

**Ocean Sciences Educator's Retreat Minutes (OSER)**  
**Savannah, GA – 24-25 September 2014**



The challenges and needs many graduate programs in the ocean sciences are facing – resource limitations, building cross-institutional partnerships, more diverse career mentoring for students and facing declining enrollment – were all discussed over the two days of OSER 2014.

***Review of OSER 2012 Actions – Jim Sanders, Skidaway Institute of Oceanography***

The actions resulting from OSER 2012 were:

- Think about survey design and future – subject categories, what are we trying to solve? Faculty data?
- Further research what is included in NSF, etc datasets. Are we being repetitious or complementary? Better peak in to retention, those who are doing a master's only on purpose, those who carry on to a PhD and those who stop at master's for other reasons
- Fill in the gaps in the present survey (schools missing from some reports); ask for some more details on MS-PhD numbers to get a better handle on the pipeline; increase participation beyond the current schools that are reporting.
- How to improve the community survey (this was a preliminary effort – interest in continuing? Improving?).
- Formulate a white paper discussing how science is taught in the United States. (Separating out subject areas versus integrating them into one interdisciplinary program.)
- Develop generic oceanography recruitment materials and travel to “unconventional” conferences such as regional conferences that target minorities. Organize a workshop in which federal government employees, Historically Black Colleges and Universities (HBCU) professionals and others can attend to begin to build partnerships and networks of teachers, professors, and students.
- Explore methods and ways to bridge partnerships between HBCU/MIs with Majority Serving Research Institutions.
- Explore and inventory what is being done to engage families in the oceanographic community.

Jim Sanders briefed the group on the OSER 2012 actions. The survey has been revised in 2013 to collect more specific data based on OSER community feedback. There are gaps from year to year for participating institutions that need to be filled to make the analysis more robust. There is a need for career development for PhD students that may want to follow different career paths other than academia.

Consortium for Ocean Leadership (COL) has put together ocean futures group and part of that has spun off a task team, for education and diversity.

***Keynote Address – Corey Garza, California State University Monterey Bay***

Corey Garza kicked off the retreat with a Keynote Address on challenges that face Ocean Science engagement, including cultural barriers among underrepresented groups, as well as lessons learned from the Monterey Bay Regional Ocean Science Research Experiences for

Undergraduates (REU) Program and Society for the Advancement of Chicanos and Native Americans in Science (SACNAS) Conference. He discussed the importance of engaging students earlier in their academic career and conveying a strong message on what ocean science is and the variety of disciplines it spans. We need messaging that resonates with different groups. There is a disconnection and lack of personal investment in ocean science for many underserved communities. The connection needs to be made on how ocean sciences can help them serve their community and how they can apply skill development in a variety of ways. Social media and informative YouTube videos have helped engage students and help them understand some of these missing connections. Grad student panels at SACNAS have enabled students to make connections with other students. Recruiting remains a challenge because of how students perceive themselves and their place in science. There needs to be more focus on getting students involved in the research earlier and integrating research into classes so students are involved in more than just a class. As the landscape of opportunities and available jobs changes, there is a need for training for more diverse career development and opportunities for students, as many are interested in pursuing careers outside academia. Faculty needs to be educated on how to provide guidance for non-academic career paths.

Corey's presentation can be found [here](#).

#### ***Where we are: What the data tell us***

- *Long-term Data Perspective: Graduate Students – Russ McDuff, University of Washington*

Russ presented his analysis of the OSER dataset from the beginning (1978). He made comparison between 1984-85 (the last major completed synthesis of the data) and 2011-12. There are ongoing issues with consistency of the data collected, with changing surveys and varied response rates over the length of the dataset (37 years). Accessibility has also been a challenge – Russ is currently working on setting up an SQLShare database with all of the graduate data. Regarding the most recent data, Russ posed some important questions. Only 43% of students are continuing into academia – do curricula reflect this cultural and economic shift? Are faculty mentoring students that go into non-academic careers? There is attrition among women in the marine sciences – how do we retain more women in academia? Russ's presentation on the survey data analysis can be found [here](#).

Russ also mentioned his plans to move on from being the analyzer of OSER data. He identified Meg Tivey and Mark Warner as potential successors. If you are interested in being involved in the survey process, please contact Amanda Holloway ([aholloway@oceanleadership.org](mailto:aholloway@oceanleadership.org))

- *Current Data Perspective: Faculty – Hans Vogelsong, East Carolina University*  
Hans presented an analysis on the faculty data component of the survey. The data spans 2008-2014. Due to varied response rates each year, the data may just be representative of the institutions that participate in a given year, rather than actual trends. The survey changed after 2012 which also contributes to some inconsistencies. Moving forward, we need to identify gaps and increase consistency in survey responses. Hans' presentation on faculty in the ocean sciences can be found [here](#).

### ***Trends in Marine Science Degree Completion – Matt Lettrich, formerly NSF***

Matt utilized Integrated Postsecondary Education Data System (IPEDS) data to look at trends in degree completion for core and related marine science disciplines over the last 20 years (1993-2013). He looked at trends in gender, race, degree level and geographic distribution. IPEDS uses Classification of Instructional Programs (CIP) codes, some of which have vague or not comprehensive descriptions. Marine science is so interdisciplinary that reported codes vary widely across institutions. It would be beneficial to compare CIP codes to data collected by OSER surveys and NSF surveys. Though, nomenclature varies among surveys and there is not a 100% return rate. We should also run CIP codes of interest annually for institutions in the OSER community.

Matt's presentation can be found [here](#).

### ***Progress Report – Ocean Futures Education Working Group: “Drivers of Change, External and Internal Demands and Expectations” – Jim Sanders, Nancy Targett, Fei Chai, & Christopher D’Elia***

The Ocean Futures Education Working Group is charged with determining COL's role in helping members explore the future of education and what the scope and scale should be. Potential recommendations include increased innovation and partnerships, creating best practices for alliances between institutions, ocean science curricular resources, k-12: building the pipeline and COL-sponsored recognitions for educators. The group discussed the drivers of change with changing demands and expectations, emerging technologies and more diverse opportunities for innovation and partnerships. Matchmaking between institutions and exploring course exchanges would be a great way to collaborate to address current needs and challenges many institutions are facing. COL can potentially serve as clearing house for resources – need to identify existing curriculum resources (such as Cathy Manduca's projects: [Pedagogy in Action](#) and [On the Cutting Edge](#); COSEE's work) and determine gaps that need to be filled and how that aligns with COL members' areas of interest. Best practices for mentoring students need to be developed. We need to remain conscious of funding pressures and constraints – currently, there is no funding within COL for these efforts.

### ***Recruitment Strategies in the Face of Declining Enrollments – Panel Discussion***

- *Ed Houde – University of Maryland Center for Environmental Science (UMCES):* Ed spoke about the trend of declining enrollment at UMCES following national economic patterns and shifts. There has been a substantial decline since 1990, especially for the PhD program. UMCES is restructuring the Marine Estuarine Environmental Sciences (MEES) program to be more interdisciplinary, specifically offering more policy courses, in hopes to increase applications. Ideally, the program will offer more well-developed remote lectures across campuses. Short, concentrated (immersion) courses have also been successful. Though, funding is scarce, UMCES will try to offer 3 years of support upfront to PhD students. They are also trying to improve web presence and appearances at conferences as well as exploring a non-thesis degree to increase enrollment.
- *Christof Meile – University of Georgia (UGA):* UGA has a smaller marine science program – there has been some fluctuation in the past five years (2009-2013) but not noticeable, sustained decrease. They are working to better advertise and recruit, including limited, site visits of promising applicants. The graduate school holds a recruiting event and wants to tap more into the larger umbrella of students' interest in general life science.

Since it is a small program it is difficult to offer more specialized classes so UGA is interested in matching up with peer institutions,

- *Debbie Thomas – Texas A&M University (TAMU)*: Debbie discussed the challenges of marine science as one department in TAMU's college of geosciences. The students and budgets are split between two campuses – undergraduate students at Galveston and graduate students at College Station. Applications have increased but enrollment is capped by funding, mainly through TAs. TAMU's department-wide recruiting strategy is to have greater presence at large society meetings, create new recruiting materials and offer a new professional non-thesis MOST degree to pair with STEM undergraduate degrees for 5 year fast-track.
- *Meg Tivey – Woods Hole Oceanographic Institution (WHOI)*: WHOI has a joint program with MIT and they have had a steady pool of applicants in the last 5 years. They advertise on personal webpages and mention climate and interdisciplinary opportunities. WHOI runs the Partnership Education Program (PEP) diversity initiative for undergraduate students. The challenge is that the PEP students do not tend to feed into the graduate program. They are also experiencing decreased grant funding, which is hopefully temporary.

***Opportunities and Challenges of Broadening Scope within Colleges – Nancy Targett, Mark Warner & Rob Wheatcroft***

The group discussed the various structures and level of interdisciplinary focus of their respective program. Oregon State University (OSU) has developed a Marine Resource master's program. It is a terminal master's program that focuses on the interdisciplinary studies and exposes students to a little of many disciplines. This model has been in place for five years and it needs to be evaluated. They also offer a more traditional oceanography concentration under the Ocean, Earth and Atmospheric Sciences major. The reorganization of school structure at OSU has been bottom-up driven and still needs some restructuring to be more effective and efficient. The University of Washington (UW), School of Oceanography has followed a top-down process - the provost formed the College of the Environment by merging 6 schools. The curriculum has not been significantly impacted but each student is required to take a 3 credit course from the other disciplines. Students can also work toward a dual-title degree that combines science with policy, communication or ethics. UW is now reviewing their curriculum and plan to develop new courses for their Future of Ice initiative, which will focus on polar ice science. The University of Delaware's College of Earth, Ocean and Environment (CEOE)'s structure is more resource-driven. The focus has historically been on research but they are looking to reorganize and integrate marine science-related disciplines.

With the trend of more interdisciplinary focus, less students are continuing on in academia but there is a lack of faculty trained to educate and mentor about non-academic opportunities. One possibility is to connect alumni who have gone into non-academic careers with current students. Another challenge is a decline in applications to more traditional program as students apply to more interdisciplinary options. This is creating a trend of broadening out too soon before getting a strong base in a traditional discipline. There needs to be a stronger focus on advising students properly at an earlier stage in their academic careers and better messaging about opportunities in ocean science. An opportunity of broadening scope lends to building more online classes and course-sharing. The on-going challenge with online courses is evaluation methods and building the infrastructure. OSU has a successful model for distance learning.

***Diversity Report – Ocean Futures, Diversity Working Group – Meg Tivey for Jim Yoder***

The Ocean Futures Diversity Working Group is charged with determining COL's role in helping members increase recruitment, enrollment and retention of underrepresented minorities (URMs). Recommendations include proposing a project to the Alliance for Graduate Education and Professoriate – Knowledge Adoption and Translation (AGEP-KAT) to support adoption or adaptation of demonstrated strategies and practices to increase URMs in STEM graduate, postdoc, and academic careers and building the relationship between COL and Louis Stokes Alliances for Minority Participation (LSAMP) and Institute for Broadening Participation (IBP). The strategy is to get ocean sciences on the radar of URM STEM undergrads as a possible school and career route. Maybe IBP could provide a mentoring manual for faculty providing advice on mentoring URM students and lead a workshop on mentoring for COL faculty/administrators. COL could attend more LSAMP partnership meetings and encourage LSAMP undergrads to visit the ocean science departments of its member institutions. The main challenges with increasing diversity are recruitment, lack of mentoring support, poor messaging, admission screening that weeds out students too quickly and advisors that are not educated in ocean science opportunities. Some of the best practices in increasing diversity are early intervention, supportive mentoring and advising, career counseling, campus learning centers, workshops and tutoring. It might be productive to have conversations with presidents of Minority Serving Institutions to bring on more ocean science curriculum and spread the words about opportunities, such as REUs. Student sharing will also help students find the best fit.

***Diversity Report – Dionne Hoskins, Savannah State University (SSU)***

Dionne discussed SSU's strategies for increasing diversity in the Marine Sciences. SSU's Marine Science Master's program is a cooperative education and research program with NOAA. Only 1% of PhDs in the ocean sciences are underrepresented minorities and only 10% of NOAA's workforce is from underrepresented groups. NOAA is working with Minority Serving Institutions through their [Educational Partnership Program](#) to increase the number of students from underrepresented communities that are educated, trained and graduated. SSU's program is achieving this mission by promoting success and building close relationships with students to ensure that they succeed. Some of the key components to SSU's success include developing career resources, requiring a "survival skills" for graduate school class, evaluating funding plans for students each semester; developing their communication skills through a technical writing class and by attending professional meetings and, one-on-one mentoring. Some of the obstacles they face are limited resources, messaging, and "gatekeeper" requirements, such as test scores.

***Miscellaneous Discussion***

- Follow up activities from OSER 2014, including the following actions:
  - i. Fill in the gaps in the present survey
  - ii. Provide clearing house for resources that are useful to graduate-level educators and administrators, including examples of non-traditional career paths for their students
  - iii. Work as a community to create better messaging about what ocean science is and derive an outreach tool for potential students. Some examples of areas where improvements could be made include:
    - In terms of attracting underrepresented groups, there is a perception that ocean science is a "soft science."
    - In terms of attracting a broader range of students in general, people do not necessarily understand that ocean science encompasses so many disciplines (e.g., someone interested in microbiology may not realize that this can be done as part of ocean

- science)
  - Some terminology can be confusing for outsiders. For example, those not familiar with the field might wonder about the difference between ocean and marine science.
- iv. Create a match-making message board (or other mechanism) for institutions to collaborate on student- and course-sharing
- Identify host and planning committee for OSER 2016

## Meeting Attendees

Ajoy Kumar	Millersville University
Amanda Holloway	Consortium for Ocean Leadership
Anne McElroy	Stony Brook University
Chris Burke	Institute of Marine and Antarctic Studies in Hobart, Tasmania,
Christof D Meile	Associate Professor and Graduate Coordinator Department of Marine Sciences - The University of Georgia
Christopher D'Elia	Louisiana State University
Corey Garza	California State University, Monterey Bay
David Naar	University of South Florida
Debbie Thomas	Texas A&M University
Dionne Hoskins	Savannah State University
Ed Houde	University of Maryland Center for Environmental Science Chesapeake Biological Laboratory
Fei Chai	University of Maine
Gail Scowcroft	URI, National COSEE Network
Hans Vogelsong	East Carolina University
Jane Teranes	Scripps Institution of Oceanography, UC San Diego
Jim Sanders	Skidaway Institute of Oceanography
Kristen Yarincik	Consortium for Ocean Leadership
Linda Schaffner	Virginia Institute of Marine Science
Mark Warner	University of Washington
Matt Gilligan	Savannah State University
Matt Lettrich	previously NSF and Knauss Fellow
Meg Tivey	Woods Hole Oceanographic Institution
Nancy Targett	University of Delaware
Peter McCarthy	Harbor Branch Oceanographic Institute
Rob Wheatcroft	Oregon State University
Russ McDuff	University of Washington
Sue Ebanks	Savannah State University