

Kerckhoff Marine Lab — Newsletter —



Summer 2023

Orange C



KML Partnerships



Above: Pacific Oysters undergoing depuration at KML.

Right: SCCWRP staff collecting oysters for deployment into Newport Bay.



Over the winter, KML partnered with Southern California Coastal Water Research Project (SCCWRP), a public R&D agency designed to help guide Southern California aquatic management by utilizing new science and technology practices. SCCWRP's primary objective was to provide rationale for reconsideration of appropriate numeric water quality targets related to the Newport Bay Total Maximum Daily Load (TMDL) for fecal coliform. The project goals were to evaluate water column fecal indicators, shellfish tissue pathogens, and fecal indicator levels to determine if significant relationships exist.

SCCWRP collected roughly 1,500 Pacific Oysters from the Newport Bay, where a subset was processed to characterize background concentrations of these pathogens and indicators. The remaining oysters were then held at KML to undergo depuration with disinfected seawater using UV sterilization. The oysters were held at KML for a few weeks, where they received regular feeding. After the depuration, the oysters were removed from KML and deployed in small mesh cages at various sites in the Newport Bay. We always appreciate supporting our local agencies with continued efforts in understanding the impacts to our local water quality and improving the health of the Newport Bay.

Research

Captura is a climate startup founded in 2021 by Caltech professors Harry Atwater and CX Xiang. It harnesses the proven carbon removal powers of our oceans to draw down planet-warming atmospheric CO₂ using a proprietary electro dialysis process, which requires just renewable energy and ocean water as inputs. The technology is currently undergoing rigorous R&D at KML, where Captura's first 1-ton pilot is fully operational. The next system, projected to deploy in 2023, will have 100 times the capacity of the first and demonstrate the substantial scaling potential of Captura's process. As Captura moves closer to global commercialization capacity, it is excited to bring forth an effective and powerful tool to the decarbonization market to help accelerate worldwide Net Zero goals.



Captura staff, Ibadillah Digdaya and Cory Atwater at work in KML



KML Volunteers

We welcomed a new volunteer to KML this year, Brian Tram. Brian is completing his undergraduate degree in marine biology at Cal State Fullerton. He is gaining experience learning seawater system maintenance and assisting with projects around the lab. Brian hopes to continue developing knowledge around marine science and aquaria as he seeks to transition into a role at a public aquarium.



New eelgrass blade growth harvested after the experiment. Total length and biomass (wet weight) were measured from each plant.



Growth treatment aquaria of eelgrass for experiment.

Our current volunteer, Evelyn Kosoff, performed her high school AP project here at KML over the last couple months. She was examining eelgrass growth in various temperature treatments. We set up aquariums (see left) along different temperature parameters (ranging from winter ambient temps to peak summer temps) to examine blade length and biomass growth. Results showed that peak summer temperatures yielded the highest growth, but when sustained warmer temperatures remained, the plants began to die off with extended thermal exposure. This demonstrates the threats of sustained warming ocean temperatures we are continuing to see.

The Locals

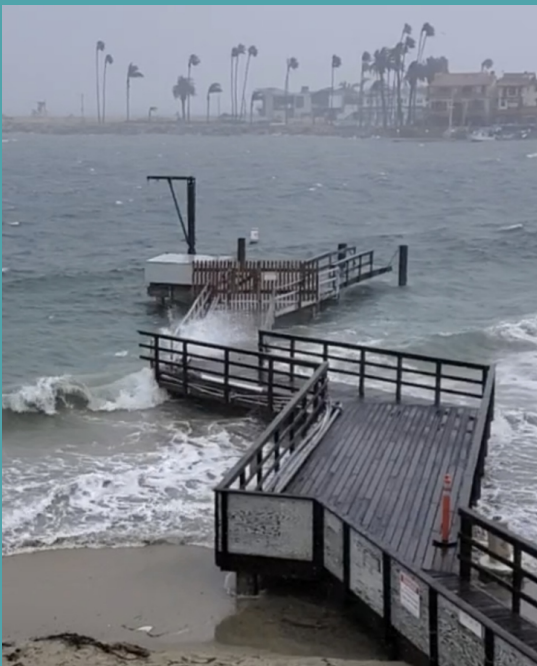


Brown pelican at KML showing off their breeding plumage. These marine birds are regular visitors of KML typically seen hunting in China Cove.

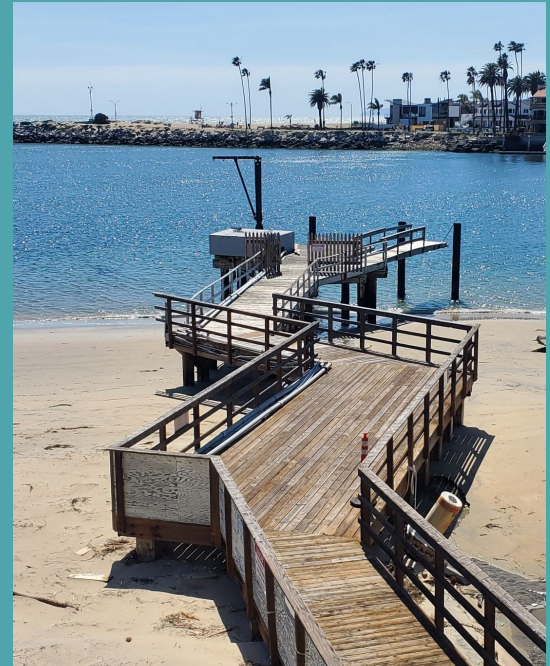


California sea lion sunbathing at KML. These marine mammals can often be seen swimming along the Newport channel throughout the year.

Stormy Days



Over this winter, like most of California, KML saw some strong storm events. These two photos, taken just a few days apart, demonstrate the changes in both tidal elevation and wave surges we see here at KML. While this winter was out of the ordinary, scientists predict we will continue to see stronger storm events in the years to come as a result to climate change.



KML History

Wheeler North (1922-2002)

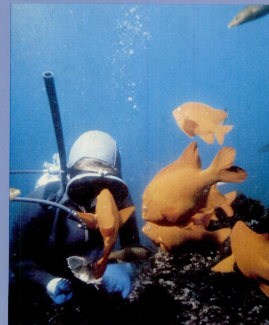
Wheeler North joined the Caltech faculty in 1962 and spent much of his time working out of the Kerckhoff Marine Lab. He was Professor of Environmental Science, and was instrumental in establishing what is now the Environmental Science and Engineering (ESE) program at Caltech. North pioneered the use of SCUBA for scientific diving, including developing safety protocols and studying diving physiology. He was an expert on kelp forests, and his work is responsible in large part for the recovery of kelp forests off Point Loma and elsewhere along the California coast.

North developed methods for control of invasive purple sea urchins, keeping them in ecological balance with the kelp forests even in the absence of their historic native predators, the sea otters. He served as a consultant to the kelp harvesting industry and to the US Navy on a variety of massive kelp forest engineering projects, including studying the use of producing food and fuel from kelp biomass. North also did extensive aerial surveys of the California coast, particularly looking at the extent of kelp beds, collecting more than 12,000 images over 30 years.



Underwater California

by WHEELER J. NORTH



Above: Wheeler North diving along the California coast.

Left: One of Wheeler North's publications on the various ecosystems and species of California's underwater coastal communities.



DIVE DEEP, BUILD HIGH!

DISCOVERING THE OCEAN
THROUGH STYROFOAM CUPS AND
SAND CASTLES

SUNDAY JULY 9, 2023

2:00PM

101 DAHLIA AVE
CORONA DEL MAR,
CA 92625

Spend your day at the beach for a Styrofoam Cup Decorating & Sand Castle Building Event! Come decorate a styrofoam cup and follow its journey to the depths of the ocean. The surfaced souvenir might surprise you! Bring the whole family to discover secrets of the ocean, dive into creativity, and swim in some raffle prizes!

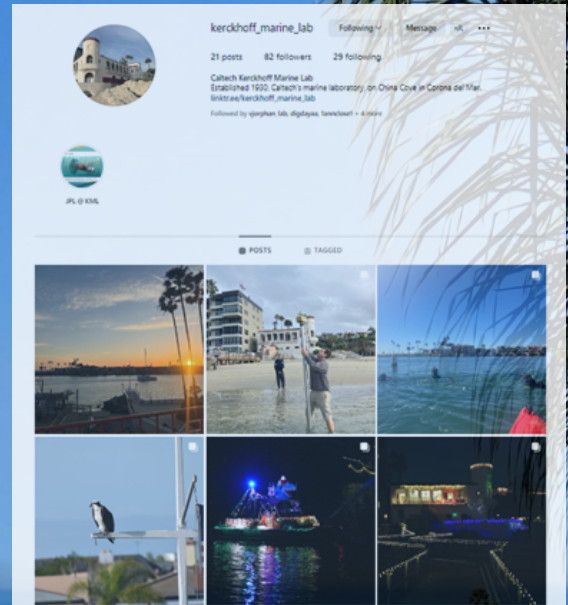
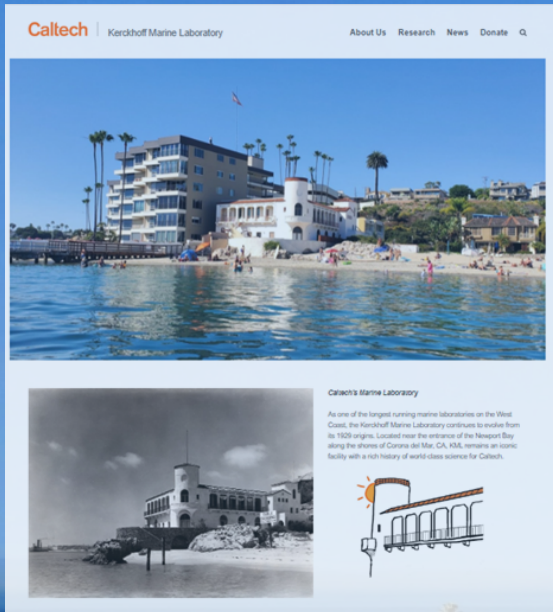


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