



Geosciences

A department in the College of Natural Sciences and Mathematics offering the B.S. in Earth Systems, the B.A., B.S., and M.S. in Geography, the B.A. and B.S. in Geology, and the M.S. and Ph.D. in Geosciences.

■ The Review Process

This was a standard AQAD review. Reviewers were:

James W. Harrington, chair (University of Washington)

Gail M. Ashley (Rutgers University)

Timothy J. Bralower (Pennsylvania State University)

Kam-biu Liu (Louisiana State University)

Calvin F. Miller (Vanderbilt University)

■ Main Issues

The visiting team found the department to be a “vibrant community of scholars ... unique among major Ph.D.-granting departments in the nation because its research and teaching directly integrate” issues related to processes in the Earth, global change, and the human dimensions of global environmental change. This integration, the result of a “strategic and visionary” reorganization ten years ago, places the department in an “ideal position to capitalize on the growing opportunities at the interface between the natural and social sciences,” and “sits at the forefront of 21st Century geosciences.”

- Faculty strength in the department has been built upon solid earth processes (e.g., tectonics and rock-forming processes). While there has been some loss of faculty, “reputation in this broad area has remained excellent.” Faculty working in the area of global change “are truly outstanding and of international acclaim,” strengthened by several recent hires. The human geography faculty were found to be “productive and well-regarded.” Faculty research productivity was praised, with the team noting that “few geoscience programs exceed their per-faculty publication and funding rate.”
- Graduate students were found to be “generally content,” and “unanimous in their commendation of the faculty for their collegiality and respect for students.” The team did, however, express concerns about overcrowding, the quality of computing facilities, and uncertainties about graduate student support after grants or TA appointments have expired. In general, the team found support for TAs to be shrinking and inadequate. The team also urged the faculty to take “a collective look” at advising, mentoring, and time to degree.
- The undergraduate programs were effective, with the new Earth Sciences B.S. found to be “innovative and timely.” Such programs “are still rare but they are likely to be a cornerstone of Earth science curricula.” The Geography B.S. was found to be “rigorous,” with too much emphasis on physics and chemistry and too little on biological processes. Both the B.S. and the B.A. in Geography were identified as “undersubscribed”: for the B.S. the team recommended fewer and more flexible course requirements, and for the B.A. efforts to increase awareness on the part of students who “might be interested in human geography [but]

who do not recognize that it exists at UMass.” The department’s introductory courses were sound, but “would benefit from addition of discussion or exercise sections.”

- In terms of facilities, the team “was struck by the poor condition of most spaces.” Classrooms and computing facilities were identified as particular problems, and it was noted that the sedimentology and GIS labs will need upgrading as new faculty are hired in those areas.
- The team highlighted the importance of the department’s efforts to bring the State Geologist to campus in terms of outreach and improved links to business and government, and urged that the three-year trial be made permanent.

The team’s key recommendations centered on faculty hiring in the next few years. Four senior faculty are expected to retire, and the team “enthusiastically proposes” to convert those positions into six junior faculty lines. Three of these should “be filled with people with GIS [Geographic Information Systems] and spatial analysis skills” whose interests are in socio-economic-urban geography and natural hazards. These positions would complement the current search in GIS, which the team described as “the ‘hottest’ and fastest-growing area in Geography across the nation.” The other three positions should come in the areas of sedimentary processes, solid Earth materials, and solid Earth dynamics. These areas were seen as both “essential cornerstones” for Earth science, but also capable of making “powerful synergistic connections” between the Earth sciences and the global change and human dimensions emphases of the department.

■ Results of the Review

The department reported that it “fully accepts and endorses the recommendations of the review panel.” The department proposes a “measured program of new faculty hiring, funded mainly through expected retirements, in order to strengthen critical areas and shift our focus toward areas of opportunity.” In response to specific suggestions regarding the department’s academic programs, it has “decided to make a systematic review of each of our teaching programs, incorporating the suggestions of the reviewers but also considering broader revisions to better align the programs with the goals of the department.” The department outlined plans to increase graduate student support through three sources: university-supported TAs, grant-supported RAs, and alumni-supported graduate assistantships and summer support. The department observed that “perhaps the most difficult problem facing the department concerns the state of classroom and teaching facilities in the Morrill Science Center. The current status of the facilities certainly limits our ability to attract top quality students and faculty, and to carry out the level of research, teaching, and mentoring that we would wish.” To address this challenge, the department proposed a series of renovations to the most critical classrooms, laboratories, and student common spaces, all coordinated with faculty hiring and with efforts to make the most efficient use of limited space.