

Diversity in the College of Ocean and Fishery Sciences

This report covers the College of Ocean and Fishery Sciences as well as the three academic units in the College, which include the School of Oceanography, the School of Aquatic and Fishery Sciences and the School of Marine Affairs.

The report is organized into four sections:

- Context
- Challenges
- Report on Seven target areas requested
- Questions and Suggestions

Context

The College of Ocean and Fishery Sciences was founded in 1981. The College focuses on basic science of the ocean and the applied science of natural resource management. In addition, a part of the college produces professional master's students who specialize in the policy dimensions of the use of the oceans. The College has two undergraduate majors programs, three masters programs and two doctoral programs. There are 57 state-supported faculty FTEs. Research conducted by the faculty, students and staff in the College is worldwide with programs in both the Arctic and Antarctic, as well as maintaining permanent field stations in Alaska, Brazil and Washington State. In any year students and faculty will be working on sea-going projects in the Pacific, Atlantic, Indian and Antarctic Oceans. There are collaborative research and education agreements with universities in six countries as well as within the US.

The College is the third largest research unit on campus after the College of Arts and Sciences and the School of Medicine. The research funds acquired through competitive national grants by the faculty total \$75 million. The state support for the College and its programs amounts to less than \$7 million per year. As a consequence the College and its units are the most leveraged and the most nationally competitive part of the University.

The consequence however of this leveraging is that the total amount of state dollars to run the College itself including all salaries for the dean and the dean's office staff is \$260,00 per year! All the other costs are met from research related indirect costs.

Challenges

There are five major challenges facing the College in the area of diversity:

- Pipeline issues
- Unrecognized under-represented groups
- K-12 science education at tribal schools
- Lack of coordination and effective support for outreach efforts
- Inadequate long-term support from UW to match and continue Federal initiatives

Pipeline issues

The undergraduate programs in the College have a variable history of over-subscription and periods of low enrollment. Overall graduation requirements for the College are identical to those of Arts and Sciences, but student interest in natural resource issues waned in the 80's and 90's. There has been a growth in student interest in natural resource conservation and sustainability in the past ten years, which has resulted in increasing enrollments in Aquatic and Fishery Sciences. Interest and enrollment in oceanography is more driven by public visibility (the Jacques Cousteau phenomenon results in periodic surges of student applications) as students do not receive any education in high school about the oceans or oceanography.

However, because neither resource management or ocean science is part of the high school curriculum student awareness of these educational opportunities occurs late in their development. In addition, because salaries are low in these areas by comparison to other areas of science the fields are also not seen to be attractive to parents who want to see their children study in a field with good economic rewards.

As a consequence, students from diverse backgrounds are not initially attracted to our fields. Inner city and suburban schools exhibit little enthusiasm in the marine sciences because of the costs of access and difficulty brought about by the curriculum, which does not include these fields in the high school requirements. All these factors are compounded when looking to enroll students from under-represented groups in our programs.

Unrecognized under-represented groups

There is an "over-representation" of Asian Americans in higher education nationally and the UW shares this characteristic. However, in the natural resource sciences and oceanography, nationally there is an under-representation at both the undergraduate and graduate levels. The lack of recognition of this problem was highlighted at the recent "Ocean Science Education Retreat" which I chaired for 37 universities. The challenge here is to attract well-qualified Asian-Americans to a field where salaries are not as high as fields such as computer science. We are working with other universities nationally to address this issue.

K-12 science education at tribal schools

Living in the northwest where the tribes are major and sometimes majority holders of interests in forests, fish and shellfish it seems natural that the college should focus some of its efforts to educating the future managers of these resources. At present approximately 70% of the natural resource managers for the western Washington tribes have received their undergraduate or graduate degree from the College. Yet fewer than 10% of these managers are tribe members. Despite the economic interest from the tribe in this area, the students from tribal school rarely apply to UW, as their science training in school is often inadequate. Science teachers at tribal schools turn over remarkably frequently and, as most of them are not part of the tribe, the focus is often not on local natural resource examples. We have tried to address this problem through a six-year program that was federally funded.

Lack of coordination and effective support for outreach efforts

In working with the tribes we have been challenged by the lack of coordination of the UW's total efforts and by our own inexperience in working on junior high school science education. While we partnered with the College of Education to address the assessment issues around our outreach program, the real problems arose from a lack of a team approach to working with the tribes. Our program was simply too isolated and separate from other efforts. And lacking the sufficient number of faculty who could participate in the program, it was vulnerable to variable interest.

Inadequate long-term support from UW to continue Federal initiatives

Over the past five years the College has attracted federal support to create outreach partnerships with the tribes, programs to involve undergraduates in international language and science education and in K-12 outreach for city schools as three examples. Over \$1 million was brought to these programs in which the College invested a further \$250,000. However, in each case the federal funds had a specific duration after which it was hoped that the institution would pick up the programs. In no case has this proved possible because of the lack of university and state support. While the College and its faculty can compete and enthusiastically support programs, the lack of ongoing institutional support has hampered our ability to sustain and maintain diversity enhancing programs.

Report on Seven Target Areas Requested

Student access and opportunities

We offer small class size and incredible hands-on experiential research learning opportunities to our students. The chance to study at sea or in remote and often exotic locations around the state, the country and the world is an experience that few students could afford on their own. Student scholarships from our own endowment funds and faculty entrepreneurship in raising grant funds to support undergraduates, especially from under-represented groups, mean that many students have a unique experience.

The units in the College do not impose any academic qualifications or specific requirements other than those for admission to UW. We work closely with Central Advising to try to recruit students to our programs and inform them of the educational and career opportunities. All of our graduate students and our science programs, both at the doctoral and master's levels, are supported on RAships and TAships. At the undergraduate level we offer many students financial support through scholarships and research traineeships and assistantships. In part because of these efforts over 50% of our undergraduates and 50% of our graduates are women. This is a spectacular change over the past 15 years (from about 19%) and also a major result as many of our graduate students come from physics, chemistry and engineering where women are noticeably under 50% of the population.

A challenge recently faced by one academic unit was a deaf student who wished to undertake a master's degree that involved going to sea. Through excellent efforts from Helen Remick's office and truly wonderful collegial support from students and faculty we were able to get this student to sea working on our research vessel to complete her research. (As you can imagine,

being on a working ship in sometimes hostile weather conditions is a very challenging environment.) For the past several years, since I chaired a community wide workshop at Gallaudet University in DC, we have been working to get deaf students into our science and out to sea.

Student development and retention

Every student in the College, whether undergraduate or graduate, has a faculty advisor. In addition the College has 2.5 staff FTE's in student advising and counseling and 1.5 FTE in student career counseling and workplace internship programs. This large investment in student advising and counseling and the even more significant investment in career development are an important adjunct to the classroom, lab and field learning that characterizes our programs. At the undergraduate level this investment shows up in the surveys carried out over the five years post-graduation that shows that over 75% of our graduating seniors are using their degrees and the knowledge from the program in their work. This number can be compared with nursing where 80% of the nursing graduates say they are using their degree in post-graduation employment.

Our student retention rate (once we can get students to know what our programs are and that they even exist on this large campus) is very high. The financial resources from research, the investment in individual advising and the small size of classes help to ensure our programs are highly valued by our graduates.

We partner with Engineering in the MESA and ALVA programs and with the School of Medicine in its ALVA program.

Engagement with the external community

Because our programs are specialized and not widely available throughout the US we recruit undergraduates and graduates from across the country. Our external community is therefore national as well as local. For example, through a Federal grant supported by the US department of Education called Science and tribes Educational Partnership we worked with 12 tribes in Washington State to help educate junior and high school students in science related to natural resources. Through an Office of Naval Research Grant we brought four year college teachers from HBC/MIs to spend a week on this campus. This was part of a national effort involving five other universities addressing the pipeline issue. This multi-year program took as its premise that, because ocean and fishery science is not taught at many places, we needed to educate the college teachers so they could reach a larger number of their students who were considering further education. Through another Fund for the Improvement of Post-Secondary Education (Department of Education) grant, over a four-year period we have worked with three US universities and three overseas universities to get our students to spend up to six months learning science in a foreign culture, and giving students from those countries a chance to learn marine science in a US university. Foreign language competency among science students in the US is now at an all time low and as part of a national community-wide effort we have tried to make small improvements in this area. Again, federal funds provided support for five years along with college matching funds, but the long-term sustainability of the program has been compromised by the lack of long-term institutional investment from UW.

We have on a local level established articulation agreements with several community colleges especially on the Olympic Peninsula and in the Yakima valley, focusing on getting members of many tribes to transfer to UW to complete their science degrees.

We have established co-operative bachelor and master's program in fishery sciences with Tuskegee University, a university that does not offer this sort of specialization. This program has had some success.

Student counselors and professional staff make approximately 50 visits per year to local schools to show students what our science has been doing to improve the quality of life and to excite students about the future career opportunities in science.

For five years we, along with 10 other universities, have run an annual high school science bowl bringing nationally 200 high schools (100 students per year) to campus. These efforts also have been led from UW in developing specific ties to minority institutions and schools with high representation of native americans. NOAA has funded this effort at \$500,000 per year to support staff, travel of students and curriculum development.

Another federally supported program (note, these funds are generated through faculty and college effort writing proposals to bring funds) is the High Seas Salmon Program for Students from Under-represented groups. These funds support students to go to sea and earn credit (and money). One example is a Mary Gates scholar whose research expenses to go to sea are covered by this program.

A final example is the Co-Op Program in Fish and Wildlife Research through which the US Fish and Wildlife Agency supports under-represented students working on endangered species. Several recent minority students have graduated through this means of support.

Staff and Administrative Diversity

In a small college with only one part-time associate dean and a staff of 3 it is a strong record that over the past decade two women have held the position of associate dean and then progressed to other more responsible positions of academic responsibility. The position is currently held by an Asian American for the additional reason identified earlier than Asian Americans are under-represented in our field.

Several women have held administrative positions in the units and have then been promoted to other nationally prestigious positions. We are proud that our College is a successful educational environment where new leaders for the nation are developed.

Among administrative staff we have senior positions filled by African American and Native American staff: again we are acting as an effective training location.

The College, with the Applied Physics Lab and the School of Oceanography, is starting a new program to help develop more academic leaders from under-represented groups. Workshops and one-on-one training is involved. This effort will partner with Engineering and its NSF funded program to develop more leaders for our fields from diverse groups.

Faculty Diversity

In a small college, with three different academic units, we meet many of the targets, exceed some and fall short in others. When one unit has only six faculty it is difficult, given the turn-over times of positions to adjust faculty balance to changing student graduation balance. But on the whole we are achieving the targets because we offer three things: a very supportive faculty and good network (in comparison with our peers), good career mentoring, and a willingness to fight for the needs of the under-represented faculty within UW. As an example, the university policy on family leave stated that a woman could take up to 6 months leave with pay. When a faculty member said she wanted to be 50% for 12 months instead, we were told no! The department faculty and the College administration fought hard and worked out a way for her to achieve her goal. And it was to the obvious benefit of everyone to have her work with her students part time rather than being away for 6 months. A similar situation has arisen with other faculty who wanted different work schedules (part time for several years before returning) and we have fought hard to get this accepted centrally.

Curriculum and Research

In academic programs, the College through two of its units offers some specific courses that aim to involve and educate students in the cultural aspects of the marine environment. Most noticeably, at the introductory level the new Fish 101 has a component on tribal fishing, its cultural importance and also its economic significance. That course and one other also address the complex issue of “charismatic mega-fauna”: that is how whales and dolphins and seals are referred to in federal language! Cultural understanding of whaling in a societal context is a wonderful teaching tool to show how, even within supposed single groups, there are strong differences based on beliefs and social imperatives.

Other courses focus on the Pacific islands and the cultural challenges and perceptions brought about by coming from small isolated islands in a vast ocean, cultures where attitudes and respect for the ocean are different from those held by most north american cultural groups.

Climate

We are all aware that “climate change” is a global issue and a political issue. It is a global issue as it affects everyone and it is a political issue as different groups want to either take action or have someone else pay for those actions.

The climate of our field is indeed changing. Twenty five years ago fewer than 10% of the graduates were women: today it is 50%. Ten years ago fewer than 15% of our junior faculty were women: today it is 45%. So our climate in one area has changed and it changed because everyone, in the academic discipline and at the federal level supported making those changes.

In other areas of under-representation we face the challenges of getting the same thing done. The challenges listed earlier show what must be overcome. But the climate to achieve change is present.

The enthusiasm of faculty to write proposals to support students from under-represented groups, to develop specific mentorship and outreach programs is a clear signal of a healthy environment. The success of the women who have come through our faculty and now hold national leadership responsibilities heralds well for the future.

The climate of our field is comprised of three major components: the local physical climate, the local/university economic climate and the federal science support climate. We have worked hard in each of these areas to build the infrastructure for success. The weakest link is the state/university support.

Questions and Suggestions

Are we administratively organized for success?

At present when we in the College get funding for an outreach program, for example, we have to work largely alone. Finding partners for program assessment, finding partners who are skilled and experienced in junior high school science teaching, finding partners who can supervise staff working in these areas which are well beyond the skills and experience (but not the enthusiasm) of the college faculty and administration are challenges. Could we organize better so we can be more successful in the long term?

Is our portfolio properly balanced?

We put significant effort into recruitment, retention and outreach. Is the balance right among these three and more importantly is the balance between program support and scholarship right?

At one extreme we could ask, if we put this money into full-ride scholarships would we be doing more good? What is the right balance? We focus on creating programs: should we put more effort into financial aid?

How do we partner nationally effectively?

Each field of scholarship is part of a nationally competitive arena. In Ocean and Fishery Sciences our marine community works hard collaboratively to increase federal support for education, for minority student support, for building support for education into research programs. We do this through informal partnership among the top ten schools in the country and through our Washington DC based community consortium. How do we link this national effort with campus special skills (by analogy how the graduate School used CIDR to lead a national discussion on re-envisioning the Ph.D.)