

Cover/Signature Page

Institution Submitting Review: Utah State University

Program Title: Geology

School or Division or Location: College of Science

Department(s) or Area(s) Location: Department of Geology

Institutional Board of Trustees' Approval Date:

Review Type (check one)

Regents' General Consent Calendar Items		
<i>R411 Cyclical Institutional Program Reviews</i>		
SECTION NO.		ITEM
		Programs with Specialized Accreditation
	X	Seven-Year Program Review
		Five-Year Program Review

Chief Academic Officer (or Designee) Signature

I certify that all required institutional approvals have been obtained prior to submitting this review to the Office of the Commissioner.

Signature

Date

Larry Smith, Interim Provost

Printed Name

**Seven-Year Review
Utah State University
Geology Program
7/6/2018**

Reviewers

- Richard Aster, Chair, Department of Geosciences, Colorado State University
- Jean Bahr, Professor, Department of Geoscience, University of Wisconsin-Madison,
- Peter Wilcock, Head, Department of Watershed Sciences, Utah State University,

Program Description

The Department of Geology offers a field-intensive geoscience curriculum that takes full advantage of an Interior West setting. Undergraduate geology programs include three emphases to offer career-specific training, and undergraduate students routinely engage with faculty and graduate students in lab and field research. Geology students experience a personalized learning environment in an inviting, historic building that contains up-to-date facilities and collections for teaching and research.

The graduate program, anchored by a strong master's degree for 85 years, offers a non-thesis (plan B) applied environmental geoscience M.S. degree and a relatively young but successful Ph.D. program. The program attracts excellent students from across the county and generates loyal alumni and industry connections.

The number of undergraduate geology majors at USU has grown slowly and steadily, approximately doubling over the past 15 years. There is an average of 28 students enrolled in the M.S. and Ph.D. programs at a time, and an average of 7.6 graduate students complete and enter the program each year. Over 90% of geology students who complete a graduate program obtain employment in careers that are related to or build upon their degrees.

The program's 13.5 full-time-equivalent faculty have expertise spanning most, but not all, aspects of geoscience. Two primary research strengths support undergraduate and graduate programs in tectonics-and-fault studies and geomorphology-and-surface processes. Student research is supported by key laboratory facilities such as the USU luminescence lab, an isotope geochemistry lab, and an X-ray lab.

The USU Department of Geology enjoys strong support from its alumni and friends, with an active advisory board that meets annually and guides development activity. All donor-derived gifts and endowment yield goes toward student scholarships and other student support.

Cost (Cost Study Definitions)					
Direct Instructional Expenditures	1,240,325	1,562,997	1,683,746	1,667,803	1,776,942
Cost Per Student FTE	4,643.67	6,048.75	6,256.95	5,729.31	6,062.58

Funding					
Appropriated Fund	1,472,015	1,480,439	1,594,177	1,674,056	1,846,447
Other:					
Special Legislative Appropriation					
Special Fees/Differential Tuition					
Total	1,472,015	1,480,439	1,594,177	1,674,056	1,846,447

Grants & Contracts	292,669	604,523	983,607	853,723	537,747
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Program Assessment

Overview

By U.S. research university standards, the Department of Geology at Utah State University is small-to-mid sized with 13.5 FTE faculty (11 tenured and two untenured). The university's geologically dramatic setting is doubtless a drawing point for geologically inclined students with interests in field work and enthusiasm for outdoor work and recreation. Graduate TA stipend levels are generally competitive and likely do not detract from recruitment success. Teaching loads for tenure-track faculty are generally commensurate with those of other research universities. Relative to recent norms within the College of Science, the department has performed commendably in externally funded grants.

A modest decrease in undergraduate enrollments, primarily attributable to the hydrocarbon boom and subsequent drop in oil prices over the past decade, is a trend common in U.S. geosciences departments. The committee commends recent departmental efforts to engage increasingly diverse students in its programs.

Strengths

The review committee noted the following program strengths.

- The undergraduate curriculum provides students with a rigorous foundation in geology.
- The department has a distinctly strong tradition of field training through a geoscience curriculum that takes advantage of the geographic location.
- A communicating geoscience course and writing-intensive exercises in several other courses will serve students well in a variety of careers.
- Enthusiastic and engaged undergraduate students praised their core classes, field experiences, and instructors, who they indicated are very approachable and willing to help.
- A majority of seniors the committee spoke with (particularly those headed for graduate school) had participated in research.
- Graduate students expressed uniform appreciation for the department's collegial and supportive faculty-grad student environment.
- Graduate TAs were well prepared by the graduate school for their teaching assignments and were able to mentor and engage well with undergraduates.
- Graduate students are enthusiastic ambassadors for the department and doubtless effective in recruiting graduate prospects during campus visits.
- The committee was particularly impressed with junior faculty who they found to be passionate, engaged, and ambitious.
- The committee commends the department's use of a rare, internal teaching peer-review program (i.e. Teaching Tsunami) instituted by the department head.
- Meetings with students, staff, and faculty indicate the department head proactively reaches out to individuals across the department, is open to different views, and is held in uniform high regard.
- The department head has made solid and successful efforts to enfranchise non-tenure-

track and off-site/regional campus faculty.

- The committee noted the department's laudable outreach activity including a remarkable number of distance-delivered courses and engagement with other USU campuses.
- The department's geoscientific instrumentation and burgeoning analytical capabilities for teaching and research is significant (e.g. luminescence lab, isotope geochemistry lab, and X-ray lab) and comparable to, or perhaps superior to, that of peer mid-sized geosciences departments.
- Demographics and enrollment trends in the department match those of national trends in geosciences but with comparatively high representation of women faculty and graduate students.

Challenges and Recommendations

Present leadership strength presents a timely opportunity to address some of the challenging issues facing the department. Recognizing the clearly visible goodwill and sustained commitment of the department toward future advancement, the committee offered these recommendations.

- Streamline undergraduate degree programs in terms of credit requirements and prerequisites. Specifically, reassess the timing and prerequisites of the field-course sequence so they can be taken by more students earlier in their programs, and consider reducing upper-level elective credit requirements.
- Improve program support and minimize, as possible, the workloads of research faculty through employment of advising staff, teaching sabbaticals, and team-teaching of graduate courses.
- Try to increase the number of undergraduate majors, reconsider the under-subscribed baccalaureate degree emphases, and plan the future of the young Ph.D. program.
- Complete a strategic planning process, especially to consider these programmatic issues, as well as the future trajectory of faculty composition and research programs.

Institution's Response

The geology department appreciates the committee's thorough assessment and helpful suggestions and generally concurs with their recommendations. Following are responses to committee recommendations.

- The Committee provided recommendations to meet the goals of more students taking the department's own field-course sequence and taking it earlier in their degree program. The committee's perspective on this longstanding problem is helpful; and their suggested solutions, along with curricular changes for the upcoming academic year, will be discussed at the department's retreat in August 2018.
- The committee noted that the requirement for 47-49 geology course credits, while comparable to required credits for geology majors at some universities, is more than at

other universities. They suggested slightly reducing the number of required geology credits. Changing and reducing geology elective-credit requirements will be discussed in at the August faculty retreat.

- If granted, Geology would be happy to engage professional advising staff assistance. The committee points out that faculty efficiency may be improved by offering small-enrollment graduate courses less frequently and by team teaching graduate seminars. In response, most of our graduate courses already have a 2-year recurrence. Therefore, offering them less frequently is not plausible. We will pursue the recommendation of more team teaching, and we already have broad graduate seminar courses in place for delivering such custom, team-taught courses.
- Due to a small faculty and little flexibility with core courses, teaching sabbaticals would be difficult to implement. Geology faculty will utilize USU programs and services that support teaching and innovation, such as those offered through Academic and Instructional Services.
- In response to the committee's recommendation to consider recruiting strategies that target regional high schools and introductory course, the department head is in the process of implementing informational modules for more systematic recruitment of majors in the department's many introductory courses as well as concurrent enrollment course to high school students.
- The Earth Science Composite Teaching major and the Hydro-engineering and Applied Environmental emphases have key roles and have steady but relatively small subscription. The department will discuss deleting the Geo-archaeology emphasis at the faculty retreat.
- Whether faculty expertise should be broadened or changed to support the Ph.D. program will be a primary question address by the department's strategic plan, which will be developed in the coming months.
- The committee recommended strategic planning that addresses the direction of hires and research programs. The Utah System of Higher Education review process produced documents (e.g. department's self-study and committee report) that helped initiate and provided a foundation for a strategic planning process. The department started the process during the spring 2017 semester (with group deliberations to revise the mission statement and completion of a SWOT analysis by faculty and alumni) and plans to complete a 7-year strategic plan by the end of this calendar year. A faculty committee has been formed to spearhead and receive input related to a strategic plan, and the upcoming faculty retreat will be largely dedicated to discussions the committee will formalize into completion of a strategic plan.