



**Moss Landing Marine Laboratories  
2015 Annual Report  
For 2012-2015**

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## EXECUTIVE SUMMARY: 2012-2015

Moss Landing Marine Laboratories (MLML) administers the interdisciplinary Masters of Science degree in marine science for six California State University (CSU) campuses: East Bay, Fresno, Monterey Bay, Sacramento, San José, and Stanislaus. MLML functions as a consortium of seven CSU campuses; the six listed above plus San Francisco. A Governing Board consisting of representatives from each of the seven campuses meet twice a year and oversee curriculum, finances, and programmatic decisions. SJSU serves as the administrative campus, and as such, the Director of MLML reports to the Dean of Science at SJSU, and currently all faculty and staff are SJSU employees.

The lab is situated in an excellent location for the study of the marine world. The Monterey Submarine Canyon, the largest such feature on the west coast of North America, begins within a few hundred meters of the Moss Landing harbor and the MLML research fleet. To the east of MLML is the Elkhorn Slough, the largest tract of tidal salt marsh in California outside of San Francisco Bay, and an important site for shorebirds and fishes. To the north and south are sand dunes, sandy beaches, and extensive kelp forest habitats along the rocky shoreline. Some of the most productive kelp forests and intertidal areas can be found in this region. MLML also is located between two large upwelling centers, which provide nutrients that stimulate an incredible amount of productivity but also provide a wealth of opportunities to study coastal oceanic processes.

MLML provides students with a cutting-edge education that prepares them for careers in science, education and outreach, conservation, policy and management, and for doctoral studies.

### FINANCES

MLML is supported by annual academic appropriations into the General Fund from SJSU, administered by the College of Science. We supplement our operational costs with funds from the Facilities and Administration revenue (F&A) generated by our grants and contracts, the SJSU Research Foundation returns a portion of the F&A during the academic year, as such:

- 10% of our F&A goes to each Principle Investigator
- 10% into a Reserve Account MLML set up for capital planning and for withstanding budget shortages and;
- 10% goes into an account for repaying a loan to SJSURF (Resolution 198)

<i>Year</i>	<i># of Grants Awarded</i>	<i>Total \$\$ Awarded</i>	<i>F&amp;A Return To MLML</i>
2014	272	\$21,425,177	\$673,644
2013	134	\$11,812,749	\$640,722
2012	120	\$19,598,723	\$649,607

MLML Operations typically ends up with about \$600-\$700k from the F&A generated by our grants to supplement our operations and administration:





AY 14-15

Funding From SJSU:	\$3.7 Mill
F&A Return from SJSURF:	\$943,098
AY 14-15 Operating Budget:	\$4.3 Mill

AY 13-14

Funding From SJSU:	\$3.4
F&A Return from SJSURF:	\$746,847
AY 13-14 Operating Budget:	\$4.2 Mill

AY 12-13

Funding From SJSU:	\$2.8
F&A Return from SJSURF:	\$938,546
AY 12-13 Operating Budget:	\$3.7 Mill

In addition to funding from the CSU, SJSU, and SJSURF, MLML relies on funding from private donors, corporate sponsors, and endowments that help fund scholarships for MLML students, facility improvements, and MLML outreach activities such as seminars, tours and displays for our Visitor Center. The Friends of Moss Landing Marine Labs (FMLML) supports MLML development and outreach activities, with the funds being administered by the SJSU Tower Foundation.



**ACTIVITIES**

The MLML Academic Program has nine tenure track faculty:

- 4 Oceanographers (Physical, Geological, Chemical, and Biological)
- 4 Biologists (Phycology, Invertebrates, Fishes, Birds and Mammals)
- 1 Librarian

There are 8 non-tenured faculty researchers who teach courses including Scientific Diving, mentor students, and conduct marine research in:

- Geology
- Oceanography
- Subtidal Ecology
- Fisheries





**Students**

In AY14-15, MLML had 79 students enrolled from primarily SJSU and CSUMB with several that came from SFSU and CSUEB:

AY 14-15	AY 13-14	AY 12-13
73 Graduate Students	88 Graduate Students	88 Graduate Students
6 Undergraduates	12 Undergraduates	16 Undergraduates
79 Students Enrolled	100 Students Enrolled	105 Students Enrolled
13 Graduated with MS degree	15 Graduated with MS degree	19 Graduated with MS degree

MLML also supports 5 affiliated research programs that are funded through grants and awards, managed by Principle Investigators who operate in MLML or SJSURF facilities and use MLML resources:

- Southwest Fisheries Science Center (NOAA)
- Central Coast Wetlands Group
- Marine Pollution Studies Laboratory
- Marine Optical Buoy Project
- Science, Learning and Exploration With Sea Lions

**ACHIEVEMENTS (2012-2015)**

- 47 Students Graduated
- New Courses in Marine Science introduced each AY on topics like climate change, aquaculture, scientific writing, and marine spatial ecology
- 62 Scholarships Totaling \$347k
- 526 Grants Awarded Totaling \$52.88 Million
- 121 Publications by Faculty and Research Affiliates
- \$905,846 Received in Charitable Donations
- Commissioned the “Academic Village” Feasibility Study
- Opened the Center for Aquaculture

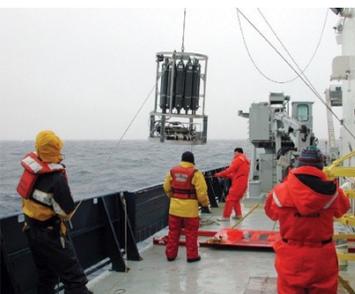
**PROGRESS MEETING MISSION, GOALS, AND OBJECTIVES**

MLML continues to meet the mission and goals of the organization, which are (1) to provide an interdisciplinary Masters of Science program for the consortium campuses, (2) provide curriculum and research opportunities for undergraduates from the consortium campuses, and (3) provide resources (e.g. vessels, diving, seawater, and laboratories) to the consortium and CSU. MLML graduates have continued to be successful entering Ph.D. programs (generally 95% success getting into Ph.D. programs); obtaining employment in federal and state agencies, NGOs, or in education; and thriving as active and productive marine scientists. We have maintained a high standard for our program and students, and this is reflected in the national and international reputation of the institution. MLML has sustained an active research component that represents about one-third of the contract and grants activities of the entire SJSURF portfolio. Finally, MLML has been an active member of the community, including providing: community seminars on marine science, an annual Open House that attracts 2,000 – 3,000 of the public, numerous talks to community groups (e.g. Rotary, schools, service clubs, museums, agencies), tours of the lab, and use of the lab’s meeting spaces by the community about 1-2 times per week.





MLML succeeded in a number of areas but continues to struggle with lack of housing options, which affects our ability to grow. The lack of housing restricts our ability to offer summer courses, expand our faculty and enrollment, offer lodging to visiting scientists from outside the area, and visits to our marine lab by school groups. Another challenge faced in 2014 was the loss of the research vessel, *R/V Pt Sur* when the National Science Foundation decided to retire the vessel because it failed to generate enough revenue to cover the costs of operation. The *R/V Pt Sur* has served MLML faculty, students, researchers and marine science colleagues around the world for 28 years, totaling 50 cruises, 5 class cruises per semester, and cruises to places like Antarctica and the Bering Sea as well as the coastal waters of the Pacific. MLML had to lay off the Marine Superintendent, crew and Office Coordinator when revenue generated by research affiliates and outside organizations came to a halt. We will continue to be hindered in our ability to provide a vessel for research and classes until we find a mechanism for acquiring another larger vessel.





## Administrative Structure

### Governance:

The mission of Moss Landing Marine Laboratories (MLML) is to provide a center for teaching and research in Marine Sciences for students of the consortium campuses, with emphasis on graduate education, in the furtherance of the goals and functions of higher education. MLML is a part of the California State University and, as a functional extension of each of the participating campuses, shares the responsibility for the accomplishment of the CSU mission.

The primary goal of Moss Landing Marine Laboratories is to deliver a premier education in marine science for undergraduate and graduate students. MLML achieves this goal by combining field-oriented research with excellent instruction in a state-of-the-art facility that provides students the necessary skills and training to become successful scientists, teachers, and resource managers serving societal needs involving marine issues.

MLML is the second oldest marine lab on Monterey Bay. It was established in 1966 when the San José State University (SJSU) Foundation, with the assistance of four other California State University foundations and an NSF grant, purchased facilities of the Beaudette Foundation for Biological Research in Moss Landing.

More than half of the United States population lives in 673 watershed (coastal) counties that generate 58% of the nation's gross domestic product (NAML 2015). Marine laboratories are vital, cost-effective, place-based "windows on the sea", which provide education and research capability to understand issues associated with our oceans.

### Consortium

MLML was formulated by the CSU as a consortium, serving essentially as a Department of Marine Science for seven California State University campuses, including San José, Monterey Bay, San Francisco, East Bay, Stanislaus, Fresno, and Sacramento. MLML provides a M.S. in Marine Science for all the members of the consortium except, San Francisco, which has recently started their own M.S. program in Marine Science. The director of MLML reports to the Dean of the College of Science at the administrative campus (SJSU) but also interacts with a **Governing Board** consisting of representatives from all seven consortium campuses.

### Governing Board

The Governing Board provides oversight over issues associated with curriculum, Director Review, faculty and staff hires, and general programmatic issues. The Governing Board of MLML is structured around By Laws (Appendix II; last revised in 2007) and Rules of Operation (Appendix III; last revised in 2007).





The By Laws include:

- Eligibility rules (any CSU can join after approval from consortium Presidents)
- Responsibilities of the Governing Board (governance and advising)
- Membership
- Organization of meetings and voting processes
- Development and responsibilities of committees

The Rules of Operation include:

- Operating Institution (responsibilities and how it might be changed)
- Directorship (responsibilities, reviews, and dismissals)
- Appointment of Faculty and RTP issues (Assignments, responsibilities)
- Appointment of Staff (mechanism)

MLML faculty in consultation with the Governing Board develops the curriculum, and then course proposals are sent up to each of the consortium campuses for approval. Once all consortium campuses have approved the course it can be listed on the campus schedules and offered at MLML. MLML is unique in the CSU system in that it is a multi-campus entity that offers a curriculum. The Governing Board serves an advisory role for course development and then helps with the approval process on the individual campuses. Curriculum offered by MLML includes undergraduate and graduate courses in marine sciences. The Governing Board also provides advice on capital projects, personnel changes, and other programmatic decisions, such as budgets.

At each Spring Governing Board meeting two proposed budgets are presented. The State budget contains all revenues and expenditures of funds allocated by the CSU and SJSU for the purposes of operating MLML. This includes faculty and staff salaries, library services, IT, facilities, diving, and ship operations. The second budget contains F&A (overhead) revenue generated by MLML contracts and grants and allocated to MLML by the SJSU Research Foundation (SJSURF). SJSURF administers all research contracts and grants generated by MLML. A large portion of the SJSURF F&A allocated to MLML is expended on supporting research activities, including salaries for administrative and support staff; IT and library support; and maintenance and facilities. Proposed budgets are presented to the Governing Board and approved by the Executive Committee, which includes the SJSU Dean of the College of Science.

### ***Administration and Operations***

There are 9 tenure-track faculty members and 6 research faculty members that serve as the primary educational and research staff at MLML. When MLML began in 1966 faculty members were associated with multiple CSU campuses (i.e. Fresno, Hayward, San Francisco, and San José) but now all faculty and administrative staff are affiliated with SJSU. Thus all RTP processes are conducted through SJSU. MLML is designated as an Equivalent Unit to a Department, thus a waiver was required for MLML to obtain a Chair. The Chair (currently Dr. Ivano Aiello) is expected to attend the SJSU College of Science Council of Chairs and is responsible for the academic program at MLML (e.g. courses taught, faculty assignments, TA positions, instructional support). The MLML faculty are evaluated by the RTP Committee at MLML, the Chair of MLML the RTP Committee of the SJSU College of Science, Dean of College of Science, University RTP Committee, and finally the Provost. Although there are a few standing committees (e.g. RTP, Curriculum, Diving Control Board, and Boats) most of the decision-making regarding policies, hires, planning, etc. is conducted in meetings of the entire faculty and a representative from the Research Faculty/Affiliates and from the students.



MLML has 15 different research groups headed by a Principal Investigator; this is composed of seven Research Faculty and eight Research Affiliates. These groups report to the Director via quarterly meetings, reviews every three years, and informal meetings. The Research Faculty members are soft money positions but also serve as lecturers and student mentors. The Chair of the Department working with the Curriculum Committee assigns the Research Faculty to courses as needed. The Research Affiliates also are soft money positions but generally do not participate in the educational aspects of MLML. The Research Affiliated groups secure their own funding via contracts and Grants are led by a PI who has been approved by SJSU and SJSURF to serve as a Principal Investigator.

The Director of MLML supervises an Assistant to the Director, the Marine Operations Manager, Supervisor for IT services, and a Director of Development. The Director is responsible for (1) developing the State and Foundation budgets that are presented to the Governing Board and approved by the SJSU Dean of Science, (2) determining how financial resources will be allocated to maintain the facilities and support the educational and research capacity, (3) developing outside sources of funding, and (4) providing leadership for future plans. The Assistant to the Director coordinates with the Director to provide leadership and direction to the head of facilities, diving, safety, and financial services. The Director and Assistant to the Director meet weekly, and other heads of departments (e.g. Library, IT, facilities, safety, finances, etc.) meet as needed.



**MLML Organizational Chart**



	<b>Faculty Chair</b> Ivano Aiello	<b>Nine Faculty</b>
		<b>Librarian</b>
		<b>Nine Faculty Researchers</b>
	<b>Assistant to the Director</b> Kathleen Donahue	<b>Information Technology</b> <b>Environmental Health and Safety</b> <b>Graduate Program Coordinator</b> <b>Financial Management SJSU</b> <b>Financial Management SJSURF</b> <b>Facilities</b>
<b>Director</b> Jim Harvey	<b>Marine Operations Manager</b> Recruitment In Progress	<b>Administrative Assistant</b> <b>Small Boats Coordinator</b> <b>Deckhand/Technician</b>
	<b>Assistant to the Director</b> <b>Development, Strategic Planning</b> Mike Prince	



## Program Overview

*“ Since it was established in 1966, Moss Landing Marine Laboratories (MLML) has grown an international reputation for excellence in marine science research and education, and is the second oldest marine lab on the Monterey Bay. ”*

*The Marine Science program at MLML provides students with a cutting-edge education that emphasizes mentoring and teaching, integrated with independent research.*





## ACTIVITIES

### *Academic Program*

MLML leadership continues to look for ways to improve the academic program and curriculum. Some models include streamlining introductory courses so that they can be completed in two semesters as opposed to three, developing online courses, and potentially introducing a new Aquaculture degree or certificate. An important concept being addressed by the Graduate Program Coordinator is a thesis proposal timeline. MLML students take a significant amount of time to develop a thesis idea that leads to a delay in graduation. Developing a thesis proposal could become part of a course component so that it takes place earlier. By the end of the first year they would have a thesis proposal developed.

The “blended” class concept is being considered by the MLML faculty. This core course would be two semesters long and give all new students a basic understanding of marine science; incorporating physical, chemical, biological and geological oceanography, along with all the biological disciplines (Invertebrate, Vertebrate, Phycology/Ecology, Ichthyology) into a concept-driven course. The new students would concurrently take data analysis, statistics, programming, and science writing classes the first year. By the end of this first year, they also would write their thesis proposal.

### **STUDENT ENROLLMENT 2012-2015**

	<b>AY 2014 - 2015</b>		
<b><i>Campus</i></b>	<i>Total Undergrad</i>	<i>Total Graduate</i>	<i>Total Enroll</i>
East Bay	0	2	2
Fresno	0	0	0
Monterey	4	36	40
Sacramento	0	0	0
San Francisco	1	4	5
San José	1	31	32
Stanislaus	0	0	0
<b>Totals:</b>	<b>6</b>	<b>73</b>	<b>79</b>

*Number of Masters in Marine Science degrees awarded: 13*



	AY 2013- 2014		
<b>Campus</b>	<i>Total Undergrad</i>	<i>Total Graduate</i>	<i>Total Enroll</i>
East Bay	0	0	0
Fresno	0	0	0
Monterey	3	39	42
Sacramento	3	0	3
San Francisco	0	6	6
San José	5	43	48
Stanislaus	1	0	1
<b>Totals:</b>	<b>12</b>	<b>88</b>	<b>100</b>

Number of Masters in Marine Science degrees awarded: 15



	AY 2012- 2013		
<b>Campus</b>	<i>Total Undergrad</i>	<i>Total Graduate</i>	<i>Total Enroll</i>
East Bay	0	0	0
Fresno	0	0	0
Monterey	6	37	43
Sacramento	0	0	0
San Francisco	3	8	11
San José	7	43	50
Stanislaus	0	0	1
<b>Totals:</b>	<b>16</b>	<b>88</b>	<b>105</b>

Number of Masters in Marine Science degrees awarded: 19



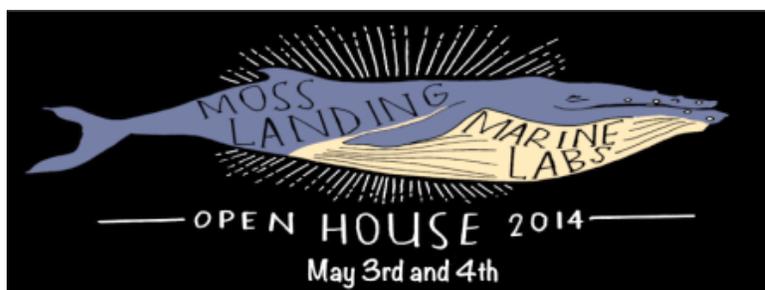
In addition to the students listed above, MLML was allowed undergraduate and graduate students from UC Santa Cruz to take a course that is a testament to our desire to further expands our enrollment capacities in the Monterey Bay area. In addition, MLML successfully partnered with CSU Monterey Bay’s (CSUMB) Undergraduate Research Opportunity Center (UROC) by bringing in 4 undergraduate students to work on research projects and take courses. CSUMB’s UROC is a cross-campus, two-year competitive program that provides undergraduate students with intensive research and graduate school preparation. Their mission is to “*build students’ educational ownership, intellectual vibrancy, and scholarly identity*”. This is achieved through “*mentored undergraduate research; rigorous, authentic, and calibrated scholarly activities; and the development of social capital.*” MLML seeks to continue this partnership and expand its reach to our other consortium campuses.

MLML’s primary mission is to serve Marine Science graduate students and provide a stellar education leading to a Master’s degree. In reviewing the enrollment figures above, one can easily see that adding housing could be a contributing factor to enticing more students from our consortium campuses.

### STUDENT SUCCESSES

#### OPEN HOUSE

Our Student Body continued their successful outreach activities by planning and hosting the MLML Annual Open House. Every year MLML opens its doors and invites the public to come and explore MLML. The event is completely free and aimed at all ages. This long treasured event allows the community, families, and educators to visit MLML, interact with our students and researchers, tour the facilities, explore our labs and participate in interactive activities geared towards marine science and our local ecology. The Student Body constructs invertebrate touch tank displays, holds a raffle to earn scholarship funds, presents a sea lion show and performs a renowned marine-themed puppet show which has become legendary. Other activities include a bake sale to help fund student research, marine-themed arts and crafts and tours of our research vessels. The 2014 Open House netted over **\$9,000** for the Student Body Treasury. The total number of public that attend the weekend Open House is typically 2,000 – 3,000 persons.





**SCHOLARSHIPS**

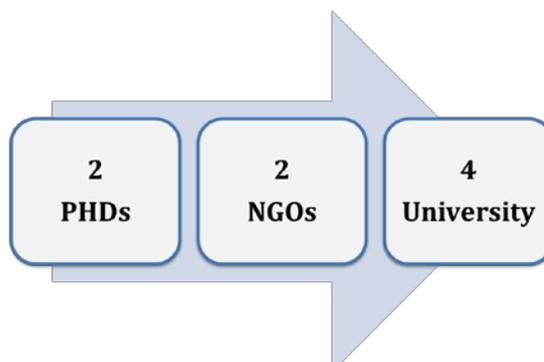


**MLML ALUMNI**

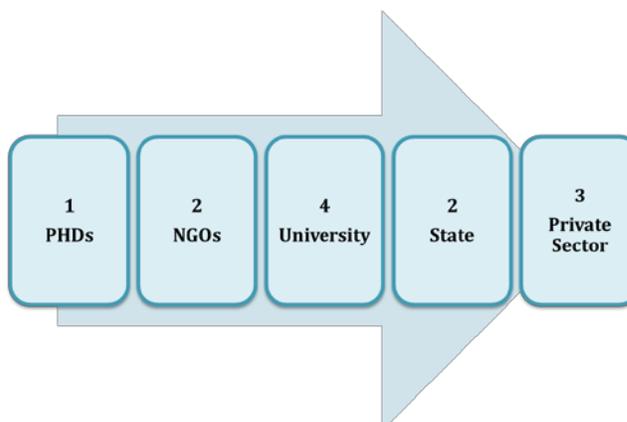
From 1998 to 2014, 238 students have graduated from MLML with Master's degrees in Marine Science. MLML alumni have found success with non-profit research organizations, the private sector, moved onto PHD programs, work for the federal government and have become educators with academic institutions around the world:



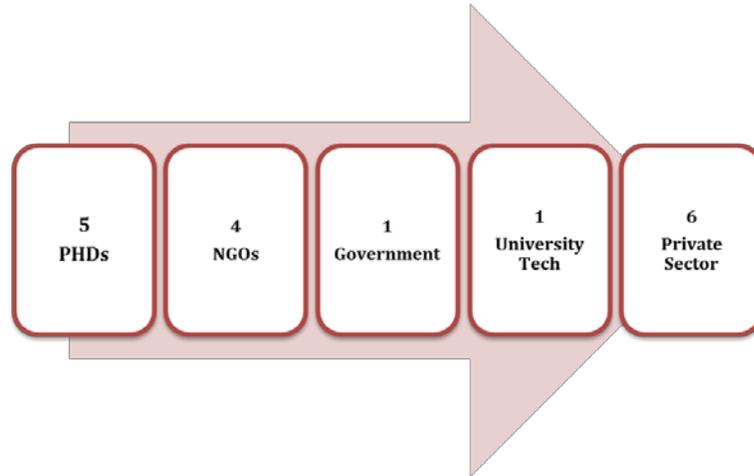
**AY 14-15  
13 GRADUATES**



**AY 13-14  
15 GRADUATES**



AY 12-13  
19 GRADUATES



Since 1998, 58 graduates have earned a PhD, or are currently enrolled in a doctoral program at the following institutions:

- Bremen University
- Duke University
- Harvard University
- Louisiana State University
- Macquarie University
- Medical University of South Carolina
- Montana State University
- Northern Arizona University
- Oregon Health and Science University
- Oregon State University (5)
- Pennsylvania State University
- Scripps Institution of Oceanography, UCSD (4)
- Stanford University, Hopkins Marine Station (2)
- Stanford University
- The University of Auckland
- The University of British Columbia (2)
- Tulane University
- Universite Laval via the Canadian Aquatic Invasive Species Network CAISN
- University at Buffalo
- University of Alaska Fairbanks (2)
- University of Alberta
- University of Arizona
- University of California Berkeley (2)
- University of California Davis (2)
- University of California Santa Cruz (7)
- University of Cape Town
- University of Florida
- University of Hawaii at Manoa
- University of Hong Kong
- University of Maryland College Park





- University of New Orleans
- University of Otago, Dunedin, New Zealand
- University of Rhode Island
- University of Washington (4)
- University of Western Australia
- Virginia Polytechnic Institute and State University
- Wake Forest University

**In addition, 9 other graduates have earned or are currently enrolled in the following degree programs:**

- Doctorate of Veterinary Medicine (2), University of California Davis
- Juris Doctor (2), University of California Los Angeles and Interamericana Law School
- Master of Business Administration, George Washington University
- Master of Public Policy, Harvard University
- Master of Science, University of California Davis
- Science Writing Certification, University of California Santa Cruz
- Bachelor of Science in Nursing, Medical University of South Carolina

**Current Employment: MLML alumni are employed by the following:**

**Federal Agencies**

- NASA Ames Research Center
- National Institute of Health, National Human Genome Research Institute
- NOAA (1)
  - NOAA, Center for Sponsored Coastal Ocean Research
  - NOAA, National Marine Fisheries Service (5)
    - NOAA, NMFS, Alaska Fisheries Science Center
    - NOAA, NMFS, National Marine Mammal Laboratory (2)
    - NOAA, NMFS, Northeast Fisheries Science Center
    - NOAA, NMFS, Northwest Fisheries Science Center
    - NOAA, NMFS, Office of Protected Resources Marine Mammal Health and Stranding Response Program
    - NOAA, NMFS, Southwest Fisheries Science Center (2)
  - NOAA National Marine Sanctuaries (2)
    - NOAA, NMS, Monterey Bay National Marine Sanctuary
- Office of Naval Research
- Southeast Data Assessment and Review (SEDAR) Program – South Atlantic Fishery Management
- The Marine Mammal Commission
- US Naval Research Lab
- US Army Corps of Engineers, New York District
- US Environmental Protection Agency
- US Navy Living Marine Resources Program
- USGS (2)
  - USGS Pacific Coast Marine Science Center (2)
  - USGS San Francisco Bay Estuary Field Station
  - USGS Western Ecological Research Center (2)

**State Agencies (California)**

- California Department of Fish and Wildlife (6)



- CDFW, Marine Wildlife Veterinary Care and Research Center
- California Department of Public Health
- California Department of Toxic Substances Control
- California Ocean Protection Council
- California Sea Grant, Delta Stewardship Council
- California State Lands Commission
- Delta Stewardship Council
- State of California

**State Agencies (Other)**

- Alaska Department of Fish and Game (3)
- Oregon Department of Fish and Wildlife (2)

**Regional Agencies**

- City of Los Angeles, Environmental Monitoring Division
- County of San Bernardino
- Metropolitan Water District of Southern California
- Monterey County Water Resources Agency
- North Carolina Division of Marine Fisheries
- San Diego Regional Water Quality Control Board



**Universities**

- Arizona State University, Decision Center for a Desert City
- Instituto Nazionale di Oceanografia e di Geofisica Sperimentale
- Jacksonville University
- Moss Landing Marine Laboratories (7)
- New Jersey Institute of Technology
- One Health Institute's Wildlife Health Center at University of California
- Oregon State University (2)
  - Oregon State University, Hatfield Marine Science Center
- Rutgers University
- Scripps Institution of Oceanography
- Stanford University, Hopkins Marine Station
- Temple University
- Universidad Catolica de Chile, Centro de Conservacion Marina
- Universite Laval
- University of California Davis Marine Wildlife Veterinary Care and Research Center
- University of Erlangen Frauenklinik, Erlangen, Germany
- University of Hawaii at Manoa (2)
- University of Miami
- University of New Hampshire
- University of Southern Mississippi, Gulf Coast Research Lab
- University of Texas, Brownsville
- University of Washington
- Woods Hole Oceanographic Institution



**Non-profit Organizations/NGO/IGO**

- Alaska SeaLife Center
- Below the Surface



- Elkhorn Slough Foundation
- Elkhorn Slough National Estuarine Research Reserve
- FISHBIO (2)
- FishWise (3)
- Gulf of Maine Research Institute
- Monterey Bay Aquarium (7)
- Monterey Bay Aquarium Research Institute (9)
- Oikonos Ecosystem Knowledge (3)
- Panacetacea
- Point Blue Conservation Science
- Point Reyes Bird Observatory
- Reef Check
- Smithsonian Environmental Research Center
- The Marine Mammal Center (3)
- The Nature Conservancy
- Virginia Aquarium Stranding Response Program
- Woodland Park Zoo

*One individual is in K-12 education, and 35 are working in the private sector.*

**Academic Positions**

*Graduates hold the following positions in academia:*



- Postdoctoral Fellow, Oregon State University
- Postdoctoral Fellow, University of Hawaii at Manoa
- Postdoctoral Research Associate, University of Washington
- Postdoctoral Scholar, Scripps Institution of Oceanography
- Postdoctoral Scholar, Stanford University
- Assistant Professor, New Jersey Institute of Technology
- Assistant Professor, Universidad Catolica de Chile
- Assistant Professor, University of Southern Mississippi
- Associate Professor, Jacksonville University
- Associate Professor, Temple University
- Associate Professor, University of Texas

***Faculty***

Our graduate students' needs for advanced training and skills in quantitative analysis are being served in new and state-of-the-art ways, thanks to our two newest Tenure-Track Faculty members—physical oceanographer Dr. Tom Connolly and physiological and behavioral ecologist Dr. Birgitte McDonald. Dr. McDonald is a Vertebrate Ecologist who specializes in marine mammals and whose research was primarily been focused in the Antarctic. Both will both be teaching quantitative courses for the first time in Spring 2016 Dr. Connolly's course will be geared particularly towards oceanographers, Dr. McDonald's towards biologists.



In 2013 Dr. Kim Null joined the Research Affiliates with expertise in nutrient analyses and water chemistry. In 2014, MLML brought in Dr. Alison Stimpert as a Postdoctoral Researcher in our Marine Vertebrate Ecology lab to work in the areas of



bioacoustics, behavioral ecology, and conservation of birds and mammals and to teach a course on Marine Acoustics. Her research interests align well with MLML’s mission to study the intersection between the behavioral ecology of marine vertebrates and the conservation and management of those species and their habitats.

Our Visiting Scientist for AY14-15 was Dr. Matt Edwards, a former MLML student, from the faculty of San Diego State University, who specializes in Marine Plant and Algal Ecology. Dr. Edwards joined our Phycology Lab to support MLML graduate students and continue his research looking at ecology, physiology, biogeography and conservation of marine algae in coastal ecosystems throughout the eastern Pacific Ocean. He taught a course in Marine Ecology with MLML’s Professor Michael Graham and one course in Quantitative Marine Science.

*Faculty Achievements 2012-2015*

AY 14/15



**Dr. Ivano Aiello:**

- Dr. Aiello’s role in the international geological oceanography community was recognized by the Hanse-Wissenschaftskolleg (HWK) Institute (Germany) that nominated him as Fellow for the years 2015-2016.

**Dr. Kenneth Coale:**

- Dr. Coale led a series of workshops and cruises for early career scientists in an NSF funded program: EAGER Chief Scientist Training Program focusing on coastal oceanography aboard the R/V *Point Sur*.
- The American Association for the Advancement of Science named Dr. Coale as a new AAAS fellow

**Dr. Nick Welschmeyer:**

- Dr. Welschmeyer spearheaded an extended cruise on the R/V *Golden Bear* (Cal Maritime Academy) which took them from San Francisco, through the Panama Canal, across the Atlantic, to the Mediterranean for ballast water testing in ports that include SF, Long Beach, Marseilles, Barcelona, Naples and Boston, USA; four Atlantic Ocean crossings was made by the end of the four month cruise.

**Dr. Scott Hamilton:**

- Dr. Hamilton received funding from the National Science Foundation (Biological Oceanography) to examine the effects of selective harvesting on the demography of sex changing fishes, with colleagues at CSU Northridge. He also received funding from the NOAA Habitat Assessment Improvement Plan to investigate life history and demographic variation in lingcod, to provide information to improve future stock assessments.
- Drs. Graham and Hamilton received funding from the COAST Strategic Investment program to support the development of a Center for Aquaculture in the CSU system. Colleagues include Research Faculty Jason Smith at MLML and colleagues from CSU East Bay and San Diego State.
- Dr. Hamilton received the Early Career Investigator Award from SJSURF.





AY 13/14



**Dr. Nick Welschmeyer:**

- Dr. Welschmeyer gave a keynote presentation on novel viability test protocols to the International Maritime Organization (IMO) annual Ballast Water Conference

**Dr. Kenneth Coale:**

- Dr. Coale received NSF funding to investigate the processes that control the flux of mercury from the oceans into fog.

**Dr. Erika McPhee-Shaw:**

- Dr. McPhee Shaw was the invited keynote speaker for the Gordon Seminar, and was elected vice-chair and future chair of the Gordon Conference for Coastal Ocean Modeling..

**Dr. Ivano Aiello:**

- Dr. Aiello has recently received a multi-institution award from the California Ocean Science Trust to carry out a multidisciplinary study aimed at a “Baseline Characterization of Rocky Intertidal Ecosystems for MPA’s along the North Coast of California”. The purpose of this project is to produce quantitative baselines and comparisons between the structures of rocky intertidal ecosystems in the Northern California MPA’s.

**Dr. Nick Welschmeyer:**

- Dr. Welschmeyer delivered a presentation to the IMAREST annual meeting in London (March) and he has been working with the EPA ETV special UV Work Group on methods to appropriately assess DNA-based UV damage during ballast water treatments. Viability-based methods to test ballast water, developed by our lab here at MLML, were submitted to the International Maritime Organization (London) in a German-sponsored project to unify testing procedures worldwide.

**Dr. Scott Hamilton:**

- Dr. Hamilton received funding from the National Science Foundation for a project funded under Emerging Frontiers. This project will examine the effects of multiple stressors related to climate change (i.e., ocean acidification and hypoxia) on the behavior and physiology of rockfishes, with colleagues at CSUMB, Humboldt State, and NOAA.
- Dr. Hamilton participated on a 5-week research expedition lead by Scripps Institution of Oceanography to study the structure and function of coral reefs on 5 remote islands in the Southern Line Islands. These islands represent the most healthy and pristine coral reefs remaining on the planet.



AY 12/13

**Dr. Ivano Aiello:**

- Dr. Aiello collaborated with the Consortium for Ocean Leadership on the 'Mini JOIDES Resolution (JR) project in Fall 2012. The 'Mini JR project' is pilot study to develop a curriculum to introduce the Integrated Ocean Drilling Program, marine geology, and UNOLS vessels to middle school classrooms.

**Dr. Erika McPhee-Shaw:**

- Dr. McPhee-Shaw’s (lead PI) NSF-funded project on shelf benthic exchange events (which includes research groups from the Naval Postgraduate School, MBARI, and the US Geological Survey) completed its final field campaign. From the R/V *Point Sur* they successfully recovered, from the 70 to 100-m deep seafloor, a profiling





mooring and several benthic frames measuring wave and intertidal-tide driven bottom friction and sediment transport.

- Dr. McPhee-Shaw was elected chair of the CeNCOOS executive council and will step up local leadership in the national ocean observing systems. McPhee-Shaw was also honored by being invited to be the keynote speaker for the Coastal Circulation Gordon Research Conference Seminar for late Spring 2012, and was selected as a 2013-2014 Leopold Leadership Fellow by the Stanford Woods Institute of the Environment.

**Dr. Michael Graham:**

- Dr. Graham Work concluded work on major lab grants: the NSF grant on the effects of climate change on kelp recruitment and the Seagrant aquaculture project. Dr. Mike Graham began focusing on furthering the MASST (Marina Academy for Sustainable Science and Technology) program at Marina High School and continuing his work as the managing editor of the Journal of Phycology.

**Dr. Kenneth Coale:**

- Dr. Coale was reelected to represent operating institutions on the UNOLS Council, he serves as a Trustee for the Ocean Science Trust, he serves on the Executive Committee of the ISIS Consortium, and the Council on Ocean Affairs, Science and Technology (COAST), he serves on the Ocean Protection Council's Science Advisory Team and acts as Chair of the MLML Marine Operations Committee.

**Dr. John Geller:**

- Dr. Geller joined a new \$4.8 million major project funded by NSF through its PIRE program, and involves metagenomic analysis of coral reef biodiversity in Indonesia. In this project, settling modules called Autonomous Reef Monitoring System (ARMS) are deployed, colonized by biota, retrieved and analyzed. Partners from MLML, SDSU, UCLA, and the Smithsonian, investigate everything from virus and bacteria to invertebrate or alga. They also work with local Indonesian scientists and conduct workshops for US and Indonesian students.



**Dr. Scott Hamilton:**

- Dr. Hamilton received a California Sea Grant with collaborators at NOAA, UCSC, and MBARI to examine the effects of ocean acidification on the olfactory capabilities and swimming physiology of juvenile rockfish.

***Research Faculty Achievements 2012-2015***

**Dr. David Ebert:**

Dr. Ebert serves as the Program Director for the Pacific Shark Research Center (PSRC) at MLML where he advises 12 MLML graduate students and mentors four undergraduate interns. Dr. Ebert's research focuses on sharks, rays and chimaeras; their biology, ecology, fisheries, and systematics.

In 2012, Dr. Dave Ebert worked on several major projects in collaboration with colleagues at NOAA Fisheries, DFO Canada, and at academic institutions in North America, Australia, Europe, and Taiwan. This included collaborating on the "Tree of Life" project funded by NSF, and biodiversity projects in North America, southern Africa, southern Indian Ocean, and Taiwan. The southern Indian Ocean project received considerable attention in the media with the discovery of at least eight new species of sharks.





In 2013 he gave the Keynote Address at the 2<sup>nd</sup> Sharks International conference in Durban, South Africa. Dr. Ebert was named the 2014 Mentor of the Year by the CSU UROC *"for his inspiring commitment to student achievement, and his leadership in fostering research and educational partnerships"*.



In AY14-15 Dr. Ebert and his students conducted field research and collaborated with colleagues on projects in North America, Argentina, Australia, Brazil, Canada, Chile, Ecuador, France, Germany, Italy, Japan, Mauritius, New Zealand, Seychelles, South Africa and Taiwan. Their research was the subject of much media attention including episodes of the Discovery Channel's Shark Week, the program Shark After Dark, and programs being produced by the British Broadcasting Corporation to air in 2015.

Dr. Ebert's public outreach activities included contributions to the annual Monterey Whalefest, the Monterey Bay Aquarium's Shark Days and the annual Sharktober event at the Cal Academy of Sciences. Other outreach and presentations were conducted at local schools and for groups such as the Monterey Bay Sanctuary Exploration Center in Santa Cruz, CA.

### **Dr. Stacy Kim:**



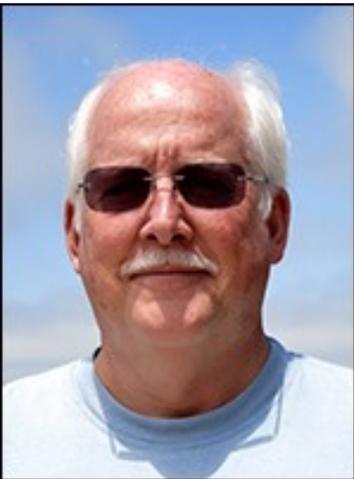
Dr. Kim's research focuses on benthic community ecology in disturbed habitats. In 2013 she developed collaborations with Monterey Bay Aquarium Research Institute (MBARI) on a time-lapse camera system. Throughout AY 12-13 she contributed subject matter expertise on food webs for BBC, worked with researchers from Italy on cetacean tracking and on long term/large scale ecological changes with Australia, Oregon and Delaware. In addition to these activities, Dr. Kim led three projects in AY12-13 for which she spent a total of four months in Antarctica.

Her research took a radical setback in AY14-15 when the government shut down, cancelling her entire research field season. Dr. Kim was slated to conduct research for four months at McMurdo Station, Antarctica. One project, funded by NASA, was to develop an autonomous underwater vehicle and test it under a permanent ice shelf to understand the structure of an ice shelf with an ultimate objective to develop a vehicle for exploring ice covered seas on other planetary bodies; a project which would have surely resulted in valuable data given recent discoveries by NASA of the MARS landscape. The second project, funded by the National Science Foundation (NSF), would have been a study of food webs ranging from phytoplankton to krill and fishes, to penguins, seals and whales to understand the influence that top predators have in this Antarctic system.

Dr. Kim continued efforts to encourage younger scientists and engineers (K-12) by co-hosting a teacher-training workshop. Dr. Kim joined MBARI in creating a classroom program for building remotely-operated vehicles (ROV's) in the classroom to enhance Science, Technology, Engineering and Mathematics (STEM) skills. This led to a very successful ROV project at Stevenson School in Carmel, CA, and to a team from a junior high in New Hampshire that won a State-wide ROV competition and advanced to Regionals. Direct mentoring efforts continued with students from a middle school in Arizona that visited MLML during the Spring semester and with gifted students from Ohio.

**Dr. Valerie Loeb:**

During AY14-15, Dr. Loeb continued her research on micro-algal blooms in the Southern Ocean and Antarctica. She submitted a collaborative grant proposal to conduct field research from 2015-2016 on zooplankton by gathering physical and environmental samples across the Drake Passage using satellite-derived information, at-sea microscope based determinations and geo-spatial modelling to develop potential capability for predicting the occurrence of massive algal blooms in that region. She also continued her work with Acoustic Doppler Current Profiling. Dr. Loeb completed the first field season in Fall 2014 in the NSF DPP funded EAGER grant “Pilot study: addition of biological sampling to Drake Passage Transits of the ‘L.M. Gould’”.

**Dr. Jason Smith:**

Dr. Smith studies the physiological ecology of marine algae utilizing a diverse array of technologies ranging from molecular biological instruments to optical remote-sensing equipment in submerged habitats.

During AY12-13, Dr. Smith and his research group completed a field evaluation of in situ pH sensors for the Alliance for Coastal Technologies Program (ACT), and his group later embarked on a field campaign for his NOAA ECOHAB grant. This entailed a series of day trips in Monterey Bay on board MLML’s R/V *John Martin*, work coordinated with MBARI’s employing autonomous underwater vehicle (AUV) technology.

During AY14-15, Dr. Smith spent a substantial portion of the year traveling to field sites in support of the ACT conducting field verification trials in the Chesapeake Bay and Lake Michigan shoreline. He also participated in a Verification Protocol Workshop where he designed laboratory and long-term field deployments for the newest generation of sensors. He and his team also went on cruises to the San Pedro Shelf to catch an upwelling driven algal bloom and spent six days sampling toxic algal blooms in the Monterey Bay. Later in the AY, Dr. Smith used the MLML’s new Aquaculture Center to grow experiments of offshore water samples to look at algal growth requirements.

In addition to his research, Dr. Smith provided scientific guidance to the Cal Academy of Sciences in San Francisco, CA during the development of their interactive exhibit “Habitat Earth” and he was invited to the White House to participate in a planning meeting for the Office of Science and Technology Policy.

**Dr. Rick Starr:**

Dr. Starr, his students, and technicians have worked on 11 different vessels to monitor marine protected areas (MPAs), evaluate the effects of long-term fishery closures, and develop new underwater tools for surveying fishes and habitats. From 2006-2012, Dr. Starr and his students conducted collaborative fisheries research to evaluate the performance of the new MPS’s in Central California.

AY14-15 saw Dr. Starr approach his eighth consecutive year monitoring central California MPS’s and he will be modeling the results to see if the data can be used in “data-limited” fishery models to better manage nearshore fisheries. Dr. Starr also continued studying the Rockfish Conservation Areas, broad depth-based closures that have been in place for 11 years, but not yet evaluated. One project involves reproducing a study that occurred in the 1990s by working with anglers to



estimate changes in density and sizes of captured fishes. The second project involves the development and use of a stereo-video camera system to conduct *in situ* surveys of the closures and to work with commercial fishermen to develop ways to target healthy stocks of fish while avoiding overfished species.



### **Dr. Diana Steller:**

Dr. Steller is on the research faculty at MLML and participates in all of the subtidal related activities and teaching at MLML. In the Fall of 2014, she helped coordinate the subtidal ecology course that was taught for Spring 2015. She continued her research on algal ecology and co-authored a paper on hurricane disturbance and slow growth in rhodoliths of the Gulf of California. She was also served as a member of the Secretariat of the Western Society of Naturalists alongside other MLML Faculty. Dr. Steller continued to conduct subtidal research, teach diving related courses and advise graduate students, all while running the research diving program and supporting specialty research diving.



### **Dr. Alison Stimpert:**

Dr. Stimpert joined the Research Faculty at MLML during AY-15 as a Postdoctoral researcher in the Marine Vertebrate Ecology lab. Her research focuses on the effects of anthropogenic sound on the acoustical behavior and foraging ecology of several cetacean species in southern California, in addition to maintaining a program on Humpback Whale acoustic behavior in the waters around Hawaii, Massachusetts, Alaska and Antarctica.

### ***Research Affiliates***

#### **Marine Pollution Studies Lab at MLML (MPSL-MLML):**

MPSL-MLML serves a scientific and technical support role for multiple federal, state and local agencies, both governmental and non-governmental. Current efforts focus on monitoring the environmental health of California's surface waters (SWRCB's SWAMP Program), on tracking the status and trends in California's non-native species introductions (CDFG's Introduced Species Program), and on environmental data management (SWRCB's SWAMP and CEDEN Programs). The staff performs a wide array of design, sampling, laboratory analysis, quality assurance, reporting and database management functions.



- MPSL-MLML is involved in the study design, sample collection, and data management of the Regional Monitoring Program (RMP) Fish Tissue project in San Francisco Bay. This work has resulted in the issuance of fish consumption advisories by the Office of Environmental Health Hazard Assessment (OEHHA), a number of technical reports and conference presentations, and peer-reviewed journal publications. MPSL-MLML conducted the 2014 fish tissue survey last year.
- MPSL-MLML was involved in the sediment collection in 2014 as part of the Bay Margins Sediment Study for the RMP for Water Quality in Central Bay portion of SF bay. Margins (mud flats and adjacent shallow areas of the bay which are more productive and highly utilized by biota of interest (humans or wildlife)





- MPSL-MLML is integral to the Western Environmental Monitoring and Assessment Program (WEMAP) - this is a four-year multi-agency cooperative study. In 2015 MPSL-MLML is leading the field effort of another round of WEMAP sampling in California's bays and estuaries with water and sediment samples to be collected at 49 stations and trawling for fish at 31 of those stations.

**Marine Pollution Studies Lab – CA Dept. of Fish and Wildlife (MPSL- DFW)**

The MPSL-DFW group, located at the CA Department of Fish and Wildlife facility in Rancho Cordova, CA offers field sampling, laboratory preparation, and analytical (trace metals, mercury, methylmercury, and some conventional constituents) capabilities. MPSL-DFW is a group of scientists dedicated to studying environmental contaminate movement through the environment. The team focus is on trace metals chemistry including mercury but they are also investigating pesticides and other organic toxins.

The lab is comprised of three departments: field collections, analytical laboratory, and research. The field crews have the capacity to collect water, sediment, and tissue samples in fresh, estuarine, or salt water environments. The analytical laboratory is equipped for trace metals and mercury (organic and inorganic) analysis in water, tissues and sediments. In addition, the lab is capable of various other measurements such as suspended solids concentrations and chlorophyll. Current research is focused on reducing mercury loads from wetlands.

**Central Coast Wetlands Group:**

The Central Coast Wetlands Group is a partnership of agencies, scientists, non-governmental and private organizations working to preserve and restore Central Coast Wetlands. The group is spearheaded by the California Coastal Commission in response to the federal and state interests in coordinating wetland activities throughout California.

**Marine Optical Buoy Project (MOBY):**

The MOBY project is the centerpiece of the primary ocean measurement site for vicarious calibration of satellite ocean color sensors and long-time collaborator with the Central Coast Ocean Observatory System (CenCOOS) stationed in the Monterey Bay.

**Science, Learning and Exploration with the Help of Sea Lions (SLEWTHS):**

SLEWTHS is an innovative project of sea lions and people working together to further marine education, research, and conservation. The SLEWTHS project functions as a teaching aquarium for the central coast:

- In 2014, Dr. Zeligs, the project's director published her first book: *Animal Training 101: The complete and practical guide to the art and science of behavior modification*. This work has already received the People's Choice Award at the recent International Animal Training Conference in the UK where Dr. Zeligs presented a workshop. So far, two colleges in addition to CSUMB will be using this text in upcoming classes.
- Dr. Zeligs taught two classes through CSUMB in AY14-15 attended by 33 students from all over the country.
- Research efforts included Dr. Zeligs supervising an installation of a sea lion deterrence system for an oil platform in southern California.
- In 2014, the SLEWTHS project conducted 3 public outreach events around California reaching approximately 34,000 people and also hosted 17 Sea Lion





Stewards beach clean-up programs for 486 students cleaning approximately 100lbs of trash off the Moss Landing beaches.

**Southwest Fisheries Science Center (SFSC):**

The SFSC’s serves as center for the Marine Turtle Research Program and continued to coordinate research on leatherback turtles in central California and the Western Pacific. In AY 14-15, Dr. Scott Benson and his team with the SFSC published a technical report for NOAA on the status of the US living marine resources and that contained a comprehensive summary of habitat information for all fishery and protected species under purview of the NOAA National Marine Fisheries Service titled “Our Living Ocean: Habitat”. The report also provided a conceptual framework for understanding habitat-use patterns of marine species.



**MLML-MBARI Library**

MLML’s campus library is a public-private partnership with the Monterey Bay Aquarium Research Institute (MBARI) that has been extremely beneficial to both partners. As a result the MLML-MBARI Library, in sharp contrast to all other CSU libraries, has been largely immune to the detrimental effects of State budget cuts as MBARI’s support serves as a financial buffer. Additionally, MBARI benefits from access to CSU contracted resources at cost as the number of users they add is trivial compared with the large numbers of student users. The library portfolio includes MLML’s Digital Commons that provides access to Masters’ Theses, publications by MLML-affiliated authors, institutional records, and an image archive.



**Marine Operations**

MLML operated the National Science Foundation's 135 foot R/V *Point Sur* for the past 28 years. In 2014, NSF decided to retire the R/V *Point Sur*, so the vessel was sold for \$875,000 and the proceeds placed in an interest-bearing account at the SJSURF. The R/V *Point Sur* primarily operated in the Northeast Pacific, but recent cruises were made to the Aleutian Islands, Bering Sea, and Antarctica. MLML is a member of the University National Oceanographic Laboratory System (UNOLS) and all R/V *Point Sur* operations were scheduled in concert with UNOLS. The research vessel provided 5 ship days each semester for MLML classes to use, summing to 50 trips over the last five years. With the retirement of the R/V *Point Sur*, the ability to take MLML classes to sea and to sample the coastal environment is compromised. Furthermore, the remaining smaller vessels at MLML cannot operate overnight, for extended periods of time, or deploy and recover larger pieces of instrumentation (e.g. corers, ROVs, submarines, moorings). To accommodate these types of gear and provide for class cruises, MLML needs a mid-sized vessel of 75 – 95’.



The MLML Marine Operations and small boat program facility consists of a 3,000 square foot structure and surrounding utility yards that house a boat workshop, air and nitrox filling stations, dive gear repair station, storage lockers, a boat ramp, and docks. MLML now has two research vessels: the R/V *John Martin*, a 56’ foot vessel equipped for oceanographic research, dive operations and sea bird/mammal surveys; and the R/V *Sheila B*, a 30’ aluminum hull landing craft that serves as a multi-use research platform capable of conducting research in shallow waters as well as the open ocean. MLML vessels operate between Pt. Lobos in the Monterey Bay to San Francisco Bay. Through a training program our small boat coordinator trains new boat drivers and maintains logistics and safety equipment according to US Coast Guard regulations.





During AY14-15, vessels were used extensively by undergraduate and graduate students of MLML and CSU consortium campuses for class-based field trips and research projects and thesis research. Most of the vessel use was local (e.g. Monterey Bay, San Francisco Bay, and central California coastline) but occasionally the vessels were used in Baja California, southern California, and the California San Francisco-Sacramento-San Joaquin Bay Delta Complex. Facilities and vessels were also used by a large group of outside researchers and educators from Monterey Bay area marine research institutions including MBARI, UCSC, NPS, ESNERR, National Marine Fisheries Service, and local community colleges and high schools.

### *Diving Program*

The MLML Diving Program is growing with an increasing number of student and faculty diving research projects. MLML Research Diving program has divers that are currently conducting research in the following areas: Antarctica, Hawaiian Islands, the Gulf of California, and many areas along coastal California. In California, divers conduct research in areas including the Elkhorn Slough, Monterey Bay Harbor, Catalina Island, Monterey Bay Canyon and around the Monterey Peninsula.



In 2012, The diving program benefited from NSF funding from a grant written by Drs. Steller, Coale and Harvey to upgrade to the current nitrox system and the MLML Research Diving program had divers conducting research in AY 12-13 in the following areas: Antarctica, Hawaiian Islands, Baja California, and many areas in Central and southern California. Also during AY 12-13 both Dr. Steller and the MLML Diving Program were highlighted in a video produced in 2012 by Hammerhead Press entitled “*Careers In Diving*” where she represented the career of a Diving Safety Officer.

Dr. Diana Steller taught Marine Science Diving in the Fall 2014 to train American Academy of Underwater Sciences (AAUS) research divers. Many CSU and UC graduate students take advantage of the AAUS training offered through the MLML Diving Program. All of these are field based research courses that are important launching places for student research and thesis work. The courses have an emphasis on the theory and logistics for conducting rigorous experiments underwater.



All of MLML’s diving courses are field based research courses that are important launching places for student research and thesis work.

### *Friends of Moss Landing Marine Labs*

The Friends of Moss Landing Marine Laboratories (FMLML) was established in 1994 as a 501c(3) non-profit organization to support research, education and conservation at MLML. Although the 501c(3) has been dissolved, the organization continues to provide support and organization for the MLML alumni and current students through donations and philanthropic giving. These funds are held and administered at the SJSU Tower Foundation. The FMLML plays a critical role in gathering community support for the facility, funding scholarships for graduate student support, undertaking special projects to enhance the MLML Visitor Center, and operating numerous public outreach programs for the local community.



FRIENDS OF MOSS LANDING  
MARINE LABORATORIES



FMLML operates a store for MLML merchandise that earned **\$5,300 in AY14-15** which went directly to the students and facilities. FMLML also produced the *Wave*



magazine which is published twice per year to highlight MLML research activity, student successes, and provide updates to our sponsors and donors.

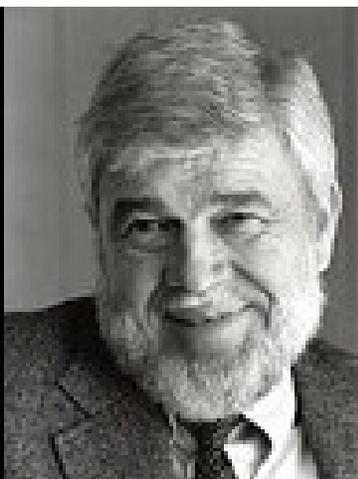
In AY14-15, FMLML received \$400,000 in private donations, endowments and corporate contributions. They opened the MLML Boardwalk Trail which meanders around the MLML Main Lab for visitors to learn about the local ecology and history of those who inhabited these lands before us and of MLML. During AY 14-15, FMLML conducted over a dozen tours to local K-12 classes and groups and awarded scholarships to 16 students totaling \$23,440 in AY14-15.

**FMLML SCHOLARSHIPS 2012-2015:**

**AY 14-15**  
16  
Awards  
**\$23,440**

**AY 13-14**  
23  
Awards  
**\$28,400**

**AY 12-13**  
14  
Awards  
**\$27,200**



**John H. Martin Scholarship:**

John Martin was Director of MLML and a beloved member of the MLML community for 18 years. MLML has a vessel named R/V *John H. Martin* and several memorial displays and plaques displayed throughout the building. John Martin was a biologist with a passion for education and seeing students realize their potential. This scholarship is awarded each year to one student who applies an innovative approach and creativity to marine research.

**Captain Lee Bradford Memorial Scholarship:**

Lee Bradford was the Captain of the R/V *John H. Martin* who had a long tenure with MLML. In his honor, this memorial scholarship was established to support a MLML student by providing funds for boat time on MLML vessels to complete thesis research.



**James Nybakken Scholarship:** This scholarship was established by MLML founding faculty member Dr. James Nybakken. Dr. Nybakken was MLML's invertebrate zoology professor for 32 years, during which he also served twice as Acting Director. This scholarship is awarded to one student each year working in the fields of marine invertebrate ecology or other aspects of marine invertebrate zoology.

**Kimberly Peppard Memorial Scholarship:**

Kim Peppard was a graduate student in the Biological Oceanography Lab who studies the biology and chemistry of marine snow. She died tragically in a diving accident while collecting data for her thesis. In her honor, her family set up a scholarship to award one student \$1,000 each year that shows dedication and service to MLML, peers and community.



**Sonia Linnik Hamilton Marine Science Scholarship:**

Sonia Linnik was a graduate student at CSU Stanislaus who studied marine science. She established this award to support students studying marine science at MLML. One student will be awarded \$1,000 each year based on GPA and an essay describing why they chose MLML.



**MLML Scholar Award:**

The MLML Scholar Award was established by the Student Body to provide financial support to MLML students who shows academic dedication and strong scientific foundations in their research. Two scholarships in the amount of \$2,200 are awarded each year.

Another major activity for FMLML is community lectures. FMLML hosts eight seminars each year which are open and free to the public, inviting guest speakers to give talks on marine science topics of interest to the Monterey Bay community. An average of 200 people attended these talks last year:

**AY14-15 FMLML SEMINARS:**

**Thomas Hoover (MBARI):** *“Long Range AUV Operations at MBARI”*

**Pete Raimondi (UCSC):** *“Sea Star Wasting Patterns and Effects Along The West Coast of North America”*

**Ivano Aiello (MLML):** *“A World Turned Upside Down – A Geologist’s Take”*

**Susan Von Thun (MBARI):** *“Marine Debris”*

**Mike Foster (MLML Emeritus):** *“Kelp”*

**John Weller (Photographer/Filmmaker – The Last Ocean):** *“The Last Frontier”*

**Dave Ebert (MLML):** *“Sharks”*

FMLML Seminars serve as a valuable and treasured link to the local community and as a primary fundraising vehicle. Several of our regulars donate to FMLML every year and have long-standing relationship with our students.

In addition to these outreach and fund raising activities, FMLML also coordinated the use of MLML’s Seminar Room. MLML provides our Seminar Room free of charge to marine research organizations throughout the Monterey Bay area and California and allows other non-profit groups to use the space at a discounted rate. In AY14-15, FMLML coordinated 30 events in our Seminar Room for groups like the Monterey Bay Aquarium, NOAA, CA Fish and Wildlife, CSUMB, The Community Foundation of Monterey County and for non-profits like the Red Cross, North Monterey County Fire District and local school districts.



### Governing Board

The MLML Governing Board (MLML GB) is comprised of the faculty and academic leadership from the seven CSU consortium campuses (See Appendix IV). The MLML GB meets twice per year, in the Fall and Spring Semesters to discuss the academic program, budget and operations.

#### December 2014 Highlights:

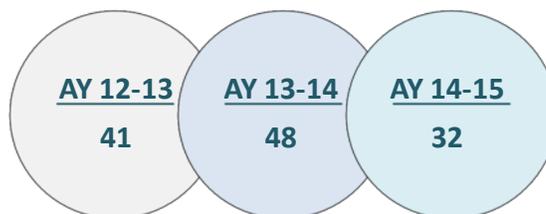
- SJSURF F&A return challenges, continued debate over the loss/surplus formulas used to determine a unit's F&A.
- SFSU marine science program in Tiburon and the impact to MLML
- R/V *Pt. Sur's* final cruise and impact to MLML Marine Operations
- Grand Opening of the Center for Aquaculture
- CSUMB student enrollment increases due to population of prospective graduate students interested in studying marine science
- Summer course potential

#### May 2015 Highlights:

- MLML Curriculum Committee reported that scheduling will be more efficient to align with CSUMB and continued effort to develop a closer connection
- 8 FTE staff released after the sale of the R/V *Pt. Sur* was completed
- Discussion on how MLML can offer class cruises to SJSU and consortium campuses
- New MLML faculty introduced (Dr. Mc Donald to the Marine Vertebrate Lab and Dr. Connolly to the Physical Oceanography Lab)
- Announcement of new Faculty Chair for AY15-16, Dr. Aiello of the Geology Lab
- Housing challenges addressed
- Announcement that the MLML Teaching Enhancement Program has ended leaving a hole in MLML's ability to continue public outreach
- MLML's 50<sup>th</sup> Anniversary Celebration and Alumni weekend set for 5-7 August 2016, planning committee formed

## ACHIEVEMENTS

### *Publications*



### *Grants and Awards*

**MLML Faculty, Faculty Researchers and Faculty Affiliates acquired \$5.6 million in grants and awards during AY14-15, administered by the San José State University Research Foundation (SJSURF):**





**FACULTY: (14) \$2.25 million**

- Biological Oceanographic studies are using techniques applied in the study of environmental problems including thermal stress, invasive species and long-term environmental change
- Near shore ecology studies with the US Geological Survey
- Ocean acidification with CA Fish and Wildlife conducting molecular analyses to improve oil spill prevention and response services; and
- A National Science Foundation grant to measure ocean acidification effects on fish

**RESEARCH FACULTY: (11) \$973,763**

The two primary grants brought in by our Research Faculty look at upwelling and coastal land use patterns and Rockfish Conservation.

**RESEARCH AFFILIATES: \$2.60 million:**

- MPLS-MLML received grants to provide ongoing analytical services to the CA State Water Resources Control Board
- Aquatic Bioassay of fish collections from the LA River and San Gabriel watershed
- MOBY received grants from the University of Miami, Florida to develop instruments suitable for a network of calibrated ocean monitoring satellites
- Central Coast Wetlands Group received a grant to evaluate nutrient reduction capacity of treatment systems for the CA Dept. of Agriculture; and
- A grant from the CA State Parks and Coastal Communities to develop an estuary monitoring system and resource management prioritization tool.



*Center for Aquaculture*

MLML celebrated the Grand Opening of their newly constructed Center for Aquaculture in August 2014 with guests from SJSU, other MLML consortium campuses, the Navy, marine research colleagues, and other stakeholders from around the state.

The MLML Center for Aquaculture is positioned where the Salinas River drains directly in to the Monterey Bay National Marine Sanctuary. Experiments and knowledge generated by work at the MLML Aquaculture facility will be focused on a range of pressing topic areas such as how aquaculture can be used to minimize nutrient and pollutant loading in the Salinas Valley region. Additionally, one of the most pressing environmental issues of our time is ocean acidification, and many organisms and processes in the world's oceans will be impacted. We expect the Center for Aquaculture will also support studies designed to assess the impacts of ocean acidification on aquaculture production and provide predictions for policy makers and regulators.

We also hope to develop partnerships with industry, and federal and state agencies that will build support for research and education activities at MLML. In April 2015 we received a grant from the Council on Ocean Affairs, Science, and Technology (COAST) Strategic Investment Program to develop a funding strategy, and a research and curricular plan for the Center for Aquaculture. The grant will run from July 2015 to December 2016.

Dr. Michael Graham, professor of Phycology has been collaborating with the Monterey Abalone Company on a number of projects to improve aquaculture



methods. For example, abalone had traditionally been fed a routine diet of Giant Kelp. Dr. Graham and his students conducted a series of experiments and found that adding red algae along with Giant Kelp increased growth rates, produced redder shells, and improved the taste for consumers.

Dr. Scott Hamilton, Assistant Professor in Ichthyology, received funding from the National Science Foundation to explore effects of ocean acidification on fishes. The Center for Aquaculture is a timely addition, providing essential space in which to conduct studies that will assess the impacts of ocean acidification on aquaculture production, leading to better predictions for policy makers and regulators.

### *Academic Village*

MLML was funded by the National Science Foundation to explore the feasibility of expanding our facilities to match those of most marine laboratories in the United States. Whereas most marine laboratories have housing and extra lab space to accommodate visiting scientists and students, MLML has none. Housing for students is limited to our Sandholdt property which can only house 8 people. This constraint has narrowed our potential for offering summer courses and building a vigorous program of visiting scientists. As the marine laboratory serving a consortium of seven California State University campuses, by definition, MLML is a remote facility. Being remote is not unique to MLML, but these types of field stations provide physical spaces and resources and opportunities for students and scientists to become immersed in research using hands-on learning and collaboration (National Research Council 2014). Distance from any campus provides both challenges and opportunities. The opportunities available at a specialized facility situated on the Monterey Bay are innumerable, but include access to incredible local marine habitats, specialized equipment, and vessel/diving capacity. The challenges remaining are insufficient space to accommodate short and long term use, including housing.

Since the inception of MLML's Governing Board almost fifty years ago, members have suggested that MLML would be well served by addressing the needs of scientists and students to visit at MLML for a day, a week, or a semester. Although MLML never lost sight of this plan, an earthquake in 1989 provided sufficient distraction pushing this vision well into the future. Beginning in 2005 with the acquisition of an adjacent property, MLML has resumed its vision of expanding. Our closest consortium campus, CSU Monterey Bay is located eleven miles away. Our administrative campus, SJSU, is a 55-mile, one-way commute. The rest of our consortium member campuses are located at even greater distances (San Francisco State, CSU East Bay, Fresno State, Sacramento State, and CSU Stanislaus). Any proposed solutions need to involve all members and to serve all CSU campuses in the future, and will require expanding beyond our current facilities.

In addition to our relationship with CSU campuses, MLML is part of a regional alliance of marine related institutions, the Monterey Bay Crescent Ocean Research Consortium (MBCORC) situated around the Monterey Bay. The community of Moss Landing sits at approximately the mid-point of the land perimeter of the Monterey Bay, making it an ideal location for a shared MBCORC meeting place. With eight members from higher education, ten federal and state agencies, and six other marine related organizations there is no shortage of marine science expertise in the area. However, unlike other well-known centers of marine science, such as Friday Harbor or Woods Hole, the Monterey Bay is geographically spread over fifty miles, thus fostering cross-pollination of ideas and research collaboration

but which requires advanced planning.

The community of Moss Landing also is home to the Monterey Bay Aquarium Research Institute (MBARI) a private, non-profit research institution that attracts a steady stream of visiting scientists to the area. There is currently one option for lodging in Moss Landing, a small bed and breakfast with a loyal clientele, priced for tourist traffic. In addition to visiting scientists, MBARI provides a highly competitive ten-week summer internship program for twelve students. At times they have struggled to identify housing options for all interns. Responses received from a variety of marine labs support our belief that housing is important as each indicated it was necessary for their existence and research capacity. Results from a survey of likely users indicated widespread interest in housing, research labs, and meeting rooms to accommodate visiting classes, offer more direct research collaborations, and provide accommodations for residential students in and beyond our graduate program.



MLML purchased a 9.6-acre parcel adjacent to the main lab in 2005 anticipating future opportunities. After purchasing the adjacent 9.6 acres (Fig. 1), MLML began to think about potential uses for this property. The concept of an academic village bringing additional classroom and meeting space and housing has broad support throughout MLML. The NSF grant funded consultants who were hired to research city, county, and state regulations and they found no major roadblocks for constructing the type of academic village we imagined for this location: a central meeting room with adjacent research labs surrounded by a diversity of housing options designed as a community. The grant has funded the work required to (1) survey present housing at other marine labs, (2) investigate future needs and interests of targeted educators and researchers in central California who are potential users, and (3) determine permitting and environmental issues that would dictate potential building constraints.



Our next step is to find funding for architectural drawings and a site plan that sets forth the financial requirements for permitting and construction. In summary, there are sufficient reasons why expansion of MLML facility, including housing will fill a large gap in local, regional, and state needs.





## FINANCIAL REPORTS

### *San José State University – College of Science*

The following table depicts the operating budget (2012 – 2015) for MLML from SJSU, administered through the College of Science. The current \$3.2 million in State funding is derived from two sources, one via the CSU system-level support currently at \$1.5 million, and the second source from the administrative campus of SJSU that is \$1.7 million. MLML like all the CSU campuses had their OE&E support decreased in recent years, and continues to operate at 33% less than the OE&E appropriated in FY2007/08. The last substantive increase in OE&E was in 2002. From 1966 to 1993, MLML was completely supported by funds from the CSU thus funding the consortium model with SJSU as the administrative campus. Since 1994, all faculty members at MLML but with appointments at non-SJSU campuses have been transferred to SJSU, so that now all MLML faculty members have assignments with SJSU. This and other financial changes have created the split State funding model for MLML.

**MLML Operating Budget 2012-2015: SJSU**

	<i>AY 12/13</i>	<i>AY 13/14</i>	<i>AY 14/15 BUDGET</i>	<i>AY 14/15 ACTUALS</i>
Salary	1,390,867	1,664,862	1,748,802	1,745,802
Benefits	616,887	709,078	815,370	780,317
OE&E	287,639	389,627	452,096	452,096
Utilities	286,879	283,771	288,640	204,310
Salary Recovery / Reimbursement	186,326	130,531	230,323	227,485
Visiting Scientist Support*	0	0	21,425	21,429
Other Reimbursement/Support	11,183	83,531	12,300	8,785
CSUMB Contribution	50,000	50,000	50,000	50,000
Prior Year Balance Forward	0	107,842	18,136	18,136
Roll-Forward Encumbrances	0	27,515	86,081	86,081
<b>TOTALS:</b>	<b>2,829,781</b>	<b>3,446,757</b>	<b>3,723,173</b>	<b>3,594,440</b>
*From all consortium campuses but SJSU and CSUMB				
<b>Operating Budget For:</b>				
<i>Administration, Instructional Supplies, Dive Program, Facilities, IT</i>				

For AY 14-15, the overall SJSU budget was slightly increased due to General Salary increases. The State budget covers costs associated with salaries for faculty and staff, diving, instructional supplies, IT, library services, and facilities. MLML also remodeled a classroom, now called “The Think Tank” which features moveable furniture, a 72” monitor on the wall, and short throw projectors; all well suited to both teaching and conferencing.



*San José State University – Research Foundation*

The following table depicts the operating budget supporting research at MLML. Income is generated from the return of some F&A allocations generated by research grant activity, rental property operated by MLML, and administrative support by SJSURF. In addition to the MLML CSU facilities and land, the SJSURF holds title to six nearby properties that house Research Affiliates and funded programs. These properties are important entities to the current and future operations of MLML.

- One property is the 2.3-acre Shorelab that was purchased in 1965 and contains the pump house that delivers seawater to all classrooms and laboratories in the main lab and to MBARI. The new Aquaculture Facility, funded largely by the Packard Foundation, also occupies this site.
- The property housing Small Boats and Diving Operations (0.6 acres) was purchased in 1983. All 13 research vessels, maintenance shop, offices, and supplies for marine operations are at this location. Dive operations also are located here including compressors, dive cylinders, lockers, shower, office, and maintenance space supporting the dive program.
- Across the street from Marine Operations is the Norte Facility that is a 1.7-acre site purchased in 2000. This site houses mostly Research Faculty and Affiliates with offices and laboratories that generate about \$10 - 12 million in funding annually.
- The 9.2-acre Sandholdt property adjacent to the main MLML building was purchased in 2005, for the purposes of building housing and teaching/research space.
- The 1.6-acre Del Mar property was purchased in 2006 to provide dock space for the 135' R/V Point Sur. The vessel was sold in 2015, so we are discussing the long-range use of this site for a new vessel and/or other research space.

Without some of these properties that provide seawater and vessel/dive support we could not function as a marine lab. The other properties are providing valuable income and research opportunities for our students or future space for housing that is desperately needed for future courses and involvement with consortium campuses.





**MLML Operating Budgets: SJSURF 2012-2015**

REVENUE	AY 12-13	AY 13-14	AY 14-15
Other Income	39,000	23,403	20,000
Rental Income (Del Mar, Sandholdt Center)	125,250	121,424	120,852
F&A Return (Less 10% to PI's)	559,886	413,936	605,830
Foundation Admin and Facility Support	214,410	188,084	196,416
<b>Total Revenue:</b>	<b>938,546</b>	<b>746,847</b>	<b>943,098</b>
<i>Less 10% of F&amp;A Return to Reserve Account</i>	<i>(62,160)</i>	<i>(45,993)</i>	<i>(67,314)</i>
<i>Less 10% to Payment on Deficit Refinance</i>	<i>(62,160)</i>	<i>(45,993)</i>	<i>(67,314)</i>
<b>Balance of Revenue To Fund Operations:</b>	<b>814,226</b>	<b>654,861</b>	<b>808,470</b>
<b>OPERATIONS DETAIL</b>			
Total Salaries, Wages and Benefits	511,757	429,815	388,320
<i>SJSURF Facility and Admin Staff - not from Grant Direct Costs</i>			
Total Administrative Costs	28,364	22,320	26,820
Total Diving Costs	10,000	0	5,000
Total Information Technology	52,100	29,600	44,600
Total Library	300	0	-
Total Maintenance and Repairs to SJSURF Properties: <i>Del Mar, Norte, Aquaculture Center, Firehouse, Sandholdt</i>	71,068	33,500	61,846
Total Services & Facility Costs	130,004	86,639	81,539
Total Supplies & Equipment	2,200	20,860	10,000
Small Boat Support	15,000	15,000	15,000
<b>Total Operating Costs:</b>	<b>820,793</b>	<b>637,734</b>	<b>633,125</b>
<b>End of Year Balance-Roll Forward AY15-16:</b>	<b>(6,567)</b>	<b>17,127</b>	<b>175,345</b>
<b>RESERVE</b>			
Beginning Balance Reserve Account	115,215	379,852	406,423
Debit To Reserve	170,000	0	(98,931)
Non F & A Expenses/Transfers	0	100,000	200,000
Transfer to Reserve Acct from F&A	(62,160)	(45,993)	(45,993)
<b>Total Annual Reserve Savings:</b>	<b>223,055</b>	<b>406,423</b>	<b>553,485</b>
<b>Balance in Reserve A/O July 2015:</b>		<b>956,654</b>	
<b>REFINANCING ACCOUNT</b>			
Refinance Begin Balance	3,242,005	3,158,966	3,112,973
<i>Deficit Payment</i>	<i>(62,160)</i>	<i>(45,993)</i>	<i>(67,314)</i>
<b>EOY Refinancing Balance:</b>	<b>3,158,966</b>	<b>3,112,973</b>	<b>3,045,659</b>





The SJSURF budget for FY 2014-15 again reflected the complicated surplus/loss formula for revenue, in which the cost to keep the SJSURF Central Office running is taken off the top of MLML grants revenue. The amount of F&A return distributed to a unit is proportionate to the prior year's grant activity by that unit. If a unit does better than the others, it pays more of the Central Office cost the next year. However, the SJSU College of Science forgoes any F&A payments that would enable more of the resources to be used by MLML.

MLML continues to struggle with the surplus/loss method used by the SJSURF to determine how F&A will be allocated among units. The difficulty is the great variability in how costs are distributed among the units generating F&A. Because the Central Office of the SJSURF has a large and generally fixed administrative cost, the units generating funds must cover these costs with F&A generated during the FY. The costs associated with running the Central Office is divided among the units generating F&A, and this proportion is based on the previous year's activities. This method leads to greater variability in the amount each unit is required to earn to cover costs, thus great variability in F&A returned to the units. The uncertainty each year of the amount of F&A that will be returned to MLML has necessitated the build-up of a substantial reserve to cover MLML during years when less F&A is returned. These returned F&A funds pay the salaries for IT staff, financial analysts, maintenance staff, services, and maintenance of properties that all support MLML's \$15-\$20 million annual research activity.

## LOOKING FORWARD 2015-2016

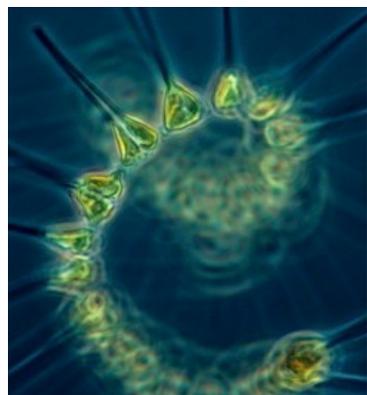
### Academic Program

MLML faculty members have been in discussion regarding a number of possible future plans for the academic program, these include: weekend courses, summer courses, distance learning, and additional faculty. In the past MLML taught weekend courses as 2-unit intensive, 2-day courses on specific marine science topics. The courses provided an introduction to marine science, the marine labs, and other possibilities to undergraduates at the consortium campuses. We are considering reinstating this program.

MLML has rarely offered summer courses, primarily because there was no consortium campus that offered summer courses and because it was difficult for students to find housing. MLML does not have housing, as do most marine labs in the US, thus making it difficult to offer such courses. With the purchase of some adjacent property and an interest in developing this for housing we once again are discussing the long-term plan to offer summer courses.

Given the remote location of MLML far from most consortium campuses, students often cannot take advantage of marine science courses unless they move to the area. Although the strength of the marine science program at MLML is based on hands-on experiences and close interactions with faculty, the potential for some courses to be offered online or as hybrid courses is something we are exploring.

The interest in marine science is exploding. There are many students that are now attracted to a degree in marine science, and there is a need for a greater diversification in disciplines within the MLML faculty. Hence, the MLML faculty





members have been discussing the need to add to the faculty in such disciplines as microbiology, toxicology, big data, etc.

### Research

A number of new projects will begin or continue in 2015 and 2016. Dr. Coale will continue his studies of the transport of methylmercury via fog, work supported by a grant from NSF. Dr. Welschmeyer has continued funding from industry and others to test ballast water treatment systems, in collaboration with the California Maritime Academy. Dr. Aiello will be organizing a team and workshop to conduct a pioneer study in the Gulf of California using the US oil drilling ship *Joides Resolution* as part of the International Ocean Discovery Program. Dr. Hamilton has recently received two NSF grants dealing with ocean acidification effects. Dr. McDonald received funding to investigate the distribution and movements of Risso's dolphins in Monterey Bay. Dr. Geller will continue his work to assess biodiversity in the western tropical Pacific.

### Faculty

In Fall 2015 the new Physical Oceanographer, Dr. Tom Connolly began teaching his first course on Physical Oceanography. Dr. Connolly is a coastal oceanographer and will conduct research in the coastal zone off California. He already has become a PI within the Central and Northern California Ocean Observing System (CeNCOOS) organization, and will assist with operating the nearshore ocean monitoring stations. Dr. Connolly will also be joined by his wife, Dr. Colleen Durkin who will join our team of Research Affiliates as a biological oceanographer studying phytoplankton and the process by which carbon is transported to the deep ocean by sinking particles. Her work at MLML will complement the geological research planned by Dr. Aiello which will aim to understand singular processes in the geological record in core sediments from the deep ocean.

In addition, MLML will welcome Dr. Corey Garza, an Associate Professor from CSUMB as the AY 15-16 Visiting Scientist. Dr. Garza has an extensive research background in marine ecology, teaching and scientific education outreach. MLML is very excited about having Dr. Garza at MLML and confident that he will be an invaluable member of our faculty during the academic year. His contributions to our Phycology, Ichthyology, and Geological Oceanography labs will benefit MLML as a whole, and our graduate students pursuing research in marine landscape ecology and environmental science. Dr. Garza's background includes serving as a research ecologist with NOAA, postdoctoral positions with CSU LA and as co-director for the Cal State University Council on Ocean Affairs Science and Technology.

Joan Parker, MLML-MBARI Librarian and member of the faculty since 1994 will be retiring in January 2016. Joan managed the digital, complementary print and archival collection and implemented many informational technologies making the MLML-MBARI library a model for best-case practices for a scientific institutional repository. She also taught a course on Scientific Writing that was consistently rated as invaluable to our graduate students throughout her tenure. A faculty recruitment will be conducted for a Senior Associate Librarian with a strong scientific background, advanced degree in library services and experience integrating information technology and digital archiving into an existing library





operation. Additionally, the new faculty member will be expected to teach the Scientific Writing course once per academic year.

### Aquaculture Center

Aquaculture activity has become a global endeavor, from the development of applied methods to research into sustainable technologies. Although worldwide farming of aquatic organisms was already on the rise, improvements in methodologies have resulted in further growth in the industry. These facts, combined with an absence of dedicated aquaculture facilities within the CSU, led Moss Landing Marine Laboratories to consider building this new center. With significant funding from the Packard Foundation, a 1,200 sq. ft. building and 1,800 sq. ft. concrete slab for seawater tanks were recently constructed at MLML's Shorelab. This one-acre, oceanfront SJSURF property was already home to a pumping facility delivering 300 GPM of seawater to both MLML and the nearby Monterey Bay Aquarium Research Institute. We envision additional tanks and research space can be created on the 10,000 sq. ft. of space surrounding the building, offering further expansion of this dynamic center for aquaculture research and teaching. The Aquaculture Facility already has allowed us to expand our seawater capabilities, has attracted some external funding, and will lead to new courses and collaborations. We hope to expand this program into one that serves the entire CSU.

Located at the point where the Salinas River drains directly into the Monterey Bay National Marine Sanctuary, the Aquaculture Center is well placed to investigate local issues relating to minimizing the effects of agricultural run-off reaching the ocean. MLML is exploring the use of nutrient-polluted agricultural runoff water to grow seaweeds, simultaneously fertilizing seaweed while bio-filtering water that can be returned to the watershed. This cultivated seaweed may be used as an agricultural fertilizer amendment that recycles nitrogen, effectively closing the loop and making sustainable use of resources.

### Marine Operations

With the loss of the R/V *Pt. Sur* and the revenue it generated, MLML had to restructure Marine Operations and let go of 8 SJSURF personnel: the Marine Superintendent and Ship's Captain who were funded by SJSU, and the ship's crew and Administrative Assistant who were funded via SJSURF by the revenue generated by vessel use at Marine Operations. The remaining vessels are the 56-foot R/V *John H. Martin*, the 30-foot R/V *Sheila B.*, a 22-foot Rigid Hull Inflatable, and four 17-foot Boston whalers and three inflatable boats. The new organization consists of hiring a new Marine Operations Manager in 2015, funded by SJSU at the CSU MPP level who is licensed to drive vessels up to 50-foot in length, and a Small Boat Operations Coordinator, a full time Technician/Deckhand and a part-time Administrative Assistant, all of whom will be funded through SJSURF with revenue generated by vessel usage. MLML Marine Operations will continue training boat drivers and maintain logistics and safety equipment to US Coast Guard regulations. Vessel use will be limited to operate within the Monterey Bay up to 50 miles offshore, and with the two larger vessels, between Pt. Reyes and Pt. Sur.

The vessels may continue operating occasionally in Baja CA and in the San Francisco-Sacramento-San Joaquin Bay Delta Complex, however the ability to operate overnight for extended periods of time, or deploy and recover large





pieces of instrumentation (e.g. corers, ROV's, moorings) is lost. The proceeds of the sale of the R/V *Pt. Sur* reside with MLML, but cannot be used to purchase a new vessel. However, the funds can support the retrofit of a donated vessel or a separately purchased vessel, and, if managed well, could be combined with proceeds for the R/V *John Martin's* sale to provide sufficient ancillary funds that could finance years of maintenance and operations.

MLML will need a mid-sized vessel of 75 to 95-feet with the following characteristics:

- Operate at sea for durations of 10 – 30 days
- Berth space for crew and at least 5 – 8 scientists
- A-frame capable of handling trawls, moorings, corers, and small boats
- Trawl winch with 5000 m of 0.4 in wire rope
- CTD winch with 1000 m of conductor cable
- 5-ton knuckle boom
- Bow Thruster
- Wet and Dry lab space

### Budget

MLML expects our CSU/SJSU funding to remain at the same level and anticipates no funding shortages, however there are plans in place to adjust for staff salary increases should the State approve for represented employees in the next academic year.

The SJSURF will be conducting a Space-Effort survey alongside federal government auditors in order to justify and calculate the indirect rates to be charged to MLML grants. Another potential outcome of this survey will be to further justify and examine MLML's F&A return on grants and the \$190k F&A support issued to MLML each year.

### Digital Archives: Photo and Museum Collection

In the Spring of 2014, MLML began digitizing its museum collection in order to make research accessible through our website and better archive its 50 year collection. With support from the Cal Academy of Sciences, MLML will refresh the marine biological collection by re-bottling, following new and improved protocols for preservation solutions, and digitizing and photographing the collection to make it searchable online. Starting in Fall 2015, museum specimens (herbarium, birds, turtles, mammals, bones, invertebrate and fishes) will be solely managed by the MLML faculty in charge of that subject area.

### Visitor Center

In Spring 2016, MLML will install a new, interactive museum kiosk in the Visitor Center. The family of Melanie Mayer Gideon (1960-2013), an alumna of MLML, has donated funds for a memorial to be created at MLML in her honor. In keeping with the family's wishes and assessing what the public enjoys when touring MLML, the Director proposed the installation of a large wall-mounted TV screen with an interactive, multi-media informational display in the lobby of the main building for visitors to learn about the lab, research, recent discoveries,





activities, the local ecology and history.

MLML partnered with SJSU's Lucas College of Business and assigned this project to a team of undergraduates taking a business development course who will scope, design and demonstrate the interface to MLML leadership as a project development exercise for course credit.

### **MLML Film**

In the summer of 2015, another alumnus from MLML will partner with a local producer to make a short film about MLML. The film is intended to be a powerful outreach tool which can be used to recruit future students, be accessed via our website, can be viewed at the Visitor Center kiosk, answer media inquiries, supplement grant proposals, and used by leadership at CSU and consortium campuses to familiarize stakeholders with MLML, its history and mission.

### **50<sup>th</sup> Anniversary Alumni Weekend Celebration**

In the summer of 2016, MLML will commemorate its 50<sup>th</sup> Anniversary with an alumni weekend celebrating 50 years of education, research, and community service. The Planning Committee has launched a website with weekly blogs from alumni, current and former faculty, ships' crew, and staff sharing stories about the early years and their experience being part of the MLML community. MLML will host a weekend event to include an alumni reunion complete with activities for each lab cohort past and present to participate in; a way the alumni can interact and connect with each other, the current students and recent grads. As part of our festivities, MLML hopes to publish a book commemorating 50 years in operation, turning out the best and brightest marine scientists who have gone on to support research institutions around the globe. The vision is to create a book that not only documents the history of MLML with photos and stories, but includes highlights from the 50th Anniversary weekend too and a photo of each lab's alumni and students gathered together on the last day.





## **APPENDICES**

- I. MLML By Laws**
- II. MLML Rules of Operation**
- III. MLML Governing Board Members**
- IV. MLML Directory**
- V. MLML Strategic Plan**
- VI. MLML – SJSURF Resolution 198**



## APPENDIX I. MLML By Laws

*Governing Board Approved: April 30, 2004*

*Revisions: April 6, 2007 Governing*

*Board Approved*

### THE CALIFORNIA STATE UNIVERSITY BY LAWS OF THE MOSS LANDING MARINE LABORATORIES CONSORTIUM

#### ARTICLE I NAME AND MISSION

1. This Consortium operated marine science facility shall be known as Moss Landing Marine Laboratories.
2. The mission of Moss Landing Marine Laboratories (referred to below as MLML) is to provide a center for teaching and research in Marine Sciences for students of the consortium campuses, with emphasis on graduate education, in the furtherance of the goals and functions of higher education. MLML is a part of the California State University and, as a functional extension of each of the participating campuses, therefore shares responsibility for the accomplishment of the CSU mission.

#### ARTICLE II MEMBERSHIP

1. The MLML Consortium membership includes the following campuses of the California State University: Fresno, Hayward, Monterey Bay, Sacramento, San Francisco, San Jose, and Stanislaus. The purpose of the MLML Consortium is to actively support excellence in marine science research and education at MLML.
2. Any campus of the California State University is eligible for membership in the Consortium. Upon written application to the MLML Governing Board, a campus becomes a member of the Consortium when that application is approved by the Governing Board and Presidents of the member campuses.
3. In special cases, the MLML Governing Board may also recommend to the Consortium Presidents formal affiliations with institutions outside the CSU for the purpose of promoting the mission of MLML. Examples may include PhD granting universities, research institutions, or other noncommercial collaborative groups, government agencies, or consortia with shared goals and purposes.
4. For administrative purposes, one of the member campuses shall be designated by the Chancellor as the Operating Institution of MLML for the Consortium. MLML shall be considered an "equivalent administrative unit", as stated in the current CFA contract, with regard to faculty.



## ARTICLE III GOVERNING BOARD AND OFFICERS

1. The Governing Board has the primary responsibility for accomplishing the purpose (Article I, 2. above) of the Consortium. The Governing Board of the MLML Consortium functions as an advisory and approval body relative to academic and administrative matters of the MLML, and a supporting and implementation body in matters concerning relationships and policies among the MLML, Consortium campuses and the California State University.
2. The presidents of the member campuses shall each appoint two members and an appropriate number of alternates to serve on the MLML Governing Board. One shall be a scientist with interests and expertise in marine science, and the other shall be an administrator. In the case of the Operating Institution, faculty representatives shall not be from the MLML, and the administrator shall be the Academic Officer to whom the MLML Director reports on matters pertaining to the MLML. The President of the Operating Institution shall also appoint a member from the Foundation at the Operating Institution. Each of the appointees shall have alternates, chosen with the same stipulation as to occupation. Under special circumstances, alternates may be appointed for specific meetings.
3. The participating institutions appointing members to the Board shall make the appointments for terms of three years, renewable, to encourage continuity and stability.
4. Alternate members are permitted and encouraged to attend any meeting of the Board and to be heard, but may vote only in the absence of regular members.
5. To provide a broader perspective, the Governing Board shall also include one member with expertise in marine science who is not affiliated with the CSU. This member will be nominated by the MLML faculty and approved by the Board of Governors.
6. The Director of Moss Landing Marine Laboratories shall be a member of the Governing Board ex officio.
7. The regular faculty at MLML shall elect two MLML faculty members to serve on the Board. These members shall not participate directly in Board deliberations on MLML confidential personnel matters. Under special circumstances, alternates may be elected by the MLML faculty for specific meetings.
8. The Associated Students of MLML shall elect a student member to serve on the Board. This member shall not participate directly in Board deliberations on MLML confidential personnel matters. Under special circumstances, an alternate may be elected by the Students.
9. The MLML Governing Board shall have a Chair who shall be selected at a Spring meeting of the Board to serve a term of two years which begins at the conclusion of that meeting and ends at the conclusion of the Spring meeting two years later. The Chair of the Board shall be elected by a majority vote of the Board. The Governing Board shall have a ViceChair who is elected at the same time for the same term as the Chair. The Director of MLML shall serve as Executive Secretary of the Board. As such she/he will, in consultation with the Chair of the Board, be responsible for the preparation of the agenda and the publishing of minutes and formal notices of meetings. The Chair of the Board shall forward to the Consortium Presidents the minutes of all Board meetings and, in a cover memorandum, shall call their attention to items (e.g., resolutions) of particular interest.



## ARTICLE IV MEETINGS

1. Meetings of the MLML Governing Board shall be called by the Chair. There will be at least one meeting of the Board per academic year, which shall ordinarily take place in the spring semester. At the annual spring meeting, the Board may choose to call an additional meeting for the following fall semester. In preparation for the annual meeting, the Chair shall ascertain from each president the current Board membership. Additional meetings of the Board shall be convened within 60 days following a request by representatives of two or more participating campuses or by the Executive Committee.
2. Each spring, at the annual meeting of the Board, the Director of MLML shall give a report on the state of the Laboratories. This report will include a summary of the MLML budget.
3. A simple majority of the voting members of the Board shall constitute a quorum. In the event a meeting is not attended by a quorum, the members attending may resolve themselves into a committee to consider the agenda of the meeting for later referral and comment to the Board as a whole.
4. Governing Board resolutions requiring the attention of the Chancellor's Office of the California State University shall be forwarded by the Chair via the President of the Operating Institution.
5. A collection of all significant resolutions of the Board shall be maintained by the executive secretary and shall be distributed periodically to the Board.
6. Robert's Rules of Order will apply in all Board meeting matters not addressed above.

## ARTICLE V COMMITTEES

1. The Chair of the Board, with the concurrence of the Executive Committee, shall appoint all committee members and may designate the Chairs with the exception of the Executive Committee (membership specified below).
2. The Executive Committee of the Governing Board shall consist of the Chair, Vice Chair, the immediate past Chair, the Director of MLML, and the Academic Officer to whom the Director reports. The Chair of the Governing Board shall be the Chair of this Committee. The Executive Committee is empowered to set interim policy as required. Actions of the Executive Committee may be undertaken through polling of its members. All actions of the Executive Committee shall be reported to and be subject to review by the whole Board at the next Board meeting. The Executive Committee will meet during the Governing Board Meetings, and will meet in the fall (usually October).
3. There shall be a Nominating Committee, responsible for providing at least one nominee for each elective office and ensuring that each such nominee agrees to accept the office if elected.
4. There shall be a Curriculum Committee, responsible for establishing and reviewing courses and course programs with appropriate consultation with home campuses. The Curriculum Committee will have at least one representative from each consortium institution and two representatives from the faculty or administration at Moss Landing Marine Laboratories.
5. Such other committees as may be desirable may be created by action of the Chair of the Board or the Board.



**ARTICLE VI RULES OF OPERATION OF THE MLML**

1. Rules of Operation of the MLML, adopted by the Governing Board in conformity with these bylaws, shall be maintained by the Board in a separate document.

**ARTICLE VII AMENDMENTS TO THE BYLAWS**

1. The Bylaws of the MLML Governing Board may be amended after the introduction of an amendment to the Board as a whole and its subsequent referral for consideration and recommendation by the Executive Committee. Upon its acceptance by a majority of the entire membership of the Board, the amendment is adopted.

**ARTICLE VIII MLML STUDENT ORGANIZATION**

1. The organization known as "The Associated Students of Moss Landing Marine Laboratories" shall be the recognized political and social representative of the students attending Moss Landing Marine Laboratories. This organization is recognized on a level equal to that of the Associated Students organizations at all of the Consortium campuses. A current copy of the organization's constitution shall be kept on file in the Office of the Director of MLML.

2. Student fees paid to the Associated Student Organizations at students' home campuses shall be returned to the Associated Students of MLML for use in supporting MLML student body activities.

**ARTICLE IX ADMINISTRATIVE  
ECONOMY**

1. To avoid multiple and potentially conflicting administrative requirements, Consortium Campuses shall adopt administrative policies developed by MLML and approved by the Governing Board. Such administrative policy may include animal care protocols, degree programs, curriculum, admission and graduation requirements, safety protocols (e.g. state vehicles, small boats, research diving, chemical safety, etc.), insurance and liability, and other policy matters where the requirements at the Consortium Campuses may differ.



## APPENDIX II. MLML Rules of Operation

### Moss Landing Marine Laboratories

#### RULES OF OPERATION

*MLML Governing Board Approved: October 15, 2004*

*Revisions: April 6, 2007*

#### 1. Designation of the Operating Institution.

The Moss Landing Marine Laboratories (MLML) Governing Board shall have the authority to recommend to the Chancellor a change in the choice of the Operating Institution for the Laboratories. The request for action leading to the recommendation may arise at the pleasure of the Board or the President of any one of the participating campuses, including the one currently operating the Laboratories.

#### 2. The Director of the Moss Landing Marine Laboratories.

**2.1.** The Director of MLML shall be appointed as a CSU Management Personnel Plan (MPP) employee by the President of the Operating Institution. The appointment shall be for a term of four years and is renewable. If the Director is not a CSU or MLML faculty member at the time of appointment but desires to be so, he/she shall become a faculty member with retreat rights negotiated with the President of one of the Consortium Campuses following an evaluation and recommendation by that Campus.

**2.2.** The Governing Board, , shall review the performance of the Director and, through its Chair, forward its recommendations to the President of the Operating Institution no later than the middle of the fourth year of the Director's term of office, and every fourth year thereafter. The MLML RTP Committee shall administer the Director's Review and submit their confidential report to the Governing Board Executive Committee for review. In addition, the President of any one of the campuses of the MLML Consortium may request a review of the Director by the Board at any time. The review process will request and incorporate comments from faculty, staff and students at MLML.

**2.2.** The Governing Board, employing the MLML RTP Committee and Governing Board Executive Committee (minus MLML Director), shall review the performance of the Director and, through its Chair, forward its recommendations to the President of the Operating Institution no later than the middle of the fourth year of the Director's term of office, and every fourth year thereafter. The Chair shall also provide a verbal summary of the review for the Governing Board. In addition, the President of any one of the campuses of the MLML Consortium may request a review of the Director by the Board at any time. The review process will request and incorporate comments from faculty, staff and students at MLML.

**2.2.** The Governing Board, employing the MLML RTP Committee and Governing Board Executive Committee (minus MLML Director), shall review the performance of the Director and, through its Chair, forward its recommendations to the President of the Operating Institution no later than the middle of the fourth year of the Director's term of office, and every fourth year thereafter. The Chair shall also provide a verbal summary of the review for the Governing Board. In addition, the President of any one of the campuses of the MLML Consortium may request a review of the Director by the Board at any time. The review process will request and incorporate comments from faculty, staff and students at MLML.



2.3 When the position of Director is open, an appropriate search for the new Director will be conducted by a search committee appointed by the Chair of the Board in consultation with the Executive Committee and the President of the Operating Institution. The composition of this committee must have the approval of the Governing Board, and shall include two tenured members of the MLML faculty, elected by the MLML faculty. This committee shall report to the Governing Board via the Chair of the Board. The Chair of the Board shall forward the names and evaluated dossiers of the best candidates selected and approved by the Search Committee to the President of the Operating Institution. After consultation with the Presidents of the other Consortium campuses, the President of the Operating Institution will make the appointment decision.

2.4. If an Acting (Interim) Director is necessary, the regular MLML faculty, in consultation with the Executive Committee, will nominate candidates. Nominees and supporting documents will be forwarded via the Operating Campus Provost to the President who will make the appointment decision. Unlike the Director position, the Acting Director position does not include appointment to a regular MLML faculty or to a Consortium Campus position.

2.5. **As an equivalent administrative unit of the Operating Institution, MLML shall follow the appropriate Operating Institution procedures for the nomination by the faculty of a Chair for the unit.**

### 3. The Faculty at the Moss Landing Marine Laboratories.

#### 3.1 Appointments to the faculty at the Moss Landing Marine Laboratories include:

3.1.1. A faculty member may be appointed to a tenure-track or regular position at MLML. Such a position is funded from the MLML allocation assigned to the Operating Institution, and the faculty member will have retreat rights to a department within the appropriate discipline on a Consortium Campus after an evaluation and recommendation by that Campus.

3.1.2. A faculty member may be appointed to a temporary position (full-time or part-time) at MLML.

#### 3.2 Procedure for appointments to regular positions (3.1.1 above).

3.2.1 The Director, in consultation with the regular faculty assigned to MLML, shall determine the nature and justification for positions to be filled. This information shall be provided to the members of the Governing Board for their review and recommendations to the Executive Committee.

3.2.2 The Governing Board Executive Committee shall review the Director's and the Board's recommendations. If the Committee's action is favorable, it shall determine if a Consortium campus other than the Operating Institution desires to serve as the home campus for the position to be filled. If a Consortium Campus so desires, then permission to recruit will be requested from the home campus or the Operating Institution (if different from the home campus).

3.2.3. Approved searches will be conducted using the home campus' recruitment and hiring procedures. However, the search committee will be composed of MLML tenured and/or tenure-track faculty. An example of the procedure currently in effect at the Operating Institution is given in Appendix A.



### **3.3. Procedures for appointments to new temporary positions (3.1.2. above).**

**3.3.1.** The Director, in consultation with the full- and part-time regular (tenure-track) faculty assigned to MLML shall determine the nature of positions to be filled through temporary assignments.

**3.3.2.** The Director shall formally announce available full-time temporary positions to all Board members, to the Science Deans of the Consortium, and to appropriate institutions outside the Consortium. Full-time temporary positions shall only be filled following a national search.

**3.3.3.** Full-time temporary candidates shall be reviewed by the Director and regular faculty assigned to MLML who will recommend the best qualified candidate with successive priorities, if these are necessary.

**3.3.4.** The Director shall offer the full-time temporary position to best qualified candidate and, as necessary, to approved candidates in priority of recommendation.

**3.3.5.** The request for appointment of full-time temporary faculty, together with supporting papers and recommendations, shall be forwarded by the Director to the Operating Institution in accordance with its procedures.

**3.3.6.** Faculty appointed to full-time temporary positions may be considered for regular appointments only through competition for an announced position as outlined in Section 3.2.

**3.3.7.** Part-time temporary assignments may be filled from a pool maintained by the Director, and selected in consultation with the MLML regular faculty.

### **3.4. Procedures for Continuing Temporary Appointments**

**3.4.1** All continuing appointments, both full-time temporary and part-time temporary, must conform to the current bargaining unit/CSU Agreement.

### **3.5. Term of regular faculty assigned to Moss Landing Marine Laboratories.**

**3.5.1.** All assignments of full-time regular faculty to Moss Landing Marine Laboratories shall be considered permanent. This arrangement would be altered by (a) failure to be tenured, (b) original written agreement specifying time limit, or (c) request for reassignment to home campus initiated by the faculty member, and approved by the MLML Director, the Governing Board, and the home campus.

**3.5.2.** All requests for reassignment shall be presented as formal written requests to special review committees appointed for each request by the Chair of the Governing Board in consultation with the Executive Committee. The special review committee shall include two members of the Governing Board, one tenured full-time faculty member assigned to MLML, one member from the home campus, and one member recommended by the individual being considered for reassignment.

**3.5.3.** The special review committees shall recommend to the Chair of the Board, who shall consult with the home campus department and administrative officers, if appropriate.

**3.5.4.** All reassignments must eventually be approved by the President of the retreat home campus.

**3.5.5** In the case of complete MLML closure, all faculty shall return to their negotiated home campus departments.



### **3.6. Retention, Tenure, and Promotion.**

**3.6.1.** All final decisions regarding retention, tenure, and promotion (RTP) are made by the President of the candidate's home campus.

**3.6.2.** All RTP evaluations of regular faculty assigned to MLML, shall be performed using MLML's RTP guidelines and will conform to the home campus' procedures. The guidelines currently in effect for MLML is given in Appendix B.

**3.6.3.** RTP recommendations of faculty assigned to MLML shall be made by an RTP Committee, elected and composed of tenured faculty assigned to MLML.

**4. Support Staff at Moss Landing Marine Laboratories.** The Director shall have the authority to make all support staff appointments at MLML. Such appointments shall be made in compliance with staff hiring procedures of the Operating Institution. The procedure currently in effect at the Operating Institution is given in Appendix C.



### APPENDIX III. MLML Governing Board Members

#### MOSS LANDING MARINE LABORATORIES BOARD OF GOVERNORS 2015

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**CALIFORNIA STATE  
UNIVERSITY, EAST BAY**  
25800 Carlos Bee Ave.  
Hayward, CA 94542

	<b>Members</b>	<b>Alternates</b>
Biological Sciences	Dr. James Murray Biology Tel: (925) 788-0557 <a href="mailto:james.murray@csueastbay.edu">james.murray@csueastbay.edu</a>	Dr. Tyler Evans Biology Tel: (510) 885-3475 <a href="mailto:tyler.evans@csueastbay.edu">tyler.evans@csueastbay.edu</a>
Physical Sciences	(C) Dr. Mitchell Craig Geology Tel: (510) 885-3425 <a href="mailto:mitchell.craig@csueastbay.edu">mitchell.craig@csueastbay.edu</a>	
Administration	(C) Dr. Michael Leung, Dean School of Science Tel: (510) 885-3441 <a href="mailto:michael.leung@csueastbay.edu">michael.leung@csueastbay.edu</a>	

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**CALIFORNIA STATE  
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	<b>Members</b>	<b>Alternates</b>
Biological Sciences	(C) Dr. Alejandro Calderon-Urrea Biology Tel: (559) 278-2001 <a href="mailto:calalea@csufresno.edu">calalea@csufresno.edu</a>	Dr. Paul Crosbie Biology Tel: (559) 278-4244 <a href="mailto:pcrosbie@csufresno.edu">pcrosbie@csufresno.edu</a>
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**CALIFORNIA STATE  
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100 Campus Center  
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	<b>Members</b>	<b>Alternates</b>
Marine Sciences	€Dr. James Lindholm Science & Environmental Policy Tel: (831) 582-4662 <a href="mailto:jlindholm@csumb.edu">jlindholm@csumb.edu</a>	(C) Dr. Rikk Kvitek Science & Environmental Policy Tel: (831) 582-3529 <a href="mailto:rkvitek@csumb.edu">rkvitek@csumb.edu</a>
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Administration	(E) Dr. Marsha Moroh, Dean College of Science Tel: (831) 582-3640 <a href="mailto:mmoroh@csumb.edu">mmoroh@csumb.edu</a>	

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**CALIFORNIA STATE  
UNIVERSITY,  
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Biological Sciences	(E) Dr. Bill Avery Biology Tel: (916) 278-6279 <a href="mailto:averyw@csus.edu">averyw@csus.edu</a>	Dr. Ron Coleman Biology Tel: (916) 278-3474 <a href="mailto:rcoleman@csus.edu">rcoleman@csus.edu</a>
Administration	Rose Castillo Assistant to the Dean Natural Sciences and Mathematics Tel: (916) 278-7670 <a href="mailto:rcastill@csus.edu">rcastill@csus.edu</a>	

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Physical Sciences	Dr. John Hafernik Romberg Tiburon Center, SFSU Tel: (415) 338-3713 <a href="mailto:hafernik@sfsu.edu">hafernik@sfsu.edu</a>	Dr. Tomoko Komada Romberg Tiburon Center, SFSU Tel: (415) 338-3748 <a href="mailto:tkomada@sfsu.edu">tkomada@sfsu.edu</a>



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Physical Sciences	(E) Dr. Manny Gabet Geology Tel: 408-924-5035 <a href="mailto:manny.gabet@sjsu.edu">manny.gabet@sjsu.edu</a>	(C) Dr. June Oberdorfer Geology Tel: (408) 924-5026 <a href="mailto:june@geosun.sjsu.edu">june@geosun.sjsu.edu</a>
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	(E) Dr. Michael Parrish, Dean College of Science Tel: (408) 924-4800 <a href="mailto:Michael.Parrish@sjsu.edu">Michael.Parrish@sjsu.edu</a>	Dr. David Bruck, Assoc. Dean Graduate Studies Tel: (408) 924-2484 <a href="mailto:David.Bruck@sjsu.edu">David.Bruck@sjsu.edu</a>

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**CALIFORNIA STATE  
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Physical Sciences	(C) Dr. Horacio Ferriz Physics, Physical Sciences & Geology Tel: (209) 667-3466 <a href="mailto:hferriz@geology.csustan.edu">hferriz@geology.csustan.edu</a>	Dr. Julia Sankey Physics, Physical Sciences & Geology Tel: (209) 667-3090 <a href="mailto:julia@geology.csustan.edu">julia@geology.csustan.edu</a>
Administration	(C) Dr. Mark A. Grobner, Dean College of Natural Sciences Tel: (209) 667-3153 <a href="mailto:mgrobner@csustan.edu">mgrobner@csustan.edu</a>	



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**MOSS LANDING MARINE  
LABORATORIES**

8272 Moss Landing Rd.  
Moss Landing, CA 95039

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Marine Sciences	(C) Dr. Mike Graham Phycology Tel: (831) 771-4481 <a href="mailto:mgraham@mlml.calstate.edu">mgraham@mlml.calstate.edu</a>	(C) Dr. Scott Hamilton Ichthyology Tel: (831) 771-4497 <a href="mailto:shamilton@mlml.calstate.edu">shamilton@mlml.calstate.edu</a>
	(C) Dr. Nick Welschmeyer Biological Oceanography Tel: (831) 771-4439 <a href="mailto:welschmeyer@mlml.calstate.edu">welschmeyer@mlml.calstate.edu</a>	Dr. Ivano Aiello Geological Oceanography Tel: (831) 771-4480 <a href="mailto:iaiello@mlml.calstate.edu">iaiello@mlml.calstate.edu</a>
Administration	(E) Dr. Jim Harvey, Director Tel: (831) 771-4402 <a href="mailto:jharvey@mlml.calstate.edu">jharvey@mlml.calstate.edu</a>	Kathleen Donahue, Assistant to Director Tel: (831) 771-4405 <a href="mailto:kdonahue@mlml.calstate.edu">kdonahue@mlml.calstate.edu</a>

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APPENDIX IV. MLML Directory

MLML Phone List
Phone: (831) 771-4400 Fax: (831) 632-4403
Website: www.mlml.calstate.edu

Moss Landing Marine Laboratories Phone List
Phone: (831) 771-4400 Fax: (831) 632-4403
Website: www.mlml.calstate.edu

Table with categories: Street Addresses, Main Lab, Shore Lab & Aquaculture Facility, Marine Ops & Diving, North Facility, Other Organizations, Emergency, Local Agencies.

Table with categories: Fax Numbers, Cellular Phones, Laboratories (Hill), Laboratories (North), Miscellaneous.

All phone numbers begin with 771, removed 1 in the extension, and use last 4 digits unless otherwise noted

Large alphabetical directory table listing names and phone numbers for staff members.

(E-mail addresses in parentheses: \_\_\_\_\_@mlml.calstate.edu)

## APPENDIX V. Strategic Plan

### A STRATEGIC PLAN FOR MOSS LANDING MARINE LABORATORIES (2015 – 2025)



#### EXECUTIVE SUMMARY

The 50-year history of Moss Landing Marine Laboratories (MLML) began with a program heavily dependent on consortium campus faculty and support that largely served undergraduates from across the consortium.

Today it is a self-contained organization administered by SJSU with faculty in residence a quality infrastructure and is predominately a graduate program, serving mostly students at SJSU and CSUMB.

For MLML's future, we envision a vibrant program built on past and present success: a combination of thriving undergraduate courses and an exceptional integrated graduate program that combines research and education.

Our vision is dependent on:

- (1) New curriculum to shorten the time to graduation and increase the number of students MLML serves, especially the Hispanic community;
- (2) Expansion of tenure-track faculty and Research Affiliates to strengthen and broaden disciplines and increase capacity;
- (3) Development or expansion of the Academic Village (housing and conference facility), Marine Operations, Research Diving, and the Center for Aquaculture;
- (4) Increased external outreach and funding required to develop new programs, summer courses, bolster support for undergraduate education, and expand infrastructure; and
- (5) A stronger consortium and increased access for underserved students.

MLML has excelled in developing a rigorous and globally recognized master's program in marine science, and in training many for the workforce in marine science, management conservation, and education. We aspire to retain our core



graduate program and add value and capacity by expanding faculty and infrastructure to serve more undergraduate students. With support from the consortium and the CSU, MLML can remain a leader in marine science.

### **STRENGTHS:**

- Education program integrated with field-based research
- Excellent resources including labs, vessels, diving, property, and location
- Strong research community of collaborative faculty and scientists
- Strong tradition and international reputation

### **WEAKNESSES:**

- Limited size of classrooms
- Limited housing
- Limited equipment for distance learning capability

### **OPPORTUNITIES:**

- Curriculum: new undergraduate courses; streamlined introductory courses; summer and weekend courses; new Aquaculture degree/certificate; hybrid online courses
- Shared faculty positions with CSUMB and SJSU
- More post-docs teaching and new Research Faculty
- Build-out of the Academic Village with housing
- New research vessel and modernization of marine operations
- Dedicated, expanded and improved space for diving program
- Increased external funding

### **THREATS:**

- Uncertainty and variability in indirect return from contracts and grants
- Uncertainty in consortium funding for MLML
- New metrics for success affecting graduate program



## ABOUT US

Moss Landing Marine Laboratories' primary mission is to deliver a premier education including field-oriented, hands-on opportunities that provide students the necessary skills and training to become successful scientists, teachers, and resource managers serving societal needs that involve marine issues.

MLML is the second oldest marine lab on Monterey Bay. It was established in 1966 when the San José State University (SJSU) Foundation, with the assistance of four other California State University foundations and an NSF grant, purchased the facilities of the Beaudette Foundation for Biological Research in Moss Landing.

MLML operates as a consortium, serving as a Department of Marine Science for seven California State University campuses, including San José, Monterey Bay, San Francisco, East Bay, Stanislaus, Fresno, and Sacramento. The director of MLML reports to the Dean of the College of Science at SJSU.

There are 9 tenure-track faculty members and 6 research faculty members that serve as the primary educational and research staff at MLML. In addition, there are 40 full-time staff members, affiliated research groups, post-doctoral researchers, and visiting scientists. Approximately 85 - 110 students are enrolled each semester; 15 percent are upper-division CSU undergraduates and 85 percent are CSU graduate students. The majority of the graduate students are matriculated in the MLML graduate program (a Master of Science is the highest degree awarded by consortium campuses) under the direction of an MLML faculty member.

Our educational goal is to produce broadly trained marine scientists with strong research skills. Access to nearby unique marine environments has supported this goal by enabling us to emphasize field research in our educational program.

More than 600 students have earned their master's degree from MLML. One quarter of our last 238 graduates have gone on to PhD programs, and nine have earned other additional degrees (e.g. DVM, JD, MBA). These recent alumni serve across the fields of marine science: one-quarter are employed by federal, state, and regional agencies (NOAA, NASA, NIH, ONR, EPA, USGS, CDFW, ADFG, ODFW), one-sixth are employed by non-profits and NGOs (Elkhorn Slough, Monterey Bay Aquarium, Oikonos, The Marine Mammal Center), and one-eighth are employed at Universities, including eleven who hold academic positions.

MLML has evolved from a field station, used by consortium faculty and students who visited the lab for classes and research, to a full institution including its own

More than half of the United States population lives in 673 watershed (coastal) counties that generate 58% of the nation's gross domestic product (NAML 2015). Marine laboratories are vital, cost-effective, place-based "windows on the sea", which provide education and research capability to understand issues associated with our oceans.



library, facilities and IT staff, with two safety officers that support faculty, staff and students in residence. To maintain this level of excellence and to thrive, MLML has undertaken a strategic planning process to chart the course for the next 10 years. The essence of this plan is to retain the core qualities of a research-intensive graduate degree program and add further human and structural resources to better serve the needs of consortium undergraduate education and research.

### 1. CHANGES IN CURRICULUM

**Background:** When MLML opened, its curriculum was focused on one-day-a-week classes to which consortium undergraduates commuted. The instructors were assigned faculty from the consortium campuses who would also travel to MLML every week.

As MLML grew and matured, its primary focus developed into an M.S. degree program with a curriculum of undergraduate and graduate courses. Faculty members are now in residence at MLML, most students are matriculated into the program and reside in the local area. This evolution, while producing an exceptional degree program, has created two challenges: high average time to graduation, and limited access for non-matriculated consortium campus students.

*High Average Time to Graduation:* The MLML M.S. degree program is demanding in both coursework and research. From 2003 – 2010 the average number of years to graduation was 4.4 years, with 4 students finishing in less than 3 years and 11 finishing in 7 years. In part, this duration is due to limited funding, which forces students to find outside employment for financial support, and detracts from their time available to progress on coursework and thesis research. High standards for excellent thesis research require considerable student time.

At present, our degree requires students to typically spend two years on coursework, during which they rarely make headway on a thesis proposal or data collection. The M.S. degree is a 30-unit program, which generally includes three 100-level core courses and a 100-level elective, and fifteen or more units of 200-level graduate courses. Students usually take two courses each semester for the first two years of the program.

MLML's evolution into a rigorous M.S. program resulted in research-intensive curricula that required greater time in classes, a high expectation for the quality of thesis research, and a need for adequate funding to fuel this research. All of these factors have caused an increase in the time to graduation.

*Limited Access for Non-Matriculated Consortium Campus Students:* A result of MLML's history and the development of the M.S. degree program, MLML classes are typically once-a-week classes of small sizes with graduate-level instruction, filled with students matriculated into the program. Three primary factors limit enrollment by non-matriculated consortium students: room size, class scheduling, and housing.



MLML has 5 classrooms:

1. Dry Classroom (Rm 109): 18.5' X 21.5' seats 12 – 14 students
2. Think Tank (Rm 202): 21.0' X 21.5' seats 14 – 16 students
3. Wet Classroom (Rm 214): 23.0' X 25.5' seats 14 – 16 students
4. Oceanography (Rm 508): 23.0' X 30.0' seats 21 students
5. Seminar Room (Rm. 101): 40.0' X 50.0' seats 25 – 30 students (lecture)  
seats 100 students (auditorium setting)

As shown above, the size of our rooms does not allow for large, lecture-like courses for more than 30 students.

The consortium campuses are suggesting that our class schedule model, in which each class is taught one full day a week, will conflict with student schedules and therefore, limit enrollment. However, a single day of MLML class requires less travel for commuting consortium students.

Finally, it is challenging for a consortium student to spend a semester or summer in residence at MLML because it is difficult to find housing for a 3-4 month stretch. As MLML has no housing available, no summer programs exist, and students wishing to take a class or whose degree requires such (SJSU's B.S. in Biological Sciences, Concentration in Marine Biology) generally commute to our campus.

### **Opportunities for the Future**

#### **1. Shorten Time to Graduation**

Our goal is to reduce the average time until graduation to 3.0-3.5 years. Recent improvements have made headway on this. A fulltime Graduate Program Coordinator (currently Terra Eggink) tracks student progress and informs students and faculty of deadlines, milestones, and deficiencies, while assisting with students' program development. Since the initiation of student tracking, no student has taken more than 6 years to complete the M.S. degree.

To achieve our goal, we must streamline program curriculum with condensed courses: an integration of thesis preparation, analytical techniques, and scientific writing into the first year of instruction; and greater faculty involvement in student thesis planning and execution. We are also considering the implementation of summer courses, which would allow students to further accelerate the completion of coursework.

#### ***Integrated Courses for Graduate Students***

We propose two new integrated courses required for all first-year MLML graduate students:

1. A two-semester course that covers all disciplines of marine science including biology, chemistry, geology, oceanography and physics
2. A two-semester course covering marine science methodology including sampling design, data analysis, programming and scientific writing



These courses would benefit our students and program in a number of ways: all students would receive standardized instruction and avoid gaps in their mastery of marine science; material would focus on system function rather than specific disciplines; curriculum would support the development of the thesis proposal; and students would receive more units toward their degree, thus progressing faster.

We have cultivated the concept of these courses over the past three years, and propose to develop and test them through our current curriculum. If they prove successful we will propose them to the Governing Board and seek approval by the consortium campuses.

We acknowledge our target time to graduation is greater than other programs. Without dedicated funding for each student, it is unlikely we can reduce it further without degrading program standards, and producing graduates with fewer skills and capabilities. Our alumni are highly competitive in PhD programs and the job market, and consistently praise our program for the preparation it provides. As such, we adamantly reject any suggestion to decrease our standards. However, we do believe that through the methods described above, we will bring the program to a prudent average length.

### **2. General Marine Science courses for Undergraduate Students**

We seek to provide consortium undergraduates greater access to MLML classes. Taking into consideration limited resources (i.e. faculty time) and the most valuable aspect of our classes for students – hands-on activities only available on site at MLML (field trips, laboratory demonstrations and exercises, experiments and sampling programs) – we conclude that the best way to serve a large number of undergraduates is through hybrid classes combining an online lecture component with an in-person laboratory component held on the weekend(s) at MLML.

Here we suggest two hybrid Core General Education classes, Marine Biology (GE-B1) and Oceanography (GE-B2). We plan to offer these in such a way that they will not compete with existing courses (i.e. GEOL 105 General Oceanography taught by Don Reed) by avoiding overlap in course scheduling.

#### ***Oceanography***

This hybrid course would introduce students to basic oceanography, including topics such as: formation of the world's oceans and geology of the basins and margins; global surface and deep sea circulation; chemical properties of seawater; planktonic life; air-sea interactions; waves and tides. Weekend field trips could include: ocean-going trips to sample seawater, currents and plankton; excursions around Monterey to discuss coastal dynamics, ancient sea beds, and analysis of satellite and mooring data.



### ***Marine Biology***

This hybrid course would offer a general introduction to marine biology covering basics of organismal biology (marine algae, invertebrates, and vertebrates), how marine organisms interact with their environment and are adapted for life in the sea, and marine communities. The weekend laboratory sections would include field trips to the intertidal, estuary, and nearshore coastal areas coupled with laboratory activities to examine organisms collected during the field trips.

### **3. New Courses: Aquaculture Science**

With the recent completion of MLML's Center for Aquaculture and a burgeoning interest in aquaculture research and education at MLML, CSUEB and elsewhere, MLML has begun discussions with Dr. Michael Lee (CSUEB) regarding the opportunity to create a curriculum in Aquaculture Science and Sustainability. Our vision is a CSU-wide certificate program with 4 - 5 courses, or a degree in marine biology with a concentration in aquaculture, which might include the following courses:

The MLML Center for Aquaculture, largely funded by the Packard Foundation, held its grand opening on 22 August 2014. Learn about the research taking place at <http://aquaculture.mlml>.

- 3XXX Introduction to Aquaculture (online with virtual field trips).
- 3XXX Aquaculture Systems Engineering and Design (hybrid: online theory/weekend labs at MLML)
- 4XXX Seaweed Aquaculture (hybrid: online theory/weekend labs MLML)
- 4XXX Molluscan Aquaculture (hybrid: online theory/weekend labs MLML)
- 4XXX Crustacean Aquaculture (hybrid: online theory/weekend labs MLML)
- 4XXX Fish Aquaculture (hybrid: online theory/weekend labs at MLML)
- 4XXX Internship in Aquaculture (industry placement or research assistantship)
- 4XXX Sustainable Aquaculture (online with research paper/senior project)

These courses could be offered within current programs in Marine Science, Biology, or related disciplinary degrees (e.g. Veterinary Science, Agricultural Science, or Environmental Science) at participating CSU institutions.

As the program develops we might take advantage of other aquaculture programs at other CSU campuses, such as Humboldt and Chico. We also might partner with UC Davis that has a mature educational program in aquaculture.

Once the research program in aquaculture blossoms, we anticipate we would hire a faculty position or a Research Faculty position to manage the Center for Aquaculture. This person would be responsible for (1) raising infrastructural support (e.g. instrumentation, supplies, tanks, etc.), (2) writing grants for research to fund specific projects in their expertise, (3) managing the facility and onsite staff, and (4) teaching aquaculture courses.



### 5. Weekend Courses

In the past MLML offered weekend courses that provided consortium campus students the opportunity to visit MLML and receive a summary of a marine science subject area (e.g. marine mammal biology, intertidal ecology, estuarine systems, physiology of marine animals, marine geology, chemistry or ocean acidification). Students earned one unit credit for the weekend course, and MLML benefitted by greater exposure to potential graduate students. In addition, these classes served as formative experiences for some students, initiating a new path into marine science. We are exploring the idea of reconstituting this program thus providing one or two weekend courses per semester in topics that are relevant and attractive to consortium undergraduates.

### 6. Summer Courses

Most marine laboratories around the world have their primary teaching period during summer, often attracting students from distant places to their unique ocean-based environments. Summer classes at marine labs have historically interested students exploring marine science as a career, marine science students who want to experience a different environment or culture than their home institution, or, who wish to take advantage of expertise that they cannot access at their home campus. To accommodate the transient nature of summer class students, almost all marine labs have their own housing. Because MLML has not had housing onsite, we have rarely offered summer courses.

There is interest in providing summer courses at MLML because it expands the options for MLML faculty and students regarding their course schedules, it introduces many more students to the MLML program thereby increasing the potential applicant pool, and it more fully uses the MLML facilities throughout the year. We expect MLML faculty to teach summer courses as resources allow, and we would also like to recruit other instructors, especially from the consortium campuses which could greatly expand the MLML network of colleagues and collaborators.

However, MLML's lack of housing currently precludes summer course offerings. Our interest in summer courses is driving decisions regarding infrastructure and land acquisition, particularly housing development, and is detailed in the "Infrastructure" section below.

## CHANGES IN FACULTY AND RESEARCH POSITIONS

**Background:** There currently are 9 tenure-track faculty members at MLML, all of whom have faculty appointments with SJSU. Four are oceanographers (Physical, Geological, Chemical, and Biological), four are marine biologists (Phycology, Invertebrates, Ichthyology, and Air-breathing Vertebrates), and one is MLML's Librarian who teaches, conducts research, and oversees the Information Technology staff. These tenure-track faculty members generally teach two courses per semester and spend a great deal of time outside class mentoring and advising graduate students. The average MLML faculty member has 10 – 12 graduate



students. Each student requires a focused effort to find support, develop research projects, edit proposals and theses, and assist with data analysis and interpretation. There are also 6 soft-money research faculty members who contribute to MLML's success by providing additional financial support, mentoring, and teaching that augment the efforts of the tenure-track faculty.

### **Opportunities for the Future**

#### **1. Shared Faculty Positions with CSUMB**

The MOU between MLML and CSUMB (May 1996) when CSUMB joined the consortium included an agreement for a joint appointment of a marine scientist to be shared equally between CSUMB and MLML. This never occurred, yet is a good idea and one MLML wishes to pursue. We propose that one or more joint CSUMB/MLML faculty members be hired with CSUMB faculty appointments. These faculty members would split their time equally between CSUMB and MLML, have office and research space at MLML, and would teach courses at both institutions. If this arrangement is successful, additional shared faculty positions could be created.

#### **2. Additional Tenure-Track or Research Faculty**

During recent faculty retreats we have identified disciplines that would add greatly to the MLML program as either tenure-track or research faculty positions:

##### ***Hydrologist***

This individual would provide the perspective and research capacity to integrate marine coastal environments with freshwater systems. Understanding the complex water systems of California would inform science and policy regarding groundwater issues and connection with the oceans, desalinization, coastal and estuarine erosion, and water quality.

##### ***Marine Microbiologist***

Although microbes produce approximately 50% of the world's oxygen and are among the most diverse organisms in the oceans, we know very little about their diversity, ecological role, and their effect on ocean health and productivity. This individual would greatly expand our oceanographic capacity in a field that is relatively nascent.

##### ***Remote Sensing/Numerical Modeling Specialist***

Satellite oceanographers and other ocean scientists are creating massive datasets that require innovative and computer-intensive solutions. This individual would provide opportunities for students and faculty in programming, modeling, and the manipulation and interpretation of large datasets.

#### **3. T/TT Faculty Reduction in Teaching and Post-doc teachers**

MLML has not used post-doctoral positions for teaching and research to our full advantage. We have had a few post-docs, but they have generally worked in



specific labs and have not contributed to the academic mission. An improved model is to seek funding, generally through faculty buyouts or consortium support that would allow MLML to recruit more post-docs for instruction of our undergraduate courses. Post-doc teachers would be in residence for two years. This provides the post-docs with valuable teaching experience and MLML with fresh ideas, invigorating and contemporary content, and potential collaborators for research projects.

### INFRASTRUCTURE TO SUPPORT EDUCATIONAL IMPROVEMENTS

Moss Landing Marine Laboratories has substantial facilities and resources that support the research and education mission of the institution. Described in depth below are their past and current status, and plans for the future.



#### MAIN BUILDING

**Background:** The main MLML classroom and laboratory facility is a 60,000 square foot building that was completed in 2000. This facility replaced the original MLML laboratory that was housed in a converted cannery building on the Moss Landing island that was destroyed by liquefaction during the 1989 Loma Prieta earthquake. Our new facility houses 4 classrooms, one large conference/multipurpose room (110 person capacity), 10 laboratories (440 sq. ft. each), a teaching/research aquaria and museum, IT services, a workshop, the MLML/MBARI Research Library, and administrative and faculty offices.

MLML has extensive instrumentation and equipment available to faculty, students, staff, and visiting scientists. These include: atomic absorption spectrophotometer, inductively coupled plasma mass spectrometer, DMA-80 Direct Mercury Analyzer, Cold Vapor Atomic Fluorescence Spectrophotometer mercury detector, Hitachi Scanning Electron Microscope with INCA Energy 250 energy dispersive X-ray spectrometer, Leica Petrographic Microscopes, Trimble VX Spatial Station terrestrial laser scanner, Beckman Coulter Laser Particle Sizer LS 1230, Ion Torrent Personal Genome Machine genome sequencer, and microwave for assisted acid digestion.

The MLML/MBARI Research Library serves a dual mission of teaching and research support. Throughout four decades of existence, fund-raising events, gifts,

membership in the California State University consortium and most importantly, a ten-year partnership with MBARI have generously supplemented modest state support to create one of the top five marine science libraries in the western United States. Today's library is a blend of innovation and tradition, allowing its users desktop access to databases and articles, while continuing to maintain a strong print collection. Access to bibliographic databases is maintained through electronic subscriptions to Aquatic Sciences and Fisheries Abstract, Biosis Previews, GeoRef, Chemical Abstracts, EI Village, Scopus, Web of Science and Zoological Record. All major scientific publishers' (Elsevier, Springer, Wiley-Blackwell, Cambridge, Oxford) electronic journal collections are part of the Library's growing digital collection. The Library is also an active participant in the Aquatic Commons,; an open access thematic digital repository of marine and freshwater publications and other scholarly materials. The library also provides an open-source framework called *Islandora*, which was designed to help MLML collaborate, manage, and discover digital assets.

**Opportunities for the Future:** The main MLML building is well utilized but there is some capacity for growth and expansion. There are presently three lab spaces (Rooms 514, 512, and 216) that are underutilized which could be retrofitted into laboratory space for new tenure-track faculty or new Research Faculty. Room 514 is currently occupied by graduate students working with Research Faculty and would need bench spaces and tables, but is plumbed with water, air, and gas. Room 512 was the trace metal lab used by former director John Martin and researcher Kenneth Coale and currently has Research Faculty Kim Null using this space with a new Lachat 6-channel nutrient analyzer. Room 216 is currently used by the Benthic Lab but is underutilized because of a recent decrease in funding to the principle PIs using that space.

### **SHORE LAB/AQUACULTURE FACILITY**

**Background:** The Shorelab is a one-acre waterfront parcel located at the base of the Moss Landing bridge (Fig. 1). This site includes a pump house (1,000 sq. ft.) that delivers 300 gallons per minute to this site, the main lab, and MBARI. The intakes for the system snake through a concrete pipe and exit into 60' of water about 300 meters offshore. There are two vertical intakes that each have a snorkel line with a pinch valve for the pigging process to clean the lines, and a separate caged intake for seawater intake. Depending on the sand level the intakes can be 0 – 5.5 meters above the seafloor.



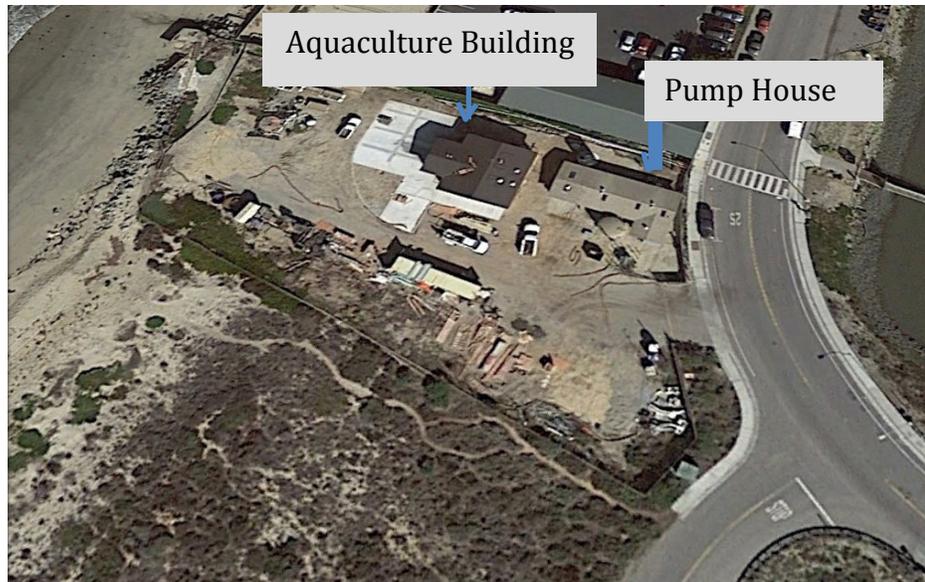


Figure 1. Shorelab facility with new Aquaculture building and seawater pump house.

The Shorelab also has a 100 sq. ft. necropsy/KOH tank facility. Dead marine mammals can be necropsied and flensed at this facility and bones and cartilaginous material can be cleaned of tissue in a tank with heated KOH that dissolves flesh.

The site also houses a newly constructed Aquaculture Facility. This consists of a 1,392 sq. ft building and a 1,575 sq. ft. concrete pad for tanks and aquaria (Fig. 2). The primary goal of the MLML Center for Aquaculture is to develop novel technologies for enhancing the sustainability and productivity of current aquaculture practices.



Figure 2. New Aquaculture building and concrete pad for seawater tanks in the foreground.

### Opportunities for the Future:

MLML's interest in Aquaculture is to expand the infrastructure and capabilities of MLML; provide research and training opportunities for students; and conduct good, rigorous science to improve aquaculture practices that provides sustainable food resources for the public and jobs for our graduates. At present we have two industrial partners, Monterey Abalone Company and Monterey Bluewater Farms, and we seek to continue developing industry partnerships to develop sustainable and efficient aquaculture practices and provide skills and job opportunities to our students.

In collaboration with Dr. Michael Lee at CSUEB, we will develop a CSU-wide curriculum in Aquaculture Science, as described in the above section on curriculum. This online course would involve faculty at MLML, CSUEB, and other CSU campuses involved in aquaculture (e.g. Humboldt). We envision the Center for Aquaculture to be a CSU asset open for collaboration and use by any CSU-based researchers or teachers interested in aquaculture.

## SMALL BOATS/MARINE OPERATIONS

**Background:** The MLML Marine Operations and small boat program facility consists of a 3,000 square foot structure and surrounding utility yards that house a boat workshop, air and nitrox filling stations, dive gear repair station, storage lockers, a boat ramp, and docks. The property containing the small boat and diving program was purchased in 1983. Dock space available at Marine Operations accommodates the 56-foot R/V *John Martin* (Fig. 3), the 30-foot R/V *Sheila B*, four 17-foot Boston whalers, and three inflatable boats (22', 16' and 14') with outboard motors. The R/V *John Martin* and R/V *Sheila B* can operate from Pt. Reyes to Pt. Sur, the 22' RHIB can operate up to 50 miles offshore, and the smaller whalers and inflatables can operate up to one mile from the coast. Through a training program our small boat coordinator trains new boat drivers and maintains logistics and safety equipment according to US Coast Guard regulations.



Figure 3. The R/V *John Martin* as viewed from the water (photo by Scott Gabara).

Our vessels are used extensively by undergraduate and graduate students of MLML and CSU consortium campuses for class-based field trips, research projects and thesis research. Most of the vessel use is local (e.g. Monterey Bay, San Francisco Bay, and central California coastline) but occasionally the vessels are used in Baja California, southern California, and the California San Francisco-Sacramento-San Joaquin Bay Delta Complex. Facilities and vessels are also commonly used by a large group of outside researchers and educators from Monterey Bay area marine research institutions including MBARI, UCSC, NPS, ESNERR, National Marine Fisheries Service, local community colleges, and high schools.

In addition, MLML operated the National Science Foundation's 135 foot R/V *Point Sur* for 28 years. In 2014, NSF decided to retire the R/V *Point Sur*. The vessel was sold to the University of Mississippi and the proceeds placed in an interest-bearing account at the SJSURF. The R/V *Point Sur* primarily operated in the Northeast Pacific, but cruises in the last few years were made to the Aleutian Islands, Bering Sea, and Antarctica. MLML is a member of the University National Oceanographic Laboratory System (UNOLS) and all R/V *Point Sur* operations were scheduled in concert with UNOLS. The research vessel provided 5 ship days each semester for MLML classes to use, summing to 50 trips over the last five years.

**Opportunities for the Future:** With the retirement of the R/V *Point Sur*, the ability to take MLML classes to sea and to sample the coastal environment is compromised. Furthermore, the remaining smaller vessels at MLML cannot operate overnight, for extended periods of time, or deploy and recover larger pieces of instrumentation (e.g. corers, ROVs, submarines, moorings). To accommodate these types of gear and provide for class cruises, MLML needs a mid-sized vessel of 75 – 95'. The vessel should have the following characteristics:

- Length of 75 – 95' and at-sea durations of 10 – 30 days
- Berth space for crew and at least 5 – 8 scientists
- A-frame capable of handling trawls, moorings, corers, and small boats
- Trawl winch with 5000 m of 0.4 in wire rope
- CTD winch with 1000 m of conductor cable
- 5-ton knuckle boom
- Bow Thruster
- Wet and Dry lab space

An example of the type of vessel MLML seeks to obtain is the 84' R/V *Pacific Storm* operated by Oregon State University (Fig. 4). This size vessel could accommodate classes of 10 – 30 students for day cruises and could also conduct week long cruises and deploy most of the same gear that the R/V *Point Sur* handled.



Figure 4. R/V Pacific Storm

A vessel this size could also operate more cost effectively with a crew of 3 persons and would require less shore-side support. To determine if such a vessel is achievable, MLML needs to conduct a feasibility study and create a business plan. MLML has begun discussions with the other marine science institutions around the Monterey Bay (e.g. MBARI, UCSC, NPS, Hopkins, and NOAA) to determine their future scientific needs, and gauge interest in chartering such a vessel. If MLML were to obtain a mid-sized vessel we would likely sell the R/V *John Martin*.

It is important to note that the proceeds of the sale of the R/V *Point Sur* will go to MLML, but cannot be used to purchase a new vessel. However, these funds can support the retrofit of a donated vessel or a purchased vessel, and if managed well, could be combined with proceeds for the R/V *John Martin's* sale to provide sufficient ancillary funds to finance years of maintenance and operations.

## DIVE PROGRAM

**Background:** MLML is a founding Organizational Member of the American Academy of Underwater Sciences (AAUS). The MLML diving program encompasses a yearly average of 65 certified divers completing 1,500 dives annually. Research that involves diving is currently conducted in most of the laboratories at MLML, including: (1) Benthic lab (polar studies, Elkhorn Slough), (2) Physical Oceanography (MOBY optical buoy in Hawaii), (3) Chemical Oceanography (L.A. Harbor, San Francisco Bay Delta Complex, high altitude Sierra mountain lakes), (4) Phycology (California, Mexico, Galapagos, Chile), (5) Marine Birds and Mammals (Monterey, Bodega Bay, and Mexico), (6) California Sea Grant (central California, Spain, Belize) and, (7) Marine Pollution Studies Lab (California). Many of our research divers travel to collaborate on projects with outside





colleagues and important reciprocity agreements have been established with all other AAUS member organizations (89 major science diving programs), and also with NOAA, the U.S. Geological Survey, NSF Polar Programs, the National Park Service, and California Department of Fish and Wildlife. Currently Dr. Stacy Kim serves as the pre-deployment trainer for NSF scientists being deployed for ice dive operations at US bases at McMurdo Station and Palmer Station, Antarctica.

The Dive Program Infrastructure includes: A membrane Nitrox system using a Bauer vt20 compressor; a BAUER Mariner compressor for filling tanks in the field; 10 regulators; 10 BCs; 40 EAN Nitrox tanks and 40 air tanks; 6 emergency oxygen kits and 1 automated external defibrillator; three inflatable boats (13.5 Zodiac Mark II, 13.5' Achilles, and 12.5' Achilles); and a 15' X 20' work space, storage, and locker space.

**Opportunities for the Future:** Although the dive program has been incredibly successful based on the number of research dives per year, the number of completed SCUBA-based thesis projects, and its safety record, it has never had the proper facilities. Therefore, future plans are for a new dive facility that would include: dive lockers for 30 - 50 divers, 2 - 3 showers, office space for the Diving Safety Officer, work space for repairing and maintaining gear, SCUBA gear storage area, and proper location for the compressor and NITROX fill station. The design of this facility will allow efficient and safe dive operations and will be integrated into the small boat program at the Small Boat and Diving Facility. New dive gear for the program might include: an upgrade to the Nitrox tank storage system, a new field compressor, a new underwater camera system, 4 pony bottles for deep diving safety, underwater recall system, and submersible VHF radios with GPS.

### NORTE FACILITY

**Background:** The Norte Facility, purchased in 2000, is located on the shores of Monterey Bay across the street from the Small Boats and Diving Facility on Sandholdt Road (Fig. ). The 10,000 sq. ft. building on a 2-acre site houses a number of Research Faculty and Affiliates:

- Marine Pollution Studies Laboratory - MLML
- Marine Pollution Studies Laboratory - CADFW
- Environmental Biotechnology Laboratory
- Southwest Fisheries Science Center Marine Turtle Research Program
- Center for Habitat Studies
- Submersible Capable of Under Ice Navigation and Imaging (SCINI)
- Two Research Faculty (Dr. Val Loeb and Dr. John Oliver)

These groups collectively bring in about \$10 – 12 million each year, mostly through State contracts, but also through funding from NOAA, NSF, NASA, and private funders. Besides securing research grants that funnel through MLML and are administered by the SJSURF, these groups also provide research opportunities and instrumentation for MLML graduate students, and often hire MLML graduates. As such, they are a critical component of the MLML research and educational community.

**Opportunities for the Future:** The office and laboratory space of the Norte Facility is near capacity. There are some spaces in the second floor that could be better utilized, therefore, one Research Faculty who would have lab space in this building could be added.

One potential future build out could be for Dr. Nick Welschmeyer, who is Full Professor and MLML’s Biological Oceanographer. Much of Dr. Welschmeyer’s research is with invasive species and testing of ballast water treatment systems. Currently most of his ballast water treatment systems testing is conducted at the Golden Bear Facility of Cal Maritime in Vallejo, CA. Dr. Welschmeyer has approached MLML regarding the establishment of a test facility at the Del Mar property owned by MLML/SJSURF. This would require a few large tanks to store harbor water and plumbing to allow different systems to be attached for testing. Dr. Welschmeyer would need laboratory space, and the Norte facility could be outfitted to allow him easy access near the MLML test facility.

### SANDHOLDT (RUBIS) PROPERTY

**Background:** For most marine labs around the world the primary period of instruction is summer. During the summer, undergraduate students are able to relocate and attend specialized courses in marine science that are not offered at their home institutions. Additionally many visiting scientists who do not have access to marine resources at their home campus often will spend summers at marine labs.

To accommodate these temporary students and scientists, all marine labs have housing on their property. Housing provides a convenient and cost-effective place to stay that often, does not require any additional transportation. In addition, the unique setting and ambiance of a marine lab is best experienced by working and living at the facility.

MLML does not have housing to offer visiting students or scientists. The Rubis Property, adjacent to the Main Lab building (Fig. 5) was purchased in 2005 to provide a location for future construction of an Academic Village at MLML. The vision was for an integrated community of different housing opportunities and a small conference/research center.

**Opportunities for the Future:** Built with sustainable methods, the Academic Village would provide housing for visiting consortium classes, visiting K-12 students, residential graduate students, and visiting scientists. The conference center/research facility would provide space for larger classes that are not currently possible at the Main Lab building, and would provide lab space for



Figure 5. MLML Main lab and adjacent Rubis property designated for the construction of a new Academic Village with housing and conference center.



collaborating scientists and visiting classes. Our concept is to provide all of the activities listed above, greatly increase our capability of serving larger undergraduate courses, and maintain a sense of a marine science community using sustainable “green” building methods.

The Academic Village could include:

- Small apartments or other housing structures
- A research lab with running seawater, wet tables and tanks for holding live organisms
- A multi-purpose conference or meeting room
- Parking
- Marine or freshwater wetlands that weave through the property that could be used as demonstration wetlands for class sampling and water quality improvement, and for habitat restoration
- Demonstration of “green” building techniques (e.g. passive energy building techniques, integrated solar electricity and heating, cistern and other water storage capacity, and native vegetation)

### CHANGES IN EXTERNAL FUNDING AND OUTREACH

**Background:** MLML has traditionally been supported via State funds administered by SJSU and Indirect funds allocated to MLML via contracts and grants administered by SJSURF. Because support from State funds has decreased during the most recent State financial crisis and it is unlikely that they will increase substantially in the near future, it is pertinent that we find external sources of funding for some activities.

Historically MLML has not sought private sources of support, either because we did not have the fund-raising resources or because it was not needed. Although the new Tower Foundation at SJSU can provide some assistance in seeking philanthropic funding, it is difficult due to the actual and perceived distance from campus.

**Opportunities for the Future:** The potential for fund raising in the Monterey region seems great, given there are few other academic institutions in the area, the elevated interest in marine issues in the Monterey region, and the incredible extent of local research conducted by MLML. Therefore, we will strive to create a mechanism and effort to raise external funds from the surrounding community. This strategy will require some assistance from the Tower Foundation but ultimately will require effort and resources from MLML.

We realize that gaining financial support from the community requires a number of conditions, including local familiarity with MLML, connection to potential donors, and interest in the activities that need funding. To increase familiarity requires constant and effective communication of MLML activities and accomplishments.

MLML currently offers a semiannual magazine, a community lecture series (attended by 50 - 100 people), a tour program, an annual Open House (attended by 2,000 – 3,000 people), press releases to local media, a Facebook page, a Twitter



handle, a YouTube channel, a student blog, and our attendance at various local programs. Even with these outreach activities we are often confused with MBARI or UCSC. We must do a better job of communicating who we are, what we do, and why we are important and relevant.

One product we are currently producing is an outreach film. This film will have three separate endings to serve three audiences: general public, potential students, and potential donors. The film will have a narrative, recorded interviews of faculty, and b-roll, however it still requires a great deal more recordings of marine organisms and Monterey Bay scenes before it can be completed. Our contracted production team is working with MBARI and a local filmmaker to get the final images for the project.

Once the community is familiar with our program, we need to find and connect with potential funders. This may require a fulltime development officer, for which we presently do not have the funds to support, but should be explored.

We have a number of potential projects (many listed above in this Strategic Plan) that might be of interest to potential supporters:

- Student Fellowships: an endowment for student support
- Academic Village: Housing and Conference Center at the Sandholdt property
- New research vessel: 70 – 90' vessel supporting marine science in Monterey Bay
- Marine Operations: vessel and dive support at Del Mar property
- Center for Aquaculture: Endowed position and facilities support

One of the most recent successful outreach programs at MLML has been the MLML student blog, "The Drop-In to Moss Landing Marine Labs". It has been viewed more than 220,000 times, and was recently listed as one of the "five favorite new ocean blogs" by Southern Fried Science. Andrew Thaler wrote: *"To be fair, the Drop-In has been around for years, but this Moss Landing-run blog continuously features new voices in the marine science and outreach world, drawn from a pool of their own master's students. The Drop-In is easily one of the best places to go to find out the latest in west Coast research, direct from the source. It's been in my RSS reader for years and it never goes stale."* You cannot ask for better outreach than your own students writing appreciated and relevant offerings.

Numerous consortium Presidents and Provosts have declared that the successes and achievements of MLML need to be better known. We have made an effort with public relations and marketing, but due to lack of personnel we have rarely had the luxury of creating outreach products for public consumption. We need a dedicated person who can constantly refresh information on the MLML Facebook page, produce news releases of recent accomplishments, assist with the student blog, create content for the MLML website and visitor center, and interact with the public and media. started in 1965/66 as a consortium of five CSU campuses (Fresno, Hayward, San Francisco, San Jose, and Sacramento). In 1972, CSU Stanislaus was added to the consortium, and in 1996, CSU Monterey Bay became a member. Each consortium campus provides some annual funding that primarily supports an annual Visiting Scientist, which is preferentially awarded to



consortium faculty members.

A Governing Board, consisting of the Dean of Science and faculty representatives from each consortium campus, serves to govern MLML through By Laws, Rules of Operation, and semiannual meetings. At these meetings the Governing Board reviews laboratory operations, educational activities, future plans and fiscal operations including both budgets that represent the State and Research Foundation funding. All seven campuses must approve any curricular changes through the Governing Board before they may be implemented at MLML.

Association between MLML and the other consortium campuses weakened as MLML became more self-contained and interacted more with SJSU as the administrative campus,. These campuses evolved from full partner to, primarily, observers, and as a result the role of the Governing Board has become more advisory. However, participation in the consortium can still benefit a CSU because it provides faculty and students access to resources at MLML including the dive and boating program, seawater, major research laboratories, instrumentation, and marine science expertise.

**Opportunities for the Future:** The strength of a consortium is based on the participation and contributions of its components. The MLML consortium can have substantial political weight because it represents almost a third of all the CSU campuses, therefore, its support for marine science and a marine laboratory in Moss Landing is crucial.

The future of marine science at CSU is based on recognition that our environmental quality, economy, and wellbeing are dependent on a healthy ocean. With an increasing number of people living near the ocean and increased threats to marine systems, it seems incumbent on the State of California and the CSU to place greater emphasis on marine science literacy and the education of a trained marine science workforce who can solve problems and create better planning for the future.

Therefore, we seek a stronger and more committed MLML consortium where the campuses are more engaged, they make better use of MLML resources, and faculty have greater collaboration. The improvements to MLML infrastructure (e.g. housing, additional laboratories, conference center, marine and diving operations), curricular offerings (hybrid undergraduate courses, summer and weekend courses) and a dedicated development officer to market MLML and generate philanthropic giving as proposed in this Strategic Plan strive to support and strengthen the consortium and shape a promising future for MLML.



## APPENDIX VI. MLML – SJSURF Resolution 198

*Resolution 198 was approved by the SJSURF Board of Directors during the June 4, 2012 Meeting and documented in the official minutes:*

BOARD OF DIRECTORS MEETING  
Minutes  
June 4, 2012  
Meeting: 11:00 a.m. to 12:15 Noon  
San Jose Athletic Club, Olympia Room, 196 North 3rd Street, San Jose

I. CALL TO ORDER

Ellen Junn called the meeting to order at 11:05 a.m.

ROLL CALL

Present: Ellen Junn, Pam Stacks, Shawn Bibb, Francis Howard, Michael Parrish, Charles Bullock, Jim Harvey, Emily Allen, Terry Austen, Rich Okumoto, Gary Silver.

Absent: Roy Okuda, William Rhodes.

Attending: Mary Sidney, Jerri Carmo, Cheree Aguilar-Suarez, Paul Harris, Kam Lam, John Troyan, Ed Karas, William Cates, Marilyn Dion.

**b. Request for Approval of Resolution concerning Moss Landing Marine Labs**

Mary presented a Resolution for Board approval relating to the completion of a Memorandum of Understanding by the MLML Management Working Group. The group addressed the MLML deficit, its repayment, and how allocations are made.

*The Board voted to approve the Resolution M-S-C 1 1-0-0*

**Resolution No. 198**

### A RESOLUTION OF THE BOARD OF DIRECTORS OF THE SAN JOSE STATE UNIVERSITY RESEARCH FOUNDATION REGARDING THE OPERATIONS OF MOSS LANDING MARINE LABORATORIES

This Resolution is established by and between San Jose State University Research Foundation and the San Jose State University {SJSU}, SJSU College of Science {CoS}, and Moss Landing Marine Laboratories {MLML} concerning general financial and facility operations of MLML.

WHEREAS, the SJSU was designated by the CSU Chancellor as the Operating Institution of MLML for the MLML Consortium; and

WHEREAS, the SJSU Research Foundation and SJSU/CoS/MLML wish to ensure a strong financial base for MLML's general and facility operations that supports strategic development and growth in sponsored research and other externally funded activity of the MLML faculty, students and affiliates; and

WHEREAS, the MLML operating budget relies on Facilities and Administrative {F&A} allocations as its primary source of operating revenue; and

WHEREAS the Research Foundation and SJSU/CoS/MLML wish to revise the financial model for ongoing MLML operations such that annual operating revenue and expenditures are in alignment with the updated F&A allocation methodology as approved by the Research Foundation Board of Directors; and



WHEREAS, there is a need for Moss Landing Marine Laboratories to establish a formal line of credit {LOC} to reimburse the SJSU Research Foundation for costs incurred totaling \$3,333,000 {Appendix A} in the purchase and renovation of the properties identified as the Rubis parcel and the Del Mar parcel in Moss Landing, California, and for various operating expenditures, all totaling an amount that exceeded MLML F&A operating revenues, due primarily to the revision of the historical F&A allocation methodology and the corresponding significant reduction in F&A allocations to MLML.

NOW, THEREFORE, in consideration of the mutual goals and organizational benefits contained herein, the Research Foundation and SJSU/CoS/MLML resolve as follows:

1. MLML sponsored program activity shall continue to receive F&A allocations based on the updated (and campus-wide) F&A allocation methodology that calculates actual F&A surplus and loss per project.
2. MLML shall reimburse Research Foundation corporate accounts by making annual payments in an amount that is no less than 10% of the annual F&A allocation to MLML, said amount to be deducted annually from the F&A allocation and continuing for a period not to exceed 30 years. Additional payments may be made at any time, but are generally expected not to occur until a \$1million target level of operating reserves is achieved. If at any point payments to reimburse the Research Foundation compromise the financial viability of MLML operations, the matter will be discussed and resolved jointly between the SJSU/CoS/MLML and the SJSU Research Foundation Board. SJSU Research Foundation shall provide an annual accounting of the status of the LOC to the Board of Directors.
3. The estimated \$400,000 in interest associated with this deficit that resulted from the restructuring of the F&A allocation methodology is considered a corporate investment both in the restructuring of the F&A formula and in the future of the MLML research enterprise, and therefore is hereby waived. All accounting records shall reflect this waiver.
4. MLML ongoing budget management will operate within standard fiscal constraints of an annual budget prepared by MLML with input from the Governing Board and approved by the MLML Director, MLML Chair, and the CoS Dean. The annual budget will include payment on this LOC, while ensuring that no further overdraft spending on MLML operating accounts occurs. Operating surpluses will accumulate in the reserve account to be expended as needed.
5. In acknowledgement of the corporate business investment in the MLML operations and facilities, MLML will develop and implement a strategic plan that articulates a vision for the MLML research enterprise, including a business plan for the development of the real property resources available to the MLML, and the pursuit of strategic funding opportunities that support the vision and mission of the MLML. The strategic plan will be updated annually as developed by the MLML Director, chair and faculty, with input from the Governing Board and subject to the approval of the CoS Dean. Presently there are 39 acres of land owned by the SJSU Research Foundation and by the CSU,
6. In consideration of all of the above terms, all parties agree that the real property assets described in Appendix B shall be used exclusively for the purposes of MLML research and education activities, as determined by the MLML Chair and MLML Director, with input from the Governing Board and approved by the CoS Dean.



**Appendix A**

Costs Contributing to the **MLML** Operations Deficit

Cumulative operating budget deficit	\$541,308
Norte Line of Credit balance	\$123,607
Rubis Purchase/Packard Fdn Loan repayment	\$2,000,000
Rubis/Packard financing shortfall	\$196,000
Del Mar property acquisition- FEMA funding shortfall	\$316,684
Creation of new reserve balance for ongoing operations	\$155,401

**Appendix B**

Research Foundation Owned Real Property at Moss Landing

Acreage

8202, 8222 and 8264 Moss Landing Road-  
Parcels 133-201-003; 133-201-004;  
133-201-005; 133-201-016 9.51

7722 Sandholt Rd, Kaiser Lot-Parcel133-232-006 2.30

7549 Sandholt Rd, Del Mar- Parcel133-2.41-013; 133-2.41-014; 133-2.41-015 1.44

7544 Sandholt Rd, El Norte- Parcel133-242.-101.67

7539 Sandholt Rd., Parcel133-2.41-011 2600 sf, plus .2.11and; fire station/dock  
small boat launching 1.00

**Total 15.92**

*Note: The MLML Main Laboratory is owned by the State of California "by and through the Trustees of the State of California."  
Total main lab acreage is 2.1.8.*