CORAL REEFS 2020

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A Living Sea Sculpture

By Colleen Flanigan, Founding Director of Living Sea Sculpture, volunteer at UCSC Long Marine Lab, TED Senior Fellow

Zoe is a memorial coral refuge designed to recover ocean biodiversity uniting art, science, technology, and education

Credit: Jessica Rose, 2018

Penn Schrader working on Zoe. Credit: Colleen Flanigan, 2019

For the past three and half years, *Zoe - A Living Sea Sculpture* has been anchored to the seafloor in Cozumel, Mexico. The DNA-inspired steel form is accreting limestone minerals through electrolysis to provide a fortifying marine substrate for corals to cement to and colonize. Corals build large natural reefs over thousands of years by secreting calcium carbonate, and with the urgency of the crisis facing coral reefs, this novel restoration method aims to give them a life-supporting pH boost and structural habitat, helping them adapt to environmental stressors such as climate change, ocean acidification, pollution, unsustainable fishing and development.

Zoe is a memorial coral refuge designed to recover ocean biodiversity uniting art, science, technology, and education. It is named in loving memory of Zoe Anderson, a young woman who wanted to help save corals and revive oceans but tragically died from a carbon monoxide leak. It's a sad irony that carbon monoxide's sister molecule, carbon dioxide, is threatening our entire planet. The project is disseminated worldwide through a virtual aquarium - the Zoecam – live streaming 12 hours a day. The daily recordings are accessible at the Living Sea Sculpture YouTube channel, where the database is growing and serves as a resource for scientific and cultural investigation and expression.

Located 60 meters from shore and four meters deep in front of Sand Dollar Sports Dive Shop, thousands of cruise tourists visit *Zoe* annually to snorkel, dive, and SNUBA. More and more, divers want to participate in coral restoration activities with our small team and volunteers. Various native coral species of Porites, Agaricia, Eusmilia, Gorgonians, and others have been transplanted - fragments of hope and a few test microfragments have been attached. In 2020, Penn Schrader and Lefke Kerr, while working on maintenance and monitoring of the project, observed larvae recruits of Agaricia and Eusmilia species. Just before the COVID-19 closures, we were discussing steps for further evaluation in preparation for more planting experiments in collaboration with local institutions. The restoration project is part of the larger local movement to transform the area devastated by hurricanes, pollution, diseases, and destructive human activities into a zone of ecological recovery and hands-on learning for the many divers and ocean lovers who want to participate. *Zoe* offers both an attraction and a practice, a catalyst for solutions and healthier relationships with the coastal ecosystem that everyone depends upon for sustenance and beauty. Living Sea Sculpture's small dedicated team, generous donors, and inspired volunteers have made this transdisciplinary project successful.

During the pandemic closures, though we miss diving and working on the project, we have the opportunity to watch and listen to the Livestream daily at the Living Sea Sculpture YouTube channel. This virtual aquarium provides an international portal into the sea during this pause, which is a valuable opportunity for discovery and research. While no cruise ships or motorboats are funneling into the zone, we are excited to observe the shifts in water quality and wildlife activity. Everyone of all ages is invited to join in our free "#iSpy With My Fishy Eye Virtual Scavenger Hunts" and participate in this coral restoration effort by capturing moments of ocean life action, identifying species, and sharing their curiosity and expertise. The details are here: https://livingseasculptures.com/%23ispy-contest-1

Low voltage electricity precipitates minerals to fortify the sculpture to become an evolving, life-supporting habitat for homeless corals and biodiversity in a region devastated by hurricanes, pollution, tourism, and climate change. As a memorial and coral refuge, this project uses the power of art, science, and technology to highlight life's fragility and its promise. Nothing happens in a vacuum. If the ocean teaches us anything, it's that everything is connected, and we belong to the same planet. It's our job to create the conditions for life to flourish.

In Honor of Zoe