I. Review of COAS: Overall Recommendation and Introduction

The Review Team consisting of James Yoder (Woods Hole Oceanographic Institution), Margaret Delaney (UC Santa Cruz), Thomas Leschine (University of Washington), Rod Harter (Nutrition and Exercise Sciences – OSU) and Luca Lucchesse (Electrical Engineering and Computer Sciences – OSU) met with Dean Sally Francis during the evening of January 24 and then spent all day on January 25 in meetings with Associate Dean Robert Duncan and staff, Dean Mark Abbott, representatives from COAS faculty, representatives from COAS graduate students, and the COAS Graduate Admissions Committee. The Review Team was also provided with an excellent and well-prepared self-study report prior to the on-campus meetings.

The Review Team recommends that OSU sustain the COAS graduate program and the faculty at approximately its current size. Because of anticipated faculty retirements and the need for new faculty to have sufficient time to establish a funding base for their research programs, maintaining the COAS faculty at approximately the same size requires following the COAS-generated hiring plan for new faculty. On the other hand, this is not the right Federal science funding environment for expanding a faculty that relies on significant salary support from Federal grants. The atmospheric sciences group is small, however, and probably needs to grow to some extent to reach a critical mass of faculty. The MRM faculty also needs to grow, and the intention that two of the hoped-for new hires of the next five years be science faculty who would represent areas with which MRM would find strong affinity seems a good strategy to build MRM given present constraints on available state salary support. The Review Committee was provided a copy of COAS faculty hiring priorities and notes that 4 out of the next 10 hires are in the area of atmospheric science or the interaction of atmospheric with ocean science. The excellence of the COAS faculty and graduate program (OSU’s oceanography program ranked 5th in the nation the last time the NRC ranked graduate programs) and breadth of the COAS mission, argues against a significant reduction in faculty.
State funds, including returned overhead funds, for COAS are highly leveraged with Federal funds. COAS has an excellent faculty with a national/international reputation, and the college produces excellent graduate students. Given the high degree of leveraging and the high quality of the program, OSU has one of the best deals, if not the best deal, in the country for an ocean/atmospheric science program at a State university.

II. Summary of Recommendations

A. COAS and Its Faculty

- COAS should continue to receive base state support and the more favorable overhead return rate specific to COAS among OSU’s units. COAS should receive the support it needs to maintain itself at least its current faculty size (p. 5).
- OSU needs to re-assign a development officer to COAS to help raise funds for Fellowships and for other needs (p. 17).
- Long-term space requirements need to be addressed. Co-location of students and faculty advisors is a desirable thing. Moreover, central locations for students in every building would be a major addition to student interactions (p. 19).
- OSU should support the COAS hiring plan, including the need for adequate start-up packages. COAS should revisit faculty hiring priorities as hiring proceeds. While it is tempting to say that MRM should direct future hires toward faculty who can extend its reach in ocean and coastal policy, given the highly leveraged nature of faculty appointments within COAS (with assistant professors, once established, expected to raise 70% of their salary) it is advisable for MRM to focus instead on faculty who can expand the scope of scientific work in areas that have direct policy implication. Current commitments to hire in the areas of climate change and coastal hazards and in marine and estuarine conservation biology thus seem good directions that
will reinforce the existing successful model and continue to promote integration of MRM with ocean science (p. 14).

- Strive to develop more open and regular lines of communication among COAS administration, faculty and graduate students (p. 19).
- Encourage COAS faculty, particularly new faculty, to take advantage of OSU programs to train faculty in teaching techniques. Research faculty tend to be out of touch with developments in pedagogy, yet graduate students have been exposed to new science teaching techniques (e.g. inquiry-based learning) as undergraduates (p. 23).
- Emphasize to students the importance of participating in the nomination process for the faculty teaching award (Pattullo Award) and the mentoring award (Dymond Award) (p.24).
- Communicate early and often about the ongoing work of the Earth Systems Science task force to COAS faculty to engage them and to hear their concerns and goals. Consider carefully the financial issues for COAS in moving away from their highly leveraged, largely research focused model to a more traditional faculty support and teaching expectation model if this is part of the Earth System Science model (p. 12).

B. Graduate Students: Recruitment and Education.

- Continue to host the COAS Open House for applicants (p. 7)
- Continue to proactively recruit graduate students from underrepresented groups (p. 8).
- Examine the issues around core course curriculum with fresh eyes. Focus on course content, year-to-year consistency, and teaching quality issues in these critical classes (p. 9).
- Consult with students and faculty about the structure and importance of the student seminar series and work to increase attendance (p. 10).
- Pursue getting educational days of ship time for student program (p. 10).
• Examine the graduate curriculum for a possible overhaul, including streamlining and increasing predictability of offerings. Although this task may seem daunting, it is likely that a more structured approach could improve the availability and predictability of timing of advanced electives, create teaching ties between faculty for more advanced courses, and avoid very low enrollment classes. Reasonable financial support for an individual to take on this task would likely get this off the ground quickly (p.10).
• Encourage COAS science-track students to avail themselves more widely of policy, economics and other social science aspects of the MRM curriculum (p. 13).
• Continue to explore new avenues of student funding support (p. 14).
• All COAS students need access to the internet from their desks. If for security reasons, access to OSU_PUB is not accessible for some students from some COAS buildings, these students must be provided with an IP address to access the internet and standard software via the COAS computer facility (p 16).
• Resolve the graduate student health insurance issue, so that graduate students can receive uninterrupted coverage throughout the year, including for those who are not registered for coursework in the summer (p. 18).

III. Detailed Findings

1. INPUTS

1.1 The Fit of the Mission and Its Relationship to the Mission of the Academic college and University Mission.

The College of Oceanic and Atmospheric Sciences (COAS) is one of the premier oceanography schools in the country and the world, with high-quality faculty, researchers, post-doctoral scholars, and graduate students. The COAS mission,
combining academic education, technology support, and scientific research, contributes to the broad understanding of the oceans, the atmosphere, and the solid Earth. COAS is unique in the state of Oregon, and its contributions are important to the academic stature and visibility of OSU nationally and internationally. COAS is highly “leveraged,” with faculty raising a significant portion of their base salaries and virtually all graduate student support from external funding sources. COAS represents an incredible bargain for OSU, with high return of quality and impact supported by relatively limited state support.

**Recommendation:** COAS should continue to receive base state support and the more favorable overhead return rate specific to COAS among OSU’s units. COAS should receive the support it needs to maintain itself at least at its current faculty size.

**1.2 College Diversity**

As for most oceanographic institutions, women representation on the COAS faculty is low – about 17%. Other oceanographic institutions, such as at University of Rhode Island and Lamont Doherty Earth Observatory (Columbia University) have tried to increase numbers of women faculty by successfully competing for the NSF ADVANCE program. This might be an option for COAS to try, or maybe it has?

Faculty from underrepresented groups are often absent from the faculty of oceanographic institutions. The Review Committee noted that COAS has 2 Hispanics on its faculty.

**1.3 Quality of students**

COAS graduate students come from different backgrounds. Some come immediately following undergraduate work, some after several years of work experience, and others already have a master’s degree. The reasons why they typically apply to COAS are the national ranking of COAS, the reputation of many of its faculty members, and their interest in research themes being conducted at COAS. The table relative to the applicant
characteristics for 2001-2007, provided in the self-study report, shows the very high quality of the applicants to the graduate program. The average GPA for the admitted students is 3.54 and the average GPA for those who matriculate is 3.49. One should keep in mind that the minimum GPA required for admission to OSU graduate programs is 3.0. Applicants are not required to achieve a specific GRE score or to take a GRE subject test. However, for the matriculated applicants the average GRE scores, during the period 1997-2007, are 550 (verbal) and 666 (quantitative). These numbers are noticeably higher than the national averages which are, respectively, 467 and 591, thus attesting to the quality of the COAS students.

International applicants must show proficiency in English by providing their TOEFL scores. In addition to this, the COAS Graduate Admissions Committee (GAC) contacts the international applicants by phone to verify language proficiency. In the case of very good applicants with TOEFL scores below average or who do not show sufficient proficiency during phone conversations, faculty members have the option of utilizing the English Language Institute at OSU either to prepare candidates for graduate school or as an additional prerequisite for admission. Another metric for assessing the quality of COAS students is provided by the large numbers of honors courses, scholarships, and fellowships along with awards received from state, national, or international institutions.

During the COAS review, two different groups of COAS students were interviewed. In the discussions which ensued, they provided several good points of constructive criticism (both in written form and orally), showing a strong involvement in the college life and commitment to improving its graduate program.

1.4 Admission Selectivity

The COAS admission process is very selective. Applicants are expected to have a minimum GPA of 3.0. In case of lower GPA scores, the Graduate Admissions Committee (GAC) can submit a petition provided that the candidate shows strengths in other areas such as outstanding research capabilities or exceptional GRE scores. As pointed out in
the previous section, the GAC has no minimum requirements for GRE scores. However, these scores do play a role in the selection process.

The Student Programs office and the GAC lead the selection process. The Graduate Admissions Committee (GAC) is composed of one faculty representative nominated by each discipline. The faculty representatives are in charge of managing the application review process for applicants in their area. All student applications are divided into three categories which are color-coded as green, yellow, and red. The applicants with a green code are given highest priority. Those with a yellow code are deemed acceptable and put on a stand-by list; offers to this pool are made contingent upon funding available from faculty members and offers already made to green applicants. Applicants with a red code are considered not ready for, or not up to the standards of, the COAS graduate program.

The Student Programs and the GAC are very proactive in contacting the top candidates early and attracting them to COAS. Also the red applicants are notified early about the negative outcome of their applications so that they can apply to other schools. The expeditious handling of notifications to green candidates allows for a prompt replacement of possible offer declinations by proceeding with offers to candidate from the yellow pool.

Evaluations of the applicants are based on academic achievement (GPA scores), TOEFL and GRE scores, previous research experience, letters of recommendation, and the student’s statement of interest and motivation. At least three faculty members are responsible for reviewing the applications. Top U.S. candidates are invited to Corvallis to attend a COAS Open House which is held in early March. This kind of recruiting tool has been proven successful in attracting the best candidates by informing them with regard to research opportunities at COAS, faculty and current students, OSU and Corvallis.

Recommendation: Continue to host the COAS Open House for applicants.
The number of applications has remained consistent with the national trend in sciences, which shows a decline starting around year 2000. During the period 1997-2007, the number of applicants has decreased but the overall number of matriculating applicants has remained constant (30-50%). MRM is a popular masters’-only program that has historically accounted for a high percentage of masters admissions to COAS. With the appointment of the new MRM director in 2005, a decision was made to reduce to about 10 the number of applicants accepted annually into the MRM track, likely accounting for some of the reduction in students matriculating annually. The intent was to better match incoming students with available research support and the capacity of COAS faculty to provide supervision. As a final note, COAS is very proactive in recruiting minority students. Through a partnership with OSU Graduate School, COAS markets its programs to under-represented minority students by using the Society for Advancement of Chicanos and Native American Students, the McNair Scholar Program, the California Diversity Forum, and some minority-base fellowships.

**Recommendation:** Continue to proactively recruit graduate students from underrepresented groups.

### 1.5 Curriculum Strength

COAS sponsors four graduate programs: (1) Oceanography (MS, MA, and Ph.D.), (2) Atmospheric Sciences (MS, MA, and Ph.D.), and (3) Geophysics (MS, MA, and Ph.D.), and (4) Marine Resource Management (MS and MA). The student population is ~90, with ~45% of the students as master’s students. The Oceanography and Marine Resource Management programs are the larger programs, with smaller Atmospheric Sciences and Geophysics graduate programs. The academic programs are generally sound, with appropriate foundation and advanced courses for students.

We engaged in discussions about curricular strength with all the constituency groups. Different groups identified many of the same issues as areas on which to focus. On a positive note, students commented in particular about the value of the proposal writing
class required for graduate students in Marine Geology and Geophysics, and thought all students should be encouraged to take such a class.

We identified several curricular issues in the course of our discussions, as follows.

Core courses. As in many oceanographic education programs, core courses in the various oceanography sub-disciplines (physical oceanography, biological oceanography, chemical oceanography, marine geology) along with an atmospheric sciences course serve as the foundation courses. Students and faculty raised a number of issues with regard to core course design and quality, core course consistency from year-to-year, course overlap, and core course teaching quality. The issue of redesigning the core courses to a more integrated sequence has been visited many times in the past, and it may be time to do so again. We think the other three issues are more pressing. Students expressed concern about the consistency of core course content from year to year, as instructors change, and they expressed a need for greater evaluation of how the various core courses articulate with each other (e.g., eliminate unneeded overlaps, look for possibilities for continuity or expansion of topics between courses, etc.). The inconsistent quality of core course instruction was also raised in student discussions as an area of concern. Students wanted a focus on teaching quality in these (and other courses), suggesting COAS institute incentives for good teaching. They found that bad teaching habits persisted from year to year, and they encouraged instructors to use the OSU resources available for improving teaching. They did not find that student evaluations of teaching were effective in addressing issues of teaching quality, for two reasons: (1) they were unaware of what happened to the evaluations after filling them out, and (2) the small size of classes meant that anonymity was not really guaranteed in filling out evaluations. With regard to the first issue, we received a clear description from the Student Programs Office about how the teaching evaluations are used, and this needs to be more apparent to the students. The second issue is difficult if not impossible to resolve, since most graduate courses are taught to only a few students.
Recommendation: Examine the issues around core course curriculum with fresh eyes. Focus on course content, year-to-year consistency, and teaching quality issues in these critical classes.

Student seminar. The student seminar series (Fridays, 4 p.m.) was identified as an issue by students, given that it is not well attended by students who are not enrolled. The participation by enrolled students includes written feedback, videotaping, and questions from the audience. Student seminars are not widely attended by faculty, and this was also identified as an area of concern.

Recommendation: Consult with students and faculty about the structure and importance of the student seminar series and work to increase attendance.

Sea-going experience for students. Some faculty identified the need for institutional support to provide more opportunities for sea-going experience for graduate students, as an integral part of oceanographic education.

Recommendation: Pursue getting educational days of ship time for student program.

Curricular stability, advanced electives, and small classes. These three issues were often raised separately, but we group them here because we think they are related. Students and faculty raised the issue of curricular stability, the predictability of what classes will be available when in each academic year, especially for more advanced graduate classes. Faculty questioned whether they could offer sufficient breadth of courses, with some resulting in small class size. Some sub-disciplines were more impacted by this, but all face this issue. Many research project obligations are driven by nationally and internationally scheduled research vessels and facilities, and faculty have little to no control over this. The volatility in scheduling of the more advanced graduate courses in particular left students finding themselves less than well-prepared for the disciplinary exams.
Recommendation: Examine the graduate curriculum for a possible overhaul, including streamlining and increasing predictability of offerings. Although this task may seem daunting, it is likely that a more structured approach could improve the availability and predictability of timing of advanced electives, create teaching ties between faculty for more advanced courses, and avoid very low enrollment classes. Reasonable financial support for an individual to take on this task would likely get this off the ground quickly.

*Environmental Sciences and other contributions to undergraduate education.* An interesting topic underlying some discussions was “What is the appropriate role of COAS in undergraduate education at OSU?” Among oceanographic institutions, COAS represents a middle ground model in the balance of hard money support from the institution and teaching expectations vs. soft money research support. For example, WHOI researchers are almost entirely soft money funded, with no formal teaching expectation unless by choice, while Scripps Institution of Oceanography (UC San Diego) faculty members receive the typical faculty member 9-month hard money support with some teaching expected. (Note the SIO also has many soft money funded researchers.) COAS faculty already contribute to undergraduate education at OSU, along with their primary focus on graduate education.

Some COAS faculty, along with other geosciences faculty at OSU, are engaged in a recent task force discussion about an “Earth System Science Program” development, one of five areas identified as high priority by OSU. This would result in an undergraduate major, as well as possible restructuring of the graduate programs in COAS. An Earth Systems Science Center was estimated to need $100M. There is little general knowledge about the work of the task force, as it appears to be in formative stages working through vision and definitions. This ambiguity was reflected in the self study documents. Among those who were aware of Earth System Science discussions, some saw it as a way to increase state support for COAS faculty, and this would come with increased teaching loads. There was also the perception that an Earth System Science undergraduate major
could result in greater availability of teaching assistantships to support graduate students and give them relevant professional experience. Some faculty saw the pedagogical and societal value of being more engaged in undergraduate education, while others thought that this was not the appropriate focus for COAS and would likely result in a declining size.

**Recommendation:** Communicate early and often about the ongoing work of the Earth Systems Science task force to COAS faculty to engage them and to hear their concerns and goals. Consider carefully the financial issues for COAS in moving away from their highly leveraged, largely research focused model to a more traditional faculty support and teaching expectation model if this is part of the Earth System Science model.

The MRM curriculum is somewhat thin in the exposure students get to ocean law and policy compared to other similar programs, particularly its nearest neighbor program at the University of Washington. MRM has nevertheless come to occupy an interesting niche among programs of its type, with a curriculum more similar to that offered at Duke’s Nicholas School of the Environment and Earth Sciences (Master in Environmental Management) program than curricula at UW, URI or the University of Delaware. Graduates are immersed more deeply in scientific and technical training than their counterparts in most of these other programs, for example receiving training in the use of GIS and applying it in thesis work, and this appears to make them highly competitive for positions in the field with a resource management orientation.

Some MRM students complained about the difficulty of having to rely on a combination of distance learning and highway travel for the required ocean law class that is taught at the University of Oregon. It is unclear what can be done to improve this situation given the absence of a law faculty at OSU. The highly compartmentalized and specialized nature of law programs makes this a difficulty for any program that lacks faculty trained in ocean and coastal law within its ranks, and the recruiting of such faculty seems unlikely given the long-established structure of faculty hiring within COAS. MRM
might do well in the longer run to explore other ways to collaborate with its neighbor institutions, such as Marine Affairs at the University of Washington, in the possible joint offering of courses that take advantage both of the internet, as well as geographic proximity that would support at least a few face-to-face sessions across programs.

These questions aside, the fact that the COAS graduate curriculum comes with expectations that all students will cross disciplines to some degree in their course work seems to be resulting in students and faculty alike having highly integrative perspectives on ocean science. The MRM program in particular seems more strongly embraced as embodying a set of ideas that all students in ocean science should be exposed to, compared to other institutions that have both ocean science and ocean policy programs. It was heartening to hear the Dean express the hope that COAS science students would in the future avail themselves more widely of policy, economics and other social science aspects of the MRM curriculum.

**Recommendation: Encourage COAS science-track students to avail themselves more widely of policy, economics and other social science aspects of the MRM curriculum.**

**1.6 Quality of Personnel and Adequacy to Achieve Mission and Goals**

COAS has high quality faculty and high quality student applicants and enrollees. There are also post-doctoral scholars and researchers, as well as computing staff, contributing to the research and academic environment. The Student Program Office is now led by Associate Dean Duncan, from among the regular faculty ranks, and we perceive this as an important commitment to the graduate programs. COAS appears supported by a relatively small number of high quality staff.

The size of the COAS faculty seems appropriate. COAS faculty have thought carefully about faculty recruitment priorities and need for faculty renewal through new hires in a timely and ongoing manner. This is critical to sustain the COAS financial support model,
with graduate student and faculty support leveraged from the state base support with external funding. Faculty hiring is particularly needed to mitigate impending faculty retirements. There are specific needs in atmospheric sciences, where the faculty numbers may be below critical strength. Collaboratively identifying priorities and conducting searches between atmospheric sciences and the physical oceanography areas may help build strength. This is important to the recruitment and support of appropriate numbers of students in atmospheric sciences and other particular areas. The number of students overall is appropriate, but some areas appear to have fewer students than desired. Faculty hiring in targeted areas can help build disciplinary strength necessary for program visibility and impact and thus student recruitment and success.

Recommendation: OSU should support the COAS hiring plan, including the need for adequate start-up packages. COAS should revisit faculty hiring priorities as hiring proceeds. While it is tempting to say that MRM should direct future hires toward faculty who can extend its reach in ocean and coastal policy, given the highly leveraged nature of faculty appointments within COAS (with assistant professors, once established, expected to raise 70% of their salary) it is advisable for MRM to focus instead on faculty who can expand the scope of scientific work in areas that have direct policy implication. Current commitments to hire in the areas of climate change and coastal hazards and in marine and estuarine conservation biology thus seem good directions that will reinforce the existing successful model and continue to promote integration of MRM with ocean science.

The size of the student population also seems in correct scale to COAS. A vulnerability for the graduate program is the nearly complete dependence of student financial support on external funding raised by faculty for specific research programs. The Student Program Office is clearly active in trying to get more diverse support for students, including having adjusted the application deadline in order to make COAS applicants more competitive for OSU fellowships.

Recommendation: Continue to explore new avenues of student funding support.
COAS has learned to do a lot with relatively little, the result of having at its core a highly leveraged faculty in which individuals are expected to raise 60% or more of their annual salary on grants and contracts. The result seems to be a faculty that has learned to be highly resourceful and is very competitive in research funding. Although students complained about inconsistencies in the mentoring they received from faculty advisors, the professional staff hired to track student project and provide career-related advice is highly professional. The “flat” structure of the college produces great economies of scale, whereby one or two individuals provide services that are often duplicated in each program in compartmentalized colleges.

1.7 Level and Quality of Infrastructure

COAS has state-of-the-art facilities for graduate education and research. COAS operates several analytical laboratories (Geochemistry Labs, Physics Labs, Biology/Biochemistry Labs, Geophysics Labs, other miscellaneous labs), field equipment, a rock and sediment core repository, and two research vessels, the RV Elakha and the RV Wecoma, which operate out of the COAS ship operations facility, located at the Hatfield Marine Science Center in Newport, OR. COAS can boast a state-of-the-art cooperative computing environment which supports all research and most educational efforts. The college has several massively parallel supercomputers, over 140 UNIX workstations, and over 200 PCs and Macs within the COAS network. This represents the largest oceanography supercomputing center in the U.S.

A serious problem raised by the graduate students interviewed is the access to the web and the overall COAS computer network infrastructure. Connectivity to the web through OSU_PUB, OSU’s public wireless network, is not guaranteed in many parts of COAS buildings (for computer security reasons) and, if present, it is spotty and unreliable. This represents a problem not only for graduate students but also for temporary visitors and visiting scholars who cannot access the web through their personal laptops. Other issues raised are the students’ difficulty some students have in securing IP addresses for
Ethernet access to the network (they have to be paid through grant support by the students’ supervisors) and the lack of a reliable and efficient communication link between the Hatfield Marine Science Center and the COAS facilities in Corvallis. Finally, the COAS intranet is an underutilized resource for documentation and calendar notifications. The College should encourage the use of this infrastructure as well as increase the amount of useful information available on the intranet.

**Recommendation:** All COAS students need access to the internet from their desks. If for security reasons, access to OSU_PUB is not accessible for some students from some COAS buildings, these students must be provided with an IP address to access the internet and standard software via the COAS computer facility.

### 1.8 Level of Financial Support of Students

Most of the financial support of graduate students is from grants or from federally-funded fellowships. Compared to other graduate programs in oceanography around the country, COAS receives very little graduate student support from OSU. For example, the University of Rhode Island provides 15 fully funded, year-around graduate research and teaching graduate assistantships to an oceanography program approximately the same size as COAS. This is approximately 5X to 8X better university-provided support than what OSU provides to COAS.

The COAS administration and faculty are very interested in having the capability to offer Fellowships to first year students. Raising private funds for graduate fellowships takes a sustained and focused fund raising effort led by a professional fund raiser. Having a half-time development officer assigned to COAS is a high priority for the COAS administration, and the rationale for having such a person assigned to COAS certainly made sense to the Review Committee. The College uses TA’s as supplemental recruitment tools, but students typically get no more than a single quarter of support. About 15 quarters of TA support are currently available, and the college is in the process of capturing an additional 7 quarters from central administration. Faculty and
administration both commented however that the ultimate solution to recruiting the best students is to have fellowship money available that doesn’t lock students into a research project prematurely, as GRA support tends to do, and which leaves sufficient time for a student to develop a relationship with a faculty mentor and commitment to a particular research project.

**Recommendation:** OSU needs to re-assign a development officer to COAS to help raise funds for Fellowships and for other needs.

The Review Committee noted that COAS recently initiated a Research Experience for Undergraduates (REU) summer program. Other institutions have found REU programs to be an excellent source of graduate students. Furthermore, faculty are often more willing to provide GRA support for a first-year graduate student who is an alumni of the institution’s REU program. Unlike many first-year graduate students, REU alumni are a known entity to their former host investigator and often come with the skills and interest they need to make an immediate contribution to a research group. Hence, they are often attractive to faculty who are normally reluctant to use GRA support on first year students. The cost of supporting a summer REU student is low compared to a graduate student, and private donors often are attracted by the possibility of providing undergraduate students with a research opportunity. Private funds could also be sought to expand the NSF-funded REU program with the goal of expanding the possibilities for GRA support of first year graduate students.

The graduate students mentioned problems with summer health insurance and referred to it as a “terrible situation.” Students lose their university-subsidized health insurance if they cease to be supported by a GRA or GTA at any time, but commonly during the summer when many are supported by student wage appointments (in order to save tuition costs). They then must make alternate arrangements for health insurance, either purchasing a COBRA plan or electing another short-term health plan. COAS needs a clear statement for students and faculty about the options for summer support, implications for health coverage, and available remedies.
The current health care system at OSU for graduate students seems out of sync with the level of attention focused on graduate student benefits in many U.S. research universities. Our understanding is that the Graduate School is trying to remedy the current summer health care situation for graduate students, and the Review Committee believes that attention to this issue should be a high priority. Our experience is that health care is of increasing concern to graduate students, and the lack of a good health care plan may make it more difficult to attract and retain high quality students.

**Recommendation:** Resolve the graduate student health insurance issue, so that graduate students can receive uninterrupted coverage throughout the year, including for those who are not registered for coursework in the summer.

A significant reduction in the number of course credits required for the MRM degree, spearheaded by the new MRM director, has made MRM students more competitive for highly valued GRA awards than formerly, when most faculty perceived them to be too burdened with course work to function effectively as graduate researchers. This has also resulted in more MRM students following the thesis track to their degrees, a highly beneficial change that leaves graduates more competitive for jobs in the field. Because this change has also been coupled with a decision to hold MRM admissions to about 10 students per year, a number roughly in line with available research support, a higher percentage of MRM students are funded than formerly and the students who matriculate to MRM are better equipped to engage in science-based thesis research. Moreover, the thesis work that MRM students do seems better integrated with research themes that prevail in the college’s science programs. A possible disadvantage is that there may be important regional policy arenas in which students don’t work because the topical focus is not well aligned with the research COAS faculty do. MRM retains relationships with faculty and researchers elsewhere at OSU and at places like the South Slough National Estuarine Research Reserve. These individuals also provide students with research guidance; though it is possible that fewer students are availing themselves of opportunities to work in external marine resource management and policy organizations as a result of enhanced funding opportunities inside COAS.
1.9 Space

The fast growth of COAS over the last three decades has created shortages in office spaces, labs, and technical research space. Reallocation of underutilized space on campus has been the primary tool used by COAS to find the facilities. As a consequence, COAS is currently spread across five (not three) buildings: Burt Hall, Weniger Hall, Strand Hall, Western Avenue core repository and cruise staging, and the COAS Administration building. Space for student and faculty offices and labs has been allocated on the fifth floor of Weniger Hall. COAS students, faculty and administrators all mentioned additional space as a critical need, and in particular, the need for a building in which all members of the COAS faculty and students can be consolidated. This will likely require a new building, and the Review Committee understands that such a building would require private as well as public funds. Raising private funds for a new building is further justification for a Development Officer assigned to COAS.

The graduate students with whom we spoke want more input into space decisions and specifically mentioned co-locating student offices in central locations to improve student interactions. The Review Committee also recognizes that student office space near the student’s laboratory is also a priority for many graduate students, and it is not always possible to have a central area for student offices that is close to all of their laboratory work spaces.

Recommendation: Long-term space requirements need to be addressed. Co-location of students and faculty advisors is a desirable thing. Moreover, central locations for students in every building would be a major addition to student interactions.

1.10 Quality of Organizational Support
Administrative model. The College currently operates with the leanest of administrative organizational models, with a full-time dean, one part-time associate dean for student programs (0.8 FTE), a director of special projects, and no department heads/chairs. While this model may be organizationally efficient and cost-effective, it was apparent from our conversations with faculty that many were not well informed as to current COAS initiatives or plans for new curricular development.

Recommendations: Strive to develop more open and regular lines of communication among COAS administration, faculty and graduate students.

With regard to student recruitment, the Office of Student Programs and the Graduate Admissions Committee have developed an impressive graduate student recruitment program and materials. Of particular note is the successful practice of funding the visits of the top 12 to 15 prospective graduate students to campus in March of each year for a 3-day Open House. Outcomes data reveal that between 33 to 50% of the participants in this annual weekend recruiting program matriculate into one of the College’s graduate programs.

At the beginning of each academic year, the College sponsors a five-day “COAS New Student Orientation” that provides incoming students with a comprehensive overview of the academic programs, computing capabilities, and tours of the various COAS facilities, both in Corvallis and at the Hatfield Marine Science Center in Newport.

Computer labs. The College supports a series of computer laboratories available to students and faculty for data reduction and analysis, as well as the creation of presentation graphics. While the Burt Hall computer labs were impressively equipped, we did not observe any graduate students or faculty using these facilities during our tour. It is unclear the extent to which these labs are utilized, and our conversations with graduate students revealed some significant concerns regarding the lack of critical software programs and updates, as well as wireless access to the COAS computing network.
*Database management.* The operation of this world-class, centrally-located supercomputer network and research database housed in Burt Hall is overseen by a full-time computer systems manager. The technology observed at this data storage facility was state of the art, with the average lifespan of the servers and mainframe components in the 3 to 5 year range.

2. PRODUCTIVITY

Much of the material related to student performance, faculty performance and the viability of the scholarly community are covered in other sections. In general, the COAS students with whom we spoke believe they are getting an excellent education and were pleased that they chose this particular ocean science program. COAS graduates are visible on the faculty of other oceanographic institutions, in postdoctoral programs and in program management positions in Federal agencies. The COAS faculty are also well known nationally and internationally with many outstanding researchers among them. For example, the satellite ocean remote sensing group is generally considered the best among all U.S. institutions.

3. OUTCOMES

3.1 Professional Viability of Graduates

COAS graduates continue to professional positions in a variety of settings. It was harder to evaluate this for some aspects of the program (e.g., atmospheric sciences which has only a small number of students compared to other COAS components). The students recognized the value of the grant writing course required for marine geology and
geophysics students. The relatively limited number of teaching assistantships available to students limit their ability to gain experience and confidence in this role.

Several people commented that the College’s ability to assist its graduates with professional placement is somewhat limited and should be strengthened. Two limitations mentioned were the lack of staffing in the COAS Dean’s office to work on placement and the low level of attention accorded in the past to maintaining a strong alumni network. Although less than half of the alumni who responded to the COAS self-study survey indicated that they had been assisted by COAS faculty, staff or other alums in finding professional employment, this might be a glass half empty, glass half full situation. An inspection of information provided in the Self Study [Table K] suggests that students are finding excellent employment opportunities comparable to those of graduates elsewhere.

3.2 Satisfaction of Students and Graduates

Student discussions raised substantive issues about teaching quality and advising quality. Students and faculty differed in their perceptions of the role of teaching performance in promotion and tenure decisions. Faculty thought that teaching quality was important in professional advancement, especially for early advancement and in recruiting students. Students did not think that good teaching or advising were promoted or valued. Students seemed unaware of the “Peer Review of Teaching” committee and its role in faculty evaluation. Students suggested instituting a teaching award in COAS, and this seems a straightforward thing to do.

Students wanted faculty to be more aware of what is found in the student handbook, and they recommended the development of a “Handbook for Faculty” about teaching and advising. For advising issues, it might be useful to identify a graduate coordinator by discipline and to have an ombudsman for students to consult. Students particularly wanted faculty advisors to be aware of guidelines, best practices, and things to avoid. A concrete example was the concern over student health insurance in the summer and the
need for advisors to understand the implications of the choices they make about how to pay students in the summer.

Student exams include a discipline-based qualifying exam and a comprehensive exam (thesis proposal based, oral exam). Students expressed the most concerns about the disciplinary exam. The content seemed somewhat nebulous, and there were perceived difficulties of appropriate scheduling with enough advance notice, especially in some areas (e.g., MGG). This issue related back to the concerns about core course content and consistency from offering to offering. Students generally thought the comprehensive exam was fair, and that it tested students on something they need to do (their research).

We did not receive much information about the satisfaction of COAS graduates, so we did not evaluate this area. Both faculty and students identified a changing mix of career goals for graduate students (a widespread development), along with the need for providing better information to students about career pathways and preparation for them.

The Student Programs Office, Associate Dean Bob Duncan, and Robert Allan are all clearly dedicated, enthusiastic, and thoughtful in their dealings with the graduate programs and graduate students. Recent changes include annual tracking of students, career planning (including working with the OSU Career Office), the COAS Alumni Speaker Series, exit interviews with students, and working on recruitment strategies. These are valuable developments, with immediate and longer-range payoffs anticipated. Students expressed a desire that options other than seminars be used for conveying career information, feeling they were a bit overloaded with seminars.

Recommendation: Encourage COAS faculty, particularly new faculty, to take advantage of OSU programs to train faculty in teaching techniques. Research faculty tend to be out of touch with developments in pedagogy, yet graduate students have been exposed to new science teaching techniques (e.g. inquiry-based learning) as undergraduates.
Emphasize to students the importance of participating in the nomination process for the faculty teaching award (Pattullo Award) and the mentoring award (Dymond Award).

3.3 Rankings and Ratings

We fully expect COAS to remain among the top oceanographic programs in the ongoing NRC rankings. The faculty’s success in obtaining large amounts of external funds, including virtually all graduate student support, is a direct indication of the high quality and persistent efforts of the faculty in the currently difficult funding climate.