

The Southern California Marine Institute



Annual Report 2016-2017

820 S. Seaside Ave, Terminal Island, CA 90731

(310)-519-3172 www.scmi.net

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Mission

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.

Who We Are

SCMI is a consortium representing a strategic alliance of 23 major universities, colleges, resource agencies, 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, the Los Angeles Community College District's nine campuses (East Los Angeles, Los Angeles City, Los Angeles Harbor, Los Angeles Mission, Los Angeles Southwest, Los Angeles Trade-Technical, Los Angeles Valley, Pierce, and West Los Angeles), The Bay Foundation, and NOAA National Marine Fisheries Service West Coast Region.

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 located 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 dive locker, 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

Another year at SCMI has flown by. As I mentioned in the annual report last year, the R/V Yellowfin was being outfitted for new Tier 4 diesel engines and generators. As I write this note, the R/V Yellowfin is currently running a trip using the most fuel efficient and cleanest engines in the research fleet. Last year I also mentioned that we were launching our Motorboat Operator Training Course (MOTC) and I'm pleased to announce that SCMI is leading the entire southern California educational region in boating safety. We are currently providing boat training for novice operators as well as seasoned marine scientists. This is in addition to the fully launched dive locker, which fully supports our scientific diving classes. Our boating safety and dive safety officers have been busy. It is not surprising that our support of fellow researchers has increased. As an example, Dr. Larry Allen (CSUN)

has launched a bioacoustic study of Giant Seabass (*Stereolepis gigas*) and we have three healthy adults in our new seabass tank. Considering the dramatically increased use of our facility, we are currently remodeling our classroom to better facilitate teaching and conferencing opportunities. We are also planning on remodeling a second aquaculture lab. So, lot's is happening at SCMI. I'm sure we'll see you soon.

Introduction

The Southern California Marine Institute (SCMI) is excited to announce many improvements and additions this year. The consortium grew to 23 members with the acceptance of the NOAA National Marine Fisheries Service West Coast Region (NMFS). NMFS becomes the first federal organization to join the consortium! More institutions have expressed interest in joining SCMI and we are excited about the opportunity to collaborate and expand in the near future. Our outreach efforts this year focused on offering internships to high school and college level students. The fall 2016 CSU Catalina Semester has come to a close, but the fall 2017 Catalina Semester is in full swing! SCMI staff has continued their work to improve the facility by installing new compressors in the dive locker and developing a small boat operations course (MOTC). Dr. Larry Allen of CSUN has brought giant sea bass to the facility, along with other projects being run through SCMI. Per usual, R/V Yellowfin demonstration cruises introduced many new classes, colleges and universities to hands-on experience with the Southern California marine world. The SCMI crew has begun the creation of a fish database based on the organisms caught on our otter trawls. After quite the busy year of expansions and projects, 2016-2017 has made for especially unique experiences for both the staff and students!



What's New?

Motorboat Operator Training Course (MOTC)

The California State University/Ocean Studies Institute has become an Institutional Member of the Scientific Boating Safety Association (SBSA) and has adopted its Motorboat Operator Training Course (MOTC) as the standard for our program. The MOTC is an entry-level course recommended for persons who will be acting as a small vessel operator or crew for CSU/OSI member institutions or other organizations. It reviews minimum requirements for safe operation of motorboats and includes a review of legal requirements, preparations, navigation, operations, emergency procedures, rescue, self-rescue, trailering, fire suppression and basic seamanship. The course includes both classroom and on-the-water instruction.

New SCMI/OSI Dive Locker

Although the dive locker has been present at SCMI for a while now, it has received an upgrade and is ready for the years to come. Dive safety officers Darrell Montague and Jim Cvitanovich have been hard at work getting the dive locker put together. With the addition of a lot of new gear, including brand new tanks, the locker is



ready to host many new incoming AAUS students. The former SCMI wood shop has now been converted into a compressor room. This compressor room is equipped with new, state of the art equipment, including a fill station, compressor, and nitrox system. All of these new additions were a much needed upgrade to the program and the facility.

NOAA Joins the Consortium

We are happy to welcome NOAA National Marine Fisheries Service West Coast Region (NMFS) to the SCMI consortium. NMFS is responsible for the stewardship of the nation's ocean resources and their habitat. NMFS West Coast Region offices are located a short distance from SCMI in Long Beach and many of their programs overlap with SCMI's interests. NMFS have programs in species recovery, specifically in endangered white and black abalone and sea turtles, habitat conservation with a focus on rocky reefs and seagrass ecosystems, and marine mammal and sea turtle strandings. NMFS is the first federal agency to join SCMI's consortium and can provide a unique benefit to SCMI members through collaborations with research and conservation efforts. Currently, NOAA biologists are collaborating with The Bay Foundation on the Abalone Project.

Outreach Programs

Volunteer Internship Program

Soon after the CSULB students from the class "History 482: Recent American Environmental History" participated in our volunteer program, the volunteers seemed to keep rolling in. The volunteers attend many of

the universities/colleges within the SCMI Consortium, and others are from less local universities/colleges. These universities/colleges range from Santa Ana College and CSU Long Beach to UC Davis and University Nevada Reno. We have been putting more effort into getting the word out for our program. The new usage of the SCMI social media has had a large effect on the number of responses from students. Having more and more help around the facility has been great in terms of assisting SCMI staff with R/V Yellowfin demonstration cruises, water quality projects, and general aquaristry.

SCMI continues our volunteer/internship program for high school and college students. We encourage students to apply for our program online to get the experience of working at a marine institute, while they benefit by gaining essential skills of the field and community service credit when fitting. SCMI is currently expanding this program by developing new projects for students to help with various research projects and daily tasks.

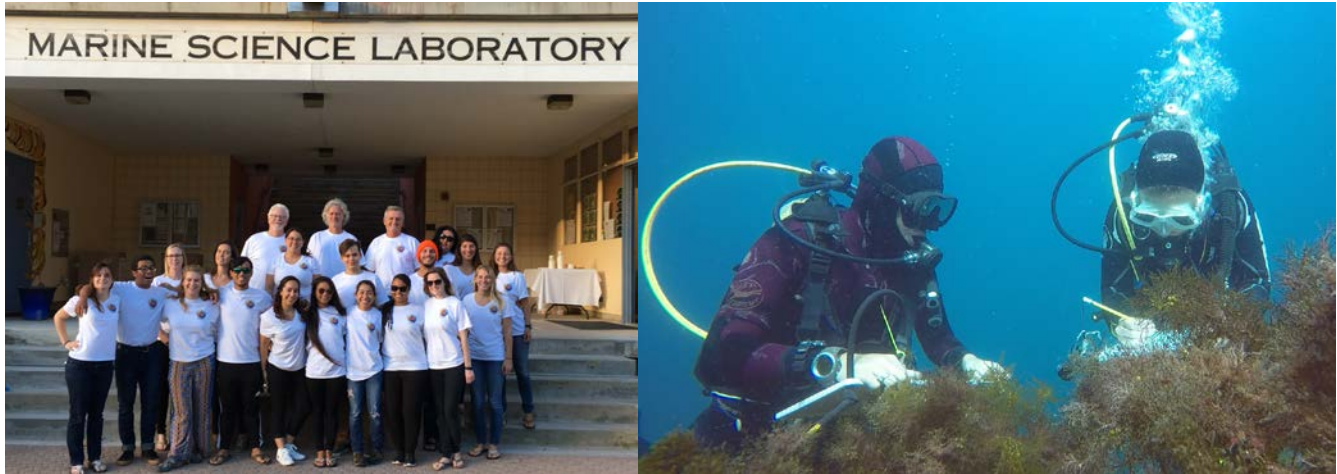


Educational Activities

CSU Marine Biology Semester on Catalina Island

The CSU Marine Biology Semester on Catalina continues to grow and benefit CSU students each Fall. The semester is a unique opportunity for CSU students to experience hands-on marine biology and guide them to a career in marine science. The Fall 2016 Marine Biology Semester was a great success with a total of 15 students from six different CSU's attending. The semester was taught by professors: Dr. Larry Allen, Dr. Steven Dudgeon, Dr. Mark Steele, and Dr. Robert Carpenter, all from CSUN. We have received positive feedback from the participating students and are excited to see the program grow to more CSU campuses. Students conducted research projects on a large range of topics from elasmobranch habitat selection to photosynthetic rates of marine macroalgae. Kathryn Scafidi, a CSULB student, told us more about the project she did over on the island, "My independent research project was looking at the effects the invasive alga, *Sargassum horneri*, has on the foraging of three local temperate rocky reef fishes, *Semicossyphus pulcher*, *Hypsypops rubicundus*, and *Halichoeres semicinctus*. I collected three of the most commonly foraged algae, which included *S. horneri* to identify and record the abundance of the micro-invertebrates present. Overall there was a low abundance of micro-inverts present on *S. horneri* and the fish exhibited a negative preference to foraging off it as well." This project is just one of many done this past semester.

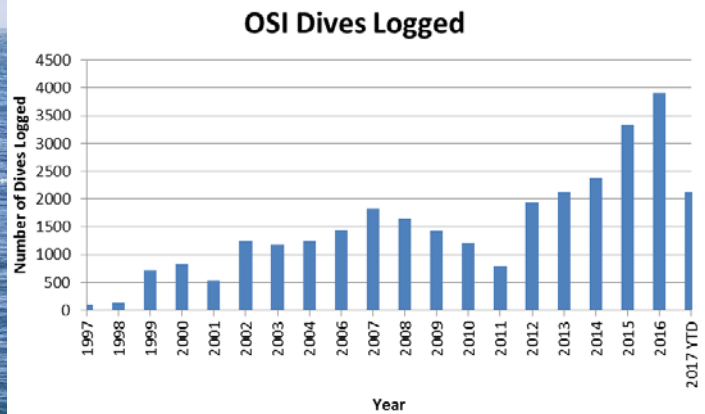
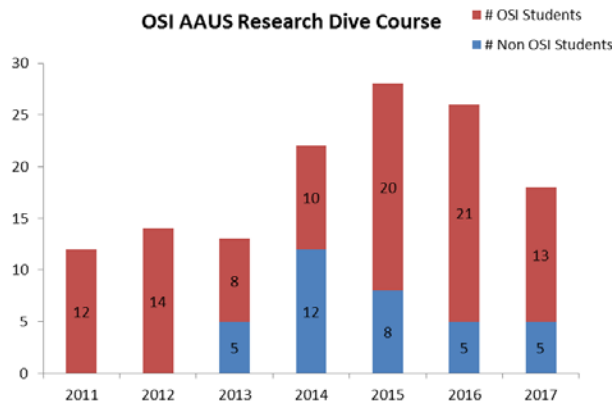
The Fall 2017 Catalina Semester is already underway. CSULB is this year’s host campus, along with two CSULB professors and one guest professor from Cal Poly Pomona. There are a total of 17 students from 5 different universities. We cannot wait to see what great research projects come out of these students.



CSU Marine Biology Semester on Catalina Fall 2016			
University	# Students	Professors	Courses
CSUN	8	Dr. Larry Allen	Biol 421/592B – Marine Biology (4 units)
CSULB	3	Dr. Steven R. Dudgeon	Biol 531/592Q – Ecology of Marine Fishes (4 units)
CSUEB	1	Dr. Mark Steele	Biol 504/592P – Marine Phycology (4 units)
CSUSB	1	Dr. Robert C. Carpenter	Biol 490/495 – Directed Undergraduate Research (3 units)
CSUSM	1		
CSUF	1		
Total # Students	15		
Total # Schools	6		

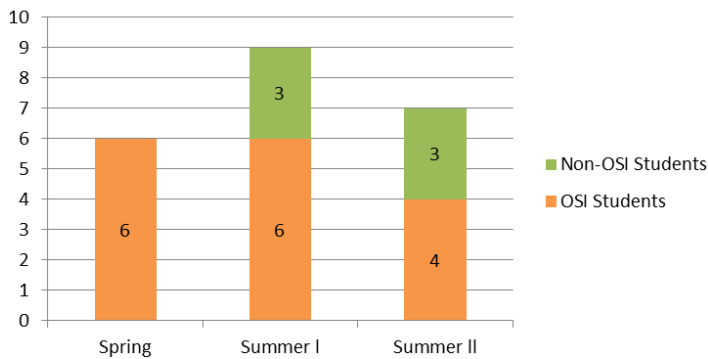
OSI AAUS Research Dive/Boating Program

Dive Operations: Dive Locker renovations including new compressor, Nitrox maker, gas banks and full-containment fill station along with additional wall storage, rolling gear racks, and lighting have been completed. Further renovations over the coming year will include additional overhead storage, workbenches and rinse bins, and a rollup door for better access to the locker. After a period of testing, tweaking, and breaking in the Nitrox system, we’re ready to begin offering Nitrox training courses this Fall. On the training side, we launched the DAN DFA Pro course (now recognized as the industry standard for emergency response training) and added an additional AAUS Scientific Diver course during the Summer of 2017 for a total of three course offerings.



Boat Operations: After conferring Lead Instructor Status on Darrell Montague and Jim Cvitanovich, the Scientific Boating Safety Association (SBSA) has recognized SCMI as the first official training facility in the region. We conducted our first five-day Motorboat Operator Training Course (MOTC) for non-experienced boat operators during the 2017 Spring Break for six students from CSULB. In conjunction with our two AAUS Scientific Diver courses, we offered two five-day MOTCs during the months of July and August, which brings the year-to-date total to twenty-four participants. Cohorts were comprised of candidates from CSU/OSI, Occidental College, NOAA, and CDFW. An additional three-day course for experienced boat operators will be conducted during the month of October, 2017. During 2018, five-day courses will again be offered during Spring Break, and in conjunction with our Summer AAUS Scientific Diver courses.

MOTC 2017 Courses



Demonstration Yellowfin Cruises

Our Yellowfin demonstration cruises have sustained their increased usage from last year. With the help of our favorite engineer, Denis, the on board demonstration techs were able to give classes experience using real-world equipment and techniques such as VanVeen grabs, plankton tows, biological dredges and otter trawls.

Over the past school year and field season for the Yellowfin, the SCMI crew has been gathering data of the organisms brought up during each otter trawl. The focus is on the vertebrate organisms, as they are a majority of what is caught in these trawls. The database has around 9 months to one year of data to date. There were a few months where the Yellowfin was on haul-out so there was no trawling. Each organism, the date, and the location it was caught at, is logged into the database. SCMI started this so that professors and students can easily access and manipulate data collected by all cruises.



Research Activities

SCMI has provided vessel support, equipment, and expertise to researchers from member and non-member campuses, and other organizations. This year SCMI has assisted researchers from University of Southern California, Occidental College, California State Universities Northridge and Long Beach, Claremont Colleges, NOAA, and the Ports of Los Angeles and Long Beach. Some featured projects include Dr. Larry Allen's (CSUN) Giant Sea Bass project, USC's ROV project, Professor Sara Gillman's (Claremont College) Settlement Plate project, and The Bay Foundation's Abalone Project.

Giant Sea Bass: Dr. Larry Allen (CSUN)

Dr. Larry Allen, over at CSU Northridge, is in the beginning stages of a study on Giant Sea Bass, *Stereolepis gigas*. A past graduate student had completed their thesis, and this study stems from the information gathered prior. *S. gigas* has been observed producing both booming and "drum roll chorusing" sounds. The goal of this study is to verify if the Giant Sea Bass is producing these sounds. As of now, Dr. Allen has three Giant Sea Bass here at SCMI, the hydrophone has been placed in the tank, and recording will begin soon!



Settlement Plates: Professor Sarah Gilman (Claremont College)

Gilman's research focuses on understanding how temperature influences the ecology and distribution of intertidal species. She studies both the immediate effects of temperature on individual success and survival, and also its more subtle effects on species interactions, population dynamics, and patterns of local adaptation. At SCMI, Gilman and her students have been examining how temperature and food supply influence the vertical distribution of barnacles (*Balanus glandula*) on the shore by hanging tiles covered with barnacles from the concrete pier and then following their survival and growth.

The Catalina Robot (ROV/AUV): USC

The Polymorphic Robotics Laboratory is a branch of the University of Southern California (USC). Under the supervision of professor Wei-Min Shen, this lab conducts research in "adaptive, self-reconfigurable, autonomous robots and systems." The lab has brought to life SCMI's old ROV unit to use at the Wrigley Institute over on Catalina Island. It is referred to as "the Catalina Robot." This robot contains 2 computers, 3 motors, 2 cameras, 2 lights, 1 IMU, 1 depth sensor and 1 compass, which give it the ability to navigate underwater. The Catalina Robot is capable of at least 50 minutes of operation time, and can safely operate at a depth of up to 300 feet. The overall purpose of this ROV/AUV is to monitor ecological systems in shallow and deep waters.



The Bay Foundation: Abalone Project Update

The Bay Foundation (TBF) joined SCMI as its first non-academic member in late 2015. Joining the SCMI team has given TBF convenient access to the local rocky reefs where they can manage and monitor their kelp forest restoration project. In the last year alone, TBF has spent 326 hours underwater on 306 dives. They have successfully removed urchin barrens at 5 coves and restored over 39 acres of kelp forest to date. TBF has also started working on bringing back the depleted abalone populations on Palos Verdes through captive and wild spawning techniques. Since July 2016, we have been spawning captive red abalone in our lab at SCMI, and conducting deck spawning treatments on wild green abalone off Catalina Island. The larvae and juveniles from these experiments will be outplanted to help restore abalone populations within Santa Monica Bay.



SCMI's Assisted Research Projects Include:

- Port of Los Angeles Water Quality Monitoring (POLA)
 - Real-Time Water Quality Monitoring Program
 - Monthly Water Quality Monitoring aboard R/V Yellowfin
- Biological Surveys of Los Angeles and Long Beach Harbors
- Barred Sand Bass Study - Dr. Larry Allen, CSUN
- Rocky Reef Ecology Studies - Vantuna Research Group
- The Bay Foundation Kelp Forest Restoration
- The Bay Foundation Abalone Recovery
- NOAA Ship of Opportunity Program
- Ecology of Harmful Algal Blooms ECOHAB
- San Pedro Ocean Time-Series SPOT
- Salt Pond Project - Dr. Christine Whitcraft, CSULB
- Temperature Influence on Ecology and Distribution of Intertidal Species - Dr. Sarah Gilman, Claremont Colleges
- The Catalina Robot (ROV/AUV) – Wei-Min Shen, USC Polymorphic Robotics Laboratory
- Giant Sea Bass Study – Dr. Larry Allen, CSUN

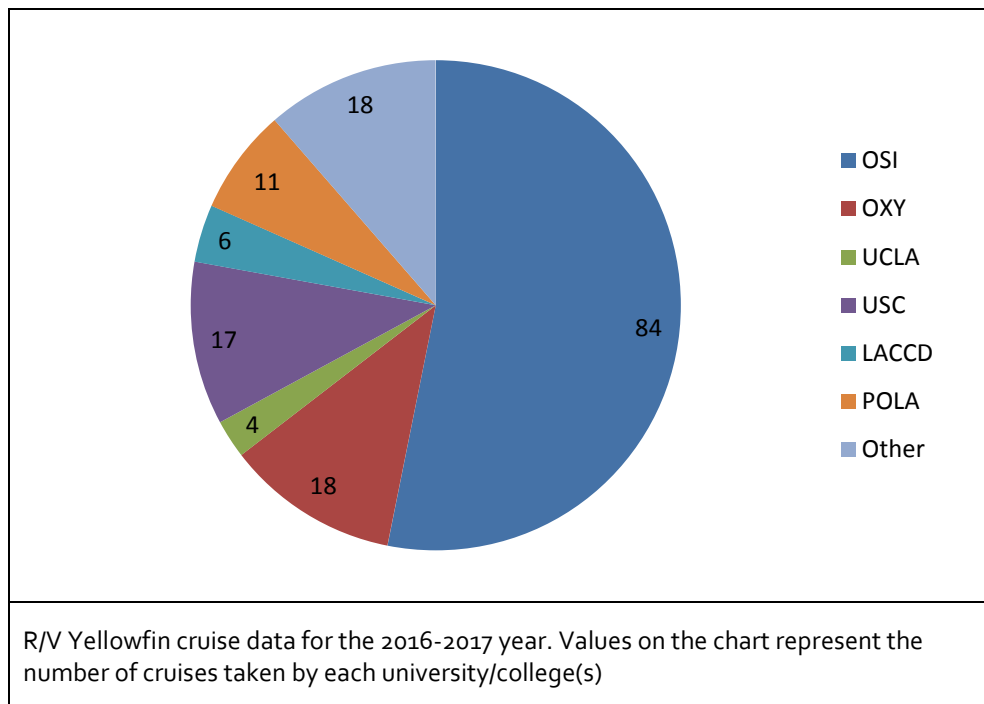
Vessel Use

R/V Yellowfin Usage by Institutions

This year, the R/V Yellowfin logged approximately 1017 hours of vessel use. The trips consisted of a combination of class laboratories, graduate and university research, and contracted research. Although we had significantly more students participate on trips this year, we conducted nearly the same number of hours of vessel use, as well as number of cruises. SCMI's goal is to continue increasing hours of vessel use and the total

number of cruises for the 2017 – 2018 fiscal year. This should not be a problem as the newly added consortium members develop a syllabus to include R/V Yellowfin demonstration cruises.

Institute Name	Students	Faculty and Staff	Hours of Vessel Use	# of Cruises
Ocean Studies Institute (OSI)	1405	96	501.2	84
Occidental College	235	33	95.5	18
University of California Los Angeles	0	25	46.75	4
University of Southern California	30	108	170.75	17
LA Community College District	95	6	37	6
POLA Water Quality Monitoring	0	24	84.25	11
Other universities, colleges, & cruises	337	23	82.5	18
Grand Total	2142	315	1017.95	158



Southern California Marine Institute Members

Southern California Marine Institute Staff 2016-2017

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Adriana Stowell
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Coordinator*

Carrie Wolfe
*Research & Education &
Operations Coordinator*

Dennis Dunn
*Captain
R/V Yellowfin*

Denis Mahaffy
Vessel Support Technician

Jim Cvitanovich
OSI Dive/Boat Safety Officer

Darrell Montague
OSI Dive/Boat Safety Officer

Ben Grime
Demonstration Technician

Mark Loos
*Demonstration Technician
Aquarist*

Joel Ingram
*Relief Captain &
Dockside Coordinator*

Erin Crowley
*Facilities &
Administrative Assistant
Demonstration Technician*

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Administrative: Dr. Tina Hartney

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Academic: Dr. Britt Leatham

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Consortium Members

