

Academic Program Review – Department of Geological Sciences, East Carolina University

Unit Final Action Plan-Response, Department of Geological Sciences, October 29, 2012

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A. Recommendations for action at the Unit level

Recommendation #1: “There is a need for improving the quantitative skills for all students (graduates and undergraduates). This might be facilitated by accepting students from highly quantitative disciplines (i.e., math, physics) in the department for research in related areas (i.e., geophysics, coastal processes, etc). As a corollary, incoming students at all levels should have SATs and GREs (required for all majors) in the top 10% of all scores. GPAs are 3.5 and higher.”

Response: The faculty recognize the need for improved quantitative skills – it is clear from our assessment activities. As a result, we have increased the quantitative input in many of our required majors courses and graduate courses over the past several years. In addition, we now offer GEOL 6950 Geological Data Analysis for our graduate students every other year. Starting in Spring 2013, we will offer annually a new, required course for our undergraduate majors, GEOL 2000 Quantitative Methods in the Geological Sciences. This is a 3 credit course with MATH 1065 as a prerequisite. The course description is: “Introduction to quantitative techniques used in descriptive and predictive aspects of the geological sciences”. This course will rotate among four faculty members, who are currently discussing with the rest of the faculty the content of the course to ensure a high level of consistency from year-to-year.

The average SAT score for ECU’s incoming freshman in Fall 2012 was 1050 out of 1600. Scores of 530 (approximately half of 1050) in Critical Reading and Mathematics represent percentiles of, respectively, 60% and 55% for tests taken in 2011. Given this reality, the suggestion that “incoming students at all levels should have SATs and GREs ... in the top 10% of all scores” and GPAs of 3.5 and higher is unrealistic and unattainable given ECU’s admissions policy and the nature of the student body. With regard to the M.S. program, a handful of applicants each year do satisfy the suggested criteria. Many of those students attend other institutions where the offered support package (stipend, tuition remission, etc.) is more attractive.

Action: Offer annually a new, required 3 credit course for our undergraduate majors, GEOL 2000 Quantitative Methods in the Geological Sciences. This course could also be used as remediation for new graduate students who do poorly on the quantitative section of the entrance exam.

Recommendation #2: “The Department should create beneficial strategies that will enable access to Honor college students. The creation of earth science Honor’s sections for courses

taught by faculty of the Department will provide such access. At the same time, incentives for the creation of these courses should be given to the Department and not solely to the faculty as it is the case at present. The latter is recommended only if this activity is beyond the normal teaching load of the faculty.”

Response: We will consider how best to recruit Honors College students into the B.S. Geology program (perhaps we will offer Honors sections of GEOL 1500 and GEOL 1550?). (It is worth noting, however, that we currently have four undergraduates who are in the Honors College and three students recently held nationally competitive summer internships at the USGS, NASA and the CDC.) Buy-outs are available for faculty who teach Honors College courses; the Review Committee apparently did not understand this based on their wording of Recommendation #2. See response to Section B, Recommendation #1 for incentives given to the Department.

Action: Meet with the Honors College administration to discuss how best to recruit Honors College students into the B.S. Geology program.

Recommendation #3: “Place an effort in attracting graduate students with higher GPA. This can be achieved by expanding the pool of prospective graduate students from other disciplines. To-date, this has been restricted by an earlier ECU requirement that graduate teaching assistants need to have had formally taken the course for which they act as instructional assistants. That policy has placed serious restrictions on the incoming graduate students as it requires them to have a degree in Geology and mainly from ECU. Relaxation of this policy allows for recruitment from other areas of the natural or physical sciences and potentially increasing the GPA of the incoming graduate student population. MS students should be TAs for upper level Earth science courses and for MS and PHD courses.”

Response: The review committee suggests that attracting graduates students with higher GPAs can be achieved by expanding the pool of prospective graduate students from other disciplines. The committee stated incorrectly that incoming graduate students are required “to have a degree in Geology and mainly from ECU”. As our faculty members have increased in number and subdiscipline diversity, we have brought some graduate students into the program with degrees other than in Geology (e.g., marine science, environmental science).

It is hard to understand how students from totally different disciplines (e.g., biology, math, physics), as suggested by the review committee, could come into a Geology Master’s program and be successful without any geological background. That can happen at the PhD level where course work can be more flexible and the program is several years in length. But at the Master’s level we have only two years to work with, and we do not have the faculty resources to provide courses that would address the needs of, for example, physics, mathematics and biology graduates. We do expect, however, that enrollment of students into our graduate program from subdisciplines within the Earth sciences will increase in the future.

We also do not think that MS students with limited or no background in the earth sciences “should be TA’s for upper level Earth science courses and for MS and PhD courses.” We believe

this would be a disservice to our undergraduates at the very least and, probably, somewhat perplexing to other MS students and PhD students in the Coastal Resources Management Program (MS students as TAs in PhD courses??). It may well be that the review committee considers TAs more as proctors and menial assistants rather than actual teachers. Our TAs do indeed teach.

Our graduate students do not come “mainly from ECU.” The review committee asked the Unit Chair for written information on the provenance of our graduate students as they were drafting their report. Data were provided which showed that for the past 11 years (fall 2000 through fall 2011) we enrolled in our graduate program 33 students from ECU’s undergraduate program and 61 students from other schools.

We certainly would like to recruit students with higher GPAs. Like other graduate programs at ECU we are somewhat hobbled by the low number of OSTRs and the low level of the assistantships that we offer. Our self-study document points out how we address this issue, in part, through funding students with our external grants. The disadvantage is that we then have “haves” and “have nots” within our graduate population.

Finally, we note that, as the reputation of our faculty, the graduate program and the department grows, more high quality students will apply to our graduate program. In 2011, we had 19 completed applications and we declined admission to 3 students. Of the students admitted, 10 enrolled and 6 went elsewhere. In 2012, we had 34 applicants and we declined admission to 4 students. Of the students admitted, 10 enrolled and 19 went elsewhere or deferred for a year.

Action: None.

Recommendation #4: "Secure the funds and create a small, competitive graduate student research grants that can facilitate research in any area of the Department’s faculty expertise."

Response: This recommendation is a fine idea that could serve as a strong motivational tool leading to graduate student excellence. Funds to support this effort have already been provided by alumni donations (see response to recommendation #9).

Action: See recommendation # 9.

Recommendation #5: "Implement mentoring program for junior, untenured faculty. This should be in addition to the currently implemented annual evaluation and meeting with the chair as it will provide an additional level of re-assurance and provide a continuous guidance for the junior faculty. Give the junior faculty the opportunity to select their mentor as mentoring requires a degree of personal connection."

Response: We currently have an informal mentoring system within the Department.

Geological Sciences is a small, friendly department and is administered as informally, and hence as productively, as possible. Reflecting that, we have a mentoring system that combines formal and informal elements.

- 1) On arrival at ECU, new untenured faculty members are encouraged to form informal mentoring relationships with one or more tenured or untenured, but more experienced, faculty members. They are also encouraged to communicate regularly with the Chair of the Personnel Committee and the departmental Chair so that they can become fully informed of the philosophy, ethos, and workings of the department. Informal mentoring relationships are not restricted to faculty members with similar subdisciplines in the geological sciences.
- 2) A copy of the unit code is given to new faculty members on their arrival.
- 3) New faculty members are encouraged to attend College promotion and tenure workshops. The Chair also attends these workshops to facilitate any resulting discussion.
- 4) At the beginning of the fall semester each untenured faculty member meets with the department Chair. Discussion includes work load and plans for activities in teaching, research and service. The discussion is recorded in a memorandum that is signed by the Chair and the faculty member. A copy of the memorandum is placed in the faculty member's personnel file.
- 5) At the beginning of the spring semester each untenured faculty member meets with the department Chair to review the agreed plan of activities for the year. If changes are required then these are recorded in a memorandum.
- 6) The annual progress towards tenure letter is used as the basis for extensive discussion between the faculty member, the Personnel Committee Chair and the department Chair, of teaching, research and service activities of the faculty member.
- 7) All research papers submitted by faculty members are copied to the departmental Chair who reads them. Special attention is paid to papers of untenured faculty and comments are communicated to them as necessary.
- 8) At the first faculty meeting of the year, all faculty members are encouraged to have all research proposals and research papers read by colleagues (at ECU or elsewhere) prior to submission. All faculty members are encouraged to be responsive to their colleagues' requests.
- 9) Frequent informal consultations with the department's Graduate Program Director, which occur as needed, help introduce new faculty members to the broad range of issues involving graduate students.
- 10) In the spirit of informality, mentoring takes place (although it might not be recognized as such) at frequent social events that often include faculty members from other departments. Thus, a broader view of various aspects of career progression is available to faculty members of all levels."

The suggestion to allow junior faculty to select a mentor is attractive on the surface but in reality may be ineffective as new faculty know very little about senior faculty personally, professionally, etc. Furthermore, not all junior faculty members are in favor of being formally mentored by senior faculty. Assigning a mentor is also problematic.

Action: One option we considered in 2012-2013 was to have interested senior faculty members (members of the Personnel Committee) volunteer to serve as mentors. New faculty could then meet once per academic year with, say, four of these volunteers. This would allow the new member to become acquainted with several senior members and provide a broad pool of experience for him/her to draw from. The faculty agreed to this modification of our mentoring system.

Recommendation #6: **“Make a collective departmental effort, including the junior faculty, to clarify and if possible standardize the annual evaluation and tenure and promotion**

criteria. Inclusion of some hard metrics like averaged publications per year; clearly defined teaching load (i.e., courses per year); funded research projects per faculty can constitute part of the metrics, although quality should remain an important parameter and not being overshadowed by numerical quantity.”

Response: Possible modifications to the annual evaluation process have been a major topic of discussion at recent faculty meetings. Some interest in further discussion of this matter appears to exist among some faculty, but the last discussion (April 2012) ended with no clear suggestions for changes to the current, faculty defined system. The inclusion of ‘hard metrics’ for annual evaluation and tenure and promotion considerations was discussed at length. This is appealing at a superficial level but would be very difficult to implement because of inherent differences between sub-disciplines. Because the departmental evaluation system is faculty-defined, we will undoubtedly have further discussions. Untenured faculty members are fully involved in all discussions on these matters.

Action: Discussion has already taken place and the faculty have determined that we will continue with the current annual evaluation process.

Recommendation #7: “Increase the visibility of the Department at various levels including: (i) the development of a good web page as this is the main portal for information for today’s highly technological environment; (ii) ensure that good u/g students are sent for graduate work to Departments top national Institutions; (iii) consider a name for the Department that it is more inclusive and that highlights the current strength of the Department in Coastal Sciences (e.g., Dept. of Earth Sciences, or Dept. of Earth and Coastal Sciences).”

Response: The review committee was not impressed by the department’s web pages (appearance and ease of use). Some faculty members have a similar opinion.

The committee suggested that, to increase our visibility, good undergraduate students should be sent for graduate work at “top national institutions.” We do, indeed, encourage talented undergraduates to apply elsewhere for graduate school. For example one 2012 graduate now attends the University of Illinois at Chicago and one 2011 graduate attends San Jose State University. We provide the advice and encouragement and leave it to the student to decide where they want to go for graduate school. In addition, our Summer Geology Field Course attracts approximately 20 students per year from outstanding universities nationwide, and thus enhances the reputation of our undergraduate program and the Department. We do have a good record of sending our Master’s graduates to other institutions for doctoral programs. Informal feedback at professional conferences indicates that this is certainly enhancing the department’s and ECU’s visibility and reputation. In recent years our students have attended/graduated from doctoral programs at Louisiana State University, Ohio State University, University of California-Davis, University of Tennessee-Knoxville, Florida International University, and University of Pennsylvania.

The review committee also suggested a name change for the Department to be more inclusive and to highlight current strengths. We did change our name several years ago (from “Geology”

to “Geological Sciences”) for exactly this reason. We also know from past discussions that faculty members have various opinions on this matter. We will discuss it again, starting fall semester 2012 but the results might be affected by the discussions taking place in committees concerning the organization of coastal sciences at ECU, the disposition of ICSP (in which four of our faculty members hold joint appointments), and a possible “Coastal School”. Our deliberations will go beyond the name of our department. We will look at the scope and organization of both of our degree programs.

Action: We consulted with the HCAS Instructional Technology Consultant concerning our web pages. Feedback indicated that our web site is better than most at ECU and that it is content-rich.

We have already discussed a name change for the department and the scope and organization of our degree programs. We have decided to leave the name as it is. The scope and organization of both our degree programs are topics of discussion every year. This discussion will continue once the disposition of coastal and environmental research and education at ECU becomes clear.

Recommendation #8: “Allow for the development of a mechanism for the creation of a cost-per-service laboratory facility within the Department.”

Response: The faculty have discussed this in the past but several efforts have been deterred by the bureaucratic complexity of setting up the accounting system for such facilities.

Action: The Chair will press this issue.

Recommendation #9: “The department should re-establish the alumni connection with the support of all faculty as this can provide the seed funding for the student research grants suggested above, an endowment, and funds for space renovations.”

Response: We agree with this recommendation although donations are unlikely to be of a scale to pay for space renovations.

Action: The Chair met with the HCAS Major Gifts Officer and the Assistant Vice Chancellor for Development during early fall 2012 to discuss ways in which the Department can enhance its Foundation accounts. The Chair wrote a message encouraging annual giving and explaining planned giving that was included in the spring 2013 alumni newsletter. The Chair will use social events to encourage alumni and graduating students to consider automatic contributions via credit card.

Recommendation #10: “Finally although the committee recognizes the great efforts of the current administration of the Department in getting the unit to its current position, as the faculty hired over the past 10 years mature, opportunities need to be created for their participation in administrative posts and their professional development through

participation in administrative positions. Positions should be rotated on a regular basis (at least for graduate and undergraduate director) as to enable all faculty members to exhibit their abilities and potential capabilities for higher post in Departmental and University administration.”

Response: The department has benefitted from the long service of both Graduate (GPD) and Undergraduate (UPD) Program Directors. The department has changed the model for both of these positions over the past three years. Due, in part, to greatly increased numbers of Geology majors, the UPD now has a committee of three faculty members to advise students. For three or four years during the past decade, the Department did have an Assistant Chair. When the stipend for this position was withdrawn due to budget cuts, this position was terminated.

Action: After the external review took place, we introduced an Assistant GPD position, and we also have a faculty member who runs the examination program for incoming graduate students. Further, elements of graduate student advising have been transferred to the primary advisors of graduate students. We are now better placed for a smooth transition when the current UPD and GPD step down. A new GPD will take over in Fall 2014.

B. Recommendations for action at the ECU and UNC system levels

Recommendation #1: “Provide incentives to the Department to allocate resources for the Honor’s College. It is our understanding that currently the incentives are directed to individual faculty, but given that every faculty member is a departmental resource, appropriate incentives should be given to the Department to deal with this. As an example, re-allocation of teaching duties of a faculty to Honors sections should be compensated with funds to the department for hiring a teaching assistant to cover the faculty’s teaching obligations and contributions to the Department.”

Response: This recommendation is based on a misunderstanding by the Review Committee. Buy-out funds are available to enable faculty members to teach Honor’s course sections without negatively affecting non-Honor’s departmental course offerings.

Action: None by the department.

Recommendation #2: “Given the multidisciplinary nature of the ICSP and the fact that administratively this is a unit outside the College, some clarification of reporting structure is required for faculty with joint appointments. This will be helpful to both faculty and individual Departments as will clearly define obligations and benefits. This issue should be clarified even in the tenure and promotion criteria of the Department as to alleviate perceptions of different categories of faculty within the same unit.”

Response: We are not sure of the reason for this recommendation to clarify the reporting structure. For those faculty members who have 49% appointments in ICSP, the Chair takes the lead (because the department is the tenure home for joint faculty members) in work load discussions at the beginning of the year and in conducting annual evaluations and progress

towards tenure meetings at the end of the year. The Director of ICSP is fully involved in formal annual evaluation discussions with the faculty member and Chair and in the separate progress towards tenure discussions with the Chair and the departmental Personnel Committee Chair. The Director indicates in writing whether he concurs with the content of all formal documents (work load allocation, annual evaluation, progress towards tenure letter). The faculty member receives all of these documents.

Action: None by the department.

Recommendation #3: **“Increased departmental research visibility and productivity in areas beyond those covered by ICSP’s CRM PhD program requires access to PhD program with disciplinary focus. The University should work with the Department to accomplish this goal if the faculty is willing.”**

Response: We have discussed the possibility of a disciplinary PhD program on and off over the past decade or more. We now have the critical mass of faculty members to, at least, revisit this issue. But, given the huge budget cuts that the Department has recently endured and the scaling back of ECU’s budget, it is difficult to consider the planning for and implementation of a PhD program when, for at least the past 20 years, our Master’s program has had non-competitive assistantships. We do not wish to cannibalize our very successful Master’s program to provide resources for a new PhD program. Further, a successful PhD program in a natural sciences subject requires considerable investment to provide the necessary instrumentation, space and technical support. That being said, we consider it time for us to revisit the discussion regarding a disciplinary PhD program.

Action: The Chair discussed the possibility of a disciplinary PhD program with the Dean of the Graduate School and the Dean of Harriot College. All agreed that the current likelihood of such a degree receiving administrative approval is negligible.

Recommendation #4: **“Finally, an important issue for further developing the research productivity of the Department is the ability to attract highly qualified graduate students. Part of this is the monetary value of graduate assistantships available for prospective graduate students and tuition abatement available for students. It is the understanding of the committee that NC University system regulations control the amount of tuition remission and that tuition reduction to in-state level for out of state and international students is controlled centrally by the NC University system favoring the major universities at the research triangle. It is imperative that the same opportunities are provide to ECU from the NC legislature to compete in the national and global graduate student market.”**

Response: The Department, HCAS and ECU administration recognize this problem. We strongly support all efforts aimed at allowing the Department to recruit high quality graduate students from national and international pools. In the meantime our recourse is to continue to deal with this as we have done by enhancing the level of funding that we offer for externally funded

Research Assistantships. As noted earlier in this document (Section A, Recommendation #3) this does result in a two-tier funding system for our graduate students.

Action: None by the department.

C. “Recommendations to Improve the Quality of an Earth Science Program Prepared for East Carolina University, by Christopher C. Barton, Ph.D.

INTRODUCTION

Significant improvement in the quality of a department’s program is the primary way to increase its national/ international standing. This section sets out the attributes of a high quality program for an Earth Science department. Program here includes undergrads, graduate students, faculty, and departmental administration.

The department’s current standing can be evaluated against this standard to evaluate how far the department needs to improve from its current status. Any changes from the current situation will require the cooperation of the faculty, the chair and appropriate levels of the administration above. Implementation may result in a temporary decrease in number of undergraduate majors, but in the long run, will attract and graduate higher caliber undergraduate students. Many of the attributes of a high quality program need not cost additional funds and depend primarily on the faculty and department head. A department should take primary responsibility for raising any funds necessary for improving the quality of its program. The university should participate in providing some of the funding needs of a department, by either paying for it all or, for example, by establishing a policy of providing matching funds for changes that will improve program quality.”

(42 attributes not reproduced here)

Response: It is our opinion that this appendix, authored by only one of the three members of the review committee, is ideological and presupposes major changes within the Department and the University itself. ECU is not a Research I university with extensive external research funding and endowments. Consequently, we did not address each of the forty-two “attributes of a high quality program for an Earth Science department”. The attributes presuppose that ECU’s mission and, therefore, the department’s, are something other than what they are.

For example, attribute #20 states that research (“contract science”) funded by “local and state agencies... is [that is, “should be”] minimal or absent.” ECU serves the East. Such “contract science” is incredibly important and clearly fits within ECU’s mission.

Some of the attributes are absolutely what we do not aspire to, for example, #29 “GenEd courses... should be taught by instructors”.

Items 34 to 42 (“Department Administration”) appear to be specific to the Department of Geological Sciences at ECU. Some of these items have already been part of the current Chair’s activities (e.g., #38 “Department head leads interested faculty to write large interdisciplinary, inter-university research proposals”), but the reviewers did not discuss this during the campus visit or ask about it after departure. Other items do not reflect the realities of a Chair’s role at ECU (e.g., #34 “Department head is relieved of day to day administrative responsibilities by transferring as much of these as possible to an administrative assistant or assistant chair”).

Inherent in Item #41 is an apparent criticism of the faculty decision to replace a retired structural geologist and a retired mineralogist with assistant professors in these fields. Structural geology and mineralogy are basic subjects in the geological sciences. We teach our undergraduate students the basics of the geological sciences. Specialization starts to take place at the graduate level. The reviewer suggests that all new hires should “tie into the shared Coastal PhD program” (i.e., the CRM PhD program). When we replaced the two retirees a few years ago we hired three other faculty members who can and do work with the CRM PhD program (two were joint appointees, but one of these has since left ECU). We believe we achieved the correct balance in hiring these five faculty members in the areas that we did. The reviewers also state that climate change and meteorology are “The most important areas of research currently missing from ECU”. This is simply not the case. A fair proportion of the Department of Geological Sciences’ research is, in fact, climate change-related and climatology is taught and is the subject of considerable research in the Department of Geography.

D. Prioritized resource needs emerging from the recommendations

Much of this has been alluded to above (and at greater length in the self-study document) and so will be dealt with here briefly. We select three items for mention. The first two are the most pressing and are of equal importance.

1. The functioning of our unit and, therefore, the quality of its products (graduates, research, outreach and service) has been compromised by the recent decimation of our operating budget. In 1999-2000 the annual operating budget of \$88,394 represented ca. \$11,000 per faculty member. By 2007-2008 the budget had increased to \$109,175 but this represented a drop to ca. \$8,000 per faculty member. In 2011 the operating budget was cut to \$32,893, or ca. \$2,000 per faculty member. Geology is a natural science and, to be taught properly, must involve extensive laboratory work and extensive fieldwork both on land and, given our location and the university’s emphasis on coastal science, on water. Currently, fully one quarter of our operating budget is committed to funding required class-related field trips for undergraduate and graduate students. When our operating budget was at its zenith, we had some funds to purchase equipment that addressed both instructional and research needs. The number of undergraduate majors has increased greatly (a national trend due, in large part, to excellent employment opportunities) while our operating budget has shrunk. We now teach required majors labs with 25 to 30 plus students. Our self-study provides example of how the cut in our operating budget can affect instructional quality.

On several occasions, prior to the recent budget cuts, we requested operating funds to be returned to the 1999 level of ca. \$11,000 per faculty member. Currently, this would translate to an annual operating budget of \$176,000.

Resource Need: A return of our operating budget to the 1999 level of \$11,000 per faculty member.

2. The Review Committee noted our problem of competing for top-notch graduate students due mainly to our low stipends and lack of OSTRs. If, institutionally, we cannot address the latter then we must address the former. In 2010 we surveyed earth-science departments to which we have recently lost applicants. At that time their GA stipends averaged \$14,561 while our stipend was \$10,900. Since then we have received an increased graduate assistantship allocation, thus bringing us up approximately to our competitors' 2010 average. However, to exacerbate this shortcoming, most of our competitors' programs offer full tuition waivers, as well as 50% to 100% relief from health insurance costs (and, of course, our competitors also now offer increased stipends). These impediments to enrolling superior MS students are impacting many aspects of our Mission. Our current graduate school GA budget is \$160,750. In October, 2012, we made a case to increase this to \$240,000 per year.

Resource Need: An increase of our GA budget to \$240,000 per year.

3. We were encouraged by the Review Committee to discuss the possibility of initiating a disciplinary PhD degree. We have not conducted the analyses, but if we were to offer a PhD degree we would need greater technician support, additional instrumentation, replacement of obsolete instrumentation and equipment, enhanced operating budget, competitive student stipends, and additional laboratory space (many faculty members currently share).

Resource Need: None, given the likelihood that administrative approval for this degree is currently highly unlikely.