

OCEAN STUDIES INSTITUTE

ANNUAL REPORT

2025-2026

820 S. SEASIDE AVE. TERMINAL ISLAND, CA 90731 | SCMI.NET | 562-985-3172

MISSION

The Ocean Studies Institute is a consortium of nine California State Universities who decided to pool their resources to explore the ocean and coastal regions more effectively. OSI currently consists of California State University Dominguez Hills, Fullerton, Long Beach, Los Angeles, Northridge, Pomona, San Bernardino, San Marcos, and Channel Islands. OSI became a founding member of larger consortium of the Southern California Marine Institute (SCMI) in 1994.

The mission of the Southern California Marine Institute (SCMI) is to foster marine research and education, focusing on urban impacts of the greater Los Angeles region on the coastal ocean. We seek to improve scientific understanding and the development of solutions that will enable coastal waters and watersheds to thrive, adapt and become resilient to ongoing environmental stressors.



ABOUT US

The Ocean Studies Institute is a founding member of the Southern California Marine Institute (SCMI) which is a consortium representing a strategic alliance of 25 major universities, colleges, and foundations in Southern California. This includes nine universities from the California State University system representing the Ocean Studies Institute: Channel Islands, Dominguez Hills, Fullerton, Long Beach, Los Angeles, Northridge, Pomona, San Bernardino, and San Marcos. SCMI also comprises the combined marine resources of the University of Southern California, Wrigley Institute for Environmental Studies, University of California Los Angeles, Occidental College, Los Angeles Community College District comprised of nine community colleges (Los Angeles City College, East Los Angeles College, Los Angeles Harbor College, Los Angeles Mission College, Los Angeles Pierce College, Los Angeles Southwest College, Los Angeles Trade-Tech College, Los Angeles Valley College, and West Los Angeles College), Pasadena City College, The Bay Foundation, NOAA National Marine Fisheries Service West Coast Region, the California Science Center Foundation.

The consortium structure of SCMI allows us to engage in specialized marine research that would not otherwise be possible through independent organizations, and to maximize the use of resources as well as collaborate on projects. SCMI is in the heart of the Port of Los Angeles on Terminal Island. Our facility is a full functioning marine research institute equipped with offices, laboratories, classrooms, a seawater filtration system, machine and wood shops, and a warehouse. There is ample docking space for small boats from various universities and organizations, as well as the research vessel R/V Yellowfin.

DIRECTOR'S MESSAGE

Despite the political winds against us, marine science is alive and well at OSI! I don't think we have slowed down at all. As you can see from our report, we've had another busy year in which we continue to improve our facility and services. Of course, the hallmark of our program is the Research Vessel Yellowfin, which continues to run flawlessly. Whenever I greet the boat, I see nothing but happy students and instructors. We can thank our crew for this experience. And, despite the out-of-control inflation, we continue to provide an affordable experience for students throughout the region. We have continued to invest in upgrading our facility and these improvements have led to increased use. So, if you have a need for any shore-based activities, let us know and we will provide them. Baked into our mission is providing the opportunity for all our students to access the marine environment. As an example, our AAUS scientific diving course is now free to all OSI campuses and we have a fully developed dive locker to support our students and staff needs. In addition, we had another excellent Catalina Semester. There's more to come, see you on the island!

Daniel J. Pondella II, MA, Ph.D.
Director, Ocean Studies Institute & Southern California Marine Institute

OSI FIVE-YEAR STRATEGIC PLAN

OSI has set forth a renewed 5-year strategic plan that focuses on four goals: strengthening its strategic partnership with Southern California Marine Institute (SCMI), growing collaboration with AltaSea, supporting CSU Marine Biology Semester on Catalina Island, and identifying foci to encourage collaboration develop funding opportunities for OSI faculty and students.

- **<u>GOAL 1:</u> OSI will continue to strengthen its collaborative alliance with Southern California Marine Institute (SCMI)** This collaboration pools the physical resources of OSI such as staff, vessels, and equipment with the resources of other SCMI institutions. OSI also gains access to laboratories, facilities, water systems, as well as grant and research opportunities. Key strategies include sustaining annual funding and advancing programs. Success of this goal will be measured through surveys of OSI constituents, annual OSI board actions, increased equipment, staffing, training opportunities and on-going delivery of services.
- **<u>GOAL 2:</u> Through OSI's role in SCMI, continue to work with and grow our collaboration with AltaSea** to develop shore-side marine facilities that include a seawater system and educational research spaces. The strategic plan for this goal is for the SCMI director to continue to collaborate and advocate for OSI's program needs at AltaSea at the planned future home of SCMI. This goal is dependent on funding goals required by AltaSea, the finalization of plans, operational fiscal profiles are set forth, and construction has been completed and is ready for occupancy.
- **<u>GOAL 3:</u> Continue to offer the CSU Marine Biology Semester on Santa Catalina Island**, while creating a more sustainable funding plan. The course takes place every fall semester at the Wrigley Institute for Environmental Studies (WIES) and is led by OSI faculty. This course is fully immersive and accelerates student learning, sparks research, and advances professional careers. This goal will be supported by the continued offering of this course and an improved funding plan that promotes faculty participation is set in place to ensure the future of this amazing program.
- **<u>GOAL 4.</u> Facilitate and develop OSI research foci that supports and creates funding opportunities** for OSI faculty and students. OSI seeks to expand participation in programs like COAST, an intercampus collaborative network. OSI will promote collaboration by updating OSI faculty bios, identifying points of mutual foci, creating dedicated working groups, and can assist CSU students in identifying career and advanced degree goals. OSI aims to coordinate a research symposium that will highlight collaborative results and research opportunities as well as promote collaboration with SCMI members.

STRATEGIC PLAN: GOAL 1

OSI will continue to strengthen its collaborative alliance with Southern California Marine Institute (SCMI)

INFRASTRUCTURE IMPROVEMENTS

SCMI and OSI advances their missions by strategically maintaining, enhancing, and optimizing the facilities and infrastructure that support marine research, education, and outreach. A primary objective of our infrastructure program is to provide a clean, safe, and welcoming environment where member institutions, researchers, staff, students, and visitors can learn, collaborate, and engage in scientific discovery. Through proactive maintenance and targeted infrastructure improvements, the adoption of industry best practices, SCMI continually strengthens its operational capabilities while maximizing the value of available resources. These efforts ensure reliable high-quality services, support long-term sustainability, and create an environment that promotes innovation, safety, and excellence in marine science.

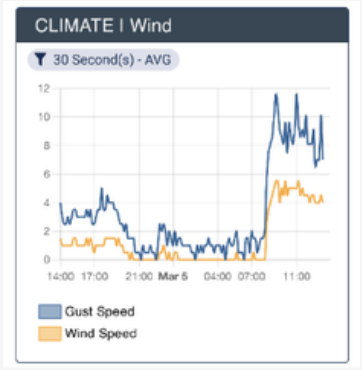
Several spaces underwent improvements to enhance functionality, and overall work quality. Aging acoustic tiles were replaced, improving the visual appearance and their acoustic performance. These upgrades help reduce ambient noise levels, creating a more comfortable environment.

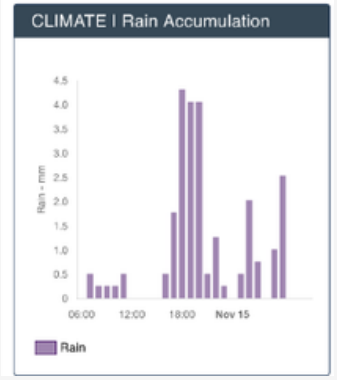


Additionally, several rooms continue to receive cosmetic enhancements, including wall and technology repairs, improved organization, and a general refresh effort aimed to extend life and reduce maintenance of existing spaces. These enhancements contribute to a more professional and welcoming atmosphere for optimal productivity.

INFRASTRUCTURE IMPROVEMENTS







PORT OBSERVING SHORE STATION ELEMENT (POSSE)

The POSSE (Port Observing Shore Station Element) received a third round of funding from the Port of Los Angeles Community Investment Grant Program. This initiative offers significant benefits to the Harbor Department and the Tidelands Public Trust by supplying real-time water quality and climate data, which supports marine-related scientific research across all educational levels within the Port of Los Angeles. By integrating multiple data sets and implementing outreach efforts, the POSSE continues to sustain and enhance a comprehensive, regional coastal ocean observing system. This continued funding supported the annual maintenance and expansion of interpretive elements.

To further broaden public engagement and increase accessibility, new digital signage was installed at SCMI, providing visitors with accessible information about the monitoring program and showcasing real-time environmental data.

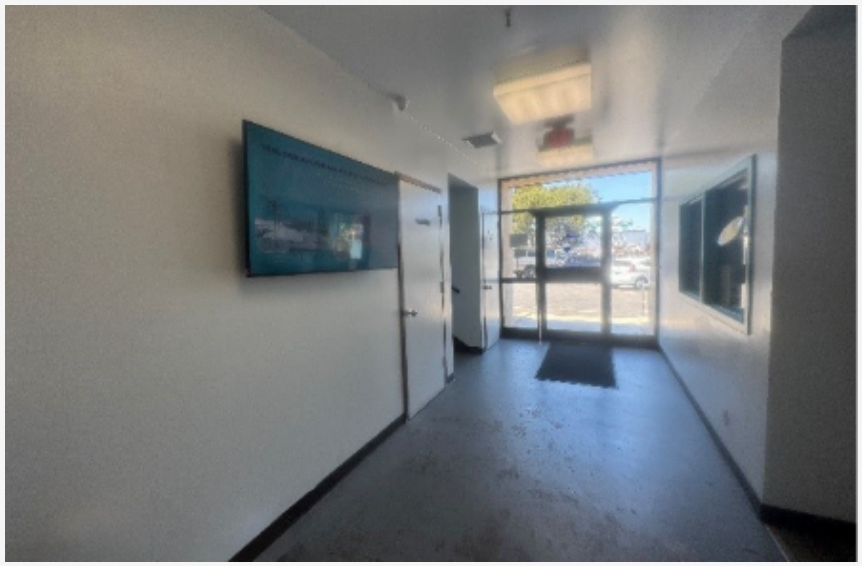
INFRASTRUCTURE IMPROVEMENTS

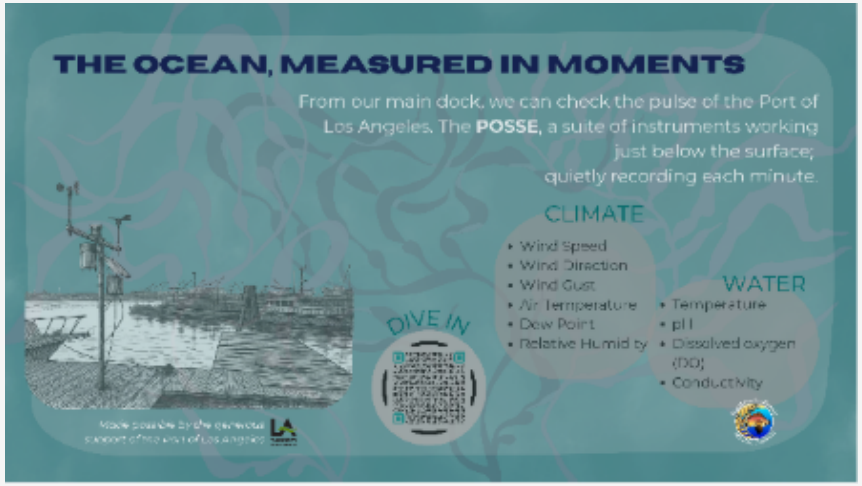
FOYER MODERNIZATION

As part of our ongoing efforts to enhance visitor engagement, scientific outreach, and facility aesthetics, our entry foyer received a paint refresh and added electrical designed to transform the space into a more welcoming and informative environment. The project included the addition of a large-format digital monitor that will serve as a dynamic communications hub for the Institute.

To support the modernization effort, new electrical supply was installed within the foyer to provide dedicated power for operating a digital display system while allowing flexibility for future technological enhancements.

The centerpiece of the foyer is a 55” digital monitor that provides real-time access to our POSSE data, SCMI programs, accomplishments, and resources. Positioned prominently within the entryway, the display serves as an engaging visual platform that connects visitors with the Institute’s mission, research activities, educational programs, and community partnerships.





INFRASTRUCTURE IMPROVEMENTS

YELLOWFIN DOCK REFURBISHMENT

Improvements focused on repairing and upgrading key dock components to better support daily vessel operations, research activities, and educational Programs. We removed aging dock hardware and welded on new marine grade cleats throughout the facility, enhancing vessel mooring safety and reliability.

A haul out and comprehensive inspection of the dock undercarriage was conducted, with repairs completed on any compromised flotation elements before the structure was sealed with a multilayer protective coating system designed to extend the life and service of the dock foundation for years to come. These upgrades reduced maintenance needs and provided a more reliable platform for personnel and equipment transfers.

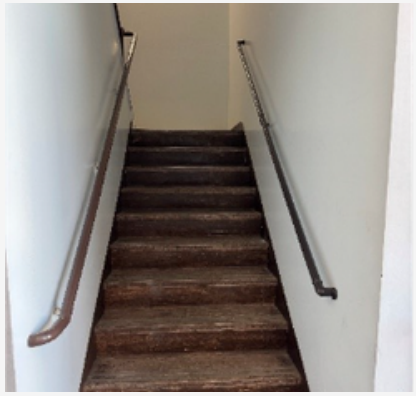




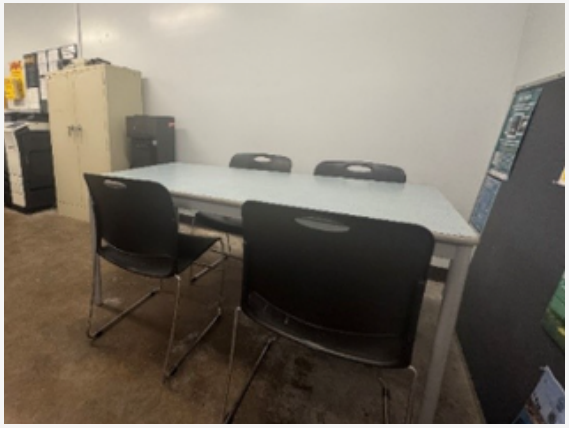
INFRASTRUCTURE IMPROVEMENTS

STAIRWELL SAFETY ENHANCEMENT PROJECT

With progress in improving facility safety and accessibility, additional handrails were installed to capture both sides of each stairwell on campus. Existing stairwells were equipped with limited handrail coverage which did not provide dual-sided support for individuals ascending and descending the stairs. Adding handrails on both sides increases stability, enhances pedestrian safety, and improves accessibility of all resources to all employees and visitors.



The completed improvements contribute to SCMI's ongoing efforts to maintain high standards of facility operations, safety, and accessibility.



BREAKROOM & STAFF GATHERING SPACE IMPROVEMENT

A highlight of our facility improvements was transforming our existing copy and mailroom by reorganizing to include a dedicated employee breakroom and gathering space. The project transformed an underutilized area into a functional, comfortable environment that supports staff and tenant well-being, collaboration, and workplace engagement.

Improvements included the installation of seating and a table for breaks and informal meetings. The furniture was sourced from CSU campus surplus at no cost. The repurposed space provides a centralized location to recharge throughout the day while fostering greater interaction among all laboratory crew.

CLASSROOM ROLL-UP DOOR INSULATION IMPROVEMENT

To improve thermal comfort, energy efficiency, and year-round usability of the classroom space, the existing roll-up door was upgraded with R-10 rated ridged foam board insulation thus reducing a significant source of heat transfer when ambient temperatures contributed to elevated indoor conditions. The insulation system was selected for its lightweight construction, moisture resistance, and durability in a coastal environment.



OSI AAUS & MOTC OPERATIONS

DIVE OPERATIONS

With 26 active dive plans in place, OSI member institutions are conducting local dive operations from Ventura to San Diego county, and remote operations in French Polynesia and the US Virgin Islands. These collaborative efforts have included researchers from NOAA, UCLA, UCSB, UCSC, UCSD, Occidental College, California Academy of Sciences, Florida State University, Boston University, University of Buffalo, Texas Tech, and the Okinawa Institute of Science and Technology.

We currently have 50 active Scientific Divers on our roster, logging 1568 dives for the period 7/1/2025 – 6/30/2026. One AAUS Scientific Diver course was conducted with eight new Scientific divers and two Divemaster candidates receiving training. The cohort was comprised of candidates from CSULB, CPP, and Occidental College.



For 2026/2027, one AAUS course is planned for the Winter Interstitial break and one for Summer. A proposed Lead Diver course has been approved by OSI's Diving Control Board and will be offered on a quarterly "as-needed" basis. Two AAUS "prep" courses are in the planning stages.

Six Emergency Response training courses (Diving First Aid and Basic Life Support) were held for a total of 46 participants.



BOAT OPERATIONS

We conducted two MOTCs during the summer of 2025, for a total of 18 participants, and two MOTCs during 2026 Spring break for 12 participants. Sessions were comprised of candidates from CSUN, CSULB, and Occidental College. For 2026/2027, two sessions are planned for summer, and two for 2027 Spring Break.

OSI AAUS REPORT

AAUS Report 2025

Created
04/01/26 07:31
by Darrell Montague

Updated
04/01/26 07:33
by Darrell Montague

Period
01/01/25 - 12/31/25

Total time
49521 min (34days 9h 21min)
From last year ▼ 13%

Total dives
1449
From last year ▼ 11%

Total divers
55
From last year ▲ 6%

Incidents
0
From last year ▲/▼ 0%

AAUS
04/02/26 13:37
by Darrell Montague

Dives by Breathing gas

	Dive time (min)	Dives logged	Number of divers	Number of incidents
Air	48488	1410	55	0
Nitrox	1033	39	1	0
Mixed Gas	0	0	0	0

Dives by Specialized Diving Environment

	Dive time (min)	Dives logged	Number of divers	Number of incidents
Required Decompression	0	0	0	0
Overhead Environment	0	0	0	0
Blue Water	163	9	9	0
Ice/Polar	0	0	0	0
Saturation Diving	0	0	0	0
Aquarium Diving	0	0	0	0

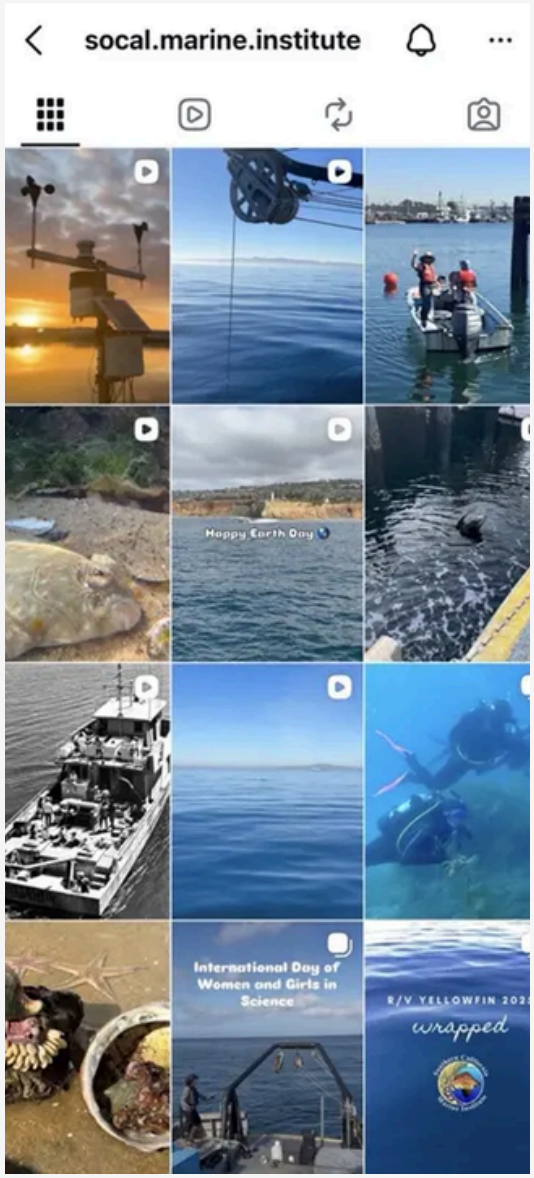
Dives by AAUS depth range

	Dive time (min)	Dives logged	Number of divers	Number of incidents
0 - 30 feet	26201	829	52	0
31 - 60 feet	22643	591	49	0
61 - 100 feet	677	29	12	0
101 - 130 feet	0	0	0	0
131 - 150 feet	0	0	0	0
151 - 190 feet	0	0	0	0
> 190 feet	0	0	0	0

Dives by Diving Purpose

	Dive time (min)	Dives logged	Number of divers	Number of incidents
Scientific	43667	1146	42	0
Training and Proficiency	5854	303	27	0

SCMI SOCIAL MEDIA



1.7 K Followers

1 K Profile Activity

51 K Views

11.8 K Accounts Reached

The Southern California Marine Institute Instagram Account @socal.marine.institute is the main social media platform utilized by both Southern California Marine Institute (SCMI) and Ocean Studies Institute (OSI). This account is primarily is used to highlight educational and research projects happening at the SCMI laboratory as well as onboard the R/V Yellowfin.

Instagram stories are popular amongst our viewers as it shows the most engagement, especially with revamping our weekly “What is it Wednesday” Quizzes. We recently turned these quizzes into a stories poll for the audience to vote on which species they think it is. Informational species cards are included after the poll to educate the audience about southern California fishes local to our area. These informational cards have additionally become highlights that users can refer back to at a later time.

This account has also been a prioritized platform for promoting courses held by the OSI at SCMI. Courses such as the Motorboat Operator Training Course (MOTC) and the AAUS Dive Program are often featured on the account to bring awareness to those who may benefit from the courses.

R/V YELLOWFIN EDUCATIONAL CRUISES





The R/V Yellowfin is well known for conducting educational cruises to local universities and colleges, with a majority of them being part of Ocean Studies Institute. Of the 133 total cruises onboard the Yellowfin between 2025-2026, 99 trips were educational. Educational cruises onboard focus on teaching students how to operate scientific equipment while aboard vessels, as well as how to collect and interpret the data collected by the gear and equipment. Equipment includes but is not limited to otter trawls, Isaacs-Kidd Midwater Trawls, plankton tows, biological dredges, gravity corers, Niskin bottles, CTDs, etc. This past year, we have seen an increase in popularity of utilizing the Isaacs-Kidd midwater trawl! These trips give students the opportunity to see different sea critters that they would not typically see in other sampling methods such as the otter trawl. These are long trips that run late at night where we usually sample before and after sunset. This allows students to see the vertical migration patterns of the deep sea species.

R/V YELLOWFIN VESSEL USAGE

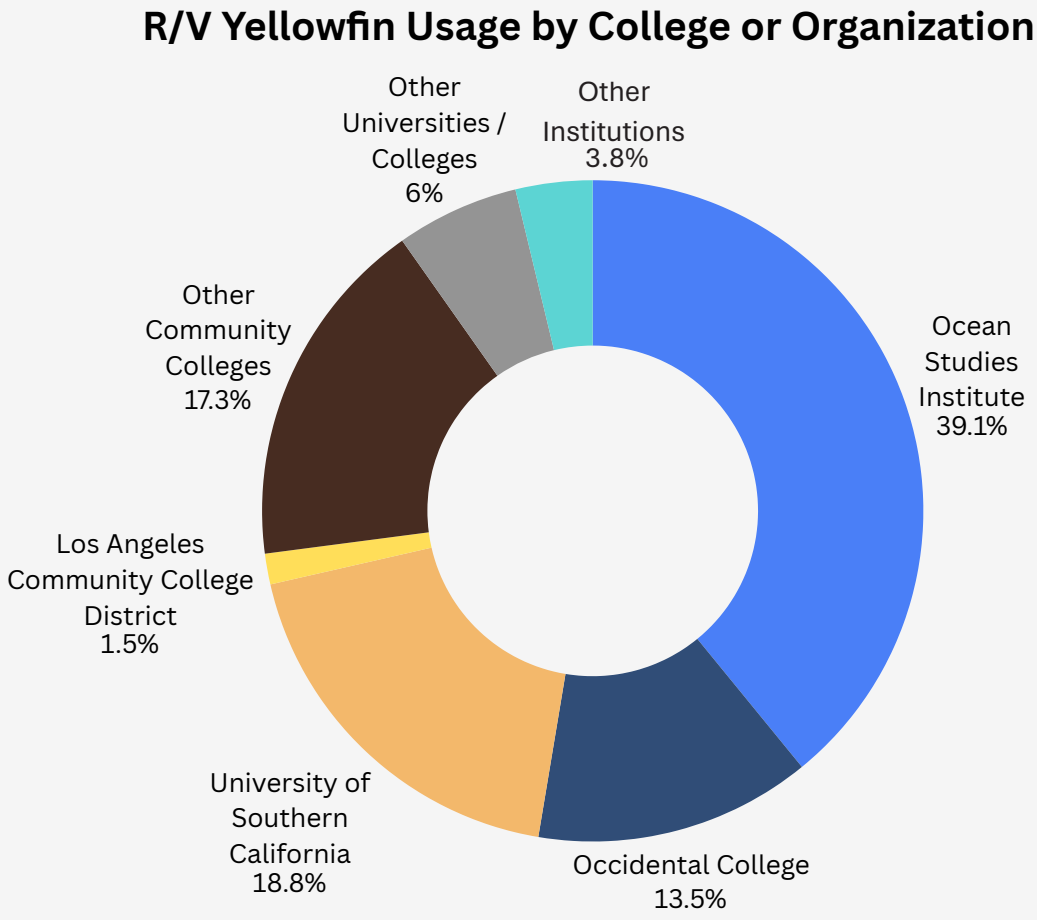
The R/V Yellowfin had another outstanding year spending over 700 hours at sea for 133 cruises. This is about a 7% increase from last year! We had a running total of 1,914 students and 319 faculty and researchers out on the water with us conducting biological and environmental surveys for research and education.



Name	# of Cruises	# Students	# Faculty & Researchers	Hours of Vessel Use
Ocean Studies Institute	52	970	90	269.25
Occidental College	18	186	31	84
University of Southern California	25	109	118	184
Los Angeles Community College District	2	37	4	8
Other Community Colleges	23	492	49	72
Other Universities / Colleges	8	120	17	38.5
Other Institutions	5	0	10	47
Total	**133**	**1914**	**319**	**702.75**

R/V YELLOWFIN VESSEL USAGE





FISCAL REPORT

Ocean Studies Institute FY Budgets 2021/2022 through 2025/2026

Fund Description	FY 2021-22	FY 2022-23	FY 2023-24	FY 2024-25	FY 2025-26
Revenue					
Salaries and Wages	$ 544,799	$ 603,297	$ 605,473	$ 651,832	$ 658,525
Benefits	$ 286,313	$ 309,865	$ 351,832	$ 346,426	$ 382,762
OSI Member Contributions [2]	$ 76,500	$ 76,500	$ 76,500	$ 76,500	$ 76,500
OE&E [1]	$ 109,761	$ 128,752	$ 99,798	$ 25,195	$ 5,840
Misc. Revenue and User Fees [3]	$ 33,090	$ 48,758	$ 59,691	$ 64,260	$ 47,966
Total	$ 1,050,463	$ 1,167,172	$ 1,193,295	$ 1,164,213	$ 1,171,594
Expenditures					
Salaries and Wages	$ 521,423	$ 587,059	$ 638,626	$ 662,580	$ 648,675
Benefits	$ 286,313	$ 309,865	$ 351,832	$ 346,426	$ 382,762
Operating Expenses [4]	$ 139,391	$ 195,780	$ 158,959	$ 135,303	$ 116,023
Accounting Charges	$ 1,293	$ 2,125	$ 2,031	$ 1,652	$ 5,187
Total	$ 948,419	$ 1,094,829	$ 1,151,448	$ 1,145,960	$ 1,152,647
End-of-Year Balance	$ 102,044	$ 72,343	$ 41,847	$ 18,253	$ 18,947

[1] OE&E includes carryover balance from previous year. In FY 2024-25 $40,050 dive budget was moved to salaries and wages

[2] OSI Members contributions are received annually and vary among the nine OSI institutions based on historic patterns of facilities and service use.

[3] Miscellaneous OSI Revenue comes from indirect cost returns from external grants; user fees are associated with use of the R/V Yellowfin. This revenue source varies from year to year and include carryover from prior years.

[4] Operating Expenses include contractual services, supplies, minor boat repairs, and diving related expenses

STRATEGIC PLAN: GOAL 2

SCMI will continue to collaborate with AltaSea in the design and construction of a new Marine Research Facility

AltaSea plans to build a new a 35-acre marine science facility at the Port of Los Angeles with the goal that it will become the new home of SCMI and OSI. Once complete, this facility will have seawater systems and expanded spaces that support educational and research programs. Throughout the year, the director of SCMI continued to meet with AltaSea to receive progress updates and to advocate for the needs of our programs. The SCMI director also continues to work with the OSI and SCMI Boards to ensure that all programs will be properly supported. This goal will be accomplished when funding is secured by AltaSea, the finalization of plans, and finally the construction of the new marine science facility.

In addition, AltaSea and SCMI are collaborating on the possibility using AltaSea as an alternative loading location for the R/V Yellowfin during the planned 16-month closure of the Vincent Thomas Bridge which may affect access to SCMI's current location on Terminal Island beginning November 2026.

STRATEGIC PLAN: GOAL 3

Continue to offer the CSU Marine Biology Semester on Santa Catalina Island



CSU MARINE BIOLOGY SEMESTER ON CATALINA ISLAND 2025

Strategic Plan: GOAL 3

The Ocean Studies Institute held another incredible CSU Marine Biology Semester on Santa Catalina Island during the Fall 2025 semester. Twenty students attended the unique program where they stayed at USC Wrigley Marine Science Center full time for the entirety of the fall semester. This year was hosted by California State University, Long Beach and courses included Marine Ichthyology (taught by Dr. Darren Johnson), Marine Ecological Processes (taught by Dr. Bengt Allen) and Marine Phycology (taught by Dr. Christopher Janousek). After finishing all three courses, students develop and conduct a research project utilizing the knowledge and skills they gained. Students further present their research and their findings at the end of the semester student symposium.

This invaluable program provides students with a once in a lifetime opportunity to not only learn about marine science, but to conduct it with unlimited access to an incredible marine station. This prepares our students with unique knowledge and experience to enter the workforce after graduation. This is a program that has been running for over 25 years and we are proud of the success it has brought over the years.





STRATEGIC PLAN: GOAL 4

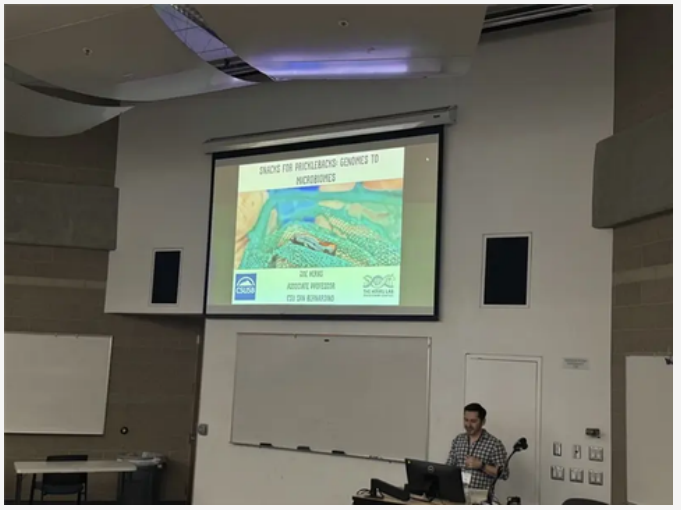
Facilitate and develop OSI research foci that supports and creates funding opportunities



OSI SYMPOSIUM

In April 2026 OSI held its annual symposium in conjunction with the Southern California Academy of Sciences (SCAS) Annual Meeting at Chapman University. Nine research abstracts were submitted from OSI consortium members and graduate students highlighting important topics in marine biology research.

CSUN - Larry Allen, Spawning time of giant sea bass *(Stereolepis gigas)*
CSULB - Darren Johnson, Evolution of larval fish in a warming ocean
CPP - Rachel Le, Population ecology of *undaria* in Dana Point Harbor
CPP - Sandra Dansereau, Human trampling impacts on two sea anemone species
CPP - Natalie Shubin, A half-century of ichthyoplankton: How studying larval fish can improve food security in our urban ocean
CSUF- Alec Lamond, Ryan P Walter, Resilient restoration: Temporal genetic stability of *Zostera marina*
CSUF - Ryan Walter and Nathalie Carrillo Munoz, Fine-scale genetic structure of restored *Zostera marina* in a SoCal urban seascape
CSUSB - Joe Heras, Snacks for Pricklebacks: genomes to microbiomes
CSUN - Jade Zounes, Effects of food availability on the diet of a fish





SOUND PRODUCTION IN YELLOWFIN CROAKER | CALIFORNIA STATE UNIVERSITY, NORTHRIDGE

Graduate student Vanessa Benoit (CSUN) continues her research at SCMI investigating acoustic communication in yellowfin croaker *(Umbrina roncador*), a native Southern California species. Over the past year, research has focused on acoustic monitoring during the species' spawning season, when sound production is expected to play an important role in reproduction. Using hydrophones in SCMI's outdoor aquaria, acoustic recordings continue to be collected throughout the spawning season to capture sounds associated with reproductive activity. These recordings are helping document the vocalizations of yellowfin croaker, whose acoustic behavior has not been formally described. Anatomical comparisons of male and female fish complement the acoustic data by examining differences in sonic musculature. The continued support of SCMI staff and facilities has been essential to advancing this research.





PALOS VERDES REEF RESTORATION PROJECT



The Palos Verdes Reef Restoration Project with the Southern California Marine Institute (SCMI) and the Vantuna Research Group (VRG) from Occidental College continues to show incredible success. In 2020, the two organizations collaborated to build the new offshore rocky reef near the Palos Verdes Peninsula to help restore the ecosystem. Since its construction, several research projects around artificial reefs have been conducted to support the thriving success. Studies have shown not only an increase fish production which was one of the primary goals of the project, but an increase in species abundance across the board of marine fishes, invertebrates, algae, etc.

As the restoration of artificial reefs have provided a number of research opportunities to local scientists, the next several pages highlight the studies being done on artificial reefs.

PALOS VERDES REEF STUDIES

Palos Verdes Reef: a test of artificial reef design criteria to increase regional fish production in southern California

Dan J Pondella, Jeremy T Claisse, Chelsea M Williams, Jonathan P Williams, David Witting

Abstract

The first offshore and in situ restoration rocky reef in California, the Palos Verdes Reef (PVR), was designed to maximize the secondary production of fishes. The overall project goal was to restore 35.2 ha of sediment impacted or buried rocky reef utilizing 52,729 mt of granitic quarry rock modules distributed strategically with a footprint of 3.2 ha. Module design, modeled after a nearby highly productive natural reef feature, incorporated relief and rock size criteria to theoretically withstand sedimentation and turbidity impacts. In a first for temperate reef ecosystems, reefing modules were placed adjacent to the natural reef. Further design criteria included maximization of ecotonal perimeter and soft-bottom halos increasing niche and resource availability. Postconstruction, we documented the relocation of resident reef fishes from surrounding reefs to the newly created habitat. From 2021 to 2023 for reef associated fishes, standing biomass and secondary annual production increased across all modules: total fish biomass increased from 223 to 3286 kg (1372%) and production increased 59 to 690 kg yr−1 (1062%). Halo biomass density increased; from 6.9 to 22.5 g m−2 and production density from 1.8 to 6.0 g m−2yr−1. Due to their relatively large area, overall halo production was nearly equivalent to module production. Over the entire restoration site, fish biomass increased 96% and production increased 93%, demonstrating its carrying and productive capacity was almost doubled during the initial three-year period postconstruction PVR modules. These metrics of strong success occurred while the system is still developing, despite declining biomass and production at reference sites.

Bull Mar Sci. 101(4):1827–1846. 2025
https://doi.org/10.5343/bms.2025.0053

ENVIRONMENTAL STATUS OF ARTIFICIAL STRUCTURES OFFSHORE SOUTHERN CALIFORNIA | BOEM GRANT





In cooperation with the Bureau of Ocean Energy Management (BOEM), the Vantuna Research Group at Occidental College, the Claisse Lab at Cal Poly Pomona and the Southern California Marine Institute continued monitoring of artificial reefs along the coast of Southern California. Together, they surveyed over 150 reef modules or shipwrecks throughout the coast through sonar mapping, and biological surveys by divers and remotely operated vehicles (ROVs). These surveys take a closer look at how artificial structures act as habitat to support species along the Southern California Coast in comparison to natural reefs. The findings from these surveys help determine how ecological dynamics in these habitats, to help assist in decision making of future marine infrastructure.

ARTIFICIAL REEF MONITORING | COAST

With the support of the CSU Council on Ocean Affairs, Science & Technology (COAST), Dr. Jeremy Claisse from Cal Poly Pomona and Dr. Daniel Pondella from Occidental College have been conducting research on artificial reefs along the southern California coast. The research developed a deeper understanding of the physical status and habitat features of artificial reefs. They mapped 13 artificial reef complexes using high-resolution sonar, identifying 154 individual reef modules and quantifying habitat characteristics including reef size, vertical relief, slope, and surface roughness. These habitat maps were combined with biological SCUBA surveys, allowing for in-depth analyses of reef habitat and biological communities. The project demonstrated that reef design, construction materials, habitat complexity, and proximity to natural reefs strongly influence biodiversity, fish abundance, and productivity, providing practical guidance for future artificial reef design, habitat restoration, and marine infrastructure management.

This research project has been an excellent opportunity for OSI researchers, graduate students, and undergraduate students to participate in important and necessary research along our coastline.





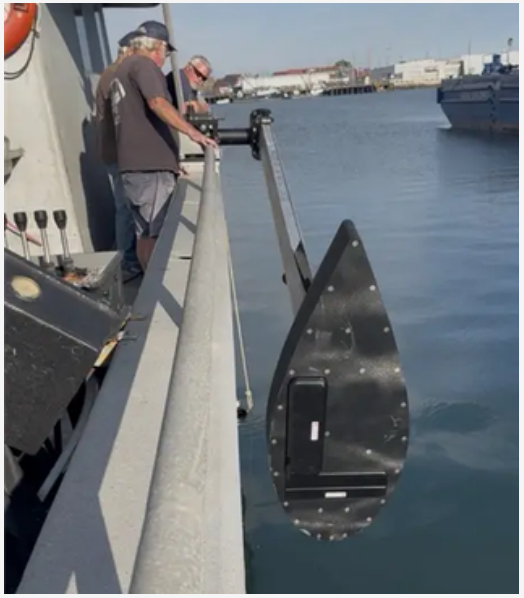
WIND ENERGY AREAS (WEAs) IMPACT | COAST

A grant was awarded by the CSU Council on Ocean Affairs, Science & Technology (COAST) to study the impact Wave Energy Areas (WEAs) have on benthic taxa off the coast of southern California. The following summary encompasses the focus of the study.

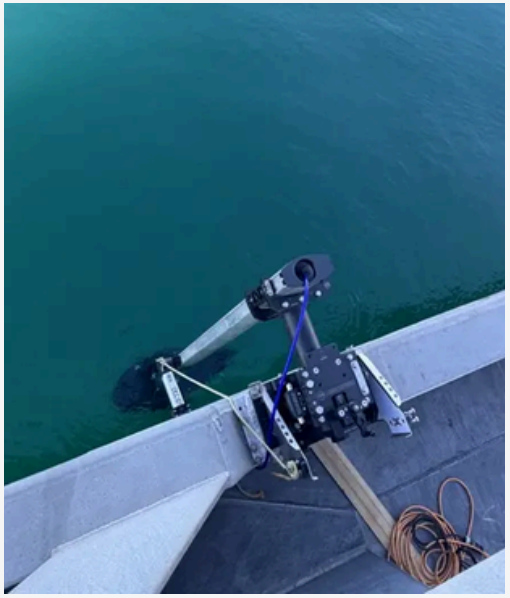
Development of Wind Energy Areas (WEAs) off the coast of California will impact benthic taxa (e.g., sablefish, rockfish, thornyheads, flatfishes, etc.) that have significant importance for the recreational, subsistence and commercial fishing industries. However, it is currently unclear how these infrastructure projects will affect these softbottom communities. We will generate a baseline assessment of the spatial distribution of these valuable taxa in relationship to the proposed footprints of these projects. Utilizing life history parameters and drawing upon processes associated with other deep infrastructure projects, such as oil platforms, we will project cumulative impacts upon this community. Theoretically the longterm impacts of these structures are potentially positive, negative or neutral. For instance, if the WEAs reduce fishing effort, then a de facto Marine Protected Area effect potentially can increase abundance and biomass. This has been documented in other artificial reef programs around the world, and in some instances, reefs are intentionally placed to restrict fishing and protect sensitive and critical habitats. Alternatively, the addition of new structure can alter habitat resulting in changes in community composition reducing the availability or the distribution of these taxa through a variety of mechanisms. The inclusion of hard structures, depending on their design, can introduce reef associated species that may, in turn, prey upon the soft bottom taxa reducing their local availability. The transition of soft bottom habitat to hard structures will reduce the amount of this habitat also potentially reducing stock availability. Meanwhile, some taxa may not be impacted at all. These and a variety of other processes will be examined in detail. Each fishery has unique parameters in terms of life history characteristics and fishing methods necessitating a species-by-species evaluation of these proposed projects. Outputs from this project will allow stakeholders to make informed decisions concerning these valuable resources.

MULTIBEAM SONAR SYSTEM | OCCIDENTAL COLLEGE, VANTUNA RESEARCH GROUP

In December 2025, the R/V Yellowfin was outfitted with a new Kongsberg EM2042 multibeam sonar system, expanding the vessel's capabilities to support ultra high resolution seafloor mapping. Following installation, the system successfully passed initial testing in the harbor and is now ready for deployment on future research cruises. The sonar will enable researchers to produce detailed maps of seafloor topography and benthic habitats, supporting studies of rocky reefs, eelgrass beds, artificial reefs, sediment dynamics, and coastal restoration throughout southern California and beyond.

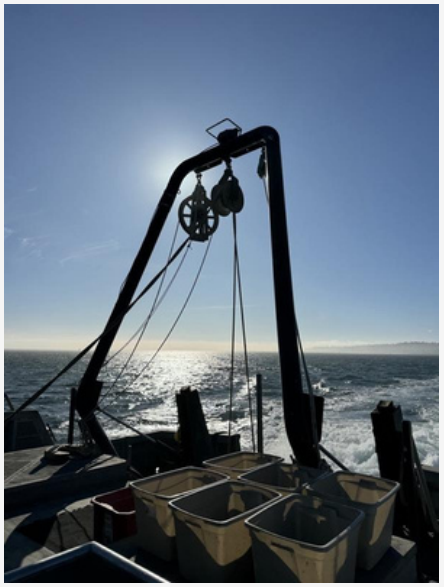






CONSORTIUM MEMBER & COLLABORATOR UPDATES





SOUTHERN CALIFORNIA MARINE INSTITUTE & PORT OF LOS ANGELES

WATER QUALITY SAMPLING PROJECT

In collaboration with the Port of Los Angeles The Southern California Marine Institute relaunched the Water Quality Sampling Project. The Port of Los Angeles previously conducted a similar project on the R/V Yellowfin prior to 2020, but put a pause on the project during the 2020 Covid-19 pandemic.

Starting in 2025, this exciting project is now conducted monthly by the SCMI crew visiting 33 different stations throughout the Port of Los Angeles to collect water quality data. The SCMI crew deploys a Seabird SBE 25+ CTD to collect water quality profiles at each site, along with additional environmental data collected through secchi disks, forel-ule color scales, anemometers, tide charts, etc.

This has been a highly anticipated and important project to SCMI, and we are looking forward to continuing this project throughout 2026 and in future years to come.



PALOS VERDES REEF STUDIES

Aerial Canopy Mapping Paired with eDNA Metabarcoding Reveals Quantitative Links Between Kelp Dynamics and Fish Community Structure in Palos Verdes, California

Elijah Catalan, Ryuichiro Nonomura, Omaia Olivas, Ariadne Reynolds, Kyle C. Cavanaugh, Paul H. Barber, Robert A. Eagle

Abstract

Giant kelp *(Macrocystis pyrifera)* is a foundational species whose canopy structure supports high fish diversity and community complexity in temperate rocky reef ecosystems. The Palos Verdes Peninsula has a historically significant but degraded kelp forest ecosystem embedded in the urbanized Southern California Bight that has been the focus of recent restoration efforts. Here we utilized a combined approach of aerial drone mapping with eDNA metabarcoding to compare teleost fish diversity to kelp canopy coverage, spanning a winter-to-spring seasonal transition. eDNA detected 106 fish taxa representing 57 families. Fish species richness and Shannon diversity significantly increased with percent kelp canopy coverage, with samples from sites exceeding 30% canopy cover exhibiting markedly higher fish diversity than areas with lower kelp canopy coverage. Simpson diversity also differed significantly across canopy groups overall, but no pairwise contrast survived Bonferroni correction, suggesting that the differences in richness and Shannon diversity were driven primarily by the addition of less abundant taxa under high kelp cover rather than by shifts in evenness among dominant species. These results demonstrate the utility of eDNA metabarcoding and drone mapping as an efficient and effective tool for non-invasive kelp forest biomonitoring and restoration assessment.

PALOS VERDES REEF STUDIES

Environmental DNA metabarcoding constraints on fish community composition and ecological succession following artificial reef construction off the Palos Verdes Peninsula, California

Elijah Catalan, Tanner Waters, Paul H. Barber, Robert A. Eagle

Abstract

The Palos Verdes Shelf contains a rocky reef ecosystem that has been heavily impacted by pollution and sedimentation over multiple decades, resulting in the loss of rocky reef habitat. The NOAA Montrose Settlements Restoration Program (MSRP) constructed artificial reefs in an attempt to restore important fish habitats. Here we compare previously reported visual survey data collected at this site to environmental DNA data collected in the same season from 2020-2022, post reef construction. During this time period the reef blocks underwent a transition from raw granite rock, to a transient algal and bryozoan colonized period, to supporting kelp. By 2022 both survey methods indicate community structure was still developing and was different to a nearby mature rocky reef environment. eDNA data captured the succession of reef associated fish communities. Notably it documented the presence of difficult to detect/cryptic species that were not reported in visual surveys and which require a more mature reef ecosystem to be supported.

UNIVERSITY OF SOUTHERN CALIFORNIA

PORE WATER CHEMISTRY

Professor William Berelson on his ongoing research on Pore Water Chemistry, *"My group has been studying how ocean water interacts, chemically, with sandy sediments with a goal of quantifying how ocean acidity can be neutralized while water interacts with sands.*

We have been using two novel approaches: a) we measure shelf sand pore water chemistry and infer from tracer chemical data the rate of water moving through the sands and the reactions occurring within the interstitial waters; b) we collect shelf sands, place them in a cylindrical column and pass seawater through them to determine what reactions are occurring and how rapidly the pore water chemistry changes.

Both approaches are meant to be complimentary, measuring real pore water profiles with an in situ sampler provides the best window into what is happening in sands in the real world, yet the second approach provides the controlled setting whereby water interaction with sands can be very purposeful and can be manipulated and easily sampled.



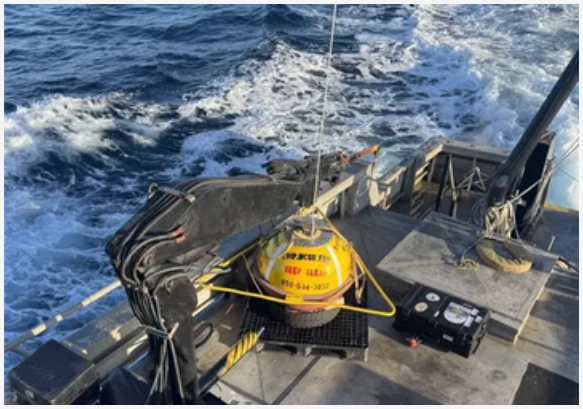
The sands we've worked on are from a) Venice/Santa Monica Beach, b) Wrigley's Catalina ocean front, c) a 'sand pile' outside LA Harbor, and d) off Huntington Beach. We find differences in how these sands behave when exposed to similar water and strive to understand what is driving these differences in geochemical behavior.

At the end of the day, we want to understand how natural processes occur to shape ocean chemistry and ecosystem structure. The interaction between ocean water and the sandy sea floor is shaping ocean chemistry——traveling to sites on the California coast to examine this process is made possible by our collaboration with SCMI and its wonderful staff."

William Berelson
Paxson H. Offield Professor
University of Southern California

COASTAL DATA INFORMATIONAL PROGRAM (CDIP)

WAVE BUOY DEPLOYMENTS



The Coastal Data Information Program (CDIP), based at Scripps Institution of Oceanography, operates a network of coastal wave buoys that provide real-time observations of waves and ocean conditions throughout the United States and internationally. The data support maritime safety, coastal management, scientific research, engineering, and recreational ocean users by delivering reliable information on changing ocean conditions.



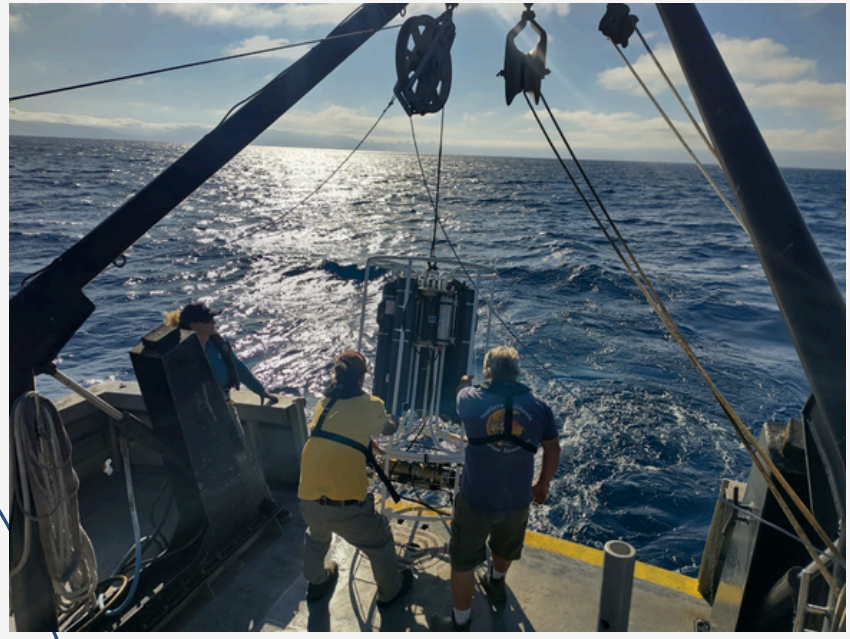
CDIP recently had the pleasure of working aboard the R/V Yellowfin to service two nearshore wave monitoring stations in the San Pedro region. During the missions, the team conducted maintenance activities to ensure the continued operation and reliability of these stations, which provide real-time wave data used by coastal mariners, harbor operations, the Marine Exchange of Southern California, researchers, and the broader coastal community. Collaborative efforts such as these help maintain critical observing infrastructure that supports safe and informed decision-making along the Southern California coast.

ETH ZÜRICH STOCKER LAB

DeepISCA Deployment & Prototype Test

The Stocker Lab (ETH Zürich), in collaboration with the Levine Lab (USC), conducted several successful deployments of an autonomous sampler for in-situ chemotaxis assays of marine microbes. Over three days aboard the RV Yellowfin, samplers were deployed to depths of up to 870 m between Los Angeles and Catalina Island. The goal of the campaign was to compare microbial chemotactic activity between surface and deep-sea waters. A dedicated deployment was also conducted to test a prototype of the next-generation deep-sea sampler.

The expertise and support of the RV Yellowfin's crew played an essential role in achieving successful deepwater deployments and producing valuable scientific data. SCMI staff also provided invaluable assistance in resolving several logistical challenges ahead of the cruise.





THE BAY FOUNDATION

The Bay Foundation (TBF) has gladly been an SCMI consortium member for over 10 years. SCMI's facilities and location have allowed TBF to continue culturing and propagating juvenile red and endangered white abalone, while simultaneously providing accessibility for kelp forest and eelgrass restoration efforts. TBF values the resources and support that SCMI has provided over the years.

TBF ABALONE PROJECT UPDATES

TBF's abalone restoration projects aim to implement a multifaceted approach to restoring and developing abalone populations, and ultimately rocky reef habitats, throughout Southern California and the Channel Islands. TBF maintains two abalone aquaculture facilities at SCMI where they advance research on captive-bred juvenile abalone husbandry techniques. Since 2019, TBF and project partners (NOAA Fisheries, the California Department of Fish and Wildlife (CDFW), Paua Marine Research Group (PMRG), UC Davis Bodega Marine Lab (BML), Aquarium of the Pacific (AOP), The Cultured Abalone Farm (TCAF) and others) have outplanted (or released) over 10,000 captive-bred juvenile red abalone (Haliotis rufescens) and over 26,000 captive-bred federally endangered white abalone (Haliotis sorenseni) to rocky reefs off Palos Verdes, Point Loma, and Santa Catalina Island.

From July 2025 to June 2026, TBF and other Southern California White Abalone Restoration project partners completed 2 abalone outplant events in Fall 2025 and Spring 2026, set up 4 new abalone restoration sites, and released 5,218 red abalone and 8,069 white abalone to 6 restoration sites in Point Loma, Palos Verdes, and Catalina Island. Additionally, during this reporting period, a total of 9,952 white abalone were transferred to TBF at SCMI to support the Fall 2025 and Spring 2026 outplant events, as well as future outplants scheduled for Fall 2026 and Spring 2027.

This work supports the Pacific Coast Ocean Restoration (PCOR) Initiative, a NOAA-funded statewide collaborative, through which TBF serves as a core partner and leads white and red abalone restoration efforts. The next white abalone outplant event is scheduled for September 2026. As part of this effort, two new restoration sites will be established with the release of 5,000 red abalone, and more than 5,000 white abalone will be released at existing restoration sites throughout the region.

THE BAY FOUNDATION

TBF ABALONE PROJECT UPDATES CONTINUED

Furthermore, TBF and partners – Paua Marine Research Group, Rincon Consultants, and The Cultured Abalone Farm are currently in Phase II project events for the Gaviota Coast Abalone Restoration Project, in which partners are undertaking abalone restoration in subtidal habitats affected by the Refugio Beach Oil Spill in May 2015. Since Fall 2024, a total of 15,000 captive-bred juvenile red abalone, produced at TCAF, have been released to restoration sites off the Gaviota Coast in Santa Barbara County. The next outplant event is scheduled for August 2026, where an additional 5,000 red abalone will be released, advancing the project's long-term goal of releasing 40,000 red abalone by Fall 2028!

Additionally, TBF is excited to continue their partnership at SCMI with the development of a new abalone aquaculture system, designed by Tenji Aquarium Design + Build aquaculture consulting firm, that is expected to be onsite by end of 2026. TBF staff look forward to this new aquaculture system, which will support the expansion of the captive breeding program and abalone restoration for future years to come. This new system will allow TBF to continue to serve as a vital abalone grow out and holding facility in the greater Los Angeles area prior to outplant events throughout Southern California!



Figure 1. Southern California White Abalone Restoration partner photo taken after the Palos Verdes spring 2026 outplant – TBF, NOAA, CDFW, PMRG, and AOP partners pictured here. Photo Credit: Fabian Aguirre and Maya Pisciotto, PCOR.

TBF and project partners will continue to perform scheduled biannual abalone outplanting and monitoring events, ultimately helping to inform the success of the project and the recovery of the species. TBF is always eager to develop new partnerships to further abalone restoration throughout Southern California, with continued and new projects coming soon!

More information about the Bay Foundation can be found on SCMI's Annual Report.

HOURGLASS CLIMATE



Hourglass Climate is a non-profit research organization dedicated to researching the safety and efficacy of marine carbon dioxide removal (mCDR). We are particularly interested in ocean alkalinity enhancement (OAE), which increases the ocean's capacity to absorb carbon dioxide from the atmosphere. We publish all of our work to provide the public with transparent and informed knowledge about this class of climate solutions.

Hourglass is conducting cutting-edge OAE research from our laboratory at the Southern California Marine Institute. Over the last year, we have conducted two experiments using our custom-built reactor system, which is designed to realistically simulate coastal processes in the lab. This reactor system allowed us to measure the dissolution of alkaline minerals in coastal sediments and support the development of modeling tools to evaluate the efficacy of OAE. The reactors also allowed us to rigorously evaluate the carbon removal potential and safety of new alkaline mineral feedstocks before they are tested in the field.

Our analytic laboratory at SCMI also serves as a vital resource to the broader mCDR ecosystem. We perform high-quality, independent carbonate chemistry measurements of parameters such as pH, dissolved inorganic carbon (DIC), and total alkalinity (TA) for mCDR companies and other interested parties. These services help quantify carbon dioxide removal and fill a critical industry gap.

HOURGLASS
CLIMATE

PASADENA CITY COLLEGE

PASADENA CITY COLLEGE AND SCMI BEGIN NSF-FUNDED PARTNERSHIP IN OCEAN SCIENCE

Students from Pasadena City College (PCC) are enjoying research experiences this summer at SCMI on board the R/V Yellowfin. This is all thanks to the new 3-year NSF Program “Ocean Science Research Experiences to Engage Two-Year College Students” with PI Elizabeth Nagy and co-PI Michael Vendrasco.

The summer program combines workshops and weekly boat trips during four weeks of July for a cohort of 16 PCC students. Students will develop and complete research projects and present their results in September at the PCC Division of Natural Sciences Summer Research Poster Session. Projects will relate to the ecosystem health of LA Harbor and nearby coastal regions.
This year’s student cohort is being mentored by five faculty from the Biology, Chemistry, and Geology departments at PCC. The faculty team includes KeChaunte Johnson, Elizabeth Nagy, Noel Rico-Corrales, Michael Vendrasco, and Kelley Voss. Taxonomist Kelvin Barwick and SCMI staff will provide additional support to students.

The boat trip and dock sampling plan to support student research projects was developed in consultation with Kelvin Barwick and SCMI staff including Carrie Wolfe, Julianne Steers, Nicole Christian, Mark Loos, and Denis Mahaffy. PCC faculty really appreciate their expertise and enthusiastic support, and we hope that this program will reinforce connections between PCC and SCMI.

Michael Vendrasco
Associate Professor of Geology and Chair of Geosciences,
Pasadena City College





PASADENA CITY COLLEGE

OCEAN ANIMAL RESPONSE AND RESEARCH ALLIANCE (OARRA)

EVERY ANIMAL HAS A STORY TO TELL

Over the past year, the Southern California Marine Institute has become an increasingly important scientific, educational, and operational hub for the Ocean Animal Response and Research Alliance (OARRA). From field response and wildlife monitoring to necropsy, biological sampling, research, education, and professional development, SCMI is becoming a place where the stories carried by Southern California's marine wildlife are transformed into science, and where science can inspire action and change.

The relationship is a natural fit. SCMI's collaborative model brings institutions and organizations together to share resources and advance marine research and education, while its Terminal Island location places OARRA's work in the heart of one of the nation's most dynamic urban coastal environments.

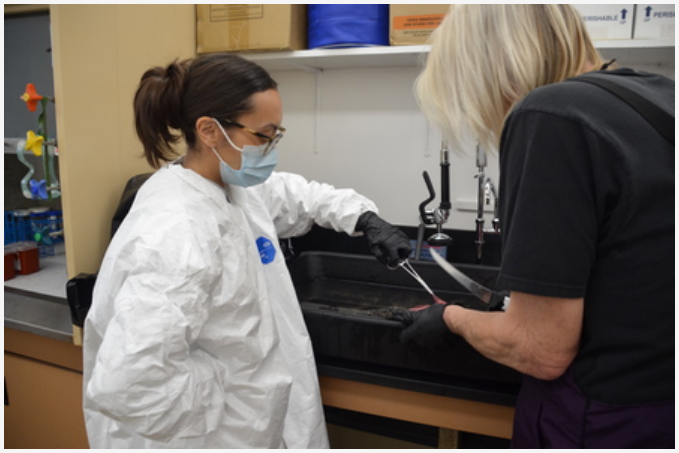
During 2025, OARRA conducted 367 marine wildlife responses and built a biological archive that now fills four freezers, containing more than 2,500 samples. In 2026, OARRA has already responded to 96 animals. All eight sea turtles responded to this year have shown evidence of vessel strike, while whale cases in and around the Port complex have raised additional concerns about vessel interactions. Marine mammals affected by domoic acid exposure further demonstrate the challenges facing wildlife along our changing coastline.



OARRA + California Science Center team
OARRA and California Science Center team members aboard the Ocean Endeavor at SCMI before a collaborative marine animal survey and monitoring trip.

OARRA
Ocean Animal Response and Research Alliance

OCEAN ANIMAL RESPONSE AND RESEARCH ALLIANCE (OARRA)



Hands-on training in the laboratory
Hands-on necropsy work at SCMI provides opportunities for biological sampling, investigation, and training—connecting individual marine wildlife cases with research and professional development.



LA STEM Faire — specimen-based education
OARRA volunteers engage young scientists at the 2026 LA STEM Faire using educational specimens prepared from animals examined through OARRA's marine wildlife response and research program.

Necropsies conducted at SCMI allow OARRA scientists to investigate these cases, document human interactions, examine potential causes of mortality, and preserve biological samples for current and future research. OARRA is also developing a collection of educational specimens- including skulls, vertebrae, teeth, barnacles, and whale lice allowing these animals to continue teaching long after examination.

Beyond the laboratory, OARRA conducts marine wildlife surveys from SCMI's docks in collaboration with the California Science Center, supporting monitoring, education, and professional development. SCMI has also become an important training ground where students and emerging professionals gain hands-on experience alongside OARRA scientists. Our work there has even welcomed international media, helping bring marine wildlife mortality science to audiences worldwide.

At OARRA, we believe every animal has a story to tell. Without investigation, these animals can remain individual tragedies. Through science, their stories become evidence; through research, evidence becomes knowledge; and through education and storytelling, knowledge can inspire action and change.

We love being part of the SCMI community. What began as laboratory space is becoming a home for OARRA's science, collaboration, education, and discovery, and a place where every animal's story has the opportunity to be heard.

OARRA
Ocean Animal Response and Research Alliance

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