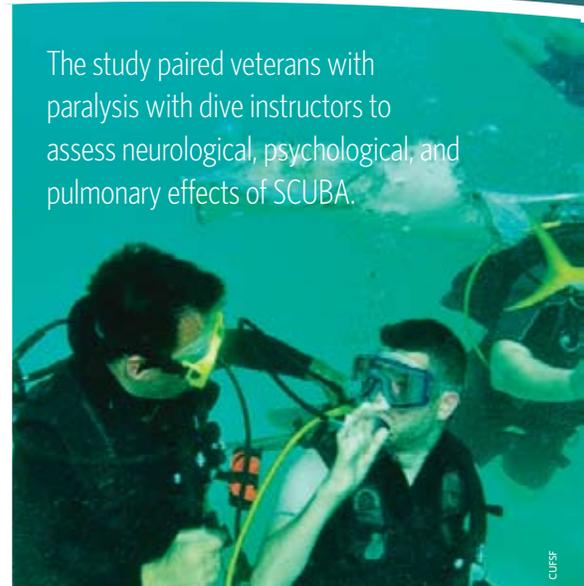
MR. THOMAS TURNEY

MS. DENISE WYNN

MR. STEPHEN YOUNG

WWW.AQUARIUMOFPACIFIC.ORG

AQUARIUM BOARD OF DIRECTORS



The study paired veterans with paralysis with dive instructors to assess neurological, psychological, and pulmonary effects of SCUBA.

AQUARIUM DIVE SAFETY OFFICER HELPS WITH GROUNDBREAKING SCUBA STUDY

AQUARIUM ASSISTANT DIVE SAFETY OFFICER ERIC CASTILLO spent two weeks in the Cayman Islands in May to help with a pilot study conducted by the Cody Unser First Step Foundation (CUFSF). The purpose of the study was to see how veterans with paralysis responded to SCUBA diving.

Cody Unser, whose father is race car driver Al Unser Jr., is currently a student at George Washington University and founded CUFSF in 1999 after developing transverse myelitis, a paralyzing and sometimes fatal spinal cord inflammation, in sixth grade. Castillo first met Cody Unser when she came to Long Beach to become the first diver with a disability to dive at the Aquarium during our annual Festival of Human Abilities in 2009.

During the trip doctors from Johns Hopkins University and the International Center for Spinal Cord Injury at the Kennedy Krieger Institute conducted the first-ever study of the neurological, psychological, and pulmonary effects of SCUBA on individuals with paralysis. The subjects of the study were ten veterans with disabilities selected through Paralyzed Veterans of America. CUFSF and its Operation Deep Down SCUBA Instructor Team wanted to scientifically measure the efficacy of SCUBA as an activity-based therapy that benefits people with disabilities.

The ten divers with disabilities, paired with ten dive instructors without disabilities, completed neurological and psychological evaluations with the investigators, followed by SCUBA training and open water diving. Castillo was paired with Chris Sullivan, whose goal was to complete Handicap SCUBA Association (HSA) B-level certification. Sullivan is a veteran of the war in Afghanistan, where he survived a gunshot wound to the neck. "To think these guys went into a war zone and got injured and now we are helping them to achieve something they never thought was possible—it's really an amazing thing," Castillo said.

As Unser said in a statement when the study received approval to go forward, "We have known for quite some time that SCUBA benefits people with paralysis through movement in a neutrally buoyant environment, not to mention the empowerment and confidence realized by achieving your open water certification." Unser discovered SCUBA after becoming paralyzed and was thrilled to find a new kind of mobility underwater.

Castillo reports that all ten veterans achieved their certification, including Sullivan. "His dexterity limits the use of his appendages, but his heart and desire overcame any obstacle set in front of him."



DIVE AT THE AQUARIUM

OPEN WATER-CERTIFIED DIVERS can experience the Tropical Reef exhibit up close in a two-and-a-half-hour dive immersion tour. Our largest exhibit, Tropical Reef's warm 350,000 gallons are home to more than 1,000 tropical fishes. Participants receive a behind-the-scenes tour of the Aquarium's dive program, a certificate of completion, souvenir towel, use of an underwater camera, and memory card of photos to take home. Up to four participants can take part in a dive. To schedule a dive, call (562) 590-3100, ext. 0 at least twenty-four hours in advance.

"The Aquarium of the Pacific's Dive Immersion Program is a unique dive experience for anyone who enjoys warm-water diving in controlled conditions, crystal clear visibility, and rare encounters with diverse underwater life," said Aquarium of the Pacific Board Member Eugene "Rod" Roddenberry (pictured, left), who recently completed a dive in the Tropical Reef Habitat.

SolaTubes use reflection to bring additional natural light into a room, making it possible to go without electric lighting on sunny days.



Aquarium Pacific Circle member Nancy Higginson installed solar panels on her garage in 2002.

Monitoring and reducing energy use can help you reduce your carbon footprint—going solar can help you nearly eliminate it.

G **OING GREEN at home benefits the environment—but saving energy and water and finding ways to boost efficiency also helps save money.** As demand for energy-efficient and environmentally conscious

products increases, existing technologies are improving and more products and services are being introduced to the marketplace.

Heating and cooling tops the list of typical energy usage in homes, followed by water heaters and clothes driers, lighting, electronics, and other appliances. Many of these energy users can be made more efficient. The United States Department of Energy provides a wide variety of resources and ideas for reducing energy use at home at www.energysavers.gov. But one way to nearly eliminate your carbon footprint is to generate your own electricity with solar technology.

According to the Solar Energy Industries Association, total grid-connected photovoltaic solar installations in 2010 doubled that of 2009 in the United States. While most installations are being done by utility companies and large corporations, the residential market is predicted to expand, says Michael Hodge, manager of business development for American Honda Motor Co.'s Home Energy division. While the company's solar products are primarily sold in Japan, American Honda is doing demonstration projects on select Honda facilities in the United States, installing photovoltaic solar panels on rooftops and in parking areas.

So what will it cost to outfit your home with solar panels? Solar panel dealers price the installation by wattage, typically at \$7 to \$9 per watt. For a 2,000- to 2,500-square-foot home, Hodge says a 3,000-watt system is sufficient. At the top end of the pricing spectrum, homeowners would be looking at a total installation cost of about \$27,000. But solar systems eventually pay for themselves, depending on how much electricity is generated. "A

typical payback period is seven to nine years," Hodge says. "The systems are guaranteed from twenty to twenty-five years. So if you get a payback period of nine years, you've got sixteen years of free electricity."

To ease the burden of the initial installation costs, the federal government offers a 30 percent tax credit on residential solar installations, and California offers an incentive at the state level. The Go Solar California! Campaign (<http://www.gosolarcalifornia.org/>), a joint effort of the California Energy Commission and the California Public Utilities Commission, has set a goal of installing 3,000 megawatts of solar energy systems on homes and businesses by the end of 2016. Utility providers, like Southern California Edison, also offer rebates for residential installation.

There are also many products and home improvements consumers can install themselves, from dual-pane windows to reduce home heating and cooling costs, to dual-flush toilets that reduce water consumption. An example of some of the unique new products being developed, SolaTubes (<http://www.solatube.com/>) use reflection to bring additional natural light into a room, making it possible to go without electric lighting on sunny days. Installations cost between \$300 and \$500 each, and homeowners receive a 30 percent tax rebate. Many of these products are available online or through home improvement stores, where consumers can also connect with dealers and contractors to install systems.

Coming years are likely to bring a wider variety of products to the consumer marketplace, from solar-powered generators for recreational vehicles, an already popular solar energy application, to countertop energy use monitoring systems that allow homeowners to "power down" certain appliances or systems to boost efficiency. For those wanting to save money and the planet, going green at home is becoming easier and more accessible every day.

©2011 Aquarium of the Pacific All Rights Reserved
Free for members | \$3.95 for non-members



Saturday, October 15, 2011
7:00 p.m. – 11:00 p.m.



SEA FARE

**TASTES FROM OVER 25
Local Restaurants
and Food & Beverage
Providers**

OPEN BAR

Help Support Aquarium Education, Conservation, and Animal Care Programs!

**COOKING
DEMONSTRATION**
by the **SAVOR...Long Beach**
Culinary Team and Chef
Andrew Gruel of SlapFish

**GREAT DEALS
on Unique Silent
and Live Auction
Items**

**\$500 CASH
Raffle**

**GO FISH
Opportunity
Game**

**LIVE MUSIC
AND DANCING
with Ronny and
the Classics**



**PARTICIPATING RESTAURANTS
AND FOOD & BEVERAGE PROVIDERS**

- | | |
|----------------------------------|-------------------------|
| Alegria | Naja Tea |
| Bubba Gump Shrimp Co. | P.F. Chang's |
| Buono's Authentic Pizzeria | Parkers' Lighthouse |
| Cabot Creamery Vermont | Primal Alchemy Catering |
| California Pizza Kitchen | SAVOR...Long Beach |
| Deb's Kitchen | simply sweet cakery |
| Decadence | SIP at the Renaissance |
| Delius Restaurant | Hotel |
| Dinner Mojo | SlapFish |
| Famous Dave's | Stone Brewery |
| Four Paws and a Tail Wine | Taco Beach Cantina |
| Gladstone's Long Beach | Temecula Olive Oil |
| Haven Gastropub | Company |
| Islands Fine Burgers &
Drinks | The Auld Dubliner |
| Kavikas | Irish Pub |
| L'Opera | The Lazy Dog Café |
| Mai Tai Bar | Veev Açai Spirit |

Tickets \$100

**ORDER TICKETS ONLINE BY VISITING
AQUARIUMOFPACIFIC.ORG/SEAFARE
OR CALL (562) 437-FISH (3474)**

