

PACIFIC **Currents**

WINTER 2024



Ocean Life in a Changing World

Climate change is impacting the ocean, the animals that live there, and ultimately each of us. Learn why this is happening and what we can do to help.

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LETTER FROM THE CEO

Envisioning the Next Twenty-Five Years

Our CEO looks forward into the next 25 years and what that means for the Aquarium.

The Aquarium has grown up. The first 25 years were about getting established, connecting with the community, building world-class exhibits and education, leveraging animal husbandry expertise for conservation, and growing a volunteer program that is the heart and soul of our operations.

It is time to envision the next twenty-five years—a daunting challenge under today’s breathtaking pace of social and technological change. It is worth noting that when the Aquarium was founded, social media was non-existent. Today, social media is a mainstay of our business.

As we look to a future replete with possibilities, our values provide an anchor. Those values are science, inspiration, innovation,

community, and fun. Energized by these values, we have just completed a strategic plan that identifies our priorities for the next twenty-five years:

- The experience guests have when they engage with our staff and our animal exhibits is core to everything we do. We imagine a journey of continuous improvement in the guest experience at our exhibits, while simultaneously making animal wellbeing our highest priority.
- Drawing on paid staff, volunteers, and the local community, we will become a leading force for marine conservation in California. This will include a California Marine Species Report Card, more and more species head start programs, and expanding our community science efforts.
- Sustainability will be lived and shared as a way of life. Plastics, emissions, waste, and consumption choices all need to change. We will be a leader in that change.
- Colleges reach less than one half of our population. The Aquarium reaches everyone. Our education team is committed to making everyone feel they can find opportunities in science and technology so that everyone understands they have a voice in selecting our future.

What we do at the Aquarium of Pacific has never been more necessary. We connect people to nature. Deprived of nature—our happiness, our mental acuity, and our well-being is also deprived. Most of us cannot afford to enjoy safaris, scuba diving, or even backtracking treks. At the Aquarium, we can deliver a special connection to animals and nature that everyone can access. That is truly priceless.

We have done a lot. We can do so much more. Stay tuned and join us on the quest.

Peter Kareiva

Dr. Peter Kareiva joined the Aquarium of Pacific in August 2020. He holds a B.A. in zoology, M.S. in environmental biology, and Ph.D. in ecology and evolutionary biology. He is committed to science that engages the public and believes that connecting to nature is the one thing that can overcome the deep political and social divides that plague the nation today.



FRESH VOICES

The Conservation Generation

I grew up in a generation in which conservation is central to our values and spirit.

One of the greatest parts of working with the marine biology community is meeting new people—especially people my age. In participating in conservation efforts around the world with my peers, I have learned the emotions and passion of my generation surrounding climate change and protecting our planet. Working with my peers has changed the way I view different issues our planet faces—regarding them with a sense of hope rather than gloom.

This past summer I had the opportunity to travel to the island of Curaçao as a part of a marine biology and conservation-focused trip. In Curaçao, I stayed with around eleven other people, all of high-school age. We attended a general marine biology course and worked on local research and restoration projects around the island.

One such effort involved gathering data on sea turtles. During the session, we collected data on a virus affecting sea turtles called Fibropapillomatosis (FP), which is thought to be caused by various types of pollution. As a group, we tagged and measured a total of 18 sea turtles. Unfortunately, a few of the turtles we tagged had the FP virus, which manifests itself in the form of tumors around the turtle's eyes, face, and cloaca.

After we had released all of the turtles, we debriefed with the lead researcher, reflecting on the work we had just done. Many of my peers and myself were in tears after seeing the diseased turtles.

After witnessing the pain inflicted on the turtles by the anthropogenic disease, a penetrating gloom persisted throughout the rest of the day. The bus ride home was a silent one, as each of us contemplated the ever more severe impact of humans on our planet.

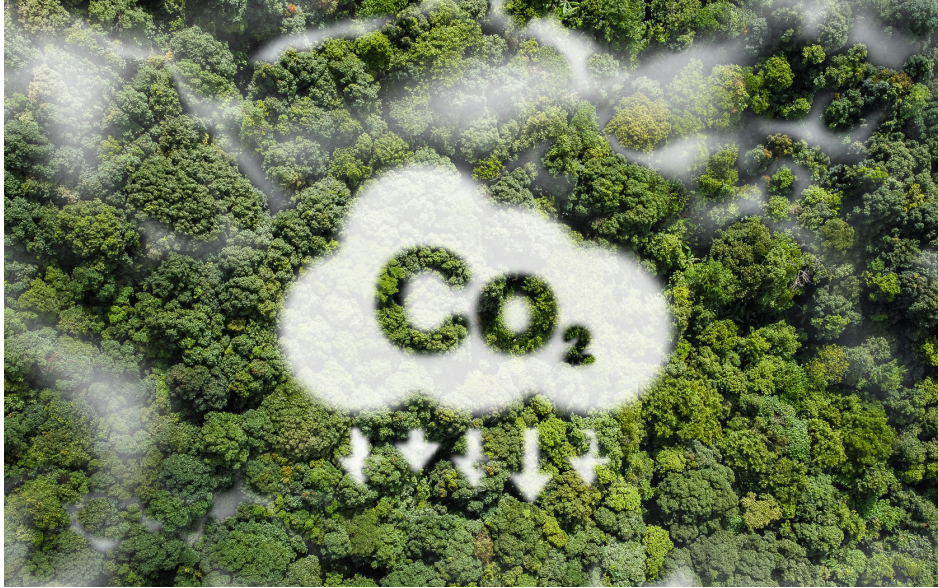
As soon as we returned to our dorms, many of us began researching more ways to help these endangered creatures. A few of us also donated money to help the team on Curaçao treat more sea turtles. We also reflected on the effort we had made to help the sea turtle population on the island. By collecting data on FP's abundance, we helped scientists better understand the prevalence of this disease.

Experiencing the peril in which our marine life is in was extremely moving. It also demonstrated how much care and devotion each of us had for the environment. The sense of renewed stewardship and urgency that spread throughout our group after working with the sea turtles was palpable.

Conservation is so crucial to the fate of our planet, and bringing such conviction to restoration and protection efforts makes a huge difference. Seeing this determination first-hand gave me faith that this generation of climate activists will aid in taking massive steps towards limiting and reversing the effects of climate change.

Marjorie Lian

Marjorie Lian is a member of the editorial committee of the Teen Climate Council and has been a volunteer at the Aquarium of the Pacific for three years. With the Teen Climate Council, Lian has completed projects with the goal of raising awareness about climate change, such as the children's book titled *Yutaka Finds a Friend*. She has also been a part of many of the youth programs, including Junior Exhibit Guides, Ocean Neighbors, and VolunTEENS.



CONSERVATION CORNER

Solving the Climate Crisis

The solutions to solving the climate change crisis are complex and each will play an important role.

A top priority is preventing carbon and other greenhouse gases from entering the atmosphere with reduced reliance on fossil fuels. This will be accomplished through individual actions such as reducing the consumption of meat and using public transportation, community actions such as investing in public transportation infrastructure, and corporate actions such as using cleaner energy sources. Another part of the solution is removing carbon that is already in the atmosphere. Let's explore these strategies.

What is the Carbon Cycle?

The carbon cycle is the natural phenomenon in which Earth processes carbon. Carbon dioxide is emitted into the atmosphere naturally through plants and animals as well as emissions from vehicles, factories, and other industrial processes. Plants will

use some of the carbon dioxide in the atmosphere to create food through photosynthesis and carbon is naturally absorbed by other means.

Unfortunately, with our increasing use of fossil fuels in the past century, the natural carbon cycle is too slow for the amount of emissions being emitted. This is leaving too much in the atmosphere, trapping excess heat and warming the planet, and causing other environmental issues.

“One need only reflect on increasingly severe wildfires and hurricanes to realize that it is time to forego patience and commit to doing all we can in the next two to three years.”

DR. PETER KAREIVA, Aquarium president and CEO

How can we remove more carbon from the atmosphere?

The term “removal” needs to be considered lightly since matter can neither be created nor destroyed. It only changes forms. And because of that conservation law of matter, how we approach carbon removal needs to be creative and safely stored.

We can help by using two general strategies: carbon capture and storage (carbon sequestration) and carbon offset.

What is Carbon Capture and Storage?

This method of carbon removal uses the incredible versatility of carbon to creatively capture it in the air and store it in other forms. There are two routes the technology can follow: geologic and biologic.

Geologic methods include taking the carbon from the atmosphere and processing it into rock formations for permanent storage.

Biologic methods transform the carbon into various forms such as vegetation, soils, wooded products, and aquatic environments.

Another aspect to this route is the carbon is used to encourage the growth of plants and trees.

The key part of these technologies is that the carbon is being sequestered, which is why this method is called carbon sequestration. Carbon can also be used in building materials as an alternative way of storing the carbon elsewhere and safely.

What is Carbon Offset?

Carbon offset is an approach that improves the natural carbon cycle. A very common carbon offset method is reforestation, which is planting more trees to absorb carbon. Other methods include outfitting a building with carbon-storing agricultural practices.

These practices are important in protecting key habitats such as mangroves, estuaries, and seagrass beds. These key coastal habitats are not only important for many animals, but also serve as buffer zones for storms.

What is Carbon Reduction?

This approach focuses on managing the carbon output of individuals, businesses, or other entities—the amount of carbon emitted into the environment. These are the methods such as walking versus using a car, purchasing products that are sustainably produced, managing waste, and using solar and other alternative energy sources.

It all begins with us!

As researchers and inventors find ways to effectively remove carbon or transform the carbon, we can take action by looking at what each of us can do to reduce our carbon footprint.

However, it is not just one individual doing one thing; it is going to take everyone doing multiple things in communities and across the world. And by working together through the combination of community effort and science, there's hope for a sustainable path out of the climate crisis.



FEATURED ARTICLE

Ocean Life in a Changing World

Ocean life, including many animals represented at the Aquarium that you know and love, are in peril and need our help.

Fossil fuels like coal, oil, and methane gas power our world. Burning fossil fuels releases carbon dioxide (CO₂) gas into the atmosphere, which acts like a heat-trapping blanket that is warming our planet and our ocean. This is causing negative impacts on habitats across the globe that affect people and the animals that share our planet.

Animals have evolved over millions of years to survive and reproduce in specific ecosystems. The effects of climate change can drastically change these ecosystems, making it difficult for many animals to adapt.

This past summer scientists observed an alarming global marine heatwave. Parts of the central and eastern Pacific (including off

the California coast) saw water temperatures that were as much as 5 degrees (Fahrenheit) warmer than usual. These types of increased temperatures put animals in jeopardy when they are unable to tolerate or adapt to changes.

We'll explore several of the many examples of how climate change is impacting ocean and coastal habitats familiar to us at the Aquarium—coral reefs, wetlands, and kelp forests—and how those impacts are affecting marine life.

Coral Reefs

Corals are incredible living landscapes that also provide habitat and nursery and feeding grounds for entire ecosystems from zebra sharks and colorful parrot fish to iconic blue tangs and mesmerizing cuttlefish.

Corals live at the edge of their thermal (or heat) tolerance. Algae, also called zooxanthellae, live in corals. These algae give corals their beautiful colors, in addition to providing food for the corals via photosynthesis.

Rising ocean temperatures stress the coral, causing it to expel the algae and resulting in the fading of the coral's color. This process is called coral bleaching. Because corals are the foundation of the reef ecosystem, heat events leading to bleaching can result in significant impacts.

Coral bleaching is not the only issue coral reefs face with climate change. Animals like corals build their complex skeletons out of calcium carbonate. Ocean acidification, caused by climate change, reduces the amount of building materials (calcium carbonate) available to animals in the ocean. Over time it becomes increasingly difficult for these animals to build their skeletons. This also affects many other animals that use carbonate to build their structures such as giant clams.

Coral reefs are teeming with life, including colorful fishes of all shapes and sizes that you see in our Tropical Pacific Gallery. Any threat to the reef is a threat to the vast diversity of life that depends on it.

Despite all this, there is hope. Bleached corals can recover. Understanding coral resiliency has been an important part of conserving corals. SECORE (SExual CORal REproduction) is an organization that the Aquarium partners with to study coral resiliency by learning about coral reproduction and why some corals are better adapting to climate change.

Wetlands

Wetlands, like marshes and swamps, are unique and diverse habitats that can connect the land and the ocean. They provide storm protection and homes for numerous animals, from scores of baby fish to a variety of shorebirds.

The impacts of climate change on wetland habitats puts added stress on this ecosystem that is already experiencing other human induced stressors, including land development and pollution.

One of the many impacts climate change has on a wetland habitat is its ability to act as a buffer between the ocean and land. Wetlands provide space for water to collect during storm surges and tidal changes. Rising ocean temperatures causes thermal expansion of the water. Warmer water takes up more space than cooler water. This, coupled with the melting of polar ice caps, is leading to an increase in sea level rise.

Habitats like wetlands struggle to take on this increase in water, impacting the plants and animals that live there. For coastal wetlands where fresh and salt water meet, sea level rise means more salt water. This impacts the animals that live in fresh water or depend on freshwater animals as food.

American avocets, which can be seen in our Shorebird Sanctuary exhibit at the Aquarium, are just one example of a bird that is built to thrive in wetlands and depends on them for food and nesting. The impact of climate change on wetlands will affect these and many other birds.

The Aquarium is working with other partners to ensure our local wetlands are more resilient through cleanups and restoration efforts, which you can volunteer to help.

Kelp Forests

Kelp forests are home to many different animals such as sea otters, sea lions, and the iconic garibaldi.

Kelp is particularly sensitive to warm waters. It can literally melt away when the water is too warm off our coast. Also, kelp normally absorbs dissolved nitrogen gas in the water as a source of nutrients. But if the water gets too warm, the nitrogen “escapes” because there is more room between the water molecules in warm water.

Scientists are studying kelp to understand the genetic composition of different kelp species, especially in the face of change. One project that Aquarium staff members are participating in is bull kelp seed banking. Along with a network of partners, we are storing kelp gametophytes.

Our aquarists are also studying the early development of giant kelp. These are all steps that help kelp forest systems become more resilient and ensuring a future home to the giant seabass, leopard sharks, moray eels, and many of the other species seen in our Southern California Gallery.

Climate-Friendly Solutions

At the Aquarium, the animals serve as ambassadors for their natural habitat counterparts. It is our hope that they will inspire everyone to act to protect them and our planet from climate change. We are also looking to set an example for our community in sustainable practices in everything from energy usage to sourcing supplies.

Taking collective action and finding ways to challenge each other is an effective (and fun!) way to reduce our carbon footprint. You can walk, ride a bike, take a bus, or carpool as some alternatives to using a car. Challenge yourself to find new vegetarian recipes, and cook them with friends.

Use resources to help track your carbon footprint such as the Cool Climate calculator, Carbon Footprint calculator, or the carbon calculator provided by the Environmental Protection Agency. You

can also reach out to government representatives and businesses to encourage actions to reduce climate change.

Most importantly, bring someone along with you as you explore new ways to reduce your carbon footprint. Advocate for bike racks at your work place, share a great vegetarian recipe once you find one, or organize a group call session to your local representatives with your friends. Working together as a community is the solution since it levels up our actions to a higher scale, which then has an even greater positive impact.

There is hope for people and all the amazing animals that we share this planet with if we work together.



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Animal Updates

Read about a new animal added to the Tropical Reef Habitat.

When Fish Grow Too Big for a Home Aquarium

The Aquarium of the Pacific recently acquired a juvenile Queensland grouper through a donation from a home aquarium keeper, who discovered that this species of fish grows to a very large size. Queensland groupers commonly grow to 6 feet in length. This juvenile is projected to grow to a similar size or even larger. Patient guests to the Aquarium can sometimes get a glimpse of our full-grown Queensland grouper in our Tropical Reef Habitat. The juvenile Queensland grouper is also currently in the Tropical Reef Habitat. Learn more about the Queensland grouper in the animal database.

A common misconception is that fish grow to the size of their tank. But there's more to consider than just the size. Like the

habitats at the Aquarium, a home aquarium should strive to replicate the ecosystem the fish would normally be found in, be housed with compatible species, and provided with a proper diet. Choosing sustainable fish stores, asking questions regarding how the fish were acquired, and properly researching the care requirements and adult size will help ensure a conscientious home aquarium. Sustainable fish stores will be able to provide details on how the fish were acquired and that those sources engage in responsible practices.



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Philanthropy Highlights

Read about a trip to help teen volunteers learn about turtles, about a record-breaking coastal cleanup and two charter donor spotlights.

Record-Breaking California Coastal Cleanup

On September 23, over 400 people of all ages joined the Aquarium for another record-breaking California Coastal Cleanup at the end of the Long Beach Peninsula. Volunteers from over 25 companies and organizations from across Southern California pitched in to remove an impressive 1,057 pounds of trash off the beach, including tiny micro-plastics, fishing wire, food wrappers, barstools, and even a lobster cage! “Thank you to all that joined to make our beaches even more beautiful!” said Ryan Ashton, vice president of development.

SoCal Honda Brings Aquarium on Wheels to Local Students

Long-time sponsor, the Southern California Honda Dealers Association granted a special “random act of helpfulness” this past October by bringing the Aquarium on Wheels to the Un Mundo De Amigos preschool in Long Beach. The Helpful Honda team surprised more than 100 students and their parents with an opportunity to touch and learn about anemones, urchins, sea stars, and more. For many of the children, it was their first interaction with the Aquarium or any sea life.

“The Aquarium on Wheels event meant the world to the Un Mundo de Amigos school community, where many families face financial challenges. This special experience brought so much happiness to our students and their families, sparking their curiosity about the ocean and marine life. We want to express our deepest thanks to the Helpful SoCal Honda Dealers and the Aquarium of the Pacific for making this incredible event possible,” said Elisa Coburn, program director at Un Mundo De Amigos.

Charter Donor Spotlight: Honda

As a founding supporter, Honda supports the Aquarium’s mission to educate and raise awareness of the issues facing the ocean planet and inspire stewardship. Honda has supported numerous education and conservation initiatives, provided in-kind support such as vehicles and boat motors, and contributed to Pacific Visions. In addition, hundreds of Honda associates have volunteered at Aquarium-hosted beach clean-ups, and Honda leadership has volunteered time and talent to the Aquarium’s Board of Directors and the Trustees of the Pacific.

Most recently, the Honda Engineering Roadshow, in partnership with the Center of Science and Industry, stopped at the Aquarium’s Family Science Night on October 12, 2023. This national education program delivered 400 Engineering Learning Lunchboxes containing hands-on science kits to early learners and their families.

In May 2023 Honda provided a \$100,000 grant in support of the Aquarium's Ocean Science Education program, which emphasizes experiential learning and STEM (Science, Technology, Engineering, and Math) identity-building through on- and off-site school programs and career exposure and skills development for teens.

Charter Donor Spotlight: Boeing

Over the past 25 years The Boeing Company has supported the Aquarium in multiple ways. The grant investment has funded key Aquarium education initiatives such as the Boeing Teacher Institute, school field trips, paid internships, and scholar programs. Boeing employees volunteer their time onsite with the Aquarium's education and husbandry departments, as well as at offsite events such as the Earth Day Wetland Restoration Day. Boeing executives have served on the Aquarium's Board of Directors and Trustees of the Pacific, and numerous in-kind gifts have been donated to the Aquarium's fundraising events.

"The depth and breadth of Boeing's support is amazing," said Ryan Ashton, vice president of development. "We are excited for a vibrant future of working together to make an impact on young students and to create pathways of entry into the STEM fields."

In August 2023 The Boeing Company provided a \$100,000 grant in support of the Aquarium's suite of STEM Pathway Initiatives, which span from early childhood to college career scientists.

Hatching a New Generation of Conservationists

Six teens traveled with Aquarium of the Pacific staff to Oaxaca, Mexico as part of a Student Eco Ambassadors (SEA) program this past November. The group partnered with a sea turtle researcher, who served as the instructor for the trip. The focus was to inspire youth and give them the opportunity to learn about sea turtle conservation.

“It was an honor being part of this amazing program! Not only did we learn about the importance of turtle conservation, but we also met amazing people from the local communities of Oaxaca”

—CRISTINA HERNANDEZ, Youth Volunteer Coordinator at the Aquarium of the Pacific

The teens patrolled the beaches at night watching for nesting turtles. The patrols are coordinated by the local hatchery every two hours. Some of the species seen at these beaches are olive Ridley and leatherback sea turtles. The teens also had the chance to release some turtle hatchlings in the morning. During the day, the students spent time learning about the local culture.

Two of the teens were sponsored by the Stanley G. Cohen Student Travel Award, generously provided by the Cohen family. This award allows students to travel and experience other cultures and in doing so, broaden their horizons and appreciation of the world. The spirit of this award is to give students a chance to travel and see how other people live as well as learn their beliefs, and in doing so, the hope is the students can appreciate what they have while broadening the horizons and appreciation of the world.

“My father’s philosophy gave me the opportunity to travel with him and that love of travel is part of my life. My family wanted a way to honor my father while helping others.”

—Andrew Cohen



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Aquarium Accolades

Read about Aquarium honorees from our community.

Moompetam

At the Moompetam American Indian Festival, Tina Calderon was honored with the Heritage Award. Calderon is a Tongva elder dedicated to the cultures of the Gabrielino, Tongva, Chumash, and Yoeme.

Calderon is a culture bearer, a traditional dancer, and storyteller who shares the history of her ancestors to educate others and honor her ancestors. Calderon is currently on the Tongva Language Committee, and she is a student learning the Šmuvič dialog of Chumash. Calderon also serves on the Parent Advisory Council (PAC) for the Fernandeño Tataviam Tribe's Education and Cultural Learning Department.

Calderon is also a singer who uses creative writing, poetry, and songs to tell her stories. She has over a dozen songs in her ancestral languages of Tongvé and Chumash. Calderon hopes to educate and inspire others to respect the environment just as her ancestors have done.

“Our language holds and ties us to our place.”

— Tina Calderon

Southeast Asia Day

Filipino American Service Group, Inc was honored with the Heritage Award at Southeast Asia Day. Executive Director Yey Coronel accepted the award.

The Filipino American Service Group, Inc. (FASGI) supports the Los Angeles Filipino American community. Originally founded to serve Los Angeles Filipino American veterans of World War II, FASGI focused on the socio-economic development of the community. Over the years FASGI expanded its scope to include the greater Los Angeles area, and in May 2016 FASGI began to focus on the unmet needs of all Filipino Americans.

FASGI offers mental health services, naturalization application assistance, health and wellness, disaster and emergency preparedness, legal referrals, and more. With a motto of, “Happy to help, honored to serve!”, FASGI is dedicated to improving the lives of the Filipino American community.

“To be recognized by the Aquarium of the Pacific for this and to be given this award is such a big honor.”

— Yey Coronel

Autumn Festival

The Aquarium presented the Heritage Award to the Terminal Islanders Club at the Autumn Festival. June Miyamoto Donovan, the president of the club, accepted the award.

The Terminal Islanders are a group of Japanese Americans that lived on Terminal Island at the mouth of the Los Angeles Harbor. This fishing community was started in the mid-1890s with fifteen Japanese men, who worked on the railroad, beginning to dive for abalone.

By 1915 nearly 3,000 Terminal Islanders were enjoying this community at its height. In the aftermath of Japan's attack on Pearl Harbor, the leaders of this community were arrested. By 1942 the Terminal Islanders rallied to stick with each other by voluntarily going to the Manzanar internment camp near Lone Pine, California. After the war, most of the families returned to the Los Angeles and Long Beach Harbor area to find that their community was bulldozed. But as the families began to settle they maintained a commitment to keep their history and connections alive and a memorial was built in 2002.

The next generation of Terminal Islanders continue educate others on the history and legacy of this important community. Three of the original Terminal Islanders were in the audience at the award presentation: Higeiko Yamamoto, Alice Nagano, and Hiroko Nogawa.

“We’re keeping the legacy going so that you guys don’t forget because it was a very happy place for everybody.”

— June Miyamoto Donovan