

Assessment of the Nearshore Rocky Reef Resources of Santa Monica Bay



The coastline of Santa Monica Bay is characterized by rocky reefs in the North (Malibu) and South (Palos Verdes) and sandy shores punctuated with breakwaters and jetties. The ecological and economic importance of rocky reefs and kelp forests is immense. Giant kelp (*Macrocystis pyrifera*) is a foundational species of rocky reefs, creating habitat for more than 700 fish and invertebrate species. It also serves as a food source for species within and beyond rocky reef habitats. Forests of giant kelp support recreational and commercial fisheries for California spiny lobster, red sea urchin, cucumbers, Kelp Bass, California Sheephead, White Seabass and more.

The Vantuna Research Group (VRG) at Occidental College has been monitoring the rocky reef resources in Santa Monica Bay since 1974, making it the longest continual monitoring program of rocky reefs in the world. However, monitoring programs at such a large scale are difficult to maintain, and occasionally there are gaps in rocky reef data. Given the rapid onset of climate change that has taken place over the last decade, VRG has little information on the current extent and condition of some of the bay's rocky reef ecosystems. Therefore, it is a priority to reassess all rocky reef ecosystems in Santa Monica Bay, and specifically those in Malibu which have not been surveyed since 2012.

With funding from the Santa Monica Bay Restoration Commission's [Proposition 50 grant program](#), VRG surveyed 68 rocky reefs in Santa Monica Bay over two years to understand the overall condition of the rocky reef habitats and help researchers predict their future condition under different climate change scenarios. The project will measure:

- Size and abundance of all fish and targeted or keystone invertebrate species such as urchins and sea stars. Whether certain species are present or absent can indicate habitat condition. The fish size measurements will be used to estimate fish production.
- Benthic cover of the ocean floor. The ocean floor may be covered in sand, rock, algae, or colonial invertebrate species. Benthic cover can also indicate habitat condition by revealing how much coastal erosion has taken place. Coastal erosion and landslides driven by climate change are a threat to rocky reefs.

Habitat Highlight – Prop 50: Occidental Rocky Reefs

- Preferred habitat of abalone species. Abalone are threatened, and this information will give insight into the conditions necessary for reintroducing these important species.
- Physical characteristics of the reefs including visibility and temperature. Coastal erosion creates lower light availability, which negatively impacts rocky reefs. The ocean is becoming warmer, which threatens species that require cooler temperatures.
- Size and extent of the rocky reefs, which will indicate if these habitats are expanding or shrinking over time.

The project will also identify any remaining data gaps for future studies to address. The findings of this study will be published in the next [State of the Bay Report](#) for the Santa Monica Bay National Estuary Program.

Meet the Team

Dr. Dan Pondella – Occidental College, Vantuna Research Group

Pondella is the project director and principal investigator of this Prop 50 project, overseeing all project activities, analysis, and reporting and participating in field surveys.

Pondella's other work includes projects on the Palos Verdes shelf to assess kelp restoration success and implement a 40-acre rocky-reef restoration project at Bunker Point and the baseline assessment of the newly created Marine Protected Areas. Pondella is a professor of biology at Occidental College. Pondella is also director of the Southern California Marine Institute. Learn more about [Dr. Pondella's](#) work.

Chelsea Muñoz Williams – Vantuna Research Group

Muñoz Williams is the administrative lead and database manager for this project. Muñoz William's roles include overseeing data entry, maintaining records, and coordinating and participating in field surveys.

Muñoz Williams started working with the VRG in 2007 as an undergraduate research assistant and most recently as Assistant Director since 2021. Muñoz William's master's thesis research focused on spatial variation in life history parameters of the Garibaldi in the Southern California Bight. Learn more about [Muñoz Williams'](#) work.