## 9. Performance

Normally this section would involve comparison of our department to peer institutions. However, after looking at data from each of our designated peers, and at departments suggested as aspirational peers by our faculty, we determined that there were significant differenced between our department and our peer departments. Our structure, including three disciplines with a faculty of about 30 requires us to offer such an array of courses that comparison to departments with similar number of faculty, but fewer disciplines, is not valid. On the other hand, metrics such as grant dollars and enrollment should scale directly with number of faculty.

Equally importantly, our inherently interdisciplinary programs are not confined to our department. Our environmental program includes faculty in environmental engineering, biological and agricultural engineering, soil science and forestry. Our marine science program includes faculty in biology, zoology, veterinary medicine, electrical engineering and natural resources. Our atmospheric program includes faculty in civil engineering, forestry and statistics. Evaluations of faculty strength and external support that do not include these collaborations do not provide an accurate reflection of our departments programs.

**Benchmarks**

Instead we have decided to develop a set of performance metrics that we aspire to, and compare our actual performance to our conceptual model. In recognition that faculty contribute to departments in different ways, we developed two faculty models. Our performance metric is thus comparison to the idealized faculty productivity model.

**The "regular" faculty member.** One who contributes to all areas of faculty responsibility. A regular faculty member, as described in our formal offer letters, would be one who teaches three courses per year, has several graduate students (2-3), and generates sufficient external support to support his research and one or two students. With total student costs about $25,000 per year this would require about $100,000 per year of external support.

**The "research extensive" faculty member.** One who maintains a large sponsored research program. This would involve teaching only two classes per year, maintaining a graduate group of five graduate students and providing research support for students and professors research. Considering that we typically provide ½ of a students support from the department in the first year, this would involve supporting 3 student full-time and would require approximately $200,000 per year.

Obviously there are large differences in actual research costs depending on the project. Some involve only computer modeling using existing equipment, others require international travel and expensive field equipment so the numbers are simply crude estimates that serve as a benchmark. Similarly the cost of students varies with in-state, out of state and foreign students and masters vs. doctoral students.

**Teaching Load:**
The average teaching load in MEAS (computed for all tenured and tenure-track faculty present for both Fall and Spring semesters in the 2005-2006 academic year) was 2.8 courses per year

**Table 9.1 MEAS Teaching Load (2005-2006 academic year).**

| Load (courses per year) | Number of Faculty Members |
|---|---|
| 2 or less | 7 |
| 2 < load < 3 | 9 |
| 3 | 6 |
| 4 or more | 6 |

It is apparent from Table 9.1 that the department is not at its goal of 2 courses for research extensive faculty and three for others as six faculty members taught 4 courses or more last year and the average was almost 3 courses per year. However 16 of the 28 faculty had loads lower than 3 courses indicating progress is being made in lowering the load for research extensive faculty.

Two of those who taught four or more courses per year retired last year (Al Riordan and Skip Stoddard). Our four new faculty are being asked to teach only one course their first year and two courses their second. With these changes the projected load will be:

**Table 9.2 Projected MEAS Teaching Load (2007-2008 academic year)**

| Load (courses per year) | Number of faculty members |
|---|---|
| 2 or less | 11 |
| 2 < load < 3 | 9 |
| 3 | 6 |
| 4 or more | 4 |

With the projected changes shown in Table 9.2, the average load will be 2.6. Progress is being made in lowering load, but too many faculty members are still teaching more than the optimum load.

There are two problems causing the overload, and two paths to solution. One of the problems is the historical proliferation of degree programs that resulted in requiring the offering of a very large number of courses. The other is the retirement of faculty who historically have taught large teaching loads (4 or more) and their replacement with research extensive faculty. One way to reduce the load is to reduce the number of courses offered (either eliminating them or going to alternate years). The earth science group spent 18 months examining their many degree programs and simplifying to one curriculum and two degrees (BA and BS), with a number of "tracks." This process, identifying a common core for all earth science students and eliminating courses (there were four separate undergraduate paleo courses for different degree programs) resulted in a substantial reduction of load for earth science faculty. With the very large number of

changes in staff in atmospheric sciences, a similar examination will be undertaken this spring. Marine sciences should also undergo this process in the near future.

The second way to reduce load is to utilize non-tenure track instructors. In the past the tactic has been to plea for more faculty to reduce teaching load, and indeed this was the college approach in the last compact plan. No funds were allocated by the administration for this effort and it is relatively clear that an increase in the number of faculty for this purpose will not occur. The use of instructors (non tenure track faculty) is another alternative, we have been able to identify a few instructors who have qualifications appropriate for instruction in our program; however, a new class of teaching professors is more appealing. Teaching professors are non-tenure track permanent faculty hired primarily to teach. The department will consider such a person in future hiring decisions.

**Sponsored Research:**
Sponsored Research in MEAS has increased steadily, reaching $6.8 million in new awards in the last fiscal year (ending June 30, 2006). Table 9.3 shows recent MEAS research. The department has been the third highest in sponsored research for more than a decade.

**Table 9.3 MEAS Sponsored Research**

| Fiscal Year (ends June 30) | New Awards |
|---|---|
| 2002 | $4,821,587 |
| 2003 | $5,546,746 |
| 2004 | $6,064,702 |
| 2005 | $6,293,483 |
| 2006 | $6,837,201 |

With five retirements at the end of 2006, the department had 27 faculty members actively seeking grants. The 6.8 million obtained averages to $252,000 per person per year, a level of research activity that is above our benchmark of $200,000 per research active faculty member. This is evidence to the high level of sponsored research activity in the department.

We expect research to grow as the four faculty hired this year, and the two to be hired next year develop their sponsored programs. That this support translates to graduate student support is evidenced by our supporting of approximates 110 graduate students last year (the number changes throughout the year as students graduate, are admitted in mid year or drop out) while only 29 were supported on teaching assistants. Thus 81 grad students were supported on research grants (note that in many cases students are supported partially on TAs and partially on RAs but this does not change the totals – for example there may be 10 students supported half on TAs and half on RAs which would mean that there were 39 students receiving some TA support and 91 receiving some grant support, but the total is still 110 students).

**Graduate Students**

The section on our graduate program discussed the fact that we have far more good applicants for our program than we can accept. Limitations are based on two factors, available graduate student support and the willingness of faculty to accept more students. As discussed above, we have four new faculty hired this year and will hire two more next year, thus we expect both graduate student support to increase and the number of students who can be accommodated to increase. Two of the current hires, and one of the projected hires are in atmospheric science. There are always more excellent applicants in this area than we can accommodate, the graduate program is sure to grow in this area. Our other hires were in geophysics and physical oceanography. Geophysics has historically had a very high demand and excellent graduate applicants (Tom Drake, our last geophysicist had a large and successful graduate group when he left for a full time job at the office of Naval research). Physical oceanography has a highly successful history or raising external support and is part of our departmental program to develop and instrumented estuary. There has been great student demand for our estuary program and it is anticipated this will translate into graduate student growth.

**Undergraduate Programs**

The meteorology undergraduate program is large and growing, and is now at the limits of our facilities. The addition of two new hires this year, and one projected next year, will keep this program strong. The marine science undergraduate programs are relatively new (beginning in 2000) and are quite small. Recent trends (doubling of total marine science enrollment over the last three years) are good, but continued emphasis must be placed on program development. The loss of 7 people through retirements or departure (D. Wolcott, E. Knowles and T. Hopkins plus the departure of Tom Drake, Steve Snyder, John Morrison and the move of Len Pietrafesa from the department to the dean's office since the program started has resulted in constant turmoil. Now that the faculty are nearly stabilized it is important to develop the small undergraduate program carefully. It should be noted that the natural resources-coastal and marine degree program, which was the largest marine science program, lost the person teaching the capstone course (Hopkins), the coastal geologic processes course (Snyder) and the coordinator and major marine sciences advocate (D. Wolcott) which led to the canceling of the coastal processes field camp and a substantial reduction in enrollment. The proposed hiring of a coastal processes person next year should re-energize the program.

The minimum class size for undergraduate course is 10 students, so the minimum requirement for a degree program should be 10 students per year assuming there are classes specifically taught for that degree program. Since many students do not decide to major in one of our programs as freshman, we set a target of a minimum of 30 majors in any program. New programs (such as biological oceanography that has been in existence for only one year, are allowed time to build. On the other hand, degree tracks, which include a concentration of courses, each of which is not unique to the program, can be sustained with smaller numbers. For example, if a marine meteorology track is composed of courses taken by meteorology majors, plus some by marine science majors,

it does not require additional resources to run the concentration. Each degree program in the department must be large enough to sustain the courses it requires.

**Summary:**
Sponsored research in the department is strong and growing. Recent and planned hires of a large number of new research extensive faculty should enable sponsored research to continue to grow. Similarly the graduate program is strong in numbers and should continue to grow as the new faculty increase their research groups. Undergraduate enrollment is strong in meteorology but need continued growth in the other areas.

Teaching loads are higher than desired, but will be slightly reduced with the planned faculty changes. Either a reduction in the number of courses offered each year, or the hiring of teaching faculty are required to reduce the load to the desired level in the apparent absence of substantial increase in the number of faculty.