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October 21, 2014

CHAIR ANDRÉ KNOESEN
UC Davis Academic Senate

RE: Request for Comments on the Bodega Marine Laboratory (BML) 5-Year Review

Dear Chair  Knoesen:

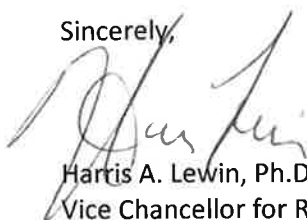
An *ad hoc* review committee has completed an in-depth five-year review of the Organized Research Unit (ORU) Bodega Marine Laboratory (BML) following UC Administrative Policies and Procedures concerning ORUs. Enclosed is a copy of the *ad hoc* review committee's report for your review and comments.

Comments on the committee's report are also provided by the Deans and the Director for your consideration.

I request formal Academic Review of these documents and ask that the report and comments be reviewed by the Committee on Academic Planning and Budget Review, the Committee on Research, the Graduate Council and the Committee on Education Policy. Furthermore, I respectfully request that, if possible, the Academic Senate review be completed **by November 24th, 2014**.

Thank you in advance for your cooperation.

Sincerely,



Harris A. Lewin, Ph.D.
Vice Chancellor for Research

Attachments:

- BML 5-Year *ad hoc* Review Committee Report
- Comments on Report by Dean Dillard (CA&ES)
- Comments on Report by Dean Lairmore (SVM)
- Comments on Report by Interim Dean Navrotsky (MPS)
- Comments on Report by BML Director Gary Cherr

/cep

c: Associate Vice Chancellor Paul Dodd
Executive Director Nancy Bulger
Research Program Coordinator Christine Parks

Review Committee: Kennneth P. Sebens (U. Washington) (Chair)
Craig M. Young (U. Oregon)
Peter Wainwright (UCD)
Gretchen Hoffman (UCSB)
Graham Fogg (UCD)

The review committee met at the Bodega Marine Laboratory (BML) on January 21-23 2014. The visit included meetings with administrators, faculty, staff, postdoctoral fellows and graduate students, as well as a tour of the facilities. The committee also had discussions with the Vice Chancellor for Research and with the deans of three colleges on the UCD campus who have oversight responsibility for BML faculty and connections with the newly formed Coastal Marine Science Institute (CMSI) Prior to the review, the committee was provided with the most recent reports on BML as well as an extensive self-study document produced by the director and his staff.

Research

During the Five Year Review period (2008-2013), research at Bodega Marine Lab (BML) has been consistently excellent, diverse and multidisciplinary, capturing insights into processes from marine, estuarine and terrestrial environments. Research emphases include temporally opportune studies of climate change and ocean health as well as investigation into fundamental processes and patterns in ecology, physiology, development, evolution and coastal oceanography. Notably, much of the newer, emerging work has an applied element that contributes to solving some of California's significant environmental problems such as degrading estuaries and invasive species and also global issues such as ocean acidification. An amalgam of activity from resident BML faculty, main-campus faculty from UC Davis, and visiting investigators, researchers at the labs have used BML, including the adjacent marine and terrestrial reserves, in support of over \$26 million in external funding over the most recent five years.

Place-based research at Bodega Marine Lab takes full advantage of a relatively pristine open coastal ecosystem as well as adjacent Bodega Bay and nearby Tomales Bay. The research foci emphasize several areas of strength that span multiple disciplines: Ecology and Evolution, Physiology and Development, Coastal Oceanography, Global Change Biology and Conservation, and Ocean Health.

Ecology & Evolution: Research at BML in Ecology and Evolution, includes stand-out contributions in larval ecology, marine community ecology, biomechanics, and the biology of invasive and introduced species. Several members of the faculty have distinguished publication records and enjoy international acclaim for heavily cited works on fundamental processes of ecology and evolution. A sampling of important recent papers include studies of turbulence as a cue for larval settlement in the intertidal zone, the evolution of self recruitment in marine populations, functional aspects of growth form in algae, and genetic processes underlying biogeographic patterns of intertidal distribution. To their credit, the BML faculty are active in applying discovered principles to conservation issues such as the design of marine reserves and ocean acidification.

Physiology and Development. Two laboratories at BML focus on the physiology or development of marine animals, including work at the cellular and molecular level. These fields have a long tradition of excellence at BML. Key papers on endocrine biology in crustaceans have found extensive application in aquaculture, and studies of early development and fertilization have facilitated the development of sensitive bioassay models for studying the effects of chemical pollutants in marine and estuarine systems.

Coastal Oceanography. Research efforts in coastal oceanography exemplify the interdisciplinary research efforts where resident faculty have combined forces to develop outstanding research programs that are, arguably, greater than the sum of their parts. By linking data from oceanographic buoys and HF radar stations (i.e., information about currents and temperature), researchers at the station have made significant contributions to understanding how marine larvae might move in nearshore waters, where they are and where the larvae might travel relative to adult populations. Such boundary-spanning work is significant to basic ecology and to other activities such as the design and study of marine protected areas (MPAs).

Global Change Ecology & Conservation. With a strong foundation in basic research, BML research has bridged into studies of global change ecology. The Bodega Ocean Acidification Research (BOAR) effort links oceanographic observations of pH with important biological processes in the rocky intertidal and in Tomales Bay. BML resident faculty have leveraged the pristine coastal region by deploying oceanographic sensors and used these data to frame studies on the impacts of environmental change on marine organisms. The coast around BML experiences episodic upwelling, wherein winds cause deep, cold, CO₂-rich waters to move to the surface. These low pH waters are expected to become even more acidic in the future, thus BML is ideally situated to study future acidification impacts on the California coast. Research at BML examines problems, but also solutions. Thus, for example, faculty have initiated a new focus on “blue carbon” sites such as seagrass beds that fix carbon dioxide in coastal waters thereby ameliorating future acidification stress. Collectively, these research efforts have demonstrated that BML is a perfect place-based location to study coastal oceans.

Research that links to “Knowledge to Action”.

Ocean Health. There has been a tradition of ocean health research at BML and this has continued during the review process. Research has focused on pollution and toxicant sources from large-scale and small-scale sources. This research examines both physiological and ecological impacts of toxicants entering water sources and as such has a value to human health as well. One active effort here has been the Pacific Estuarine Ecosystem Indicator Research (PEEIR) that has been examining indicators of health in California’s estuaries. BML faculty working on water quality have pioneered collaborative projects that link basic science to real-world problems. For example, BOAR researchers have worked with local mariculture businesses to study the variability of water quality around oyster operations. This project is a great example of the societal value of some of the activities supported by the existence of BML.

In summary, as a research asset for UC Davis, BML demonstrated itself to be a unique opportunity to study and protect the natural capital in the coastal oceans of California over the 5-year review period. In particular, BML is emerging as a location for studying anthropogenic

change and understanding natural processes in a relatively un-impacted marine environment. Considerable research is also performed on the UC reserve at BML, the Bodega Marine Reserve. This is one of the most actively used reserves in the UC Natural Reserve system and BML plays a key role in supporting the success of BMR as a research asset.

Overall, the importance of the collective research effort supported at BML underscores the value of the BML as a world-class marine laboratory.

The committee believes that an untapped opportunity for BML is the collection, curation, and display of long-term data on relevant ocean and coastal conditions such as temperature, pH, and species occurrence. It would seem that long-term data records provide potent rationale justifying the need for any field research station, and indeed, might serve as a potent tool for not only leveraging additional research, but also for stimulating the teaching and outreach contributions as well. An example of how such data has served research, teaching and outreach missions can be found in the long-term record on lake clarity at Lake Tahoe without which, the formation of the Tahoe Environmental Research Center would have been less likely. Moreover, such long-term data records can be an excellent way for science to simply and powerfully motivate stakeholders toward consensus regarding state of an ecosystem, as has happened at Tahoe.

Another area of research that appears ripe for further development at BML is the coastal zone as a transition and mixing zone between terrestrial hydrologic processes (watershed hydrology) and marine processes. This is a crucial part of the “Sierra-to-the-Sea” continuum, and the exchange of fresh surface and groundwater and sea water (both surface and subsurface) and their suspended and dissolved substances is both little understood and potentially very important to future evolution of coastal ecosystems as climate as well as terrestrial land and water management change. Although the CMSI suggestion of Sierra-to-the-Sea paradigm for linking coastal research to terrestrial processes all the way to the Sierra Nevada is admirable, the best opportunities for upgradient connections between BML and the rest of the continent likely lie in the Coast Ranges watersheds, including the Bay-Delta system, that drain directly into the Pacific.

On the need for developing a more forward looking vision and strategic plan; BML’s research projects are excellent and substantially advance basic and applied science, but the long-term sustenance of a field research lab such as BML also depends on development of a long-term vision and strategic research plan that can be used to put BML in the strongest possible position for not only solving the grand challenges in science, but also for attracting major sources of research funding from the private and public sectors. A strategic plan is needed that asks the question: “Given more or different resources, what will BML be able to accomplish 5, 10, 20 years down the road better than any other comparable marine lab in the world?” Without such a vision and strategic plan, it will be difficult for BML to (1) prioritize future decisions on faculty research expertise and infrastructure and (2) excite the UCD leadership enough to motivate significantly greater investment in BML.

Teaching

Bodega Marine Lab offers course work of the highest quality to both undergraduate and graduate students, and the teaching contributions of the faculty appear to be impressive and important to the university at large. The courses offered at BML are typically small in student numbers, but they provide unforgettable capstone experiences that help students prepare for scientific careers. The relatively small numbers of students taught (and the credit hours calculated for the new budget model) clearly belie the importance of these efforts to the students and the University.

Most marine labs offer an extensive menu of summer courses from which visiting students may choose. The faculty at BML have wisely structured their course offerings in a creative way that focuses intensive learning experiences with a research-oriented, hands-on approach. Courses are taught during three terms (Spring, Summer I, Summer II). Students attending Spring Term or Summer II Term have only a single option: to enroll in two intensive, complementary courses team-taught by a pair of faculty. All students in these terms take the same set of courses. The first half of the term runs like a conventional field course, alternating lectures with lab and field experiences. By the time of the midterm, however, students are required to write a research proposal for an individual project that will be completed during the second half of the class. In our conversations with faculty, it became apparent that the mentoring of these students is thorough and time consuming; the faculty and T.A.'s devote many evening and weekend hours to assure that students learn the mechanics of research and experience success in their efforts. The long-term impact of this approach is apparent in the BMS library, where an impressive archive of student reports extends back to the 1950's. Many thousands of students, including many of the great marine scientists of our times, have learned to do original research at Bodega Marine Laboratory. Although all marine labs offer courses to resident and visiting students, these research-intensive immersion experiences at BML are nearly unique and appear to rank among the best offerings anywhere. Certainly the tradition of hands-on project-based course work is an important part of the U.C. Davis heritage.

Apart from the mentoring of graduate student thesis and dissertation projects, graduate education at BML consists of seminar and discussion courses offered on a somewhat unpredictable schedule by individual faculty members. Some of these courses deal with topical marine issues and others help student prepare for careers in science. Our meetings with both students and faculty suggested that the community of graduate students is vibrant, supportive and cohesive. Students share office space in a single large room that fosters interactions among labs and individuals. In the past, this all-important student interaction has been sustained by access to weekly seminars and by an institutional postdoc who organized seminars, activities and discussion groups with the students, and even organized co-authored publications.

Unfortunately, budget cuts have now reduced the available funds for invited seminar speakers, and the BML postdoc position has been lost because of the urgent need for operating funds. Faculty are helping to sustain the seminar program in some terms by inviting colleagues and collaborators with grant funding when they are able to do so. Nevertheless, it is apparent that the current budget situation has taken a toll on the graduate program by reducing access to important but less tangible parts of a graduate education. Students at Bodega have much less opportunity to interact with a variety of visiting scholars than students on the Davis main campus, a situation that could be partly alleviated by broadcasting seminars in both directions through a video conferencing system.

The graduate students are very grateful for the opportunity to study at Bodega Marine Laboratory; indeed, every single student indicated emphatically that he or she would not have applied to U.C. Davis if Bodega Marine Laboratory were not there. The marine lab plays a huge role in attracting students to Davis and in supporting students in Marine and Coastal Science.

The BML faculty contribute significantly to the teaching load in several departments on main campus. We were not given data on the number of students taught in Davis, but it appears from anecdotal information that most of the faculty teach either one or two courses of between 70 and 250 students per year. These assignments go well beyond what would be required of place-based faculty at many other marine laboratories. We heard some concern expressed that the BML faculty do not pull their weight because of small class sizes. This is a common perception at institutions with remote field stations, but it is unjustified. BML faculty teach very intensive, time-consuming courses of high quality at the lab while also teaching large courses that generate student credit hours. Both kinds of classes should be equally valued at a large research-oriented university.

With the addition of a Marine Science major and the coordination of the new Coastal Marine Science Institute, it seems likely that enrollments will increase at Bodega Marine Lab, particularly if the major is structured to include one or more required terms in residence. In order for this to be successful, a greater diversity of marine lab courses may be required. These could be taught by main-campus faculty who are assigned to teach on the coast, or they could be handled by the resident faculty by relieving them of some of their main-campus teaching responsibilities.

BML has an excellent large auditorium that would permit lecture and workshop courses of greater size than the usual marine lab research courses. However, an expanded student population would almost certainly require additional housing that is affordable for students. Graduate students noted that the current housing is prohibitively expensive because of the need to make the units self-sustaining. If the director had the ability to set rates that were competitive with other marine labs instead of the prevailing local rates, it is likely that the existing housing would see more use and students would be more inclined to include a coastal term in their course work. The addition of low off-season rates would probably generate some housing income during periods when there currently is none. We were surprised to learn that faculty are not compensated for their travel to and from campus despite the long distance. We also learned that several of the faculty were promised travel compensation at the time they were hired. This support has been eroded during the present budget climate. If funds could be identified to restore this support, we believe that it might have a positive effect on faculty morale.

Outreach

Outreach is a means for effecting policy development through the communication of BML research results. Outreach is also essential for BML to routinely emphasize its value to society, government and the University. Although the BML Mission Statement includes no explicit outreach mission, the 2012-13 Annual Report states: "The laboratory's history of research, training and outreach has made invaluable contributions to our knowledge of coastal systems and the policy that protects them."

BML has no outreach coordinator or budget, and its Public Outreach program is led by staff and volunteer docents. Given the importance of outreach, BML investment in a coordinator and outreach operating budget would more than pay for itself. Outreach at BML occurs through both ad hoc and organized mechanisms. An example of ad hoc outreach is the educational benefit of the tide pool exhibits and inside displays that roughly 10,000 visitors see per year. These visitors come from the general public as well as from the many conferences held at BML by outside groups. Visitors from the public included drop-in families and community members that go on docent-led tours and K-12 groups on field trips. BML is also involved in four, annual offsite exhibits: UCD Picnic Day (10s of thousands of visitors), BML Fishermen's Festival (25,000), Tolay Lake Fall Festival (19,000), and the NSF funded North Bay Science Fair (8,000 4th thru 8th graders).

According to the 2012-13 Annual Report, K-12 and community education groups included 1,237 guests in 23 public education programs hosted by BML. Community outreach groups included UCB Lawrence Hall of Science, two high school marine biology camps, UCB Jepson Herbarium, California Native Plant Society, Sonoma Ecology Center, Americorps, and Career Days at Analy High School and Tierra Buena Middle School. For four years BML has had an NSF funded program known as CAMEOS (Coastal, Atmospheric, and Marine Environmental Observing Studies) that promotes ocean literacy by supporting fellowships for graduate STEM Fellows in K-12 education. Eight BML CAMEOS graduate fellows worked with 5 schools, 500 students, and 7 teachers in 12 classes. BML also hosted NOAA staff for a two day Whale Entanglement Training Workshop for local fisherman and other boat operators (2012-13 Annual Report).

BML's SWOT analysis identified some opportunities, weaknesses and threats related to outreach. The opportunity of developing the BML facilities into a more accommodating and sought after conference center could multiply by many times the outreach impact. Furthermore, the idea of attracting support through development of a learning center is an excellent one. Importantly however, there are no dedicated funding sources to maintain the public displays, including the tide pool displays. These displays may quickly become not only uneducational, but embarrassing eyesores, without ongoing funding to maintain them.

Impact of BML on the UC Davis campus

BML is an internationally-recognized marine laboratory located in the midst of one of the world's most important high-biodiversity upwelling regions. This facility and the people who live and work at it are, to a large extent, the face of marine and coastal sciences at UC Davis. As the centerpoint of UC Davis activities in marine and coastal sciences, the lab brings prestige to the university because of its strong reputation in basic and applied research, and the remarkable opportunities it offers students. There is a major impact of BML on the research activities of the university. In the review period the lab housed 10 UC Davis faculty in several areas of marine sciences and facilitated the research of 47 additional UC Davis faculty. Most of the research is 'place-based' and focuses on processes in coastal habitats surrounding BML or other major nearby systems, such as San Francisco Bay.

The recent creation of the Coastal and Marine Sciences Institute at UC Davis, with BML as its major physical component, has provided structure that can be expected to result in greater activity and synergy between the lab and main campus. While CMSI provides an intellectual home for a broad group of over 60 UC Davis faculty with interests in marine and coastal sciences, BML will clearly be a focal point for CMSI, playing a highly visible role in the development of teaching initiatives, research, outreach and development. Activities and success at BML and CMSI will be reciprocally illuminating.

During this review period BML has also served a unique teaching function for UC Davis by offering students immersion experiences that emphasize what is often their first independent research opportunity. Compared with teaching activities on campus the numbers of undergraduate students taught is quite small (roughly 50 students per year) but the nature and quality of the program make its impact on UC Davis disproportionate to its size. Because the students live at the laboratory and focus entirely on a curriculum in marine sciences and research, the experience can be life-changing.

A major recent development is the initiation of a cross-campus undergraduate major in Marine and Coastal Sciences with teaching at BML playing a pivotal role in the capstone experiences of students in this major. The major will give undergraduates interested in marine sciences a clear home and early indications are that it will have strong enrollment. The major is likely to significantly increase the numbers of students who take spring and summer session courses at BML, which has been well below capacity throughout the review period, and will also stimulate other new course development on campus and at BML.

BML also plays a significant role in graduate education, maintaining a steady population of about 25 graduate students and about 9 postdocs. Graduate students that the review committee met with were unanimous in stating that they came to UC Davis for graduate school because of BML. Future workshop, seminar, and conference activities that emerge from the CMSI can be expected to increase the attractiveness of BML for aspiring marine scientists.

Recommendations

1. Relationship of CMSI and BML. The creation of CMSI as a cross-campus entity and a mechanism to highlight and coordinate the marine science faculty and students is a laudable and possibly game-changing development. Having BML as a major component of CMSI will bring it greater visibility and integration with other campus units. Faculty at BML are concerned that BML will be one step lower on the funding ladder than it is currently, if all funding and reporting goes through the CMSI director. **CMSI reports to a Lead Dean** (College of Biological Sciences), which is appropriate and necessary. However, **BML currently reports to the Vice Provost for Research**, and operates as an ORU. It is appropriate to maintain that reporting structure for the Director of BML, so that its funding as an ORU is negotiated directly with the Vice Chancellor. The Director of BML can also serve as Associate Director for CMSI, and thus further the aims of the larger marine science initiative. The lead dean should be encouraged to support the academic programs at BML directly with additional funding, since these are not part of the ORU mission, but are of great value to the university.

2. BML should continue as an ORU. It is clear that the faculty at BML are collaborating with each other, other UCD faculty, and many faculty from other universities on projects that fall under a theme of “climate change effects” on coastal ecosystems and organisms. This has been a conscious decision to apply their considerable expertise to this important field of research. They have generated substantial grant funding, both as individuals and in collaboration, and should be encouraged to continue along these lines. However, it is also possible that CMSI could bring together a larger group to go after more substantial funding, such as the NSF Science and Technology Center grants, which could expand the scope and scale of these endeavors. The long-term sustenance of a field research lab such as BML also depends on development of a long-term vision and strategic research plan that can be used to put BML in the strongest possible position for not only solving the grand challenges in science, but also for attracting major sources of research funding from the private and public sectors. A strategic plan should ask: “Given more or different resources, what will BML be able to accomplish 5, 10, 20 years down the road better than any other comparable marine lab in the world?”

The collection, curation, and display of long-term data on relevant ocean and coastal conditions such as temperature, pH, and species occurrence and other such long-term data records are critical and should be encouraged and facilitated at BML. They provide a rationale justifying the need for any field research station, and serve as a tool for not only leveraging additional research, but also for stimulating the teaching and outreach contributions as well (example: the long-term record on lake clarity at Lake Tahoe and the Tahoe Environmental Research Center). Furthermore, such long-term data records can be an excellent way for science to motivate stakeholders toward consensus regarding state of an ecosystem, as has happened at Tahoe.

3. The BML budget should be increased from several sources. The supplements for faculty with FTEs in other units should be continued, and expanded if other faculty relocate. These are contributions to the BML budget that relate to the basic lab space used by these faculty, whose main lab space is not provided on the UCD campus in Davis. These supplements should not be viewed as “instead of overhead return”, since overhead return goes to departments for providing facilities and services for that specific new research. Overhead return from grants originating in

other units should be split with BML, which is not currently the case. Funds for academic programs should come, in part, from the colleges based on the student credit hours taught at BML and by BML faculty teaching on the Davis campus.

4. Maintenance and Facilities Improvement. In common with other large marine laboratories around the country, BML has had to defer maintenance and replacement of facilities especially during recent years of annually diminishing budgets. Although BML has quite a lot of space overall, much of it is not usable for current needs, and some parts could soon be unsafe to occupy (e.g. decaying concrete). The North building is in the worst condition, needing a new roof as well as repair or replacement of concrete walls and pillars. There is certainly a question here of repair or replace, but that would take a careful consideration of the engineering studies that have been done, and will be done, before such a decision is made. Substantial additional annual funding is needed, at least for a defined period, to take care of deferred maintenance. \$500,000 per year was suggested as a reasonable figure, and this is comparable to what other university marine laboratories have been provided in recent years. We understood that \$250,000 will be available soon through CMSI and that the Office of Research has committed \$1.3 million for the first phase of renovation. During the planning for these renovations, serious consideration should be given to alternative energy sources including wind and solar power wherever possible. Students and faculty noted that small boats were sometimes unavailable or unusable because of lack of regular maintenance, and that the seawater system was partially shut down (now) limiting their tank space for research. Increased funds for maintenance should improve both issues.

5. Individual research laboratories for faculty are currently not all of adequate size, and there is likely to be additional need for such labs as CMSI develops and more faculty from Davis use BML. BML may also want to set aside some labs as visitor space for collaborators of resident faculty, soft-money researchers, postdocs, or others, and charge appropriate fees for use of that space for faculty from other universities. There are a few areas where renovation alone could increase the utility of the current space, such as in the courtyard area of the South Building, and this should certainly be done. A major renovation of the North building, and/or an addition to the South Building, could help in this regard.

6. The academic program at BML should be expanded and promoted through CMSI. Additional faculty are needed at BML to expand both academic and research capacity; there has not been a faculty hire in 8 years, and there are currently no assistant professors resident at BML. The new CMSI major will benefit greatly from additional courses at BML, which could expand into fall in addition to spring and summer offerings. Department Chairs should be incentivized to have their faculty use BML facilities or be resident there; this could happen through partial FTES at BML, or other direct benefits.

Faculty resident at BML noted that when they teach in Davis, their time commitment is increased because of weekly, or twice weekly, travel, and their courses at BML are often more time intensive (e.g. all day classes) so their effective teaching load is higher than usual. BML should be encouraged to maintain its focus on courses that utilize the local habitats and organisms well, and that provide a solid background for their future research. Furthermore, the increased workload of BML faculty maintaining teaching and research programs both on the

Davis campus and at BML must be taken into account when evaluating merit and promotion cases. The current lack of sensitivity to this problem is a disincentive for both BML faculty efforts and connections between BML and the UCD campus.

With the addition of a Marine Science major under CMSI coordination, and increased enrollments, a greater diversity of marine lab courses may be required. These could be taught by main-campus faculty who are assigned to teach on the coast, or they could be handled by the resident faculty by relieving them of some of their main-campus teaching responsibilities. Either way, it may be helpful to move BMS classes into the regular departmental listings so that teaching assignments can be made reciprocally, without regard to the locations of faculty offices.

7. The BML Director position should remain an active faculty position, but it could be increased from 50% to 100% administration, or something in between. The current director is still doing a lot of teaching, but that is not necessary. Similar positions at other labs are 100% administration, with some expectations of teaching and research. If the Director becomes Associate Director of CMSI, this could provide the additional funds to increase the percentage. The director should also be supported with **adequate administrative staff**. Because of budget cuts over several years, we understood that one person (now retired) is now covering the work that was done by five staff in past years. Clearly, not all that work can still be done and the next person in that position may have a harder time keeping all the pieces together. Other staff needs include IT assistance and data management, which is now done primarily in one research lab, but should be centralized for the valuable long-term data sets being generated.

8. Accommodations at BML are not sufficient, and are not affordable for students. According to the graduate students, housing is often not used because it is too expensive. In addition to long-term stays, students need access to short-term inexpensive housing when they visit BML to conduct specific research tasks, sometimes just for a night or two. Other labs have a diverse array of accommodations, from dorms to mobile homes, to high-end units that visiting faculty and administrators would find appealing; the pricing is usually set by the director, and may vary with season. At BML, it appears that potential income is being lost because housing is going unused, and there may not be enough options at present. We were shown plans for additional housing, conference, and education facilities at a site off the BML campus, at the head of the bay; such a center might be able to supply the higher end housing, and conversion or additions to the existing units could provide the less expensive options. If it is impossible to set affordable rates, soliciting donations or other funding to offset the cost for graduate students would be advisable.

9. Advancement. Although some specific donations have assisted BML, there does not appear to be an active and aggressive advancement structure that generates a reliable income stream. Other labs do this through a Development or Advancement Board comprising local well-connected individuals, alumni of the lab, and others. Such a board is often assisted by a full or part-time Advancement Officer whose sole duty is to assist and encourage that group, at that specific location – often with the assistance of other Advancement staff on the main campus. Some boards also serve an advisory function, and may include senior scientists from other universities who have ties to the lab. If the board is active, they can generate several hundred

thousand dollars per year in smaller donations from lab alumni and friends, and sometimes a few very large donations for specific needs. BML, working with CMSI, should be encouraged to develop such a board – often, people who own first or second homes nearby are very interested in activities that promote conservation, science education, or scientific inquiry of the local ecosystem.

10. Outreach. BML does a great job with outreach using existing resources, and many volunteers in their docent program. The numbers of visiting students and adults going through BML each year are very impressive, and there are adequate displays and exhibits for them to view. Like other portions of BML, however, these displays and exhibits are in need of regular maintenance, without which they will become both ineffective and an embarrassment with respect to the tens of thousands of annual visitors to the lab. It would be beneficial to have an outreach coordinator on the BML staff, and it is possible this person would also work with the Advancement Board. Often, such boards are very supportive of outreach activities in the local community. The opportunity of developing the BML facilities into a more accommodating and sought after conference center could multiply by many times the outreach impact.

11. Graduate students should be further encouraged to conduct their research at BML, and some of the impediments to that should be ameliorated. These could include providing less expensive short-term housing, alternative travel arrangements between Davis and BML, video-conferencing, short-term housing on the Davis campus (for BML resident students), and a more organized orientation for new graduate students at BML. Students noted that they cannot use some of the support structure at UCD, such as day care, while at BML so expenses are higher. They also note that it is much easier to have undergraduates work with them on the Davis campus, as interns, than at BML because undergraduates taking courses at BML have no free time during the week in which to participate. BML should explore ways of supporting undergraduates in research internships (for credit) in some creative way. Even bussing them out to BML for one or two days a week could be useful.

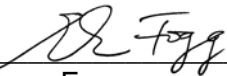
12. Postdoctoral Researchers. CMSI has proposed that some of its funding be used for salaries of two postdoctoral researchers. These positions should be funded, and should have a direct tie to BML. As described, one might be based at BML, but have some collaboration or other activity on the UCD main campus. The other could be based in Davis, but spend some time working at BML. Students and faculty noted that the BML postdoc positions was lost in recent budget cuts, but that the postdocs at BML served an important function as mentors for the graduate student group, as well as collaborators with faculty.

Report respectfully submitted by:



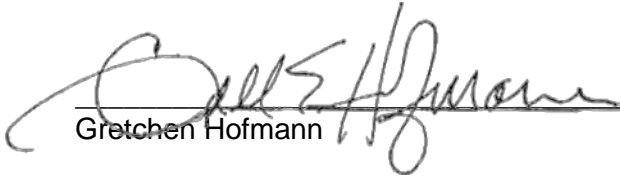
Ken Sebens, Chair

4/24/2014
Date



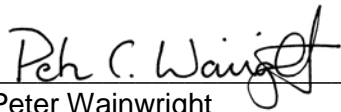
Graham Fogg

4/14/2014
Date



Gretchen Hofmann

5/5/2014
Date



Peter Wainwright

4/4/2014
Date



Craig Young

4/21/2014
Date



College of Agricultural and Environmental Sciences
Office of the Dean
150 Mrak Hall
One Shields Avenue
Davis, CA 95616
(530) 752-1605

October 17, 2014

Dear Vice Chancellor Lewin,

Thank you for the opportunity to comment on the Bodega Marine Laboratory (BML) 5-year Organized Research Unit (ORU) review. Members of the College of Agricultural and Environmental Sciences participated in the review and several of our faculty have strong research projects at the BML. Clearly the BML will be a center for research excellence on climate change and the effects on sea level rise, acidification, etc. The collaborative research being conducted at the BML is top-notch and on the cutting edge, and the scientists working at the BML are poised to lead the nation in marine research.

The review was well executed and the document contains good recommendations. My only concern is that our limited college resources are strained and many of the recommendations require financial inputs that largely are not available.

I agree with the recommendations and hope institutional support from your office can continue.

Sincerely,
Helene

Helene R. Dillard, Ph.D.
Dean
College of Agricultural and Environmental Sciences
University of California, Davis
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One Shields Avenue
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TEL (530) 752-1605
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October 18, 2014

Harris Lewin, PhD
Vice Chancellor for Research
Office of Research
University of California, Davis
1850 Research Park Drive
Suite 300
Davis, CA 95618

SCHOOL OF VETERINARY MEDICINE
OFFICE OF THE DEAN
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<http://www.vetmed.ucdavis.edu/about/lairmore.cfm>

Dear Vice Chancellor Lewin (Harris):

This letter serves to comment on the recent review of the Bodega Marine Laboratory (BML) conducted by the Office of Research. The review appeared to be quite thorough and the panel contained the appropriate expertise needed to evaluate the unit. Based on the review and my knowledge of the BML over the past 3 years, it is clear that the research, educational, and outreach programs at BML have been unfailingly excellent and trans-disciplinary in their approach to critical issues faced by our marine, estuarine and terrestrial environments. Considering the importance of the coastal and marine environment to California and the nation, the BML is positioned well to address fundamental questions about the ecology, evolution and coastal oceanography.

The BML has historically and in the past 5 years served a unique educational role in the offerings of UC Davis. It is clear that the undergraduate and graduate programs offered by BML faculty are a magnet for students interested in marine biology and the ecology of ocean environments. The BML has exploited its relatively unspoiled open coastal ecosystem location to support unique research and educational programs. The scientific programs appear to have appropriate focus in the areas of ecology and evolution, coastal oceanography, climate change biology and ocean health. Faculty members of the BML and affiliated programs have been significantly productive despite facing constraining resources over the past 5 years. Notable areas of traditional research strength include the physiology and development of marine animals, endocrine biology in crustaceans and the development of sensitive bioassay models for studying the effects of chemical pollutants in marine and estuarine systems.

I would concur with the review panel's observation that the BML efforts in coastal oceanography are an excellent example of interdisciplinary research that exploits the unique location of the BML. It appears that the BML resident faculty members have leveraged the coastal region by conducting important studies to monitor the impacts of environmental change on marine organisms. Timely research programs have focused on pollution and toxicant sources to document the impacts of toxicants entering water sources. The BML and the development of the Coastal and Marine Institute offer a significant opportunity for UC Davis to become a world

leader in studies devoted to the impact of climate change on the coastal and marine life of California.

The newly created CMSI should help coordinate and foster UC Davis faculty and students from multiple programs to help maximize the use and development of the BML. I do feel that the BML has great potential to provide critical infrastructure to the emerging mission of the CMSI. As the CMSI becomes established it will be very important for the Office of Research and affiliated schools and colleges to create incentive based policies to encourage faculty research and educational programs. The suggested strategies of improved outreach programs that engage the surrounding community that is linked to development is important and vital to the future of the BML. Examples of citizen-science and community based engagement should be exploited to link the needs of the BML to the future of the region. Active development of the BML as a vital community resource will likely expand resources and promote the mission of the BML and CMSI. Strategic planning to focus the research, educational and outreach goals of the BML and CMSI must be integrated and synergistic to maximize this opportunity. Strong and coordinated leadership and administrative structures will be needed to move the BML forward. These plans must include strong business and fiscal goals that are linked to the academic missions of the BML and CMSI. In this regard, the linkage of the Sierra-to-the-Sea concept has the potential to be a guiding principle that will propel the units into the world spotlight and make the BML a model for the world. While not mentioned in the review report, a number of other scientific programs beyond the traditional collaborations of the BML may provide new opportunities for collaborative research in marine mammal biology and their relationship to the coastal ecosystem. Strategic plans that include outreach to foster research, educational, and community partnerships should be a continuing goal of the BML. Finally, the role of BML supported science and its influence on government policies related to coastal and marine environments, climate change, and sustainable aquaculture provide unique opportunities for the future of the BML and CMSI.

Sincerely,

A handwritten signature in blue ink that reads "Michael D. Laimore". The signature is written in a cursive, flowing style.

Dean
School of Veterinary Medicine

Christine Parks

From: Perry King
Sent: Tuesday, July 01, 2014 12:23 PM
To: Paul Dodd
Cc: Nancy A Bulger; Christine Parks
Subject: FW: REQUEST FOR COMMENTS: BML Review Committee Report

Please see below

Perry King
Executive Analyst for
Vice Chancellor – Office of Research
UC Davis
1850 Research Park Drive
Suite 300
Davis, CA 95618
530-754-1025 office
530-304-8137 cell
pking@ucdavis.edu

From: Cristyn Gunther
Sent: Tuesday, July 01, 2014 9:05 AM
To: Harris A Lewin
Cc: Perry King
Subject: RE: REQUEST FOR COMMENTS: BML Review Committee Report

Comments on BML review from Dean Navrotsky:

Overall I agree with the report. The main issue is inadequate funding, which limits grad student and postdoc opportunities and appropriate interactions with the Davis campus. Both the graduate program and the new undergrad major need more support. The major challenge is where the money will come from.

Alexandra Navrotsky
Interim Dean
Mathematical and Physical Sciences
navdean@ucdavis.edu

From: Perry King
Sent: Thursday, May 22, 2014 9:48 AM
To: Alexandra Navrotsky (DEAN)
Cc: Cristyn Gunther; Paul Dodd; Nancy A Bulger; Christine Parks
Subject: REQUEST FOR COMMENTS: BML Review Committee Report

Interim Dean Navrotsky, attached is a formal request for comments from Vice Chancellor Lewin on the Bodega Marine Laboratory (BML) 5-Year Organized Research Unit (ORU) review. Please send your comments and feedback to VC Lewin at lewin@ucdavis.edu by **Thursday, July 3, 2014**. Thank you.

Perry King

Bodega Marine Laboratory

Gary Cherr, Interim Director and Patrick Helbling, Associate Director

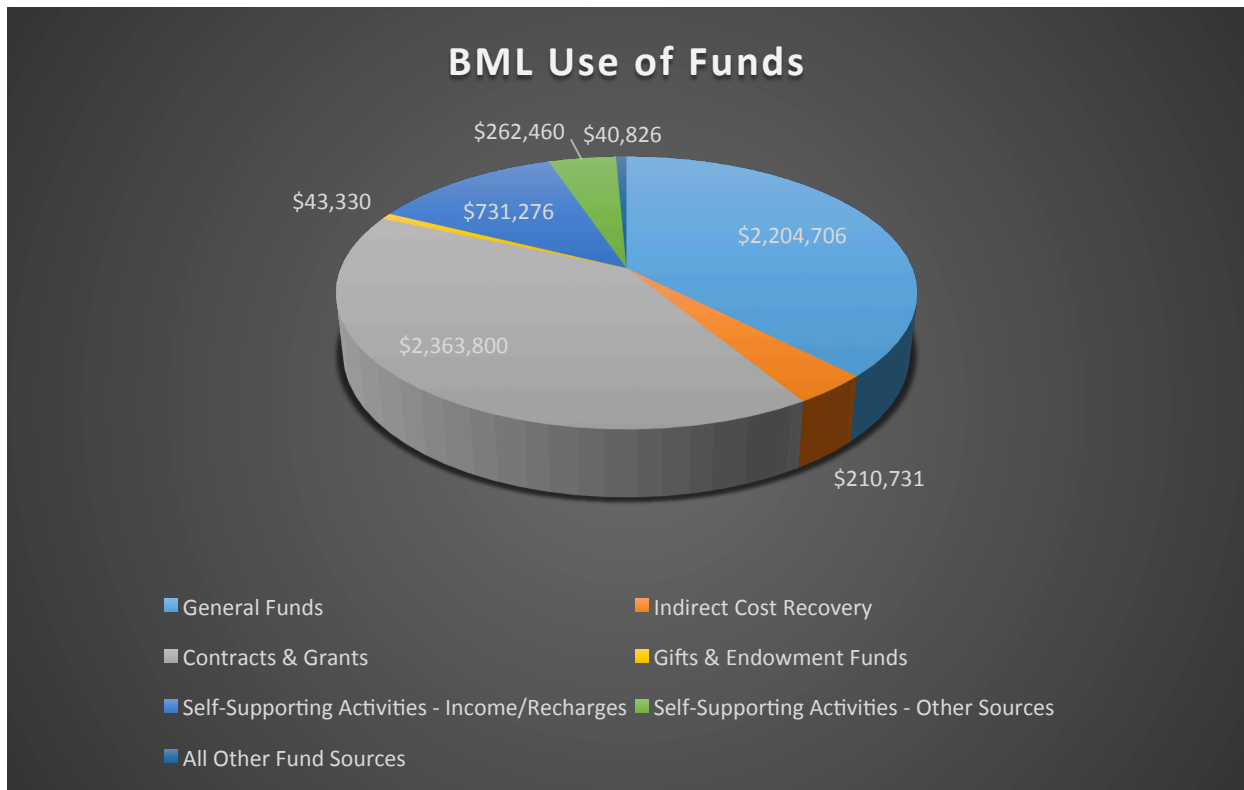
Response to Academic Senate Inquiries

1. What is the total budget for BML? The Committee on Planning and Budget would like a breakdown of the budget and explanation of what the funds are spent on (staff, outreach, facilities, etc.)

The Use of Funds below are shown as per year average expended over the last five years of operation:

General Funds	2,204,706
Indirect Cost Recovery	210,731
Contracts & Grants	2,363,800
Gifts & Endowment Funds	43,330
Self-Supporting Activities – Income/Recharges	731,276
Self-Supporting Activities – Other Sources	262,460
All Other Fund Sources	40,826
*Total	5,857,129

(*Excluding the extramural component, the operational budget is ~ \$3.5M, of which more than \$3 M supports academic & support staff.)



General Funds - \$2,204,706

General Funds are primarily used for salaries and benefits to support administration services, instructional support and research, facilities systems and infrastructure, and academic salaries. It should be emphasized that BML's operating budget within the General Funds category includes benefits funding. The cost of benefits and corresponding funding has increased dramatically over the last five years – surpassing 50% today in most payroll categories, giving the illusion that operating funding steadily increased, when in fact it merely eroded the operating margin for BML; thus reducing available reserve resources each year to cover the increases.

Indirect Cost Recovery - \$210,731

These are funds that are derived from overhead charges against contract and grant awards that pass through UCOP, and then are returned to the UCD Office of Research and distributed based on an internal OR calculation. This funding is now supplanting general funds as a main source of the lab's non-payroll operating budget. Although the percentage received by BML has increased, the actual amount received will fluctuate from year to year, based on the contract and grant activity within the previous year. Activities for these funds include director's research support, development/public outreach activities, instructional and programmatic activities, support for a replacement roof on the North Wing of the lab and ongoing support for an HVAC Technician.

Contracts & Grants - \$2,363,800

Contract and grant awards are secured by faculty and PIs to support ongoing research obligations. Contracts and Grants comprise the majority of restricted funding for BML. Of the multiple active awards, work continues in such diverse areas as environmental implications of nanotechnology, ocean acidification through a multi-campus research program initiative, commitments to ocean observation and monitoring through the CENCOOS network, larval behavior, and UV Sterilization of seawater to name a few. NSF funding represents 45% of all funds.

Gifts & Endowment Funds - \$43,330

These include two endowments (Mulder and Heitz) and BML's various donors gift accounts.

Self-Supporting Activities – Income & Recharges - \$731,276

These funds represent activities within BML's recharge units: Housing and Dining provides rooms and meals for students and visiting researchers; Physical Plant provides maintenance and repairs for BML structures; Aquatic Resources Group maintains BML's life-support systems, and also designs and modifies existing systems to meet the changing needs of each PI and researcher; Small Boat Services maintains and provides small boats for PIs and researchers in the pursuit of their research; the Research Vessel Mussel Point is used by PIs and researchers for more advanced ocean work beyond the capabilities of Small Boat Services; and a series of lease agreements with NOAA and California Fish & Wildlife also contribute to this budget category.

Self-Supporting Activities – Other Resources - \$262,460

These include revenues attributed to BML's public education and outreach programs, the UCD-wide Dive Safety Program and UCD-wide Boating Safety Program, both coordinated and housed at BML.

All Other Fund Sources - \$40,826

This category is entirely composed of funding from Summer Sessions Student Fees to support BML summer classes. These funds are used by faculty to support graduate students and research activities, and are held mostly by PIs for discretionary use.

2. If additional support/funding from the central campus is being requested, where would that additional support be used within BML?

- Deferred Maintenance

BML concurs with the recommendation from the *ad-hoc* committee that it pursue funding in support of the Facilities Condition Assessment prepared by the Division of Strategic Planning in 2011 that documents a multi-year commitment towards deferred maintenance.

In 2011 a campus facilities management team of 30 technicians, engineers and facilities experts visited BML with the charge to evaluate the condition of BML's facilities and systems, and determine the investment required to address/correct major and minor deficiencies. After inspecting and evaluating the condition of the facility, equipment and systems, the team determined that the facilities/systems were in dire need of deferred maintenance funding to address mission-critical repairs and upgrades. The report concluded that \$4,600,000 would be the investment required to correct major and minor deficiencies.

BML Facilities Assessment					
	Critical	Critical	Critical	Critical	
Location	Year 1	Year 2	Years 3 - 5	Years 6 - 10	Total
All Buildings		25,000			25,000
Boat House		14,300			14,300
Dive Locker	21,000				21,000
Greenhouse				5,095	5,095
North Lab	633,417	524,000	382,621		1,540,038
Pump House	15,979	6,200			22,179
Salmon Shed			45,125	56,500	101,625
South Lab	425,000	576,650	472,000	120,647	1,594,297
Storage	6,225		7,360		13,585
West Lab	147,000		432,750	670,000	1,249,750
Total	1,248,621	1,146,150	1,339,856	852,242	4,586,869

Although BML’s budget reflects a line item for preventative maintenance, these resources have historically been absorbed in reacting to the critical needs defined in the Facilities Condition Assessment report. If the critical needs could be addressed and corrected, then annual funding for preventative maintenance would be applied to equipment and systems as required.

- Academic Program

The academic program at BML should be expanded and promoted through affiliated on-campus departments and CMSI – Coastal and Marine Sciences Institute. The BML faculty unanimously agree that additional resident faculty are needed at BML to expand academic and research capabilities. In addition, maintaining the current resident faculty numbers is also critical, since demographics would suggest retirements will occur over the next 5 years. As pointed out by the *ad-hoc* committee, there has not been a resident faculty hire in 8 years, and only 1 associate professor is currently in residence. With the establishment of CMSI and the new MCS – Marine & Coastal Science major, as well as the developing Marine Science graduate group, new research and instructional activities will take root at BML and additional resident FTEs will be required.

- Development Position

As the *ad-hoc* committee pointed out, BML does have great potential for development. However there has been minimal attention paid to it by campus development staff in the past. In part, the multi-year time frame required for the establishment of CMSI placed development activities for BML in a holding pattern. Now is the time to increase these efforts as BML approaches its 50th anniversary in 2016. For example, BML has identified ~1700 students (now age 50-85) who took classes at BML (or in the Bodega Bay region,) with an additional ~1200 younger students identified since 1985. These students’ experiences, often described as “life changing”, provide a potential largely unexploited income stream.

As reduced state funding continues to be a challenge for the university, private funding has become increasingly important, and the efforts of a full time, qualified development person devoted specifically to BML and CMSI becomes even more vital. While not a directly comparable situation, Scripps Institution of Oceanography at UCSD has 7 dedicated development positions with annual gifts of \$5,350,000 in 2014. It should be noted that a good development person can be expected to raise between \$750,000 and \$1,000,000 annually. The development officer partially assigned to BML has departed in January, 2015, so this may be a good opportunity to broaden the investment in this vital area.

A qualified development person dedicated to BML and CMSI would be better able to understand and promote the lab's contributions and accomplishments, the current research being conducted, and better positioned to convey BML's vision for the future. These advantages would afford more effective communication with potential donors, and fuller engagement in the process of cultivating existing donor relationships and building new ones.

3. What would the effects be on BML if it were part of a college or school, rather than an ORU?

In order to address the question objectively, we endeavored to identify another existing ORU structured like BML reporting to a college or school, but were unsuccessful. Although many universities have research units connected to colleges and schools, none matched the interdisciplinary and multiple college model of BML. Our review did provide several examples of research units reporting to colleges and schools, but they were generally housed within one college or school, reporting to the Dean. Because no other model exists to our knowledge, substantial due diligence would be required if there was interest in a change in structure.

With that said, the present reporting structure of BML as an independent ORU reporting to the Office of Research can be evaluated, and the consensus within BML following that evaluation concurs with the *ad-hoc* committee's recommendation that "...BML should remain as an ORU." Particular points include:

- There is a history of BML operating as an ORU. It meets the definition of an ORU as defined in the *Administrative Policies and Procedures Concerning Organized Research Units* policy from UCOP:

An Organized Research Unit (ORU) is an academic unit the University has established to provide a supportive infrastructure for interdisciplinary research complementary to the academic goals of departments of instruction and research. The functions of an ORU are to facilitate research and research collaborations; disseminate research results through research conferences, meetings and other activities; strengthen graduate and undergraduate education by providing students with training opportunities and access to facilities; seek extramural research funds; and carry out university and public service programs related to the ORU's research expertise.

- The present situation affords greater stability for funding.

The base funding portion for BML is around \$2,200,000 annually, and is distributed by the Office of Research. It is primarily designated for salaries and benefits. The remainder of BML's budget

is composed of funds raised through self-supporting activities, gifts, leases, indirect cost returns and related agreements.

BML, for the most part, has autonomy on the use of the funds, but OR has ultimate authority on how the funds are spent. Presently, they require that we demonstrate fiscal control by staying within the confines of our proposed annual budget, and keep them advised on the YTD status of our spending, as well as regular year-end projection assumptions. The Office of Research is one entity operating within a familiar model that BML has a history with. When weighed against the option of moving BML under the banner of a College(s) or School(s,) it is unknown what the impact would be with respect to the distribution of the base-funding component, particularly when multiple colleges/schools are involved.

- Remaining as an ORU presents the best potential for maintaining BML's interdisciplinary character and independence.

The present structure maintains budgetary influence and scientific autonomy for BML, reinforces BML as a complementary but distinct asset, and provides an avenue for CMSI that is unencumbered, while also affording it the best playing field to grow and develop. Presently, BML has a relatively linear reporting structure: BML linking to OR on the front end and CMSI linking to BML on the back end. Moving BML under a multiple college/school banner model would initiate potential oversight conflicts among the colleges/schools involved, with Deans that have – according to all BML resident faculty - *“no imperative to work with each other despite potential interest to do so”* and the process of *“addressing cooperation”* is, at this time, not yet defined.

According to the *ad-hoc* committee's report, *“CMSI reports to a Lead Dean in the College of Biological Sciences, which is appropriate and necessary. However, BML currently reports to the Vice Provost [VC] for Research, and operates as an ORU. Given the multiple college affiliations of BML faculty, it is important to maintain that reporting structure for the Director of BML.”* All BML resident faculty agree with the committee's recommendation that the BML Director should continue to report to the Vice Chancellor for Research, independent of the CMSI Director.

FIVE YEAR REVIEW - Sources & Uses

Bodega Marine Laboratory (BOML)

SOURCES OF FUNDS		2009-10	2010-11	2011-12	2012-13	2013-14
Base Budget						
General Funds		\$ 1,305,935	\$ 1,309,028	\$ 1,205,404	\$ 1,789,081	\$ 1,921,004
Indirect Cost Recovery		\$ 108,281	\$ 108,281	\$ 108,281	\$ 108,412	\$ 108,412
Contracts & Grants		\$ -	\$ -	\$ -	\$ -	\$ -
Gifts & Endowment Funds - Unrestricted		\$ -	\$ -	\$ -	\$ -	\$ -
Gifts & Endowment Funds - Restricted		\$ 5,570	\$ 6,023	\$ 6,566	\$ 7,087	\$ 7,535
Self Supporting Activities - Income & Recharges		\$ -	\$ -	\$ -	\$ -	\$ -
Self Supporting Activities - Other Sources		\$ 143,007	\$ 143,007	\$ 143,007	\$ 143,007	\$ 143,007
All Other Fund Sources		\$ -	\$ 11,000	\$ 11,000	\$ 11,000	\$ 11,000
Total Base Budget		\$ 1,562,793	\$ 1,577,339	\$ 1,474,258	\$ 2,058,587	\$ 2,190,958
Current Budget						
General Funds		\$ 2,712,893	\$ 2,978,416	\$ 3,061,032	\$ 2,489,202	\$ 2,518,544
Indirect Cost Recovery		\$ 193,739	\$ 248,220	\$ 311,103	\$ 578,675	\$ 629,973
Contracts & Grants ¹		\$ 2,524,873	\$ 2,355,260	\$ 2,039,097	\$ 2,435,754	\$ 2,464,018
Gifts & Endowment Funds - Unrestricted		\$ 21,701	\$ -	\$ -	\$ -	\$ -
Gifts & Endowment Funds - Restricted		\$ 342,571	\$ 254,154	\$ 252,397	\$ 261,542	\$ 268,571
Self Supporting Activities - Income & Recharges ²		\$ 803,738	\$ 717,446	\$ 678,080	\$ 718,724	\$ 813,070
Self Supporting Activities - Other Sources ³		\$ 298,460	\$ 345,749	\$ 604,564	\$ 851,885	\$ 622,314
All Other Fund Sources		\$ 116,155	\$ 104,853	\$ 114,664	\$ 110,164	\$ 98,613
Total Sources of Funds		\$ 7,014,129	\$ 7,004,097	\$ 7,060,937	\$ 7,445,946	\$ 7,415,101

¹ For the purpose of this report, source of funds is equivalent to use of funds per the ledger for "Contracts & Grants". The source of funds will not tie to the ledger.

² Includes year-to-date activity in the expenditure column for object consolidations INCO & SUB9 in Sub Fund Group Type 6, M & Y

³ Includes activity in the budget column for object consolidations INCO & SUB9 in Sub Fund Type Group M (University Related Events & UCD Education)

USES OF FUNDS		2009-10	2010-11	2011-12	2012-13	2013-14
General Funds		\$ 1,878,627	\$ 2,017,237	\$ 2,505,835	\$ 2,298,227	\$ 2,323,606
Indirect Cost Recovery		\$ 129,500	\$ 116,785	\$ 147,027	\$ 344,723	\$ 315,621
Contracts & Grants		\$ 2,524,873	\$ 2,355,260	\$ 2,039,097	\$ 2,435,754	\$ 2,464,018
Gifts & Endowment Funds - Unrestricted		\$ 21,701	\$ -	\$ -	\$ -	\$ -
Gifts & Endowment Funds - Restricted		\$ 117,485	\$ 32,579	\$ 24,180	\$ 27,339	\$ 15,067
Self Supporting Activities - Income & Recharges		\$ 654,223	\$ 735,952	\$ 714,087	\$ 700,814	\$ 851,303
Self Supporting Activities - Other Sources		\$ 140,389	\$ 181,560	\$ 188,322	\$ 413,441	\$ 388,587
All Other Fund Sources		\$ 59,810	\$ 34,793	\$ 54,020	\$ 34,165	\$ 21,344
Total Uses of Funds		\$ 5,526,608	\$ 5,474,166	\$ 5,672,569	\$ 6,254,463	\$ 6,379,546

FIVE YEAR REVIEW - Sources & Uses

Bodega Marine Laboratory (BOML)

CARRY FORWARD excluding Contracts & Grants	2009-10	2010-11	2011-12	2012-13	2013-14
<u>Carry Forward \$</u>					
General Funds	\$ 834,266	\$ 961,178	\$ 555,197	\$ 190,975	\$ 194,937
Indirect Cost Recovery	\$ 64,239	\$ 131,435	\$ 164,076	\$ 233,952	\$ 314,352
Gifts & Endowment Funds - Unrestricted	\$ -	\$ -	\$ -	\$ -	\$ -
Gifts & Endowment Funds - Restricted	\$ 225,086	\$ 221,575	\$ 228,217	\$ 234,203	\$ 253,504
Self Supporting Activities - Income & Recharges (Accumulated) ⁴	\$ 114,649	\$ 65,747	\$ 12,743	\$ 33,331	\$ (1,333)
Self Supporting Activities - Other Sources	\$ 158,071	\$ 164,189	\$ 416,241	\$ 438,444	\$ 233,727
All Other Fund Sources	\$ 56,345	\$ 70,060	\$ 60,644	\$ 75,999	\$ 77,268
Total Carry Forward \$	\$ 1,452,656	\$ 1,614,184	\$ 1,437,118	\$ 1,206,903	\$ 1,072,456
<u>Carry Forward % of Expenditures</u>					
General Funds	44.4%	47.6%	22.2%	8.3%	8.4%
Indirect Cost Recovery	49.6%	112.5%	111.6%	67.9%	99.6%
Gifts & Endowment Funds - Unrestricted	0.0%	n/a	n/a	n/a	n/a
Gifts & Endowment Funds - Restricted	191.6%	680.1%	943.8%	856.7%	1682.6%
Self Supporting Activities - Income & Recharges	17.5%	8.9%	1.8%	4.8%	(0.2%)
Self Supporting Activities - Other Sources	112.6%	90.4%	221.0%	106.0%	60.1%
All Other Fund Sources	94.2%	201.4%	112.3%	222.5%	362.0%
Total Carry Forward % of Expenditures	48.4%	51.8%	39.6%	31.6%	27.4%

⁴ Carry forward for "Self Supporting Activities - Income & Recharges" is not a calculation of current year sources of funds less uses of funds, but reflects the cumulative surplus/(deficit) per DaFIS DS FIS193 report.

SELF SUPPORTING ACTIVITIES					
Income and Recharges	June Final, 2010	June Final, 2011	June Final, 2012	June Final, 2013	June Final, 2014
Accumulated Balance: July 1 - Surplus/(Deficit)	\$ 19,994	\$ 114,649	\$ 65,747	\$ 12,743	\$ 33,331
0500 - TO OR FROM RENEWAL & REPLACEMENT RESERVE	\$ (7,250)	\$ (7,411)	\$ (7,411)	\$ -	\$ -
0520 - CAPITAL OUTLAY	\$ -	\$ -	\$ -	\$ -	\$ -
0701 - AUX & SVC ENT & OTHER FDS BAL TO RESERVE	\$ (24,000)	\$ (24,000)	\$ (12,000)	\$ -	\$ -
0810 - STIP INVST.INCOME ON CURRENT FDS	\$ 3,891	\$ 3,015	\$ 2,414	\$ 2,677	\$ 3,570
0901 - TRFR BETWN SAME/MINOR FUND GROUP	\$ (27,501)	\$ (2,000)	\$ -	\$ -	\$ -
Adjusted Accumulated Balance - Surplus/(Deficit)	\$ (34,866)	\$ 84,253	\$ 48,750	\$ 15,420	\$ 36,901
Total Income & Recharges	\$ 803,738	\$ 717,446	\$ 678,080	\$ 718,724	\$ 813,070
Total Expenditures	\$ 654,223	\$ 735,952	\$ 714,087	\$ 700,814	\$ 851,303
Net Income/(Loss) - Year to Date	\$ 149,515	\$ (18,506)	\$ (36,007)	\$ 17,910	\$ (38,234)
Ending Accumulated Balance - Surplus/(Deficit)	\$ 114,649	\$ 65,747	\$ 12,743	\$ 33,331	\$ (1,333)
Surplus/(Deficit) Ratio	17.5%	8.9%	1.8%	4.8%	(0.2%)

FIVE YEAR REVIEW - Sources & Uses

Bodega Marine Laboratory (BOML)

CONTRACTS & GRANTS	2009-10	2010-11	2011-12	2012-13	2013-14
Number of Awards	18	10	12	12	14
Amount of Awards	\$ 2,879,709	\$ 1,761,504	\$ 2,353,570	\$ 1,693,122	\$ 2,227,668

INDIRECTS GENERATED	2009-10	2010-11	2011-12	2012-13	2013-14
Federal	\$ 327,625	\$ 365,488	\$ 309,325	\$ 435,526	\$ 309,762
State	\$ 70,550	\$ 42,949	\$ 37,184	\$ 45,257	\$ 39,524
Private	\$ 70,170	\$ 109,664	\$ 85,700	\$ 82,177	\$ 133,090
Clinical Trials	\$ -	\$ -	\$ -	\$ -	\$ -
Local	\$ 33,514	\$ 7,148	\$ 45,929	\$ 53,311	\$ 26,400
Other	\$ -	\$ -	\$ -	\$ -	\$ -
Total Indirects Generated	\$ 501,860	\$ 525,249	\$ 478,138	\$ 616,272	\$ 508,776

RETURN ON INVESTMENT (ROI) ⁵	2009-10	2010-11	2011-12	2012-13	2013-14
Total Base Budget	\$ 1,562,793	\$ 1,577,339	\$ 1,474,258	\$ 2,058,587	\$ 2,190,958
Less: Benefits Decentralization ⁶	\$ -	\$ -	\$ -	\$ (568,543)	\$ (602,055)
ADJUSTED Base Budget	\$ 1,562,793	\$ 1,577,339	\$ 1,474,258	\$ 1,490,044	\$ 1,588,903
Contracts & Grants (Uses)	\$ 2,524,873	\$ 2,355,260	\$ 2,039,097	\$ 2,435,754	\$ 2,464,018
ROI: Contracts & Grants	61.56	49.32	38.31	63.47	55.08
Total Gifts & Endowment Funds (Sources)	\$ 364,272	\$ 254,154	\$ 252,397	\$ 261,542	\$ 268,571
ROI: Gifts & Endowment Funds	0.00	0.00	0.00	0.00	0.00

⁵ Negative ROI is displayed as a "0" value, as base funding is not actually lost, but rather it did not generate a positive ROI

⁶ Prior to FY2012-13, employee benefits on qualifying fund sources were centrally managed by campus. Effective July 1, 2012 (FY12/13), the campus adopted a new funding model that included the decentralization of benefits. Under the former methodology, funding to cover the monthly cost of employee benefit expenses were automatically allocated in the general ledger to the account to which the expenses were incurred. With the decentralization of benefits, base funds was transferred from central campus to the respective school/college and further allocated to the operating units. For consistency and comparative purposes, ROI calculations reflects the base budget amount net of benefit funding.

FIVE YEAR REVIEW -- APPENDIX

Bodega Marine Laboratory (BOML)

USES OF FUNDS	2009-10	2010-11	2011-12	2012-13	2013-14
General Funds					
Academic Salaries	\$ 229,874	\$ 220,407	\$ 229,240	\$ 237,836	\$ 249,352
Staff Salaries	\$ 798,059	\$ 779,557	\$ 964,725	\$ 957,406	\$ 934,567
General Assistance	\$ 88,522	\$ 217,042	\$ 250,332	\$ 142,647	\$ 139,684
Benefits	\$ 348,632	\$ 425,093	\$ 524,859	\$ 544,351	\$ 614,832
Equipment	\$ 158,235	\$ 38,641	\$ 12,780	\$ -	\$ 6,091
Travel	\$ 17,552	\$ 15,022	\$ 24,054	\$ 9,365	\$ 21,990
Supplies & Expense	\$ 237,754	\$ 321,474	\$ 445,167	\$ 358,995	\$ 329,855
Scholarships & Fellowships	\$ -	\$ -	\$ 54,678	\$ 47,627	\$ 27,235
Other	\$ -	\$ -	\$ -	\$ -	\$ -
Sub-total: General Funds	\$1,878,627	\$2,017,237	\$2,505,835	\$2,298,227	\$2,323,606
Indirect Cost Recovery					
Academic Salaries	\$ -	\$ -	\$ -	\$ -	\$ -
Staff Salaries	\$ 30,786	\$ -	\$ -	\$ 16,289	\$ 11,273
General Assistance	\$ 34,088	\$ 48,609	\$ 53,396	\$ 136,311	\$ 127,507
Benefits	\$ 14,490	\$ 13,499	\$ 15,819	\$ 69,629	\$ 56,735
Equipment	\$ -	\$ -	\$ -	\$ -	\$ -
Travel	\$ 5,334	\$ 5,070	\$ 5,280	\$ 4,715	\$ 10,859
Supplies & Expense	\$ 44,802	\$ 49,607	\$ 72,532	\$ 117,780	\$ 109,247
Scholarships & Fellowships	\$ -	\$ -	\$ -	\$ -	\$ -
Other	\$ -	\$ -	\$ -	\$ -	\$ -
Sub-total: Indirect Cost Recovery	\$129,500	\$116,785	\$147,027	\$344,723	\$315,621
Contracts & Grants					
Academic Salaries	\$ -	\$ -	\$ -	\$ -	\$ -
Staff Salaries	\$ 9,991	\$ -	\$ 3,316	\$ 3,521	\$ 6,765
General Assistance	\$ 690,890	\$ 675,926	\$ 590,611	\$ 692,098	\$ 572,221
Benefits	\$ 168,531	\$ 167,194	\$ 181,924	\$ 206,576	\$ 181,312
Equipment	\$ 42,751	\$ 93	\$ 14,486	\$ 32,099	\$ 290,262
Travel	\$ 57,315	\$ 50,873	\$ 50,881	\$ 39,078	\$ 45,021
Supplies & Expense	\$ 995,241	\$ 935,925	\$ 323,803	\$ 418,004	\$ 311,863
Scholarships & Fellowships	\$ -	\$ -	\$ 396,149	\$ 428,106	\$ 547,799
Other	\$ 560,152	\$ 525,249	\$ 477,927	\$ 616,272	\$ 508,776
Sub-total: Contracts & Grants	\$2,524,873	\$2,355,260	\$2,039,097	\$2,435,754	\$2,464,018
Gifts & Endowment Funds - Unrestricted					
Academic Salaries	\$ -	\$ -	\$ -	\$ -	\$ -
Staff Salaries	\$ -	\$ -	\$ -	\$ -	\$ -
General Assistance	\$ -	\$ -	\$ -	\$ -	\$ -
Benefits	\$ -	\$ -	\$ -	\$ -	\$ -
Equipment	\$ -	\$ -	\$ -	\$ -	\$ -
Travel	\$ -	\$ -	\$ -	\$ -	\$ -
Supplies & Expense	\$ -	\$ -	\$ -	\$ -	\$ -
Scholarships & Fellowships	\$ -	\$ -	\$ -	\$ -	\$ -
Other	\$ 21,701	\$ -	\$ -	\$ -	\$ -
Sub-total: Gifts & Endowment Funds - Unrestricted	\$21,701	\$0	\$0	\$0	\$0

FIVE YEAR REVIEW -- APPENDIX

Bodega Marine Laboratory (BOML)

USES OF FUNDS	2009-10	2010-11	2011-12	2012-13	2013-14
<u>Gifts & Endowment Funds - Restricted</u>					
Academic Salaries	\$ -	\$ -	\$ -	\$ -	\$ -
Staff Salaries	\$ -	\$ -	\$ -	\$ -	\$ -
General Assistance	\$ -	\$ 1,107	\$ -	\$ -	\$ -
Benefits	\$ -	\$ 26	\$ -	\$ -	\$ -
Equipment	\$ -	\$ -	\$ -	\$ -	\$ -
Travel	\$ 1,688	\$ 329	\$ 510	\$ 1,539	\$ -
Supplies & Expense	\$ 115,797	\$ 31,118	\$ 23,670	\$ 25,800	\$ 15,067
Scholarships & Fellowships	\$ -	\$ -	\$ -	\$ -	\$ -
Other	\$ -	\$ -	\$ -	\$ -	\$ -
Sub-total: Gifts & Endowment Funds - Restricted	\$117,485	\$32,579	\$24,180	\$27,339	\$15,067
<u>Self Supporting Activities - Income & Recharges</u>					
Academic Salaries	\$ -	\$ -	\$ -	\$ -	\$ -
Staff Salaries	\$ 195,539	\$ 186,751	\$ 170,163	\$ 196,846	\$ 243,029
General Assistance	\$ 138,981	\$ 168,289	\$ 160,253	\$ 125,394	\$ 157,709
Benefits	\$ 96,705	\$ 105,607	\$ 131,064	\$ 132,408	\$ 194,176
Equipment	\$ -	\$ -	\$ -	\$ -	\$ 176
Travel	\$ 670	\$ 3,976	\$ 1,406	\$ 895	\$ 4,260
Supplies & Expense	\$ 222,329	\$ 271,329	\$ 251,200	\$ 225,860	\$ 244,542
Scholarships & Fellowships	\$ -	\$ -	\$ -	\$ -	\$ -
Other	\$ -	\$ -	\$ -	\$ 19,411	\$ 7,411
Sub-total: Self Supporting Activities - Income & Recharges	\$654,223	\$735,952	\$714,087	\$700,814	\$851,303
<u>Self Supporting Activities - Other Sources</u>					
Academic Salaries	\$ -	\$ -	\$ -	\$ -	\$ -
Staff Salaries	\$ 99,399	\$ 88,286	\$ 97,238	\$ 100,341	\$ 91,872
General Assistance	\$ -	\$ 1,436	\$ 7,738	\$ 99,633	\$ 95,361
Benefits	\$ 25,277	\$ 33,363	\$ 40,831	\$ 74,808	\$ 94,141
Equipment	\$ 700	\$ -	\$ -	\$ 6,367	\$ -
Travel	\$ 856	\$ 1,840	\$ 3,664	\$ 16,291	\$ 11,449
Supplies & Expense	\$ 14,158	\$ 56,635	\$ 38,851	\$ 114,102	\$ 79,327
Scholarships & Fellowships	\$ -	\$ -	\$ -	\$ 1,899	\$ 16,462
Other	\$ -	\$ -	\$ -	\$ -	\$ (25)
Sub-total: Self Supporting Activities - Other Sources	\$140,389	\$181,560	\$188,322	\$413,441	\$388,587
<u>All Other Fund Sources</u>					
Academic Salaries	\$ -	\$ -	\$ -	\$ -	\$ -
Staff Salaries	\$ -	\$ -	\$ 1,287	\$ -	\$ -
General Assistance	\$ 2,837	\$ 2,032	\$ 6,619	\$ -	\$ -
Benefits	\$ 735	\$ 903	\$ 6,637	\$ -	\$ -
Equipment	\$ 13,734	\$ -	\$ -	\$ -	\$ -
Travel	\$ 3,920	\$ 13,490	\$ 12,851	\$ 55,967	\$ 8,209
Supplies & Expense	\$ 38,584	\$ 18,368	\$ 26,626	\$ (23,043)	\$ 13,136
Scholarships & Fellowships	\$ -	\$ -	\$ -	\$ 1,240	\$ -
Other	\$ -	\$ -	\$ -	\$ -	\$ -
Sub-total: All Other Fund Sources	\$59,810	\$34,793	\$54,020	\$34,165	\$21,344

FIVE YEAR REVIEW -- APPENDIX

Bodega Marine Laboratory (BOML)

USES OF FUNDS	2009-10	2010-11	2011-12	2012-13	2013-14
Totals - All Fund Sources					
Academic Salaries	\$ 229,874	\$ 220,407	\$ 229,240	\$ 237,836	\$ 249,352
Staff Salaries	\$ 1,133,774	\$ 1,054,594	\$ 1,236,729	\$ 1,274,402	\$ 1,287,506
General Assistance	\$ 955,318	\$ 1,114,441	\$ 1,068,949	\$ 1,196,082	\$ 1,092,481
Benefits	\$ 654,370	\$ 745,685	\$ 901,133	\$ 1,027,773	\$ 1,141,196
Equipment	\$ 215,420	\$ 38,734	\$ 27,266	\$ 38,466	\$ 296,528
Travel	\$ 87,334	\$ 90,600	\$ 98,647	\$ 127,850	\$ 101,788
Supplies & Expense	\$ 1,668,665	\$ 1,684,456	\$ 1,181,850	\$ 1,237,499	\$ 1,103,036
Scholarships & Fellowships	\$ -	\$ -	\$ 450,828	\$ 478,873	\$ 591,496
Other	\$ 581,853	\$ 525,249	\$ 477,927	\$ 635,683	\$ 516,163
Total Uses of Funds	\$5,526,608	\$5,474,166	\$5,672,569	\$6,254,463	\$6,379,546