

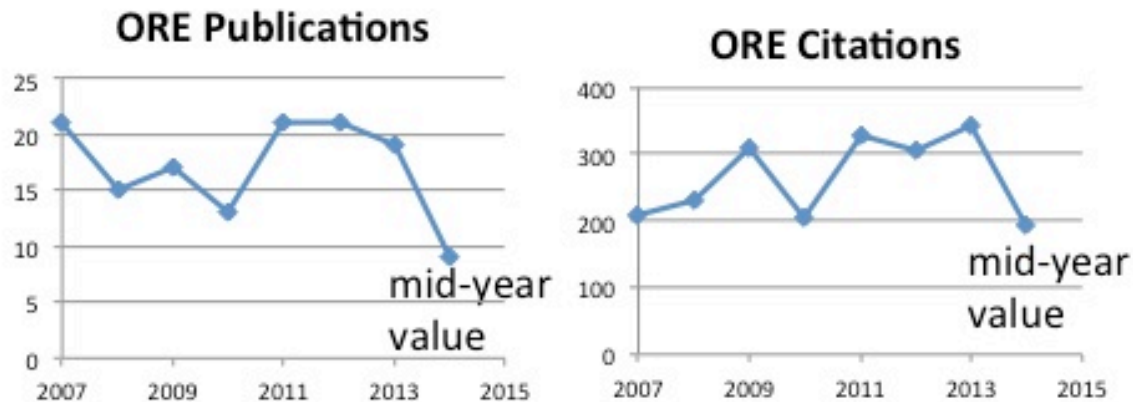
Response of the Department of Ocean Resources and Engineering to the SOEST External Review Report 2013

ORE acknowledges the overall positive review of the Department. While there was only one formal recommendation (below), there are several comments that we address.

Review Team Comment: The faculty members are doing interesting research of value to Hawaii and have an adequate record of research publications.

2013 Response: The department is actually quite productive in terms of publications. If the HURL faculty (who are S faculty in any case and whose publications are counted with ORE) are not counted in and allowance is made for new faculty just starting up, the department publication numbers should be divided by 4 or 5 instead of 8 in which case the productivity looks high rather than just adequate.

2014 Response: Research productivity as measured by publications and citations continues at a good rate. Shown here are updated plots of publications and citations vs time (Web of Science. Note: 2014 value is mid-year value).



Review Team Comment: Because the department lacks an undergraduate program, there is only one MS and one PhD GTA so there is little opportunity for graduate students to have teaching experience. If the department had an undergraduate program, it would be a feeder into the graduate program, create opportunities for more GTAs, and create an opportunity to expand the department's coverage in a field that is so vital to the state of Hawaii.

2013 Response: This suggestion to start an ORE undergraduate program is a topic worthy of serious investigation. It would bring to ORE more TA's as well as faculty (probably 3 more would be needed) and would definitely fill the need for more engineers in the Hawaii market (at the moment all ORE graduates are getting jobs and the Hawaii ocean engineering market is routinely taking twice the number of graduates that ORE is providing). It would provide more undergraduate STEM classes in SOEST. It might be a way to stimulate more interest in engineering in the

local high school population (as ocean engineering has an undying link in the minds of high school students with surfing, waves, beaches, canoes and boats - all things dearly loved). Cost, the need for support from the College of Engineering, and the effect on ABET accreditation are not insignificant factors to consider. It is something that could be instituted over a few years by adding one new undergraduate course every year until a full roster was available. We have a course on the books to start with - ORE 202 - Man and the Sea.

2014 Response: We will teach ORE 202 Man in the Sea in Spring 2015.

Review Team Comment: Since the Look Lab was closed in the late 1990s, the department has lacked an experimental hydraulics lab (e.g., wave flume) for teaching and research. As a result, students and faculty have to travel elsewhere to test their computer-created models. Remarkably, ORE is the only ocean engineering department in the country without an experimental laboratory. One Ph.D. student observed that “We are ocean engineers but don’t have ocean engineering equipment.”

The university also lacks a High-Bay Staging Area on campus for assembling and testing large pieces of equipment to be deployed at sea. Both of these could be shared facilities with the College of Engineering. It is recommended that the department work with the Deans of SOEST and the College of Engineering to establish these laboratory facilities.

2013 Response: While we do not have our own wave tank (and the old one at Look Lab was actually very difficult to use even when operational through the mid 1990's) we do have access to the civil engineering hydraulics lab, Kilo Nalu, three faculty labs (Howe, Nosal, and the new faculty member (previously Pawlak's) lab) and the HURL Makai Pier facilities with open ocean access. Taken together these are reasonable facilities although underutilized by the students. Because Holmes Hall renovation has been put on hold yet again, it is not effective to try to obtain hi-bay area there in the short term.

2014 Response. ORE requires experimental lab facilities to meet ABET teaching expectations, as well as to support research. Just recently, arrangements have been made to use the CEE Hydraulics Lab for ORE teaching use. The ORE 601 Ocean Engineering Lab class, taught by our new faculty member Prof. Zhenhua Huang, will use the Hydraulics Lab facilities for 3 weeks in Fall 2014; experiments will include evaluation of scale models of breakwaters and measurement of responses of a floating structure to waves. An ORE PhD graduate student, who has used the facility for her research, has provided (September 2014) orientation training for CoE and ORE demonstrating how to use the wave flume and wave gauges. Further, CoE is currently taking steps to install a new wave generator in the larger flume and bring that facility into operation for research and teaching (expected early 2015); it too will be available for ORE use. These are all positive steps addressing the comment, and we will continue to work with the respective Deans and all involved to further facilitate the capabilities of the Lab for the benefit of all users.

The Kilo Nalu cabled ocean observatory (just off Honolulu, 12 m water depth) is being refreshed Fall 2014 (all new shore station, cable, node) and will again serve students for instruction and research; Prof. Huang is taking the lead and he will use his startup grant to purchase ADCPs, Inertial Measurement Units, a wind vane, a data acquisition system and other sensors for teaching and research at Kilo Nalu. His lab associated with Kilo Nalu will host the ORE 601 Ocean Engineering Lab class, as well as some coastal and ocean engineering needs. There are discussions underway for other users, including CoE, to use the facility for collaborative teaching and research.

ORE now has from SOEST a half-time engineer who will assist in instructional aspects of lab/field work (e.g., instrumentation in the Hydraulics Lab, Kilo Nalu class work), and who will also be available for research related work.

It appears that HURL may be closing. It is anticipated that the new UH remotely operated vehicle (ROV) will slowly form the nucleus of a new group that will catalyze research and student involvement in a similar way as HURL has done over the years.

A SOEST High-Bay Staging Area has been established within the Marine Sciences Building MSB. It appears to be adequate at this time.

Review Team Comment: Weakness in mathematics of incoming graduate students has been a perpetual problem. Starting in September, the department will have a required math course taught by one of its own faculty members who is an applied mathematician. The courses in the Department of Mathematics are deemed to be too theoretical.

2013 Response: We have added the requirement that students take one advanced mathematics class.

2014 Response: MS students are adequately prepared with the ABET undergraduate math requirement. Our faculty will not teach an advanced math class, but rather an advanced class such as GG 600 Equations of Geophysics or equivalent is now required of PhD students. (GG 600: Least-square approximation of functions by orthogonal series; potential, wave heat flow equations; boundary value problems; Bessel Hankel functions, spherical harmonics, potential theory, plane waves, spherical waves; emphasis on geophysics application.) For information, Prof. Nosal teaches electives ORE 608 Probability and Statistics for Ocean Engineers and ORE 766 Numerical Methods in Ocean Engineering.

Recommendation 1: Efforts should be made to consolidate ORE students and faculty within the Holmes building and upgrade facilities and office space to provide an appropriate working environment.

2013 Response: While it is unfortunate that all the student offices are not in one place, this is hardly a disaster and is true of most departments at the university. In fact most department do not have office space for every student wanting it - we do.

2014 Response. ORE continues to request more space in annual SOEST space evaluations. The table shows the current (May 2014) request; note the high priority

request for 400 sq ft of additional space for students. Much will depend on having the pressure of more students, faculty and research effort, and when and if Holmes hall is renovated.

ORE Space Request, May 2014

anticipated future state, 5 years	5 year incremental need over present	SQ FT
10 faculty	2 faculty offices	300
10 students non-GA	Students, post-docs, GAs	1478
40 GAs MS/PhD that will need desks		
6-8 post docs		
6 research staff	4 research staff offices	500
2 admin. Soft funds	1 admin office	100
4 labs for research/academics	1 lab	400
1 computer lab - 10 seats for teaching and research	1 computer lab	300
1 classroom	1 classroom	300
conference room to fit 50	1 conference room, incremental	500
	Total	3878
Expect the program to grow. each professor with 5 funded GAs	High priority now: Student, post-doc, GA	400
Likely requires Holmes Renovation to happen	HIG 153 ACO Lab assigned to Howe	