California State University Monterey Bay

Marine Sciences Program

Guide for Prospective Students

Welcome to the Department of Marine Science!

This guide summarizes just a few of the key features of the Marine Science Program at CSU Monterey Bay. We recommend that you schedule a meeting if you have specific questions that cannot be answered through the guide and Marine Science web site.

Contents

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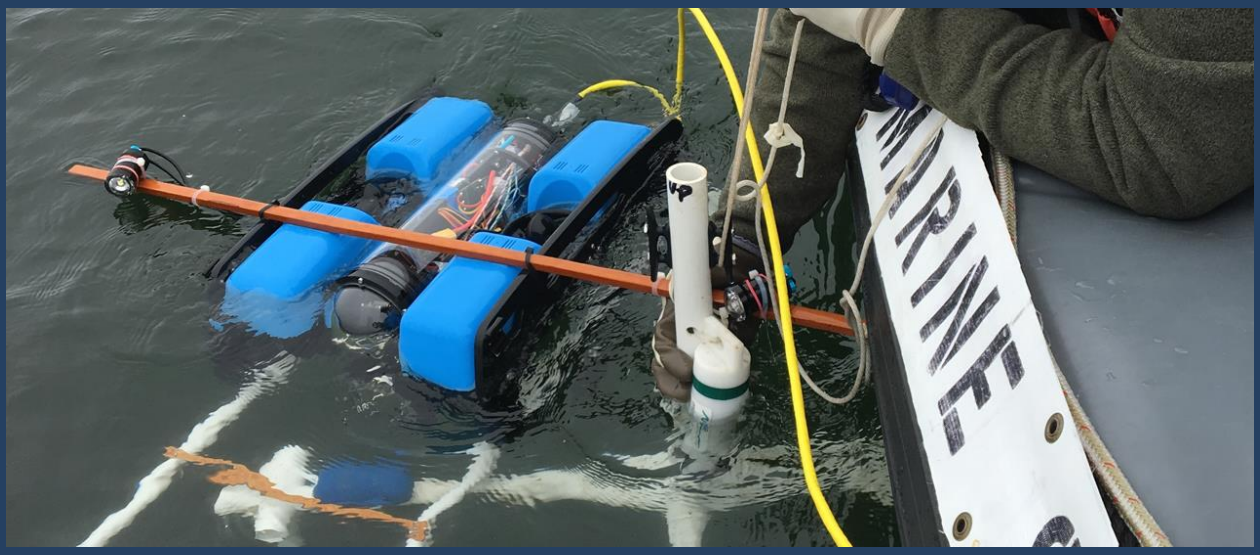


California State University Monterey Bay

Marine Science

Bachelor of Science Degree

Find all MSCI-related information at: https://csumb.edu/marinescience

What is Marine Science? Marine Science at CSUMB is the interdisciplinary study of the marine environment, with emphases on (1) the use of state-of-the-art technologies to collect & analyze scientific data, and (2) the application of the resultant information to management & policy-making.

Why get a BS in Marine Science? Marine Science students receive training in scientific diving, remote sensing, molecular techniques, geographic information systems (GIS), science communication, and many other marketable laboratory & field skills, all of which are in high demand by employers and will lay the foundation for graduate study in a variety of disciplines.

How does Marine Science differ from other majors on campus and at other Institutions around the region? Marine Science is *not* the same as marine biology. The CSUMB Marine Science program has an emphasis on inter-disciplinary skills rather than on biology alone. However, a Minor in Biology is available on campus to augment training in specific areas of biology. Our Marine Science program differs from other marine-focused programs for its *required* emphasis on the application of science to management & policy. No other local programs require this integration.

Bachelor of Science Degree

CSUMB offers a single, interdisciplinary undergraduate degree in marine science that prepares students for a wide variety of jobs and graduate school programs.

csumb.edu/catalog/marine-science-bs

CSUMB Home Catalog

Marine Science BS

Students in the Marine Science major apply a wide range of technologies to studying marine ecosystems. Through applied learning and research, you will gain the skills necessary to develop a sustainable balance between the unique environmental, recreational, cultural and economic opportunities in the Monterey Bay region.

Through lab and field experience, you will apply techniques of experimental design, data acquisition, analysis and presentation that provide you with the skills needed to monitor and analyze marine science problems. You are encouraged to interact with other Monterey Bay institutions, such as the Moss Landing Marine Labs, to take advantage of additional local expertise in marine and coastal ecology.

Graduates of the Marine Science major are prepared for a variety of career pathways in the public and private sector. Graduates are also poised to continue their education via graduate studies and research in ecology, environmental science and related fields.

Required Courses

Learning Outcomes

MLO 1: Quantitative, Research, and Communication Skills

All marine science graduates use quantitative evidence to evaluate hypotheses. They display and analyze data to interpret and communicate marine patterns and processes in written and oral formats.

MLO 2: Personal, Professional, and Social Responsibility

Marine science graduates work professionally and ethically to promote inclusive environmental decision-making based on diverse stakeholder perspectives.

MLO 3: Marine Science Depth of Knowledge

Marine science graduates demonstrate marine science content knowledge appropriate for marine science careers or graduate school.

MLO 4: Marine Science Integration and Synthesis

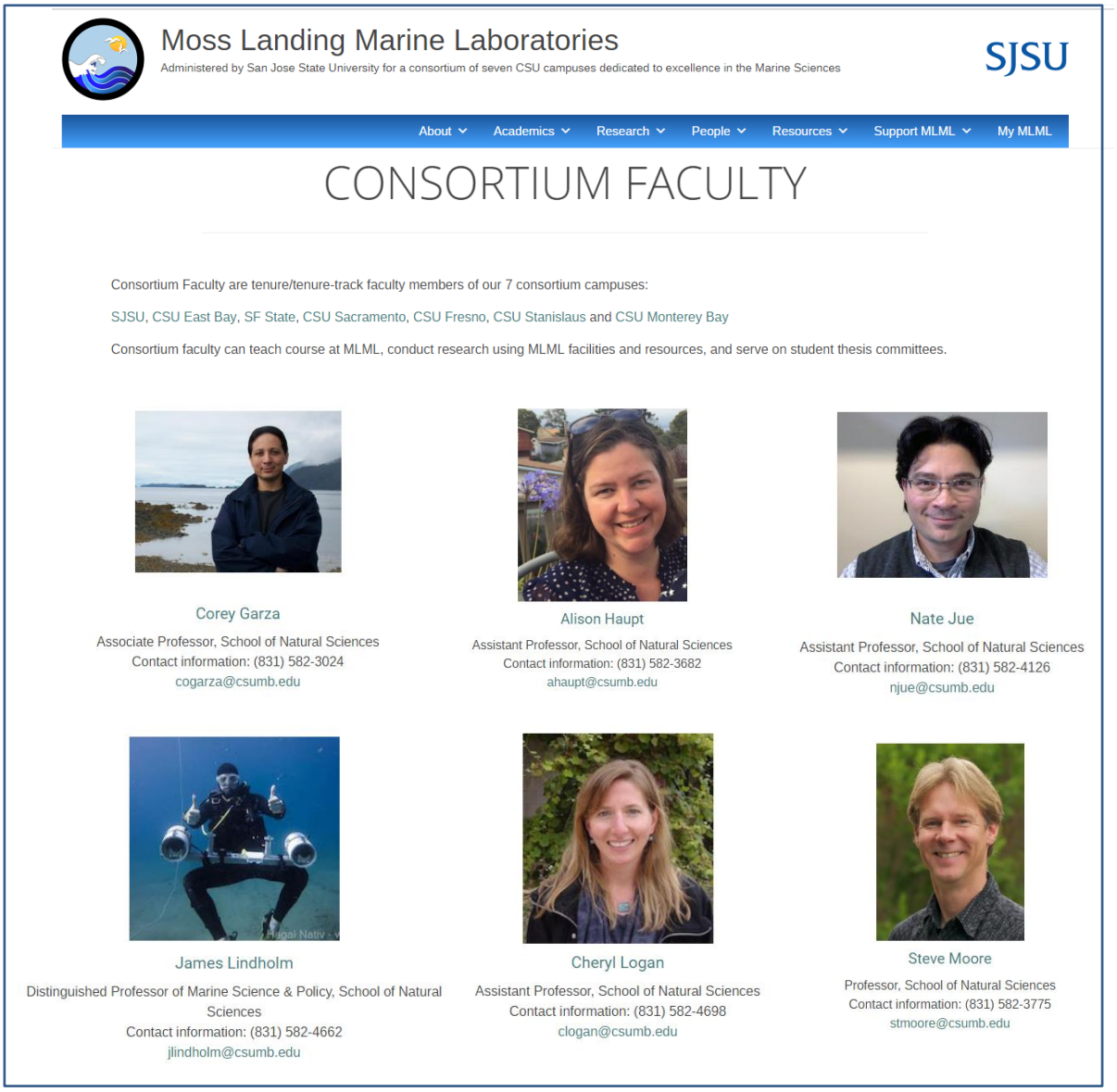
Marine science graduates synthesize, connect, and apply knowledge, skills, and experiences across the interdisciplinary field of marine science (e.g., biology, oceanography, spatial statistics, etc.) allowing them to address new and complex challenges facing the oceans.

Master of Science Degree

CSUMB offers a Master of Science in Marine Science through Moss Landing Marine Labs. Both campuses are located near the shores of Monterey Bay, an extraordinary place that is home to one of the greatest concentrations of marine science research and education institutions anywhere in the world. CSUMB is located only 20 minutes south of MLML and is by far the closest of the seven CSU consortium campuses affiliated with MLML.

You can **enroll through CSUMB** and can take advantage of CSUMB housing and other resources, while doing most of you master's **work with MLML faculty**, including **CSUMB faculty advisers**, in MLML facilities.

The **MLML master's program is widely known and respected** as one of the top marine science programs in the nation. This program will building upon your existing bachelor's degree to give you the knowledge, skills, experience, and professional contacts you'll need to take your marine-related career to a new level!



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CSUMB Home Catalog

Marine Science MS

CSUMB offers a Master of Science in Marine Science through Moss Landing Marine Labs. Both campuses are located near the shores of Monterey Bay, an extraordinary place that is home to one of the greatest concentrations of marine science research and education institutions anywhere in the world. CSUMB is located only 20 minutes south of MLML and is by far the closest of the seven CSU consortium campuses affiliated with MLML.

You can enroll through CSUMB and can take advantage of CSUMB housing and other resources, while doing most of your masters work with MLML faculty in MLML facilities. The MLML masters program is widely known and respected as one of the top marine science programs in the nation. It will build upon your existing bachelors degree to give you the knowledge, skills, experience, and professional contacts you'll need to take your marine-related career to a new level!

Required Courses

Learning Outcomes

All MLML students must meet high standards of competency in the core areas of oceanography, marine biology, and quantitative analysis as described in the Learning Outcomes listed below. You are encouraged to discuss alternative assessment options with your advisor; however, the hands-on, integrative nature of the MLML program necessitates a course-based path, followed by independently conducted research, for the majority of students.

Quantitative Foundations

Ability to apply fundamental mathematical and statistical constructs used to communicate quantitative information within the context of marine science; ability to demonstrate proficiency with biological, chemical and physical data acquisition, analysis, display, and communication.

Oceanography Foundations

Ability to apply principles and methods of the major field of oceanography (physical, chemical, geological and biological).

Marine ecology Foundations

Ability to apply advanced scientific concepts and methods to solve complex problems within an integrative ecological framework; ability to examine linkages between marine organisms and their environments; ability to recognize common patterns of change in real systems, build simple models that generate those patterns, and describe potential limitations of systems models as decision-making tools.

Area of Concentration Competency

Ability to demonstrate depth in a chosen area of marine science by completing an appropriate sequence of learning experiences that fulfill the learning outcomes of a self-designed, MLML-approved concentration.

Scientific Inquiry Competency

Ability to design, conduct, and interpret independent scientific investigations of an advanced nature, and to understand the ethical norms that guide scientific processes and methods.

Effective Communication Competency

Ability to present clearly, in written and oral formats, analyses of complex scientific issues.

csumb.edu/marinescience

Marine Science Capstone Project

Capstone provides students an opportunity to synthesize knowledge, skills, and abilities developed over the course of their learning experience at CSUMB. MSCI capstone helps students connect their marine science and policy knowledge to critical issues of ocean stewardship, conservation, exploitation, and management at local, national, and global scales.

CSUMB Marine Science (MSCI) Capstone Options

SEP Marine Science Majors may choose one of two, and only two, available options to meet the CSUMB capstone requirement for the major.

Option 1: Marine Science Group Capstone MSCI 410 (1 units)

- Student must enroll in one of the approved MSCI Group Capstone classes (e.g., MSCI 433, 455, or 470) during his/her **senior year** (specifically, the year in which he/she is planning to graduate).
- Student must simultaneously enroll in MSCI 410 to receive credit for the capstone.
- **May** include a written report, public presentation, and/or research poster.

Option 2: Marine Science Independent Honors Capstone with CSUMB Faculty Lead MSCI 490 (2-4 units)

- Student should discuss interest with a potential tenure-track CSUMB faculty advisor a minimum of **one year** prior to his/her intended graduation date.
- Student and advisor must develop a timeline for preparation of a capstone proposal.
- Proposal must achieve the equivalent of an A- from the CSUMB faculty advisor in order to proceed forward with the capstone project.
- In the student's **final semester** the student should enroll in MSCI 402 to receive credit for capstone.
- **Must** include a written report and a public presentation assessed by advisor and 1 other faculty.

Internships: Many Marine Science Majors are encouraged to and do participate in research internship experiences as a valuable addition to their education (e.g. summer internships at partnering institutions arrange through UROC or an REU). However, Marine Science Majors wishing to use a research internship experience to fulfill their capstone graduation requirement fall under and must meet all conditions of Option 2 above.

Research Programs

Marine Science Research All extramurally funded research activities in the CSUMB marine science program are conducted through Marine Science Research, formerly the Institute for Applied Marine Ecology (IfAME). Learn about faculty research labs, on-going research projects, vessels and equipment, and many other resources.

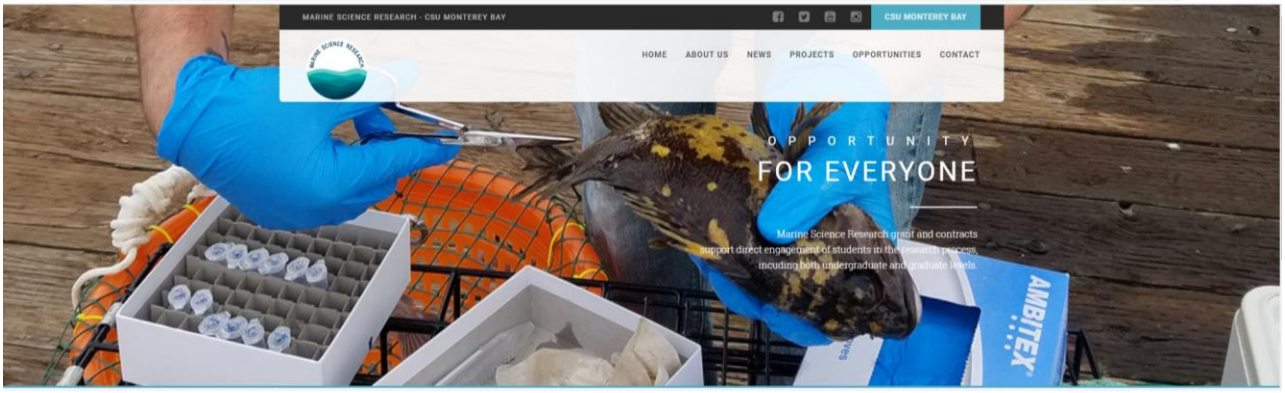
Research Diving Program All research diving activities associated with CSUMB courses, student theses, and funded projects are conducted through the Research Diving Program. CSUMB is a member of the American Academy of Underwater Sciences.

Research Diving Program

csumb.edu/diving

Marine Science Faculty Research

ifame.csumb.edu/



OUR MISSION | RESEARCH LABS | learn about us >

Conducting relevant science to inform sound marine policy

The mission of the Marine Science Research program (formerly the Institute for Applied Marine Ecology, IfAME) is to develop clear linkages between ecological phenomena and potential and realized management regimes along the California coast, across the US, and throughout the world. Using cutting-edge technology, the goal of the program is to provide insight, to reorganize thinking, and to improve paradigms for understanding the interaction of marine ecological systems and human activities.

Marine Science Research Highlights

The Department

MSCI FACULTY + SUPPORT STAFF

Starting July 1, Marine Science is officially its own department! To support the rapidly expanding interest in the sciences at CSUMB, the School of Natural Sciences (SNS) voted to subdivide into more efficient administrative departments based on majors - Marine Science, Biology, and Applied Environmental Science. Come visit us in building 49!

Nod to Marine Science Program

PEER-TO-PEER

CSUMB's Marine Science program was ranked #5 of ***The 10 Best Colleges for Marine Biology*** by College Magazine, a periodical written by a team of student journalists from universities nationwide.

Upcoming Events

29 AUG

DR. CHERYL LOGAN, PROFESSOR IN DEPT OF MARINE SCIENCE @ CSUMB

MLML Seminar Series - Galapagos Corals: Canaries in a Coal Mine

MLML Seminar Room. 4-5 p.m.

3 SEP

DR. MIKE ORBACH, PROFESSOR EMERITUS OF MARINE AFFAIRS & POLICY, DUKE UNIVERSITY

CBE Speaker Series - A Brief History of the World (and Ocean) Public Trust

McGowen Bldg, Room 102, Middlebury Institute, Monterey. 6:00-7:30 p.m.

5 SEP

DR. TIM WHITE, GLOBAL FISHING WATCH

Tracking Fish and Fisheries for Ocean management

MLML Seminar Room, 4-5 p.m.

Marine Science Faculty

lfame.csumb.edu/about.html

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- Sarena Hineser-Harwood
  Administrative Support Coordinator
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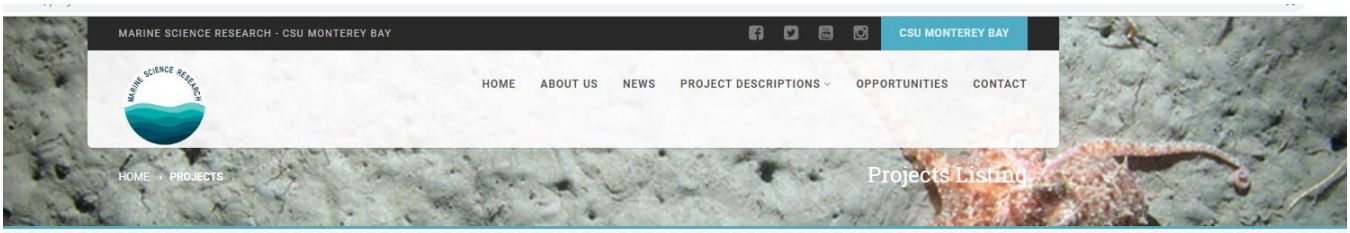
  Marine Geospatial Technology Officer
- Larissa Lemon
  CUIA Video Archvist
- Andrew Morgan
  Dive Safety Officer
- Amy Pyle
  Lab Support Technician
- Paulina Salinas-Ruiz
  MSCI Teaching Assistant
- Kameron Strickland
  Immersion! 360/VR Data Technician

SCIENCE DIRECTORY

Marine Science Research Projects

ifame.csumb.edu/projects.html



Marine Science + Policy

DEPARTMENT OF MARINE SCIENCE

Projects

California Underseas Imagery Archive (CUIA)

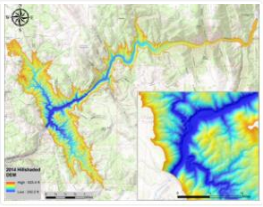
LINDHOLM

This physical archive of undersea video imagery collected state-wide using various visual tools (including remotely operated vehicles or ROVs) constitutes a vital resource for addressing management questions in the future. Data can be mined from the imagery to answer questions that were not posed as part of the original studies that collected the imagery, and the imagery can serve as an important visual baseline against which future change (from climate change and/or other factors) can be evaluated.

Climate-driven Collapse of Mussel Beds *(Mytilus californianus)* in the Southern California Bight

GARZA

This project is providing insight into the long-term effects of climatic shifts on the composition of rocky intertidal communities in Southern California and the ecosystem services that they provide. The results of this study will also provide baseline data for modeling future shifts in rocky intertidal communities resulting from climate change.



Reservoir Capacity Studies

KVITEK

The importance of this project and related SFML efforts is underscored by the unprecedented drought California is undergoing along with the predicted loss of the state's Sierra snowpack by mid-century.

Multiple Stressor Effects of Ocean Acidification & Hypoxia on Temperate Reef Fishes

LOGAN

The results of these field studies and lab experiments will be rapidly disseminated to fisheries management agencies, oceanographic observing programs, and the science community to provide information on climate change impacts for economically valuable groundfish.

‹ 1 2 3 4 5 6 7 8 9 10 11 ›

Research Labs

- Ecosystem Electronics Lab
- Coastal Ecology Lab
- Environmental Physiology Lab
- Image Analysis Lab
- Marine Landscape Ecology Lab
- Biological Oceanography Lab

Marine Science Resources

csumb.edu/library/marine-science-research-guide

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Marine Science Research Guide

Articles and databases

Books and background reading

Websites

See also

See also the CSUMB Library's guides to Biology, Earth Sciences and Environmental Studies

Your librarian

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Tanimura & Antle Family Memorial Library
3164

Proximity map showing the highly accessible location of CSU Monterey Bay to the phenomenal Monterey Bay Canyon and other world-class marine research institutions and coastal management resources.