Executive Summary of Geology Graduate Mid-Term Review (Spring 2015)

Geology currently has 32 graduate students, slightly higher than 3 years ago, congruent with our slightly higher number of faculty (12.25 FTE). Until recently, we had a 1:2 PhD to MS ratio, but currently this ratio is ~1:4. Our number of PhD students has remained consistent, while our number of MS students has grown. We believe this is due to growth in the petroleum industry. Our Geology graduate program recently had a larger proportion of women than average, but currently our program matches both our applicant pool and the overall College of Science of only 1/3 women. The number of applicants to Geology's graduate programs has more than doubled over the past five years. We accept only 1/8 to 1/4 of applicants, but we have a limited number of PhD applications.

The Geology Department has made considerable strides in reaching the goals of our 2012 Self Study and in addressing areas of concern cited by reviewers of our Self Study. Our responses to specific review questions follow below:

A) How is the department progressing relative to our own plan, as well as to national programs?

Geology's program review in 2012 identified four broad issues: 1) increasing funding for graduate students and their research; 2) increasing the number of our faculty to be commensurate with a PhD program; 3) increasing research/analytical infrastructure; and 4) expansion of our AEG-MS Program.

1) Increasing funding for graduate students and their research.

1a) Increasing the value of Graduate Research Assistant stipends

Our base GRA has been increased to its current $14.5k and will be increased to our goal of $15k next academic year, comparable to other College of Science departments, whereas it used to be the lowest in the College.

1b) Guarantee graduate tuition support

In the problematic years of 2012/13 and 2013/14, Geology provided tuition support through our Benchmark Fund, in the amount of $35k in 2012, and by 2014 it transitioned to covering student insurance and a Benchmark RA semester as well. The subsequent return of waivers and tuition funds now allows our development efforts to focus on research support.

2) Increasing the number of our faculty to be commensurate with a PhD program.

Thanks to the support of the College of Science and the Office of the Provost we have increased our faculty size from 11 faculty (10.25 FTE) to 14 faculty (13.5 FTE). Twelve of these faculty (11.5 FTE) are on the USU Logan campus. We have added excellent new faculty who are mentoring graduate students and are successful in obtaining external funding.

3) Increasing research/analytical infrastructure.

With generous start-up support from the College of Science and Research and Graduate Studies and F&A return we have established a new, stable isotope laboratory within our Department. We are also in the process of developing a mineral separation laboratory and are seeking a full time instrument manager. The creation of an SEM Core Facility on campus (headed by a member of our faculty) secured by an NSF-MRI grant adds greatly to the research infrastructure at USU.

4) Expansion of our AEG-MS Program.

Our AEG-MS program, with distance capabilities, has grown incrementally. Five students are currently enrolled in the program. The administration and coordination of the Plan-B degree is a challenge, and it will be limited in size because of our primary goal of increasing research.

5) Timeline to completion.

This is a concern raised by the reviewers of our Self Study. The number of credits required for completion of PhD degrees with a prior MS degree has been reduced from 60 to 42. The first two PhDs to graduate from our relatively young program (first PhD students admitted in 2007) required 5 years for completion. The next cohort of five PhDs required an average of 4 years to complete their degrees, which appears optimum given that most dissertation projects require both field and laboratory components. Also, all PhD students are required to complete teaching or industry internships, which add to the time required for completion.

MS Plan A students graduating since 2012 have required, on average, 2.9 years for completion. This is reasonable for thesis projects that require both field and laboratory components. In addition, many of our MS students take a one semester industry internship, which greatly enhances their training and marketability upon graduation. Data from the American Geosciences Institute indicates that across the nation, most Geology MS students require approximately 2.75 years for degree completion.

B) What are our programs specific barriers, needs, opportunities, strengths and weaknesses?

We attract many prospective students, especially those seeking a MS degree. Geology has program strengths in strong job placement and alumni support, and this provides ongoing opportunities for development. Geology has modest but growing research facilities.

The main limiting issue remains the small number of research-active faculty. We currently can support PhD students in: a) Solid Earth Processes and Geodynamics, and b) Geomorphology and Surface Processes. Building other critical-mass research groups will require investment in

cross-disciplinary faculty, such as our target of a near-surface geophysicist. Other barriers are that research-active faculty do not receive relief of teaching or service loads, and that we receive a small proportion of PhD student applications. A final need is for help coordinating, scheduling, and dealing with the logistics of offering coursework via distance education, especially those where field trips and laboratory exercises are required.

Executive Summary of Geology Graduate Program Self Study (Spring 2012)

The Department of Geology's graduate programs are robust. We currently have 10 PhD and 20 MS students for a faculty of eleven (10.25 FTE). Our relatively new PhD program anticipates its first graduates this semester. We are proud to note that one is a white female and the other is a Hispanic male, both underrepresented groups, particularly at the PhD level, in the Geosciences. Both our PhD and our MS programs are being sought after by numerous qualified applicants and our acceptances are limited largely by the current faculty's ability to take on additional students and the expense of graduate tuition.

Recommended changes to our existing programs require both internal (Department of Geology) and external (Utah State University, State of Utah) support.

Internal changes include:

1) Shortening the time to completion for all degrees. PhD students (with prior geosciences MS) have been taking 5 years to complete their degrees and MS students typically take 2.5 years to do so. The proposed reduction in required credits for the PhD program will assist PhD students in completing their degrees earlier. The value of shortened time lines to completion needs to be communicated to all graduate students and faculty advisors.

2) Graduate Research Assistant stipends need to be increased from the current $13k level if we are to remain competitive in recruiting the best graduate students. This will involve increased external funding efforts on the part of our faculty.

3) Graduate tuition support needs to be fortified. This will require a combination of external funding/research grant activity and development efforts on the part of the Department.

Changes requiring external support include:

2) Increase in faculty size from the current 10 (actually 9.25 FTE). The current faculty numbers limit the size of the graduate program, particularly our PhD program, that can be supported due to faculty student loads and research productivity. The current faculty is barely sufficient to cover the diverse spectrum of geoscience specializations. This will require support from the College and University in the form of faculty slot allocations.

3) Increase Graduate Teaching Assistant stipends from the current $13k if we are to remain competitive in recruiting the best students. This level of support from the state has been stagnant for the past decade.

4) Consistent graduate tuition support, particularly for TAs, which cannot be supported by research funds, is required from the University as these students are critical to the

undergraduate teaching mission, particularly for laboratory-based courses such as in the geosciences.

5) Tuition support for international students is required if we are to bring in the very best students regardless of their origin.

6) The research infrastructure of Utah State University needs to be enhanced if we are to continue to attract and train the best students. Centralizing some research functions and providing technician support (e.g. have a USU stable isotope laboratory or SEM laboratory) rather than having many units duplicate instruments would be valuable. The lack of an SEM facility at Utah State University is a particularly glaring deficiency.