

Student Learning Outcomes Assessment Summary

Geophysics, PhD

College of Natural Science and Mathematics

AY 2014-16

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1. Assessment information collected

A. Technical ability and knowledge: Lists of peer reviewed publications, abstracts, and conference presentations are compiled and reviewed.

B. Graduate students have performed research that contributes to their field: Lists of peer reviewed journal publications. Number of students with thesis chapters prepared for publication in peer reviewed literature.

C. Written and oral communication skills consistent with professional standards: Written thesis proposals are assessed with a rubric. Thesis defense quality is assessed by faculty present using an oral presentation rubric. The final thesis is assessed by the Department Chair using a written work rubric.

D. Graduates obtain employment or continue education in their field: American Geological Institute (AGI) student exit survey. Additional input from annual student feedback seminar. Faculty survey of recent graduate students.

2. Conclusions drawn from the information summarized above

- A.** Information on student publications and conference presentations is self-reported by graduate students in the department (Table 1). Of the 19 students who reported during the AY14-16 period, 7 students (37%) reported at least one peer-reviewed publication, and 5 (26%) of these publications had students as first author. All students (100%) reported a published conference abstract and conference presentation. Given that this information is self-reported and that students reporting range from first-year graduate students to those completing their theses, these numbers indicate that all PhD Geophysics students develop adequate technical ability and knowledge to present their work at national and international professional meetings by the end of their program. Some students are able to prepare manuscripts for publication in peer-reviewed literature during their time in program.
- B.** As indicated above, 100% of PhD Geophysics students who reported had published a conference abstract and given an oral or poster presentation at a national or international professional meeting. 37% of PhD Geophysics students reported a publication in a peer-reviewed journal. This indicates that PhD Geology students are producing research that is making contributions to their field. Furthermore, 3 of the 4 PhD Geology students (75%) who graduated in AY14-16 prepared their theses as a set of manuscripts. One student had already published two papers from their thesis, and two others had published one paper by the time of graduation. Most current PhD Geophysics students now prepare theses as either manuscripts to be submitted, as in review or in press manuscripts, or as published peer-reviewed papers. Two of the PhD theses were assessed by the Dept. Chair using the written work rubric (Table 2). Both of the theses were rated excellent in all of the categories on the rubric. This suggests that, PhD Geophysics students can produce a written thesis which is up to high professional standards.

- C.** Written thesis proposals have not been consistently reviewed with a rubric during AY14-16 but we have now adopted a written work rubric that will be used by graduate committees for evaluations of thesis proposals and completed theses (Table 3). Thesis defense quality has been evaluated for some students by faculty present using an oral presentation rubric (Table 4). Three PhD Geophysics students who defended during AY14-16 were evaluated using this rubric and no students scored below very good on the overall evaluation of their presentation (Table 5). All 3 students' presentations were rated very good to excellent overall. These data indicate that PhD Geophysics students can make high quality, professional oral presentations by the end of their program, and most students are giving very good or excellent presentations.
- D.** Three of the 4 students (75%) who graduated from the PhD Geophysics program in AY2014-16 are employed in academic positions (2 students as post-doctoral fellows), or in private consulting firms (1 student) (Table 6). One student recently graduated and is currently seeking employment. Thus, 75% of our graduating PhD Geophysics students have employment at the time of graduation.

During this period, we abandoned our own student exit surveys in favor of a national survey conducted by the American Geological Institute (AGI). This national survey allows us to compare employment of our students to national averages. Unfortunately, we received very low participation rates for the AGI surveys and have decided to re-institute our own exit surveys moving forward (Table 7). Nevertheless, the national survey does provide a basis for comparison of our student employment data with national trends. In the 2014 AGI national survey (Table 8), 69% of graduating PhD geoscience students had accepted a position in a geoscience-related field, while in the 2015 survey (Table 9), 58% of graduating students had accepted a geoscience position. Our student employment data compares very favorably to these national trends, with 75% of our students placed in a geoscience-related field at the time of graduation.

We also compiled the results of our annual student feedback seminar (Table 10). The main feedback with respect to employment focused around a perceived lack of relevant graduate classes offered. In particular, students requested that classes be taught when the catalog states they will be taught. There was also a perception that students could not ask that specific courses, which they perceive to be relevant to future employment, be taught by faculty.

3. Curricular changes resulting from conclusions drawn above

- A.** Data from student publications and presentations indicate that students do reach an appropriate level of technical ability and knowledge by the end of the PhD Geophysics program. In order to better evaluate a progression of students' technical ability and knowledge as they move through the program, we have developed a new form (Table 11) that will be used by graduate student advisory committees each year at the annual report meeting to assess how students' skills are improving.
- B.** The quality of student theses and thesis defenses is generally very good to excellent, and no students rank as inadequate in this area by graduation. The quality of theses produced clearly demonstrates that our graduates are able to identify a scientific problem, devise appropriate methods to solve it, and contribute original knowledge to their field. In order to better assess how students written and oral presentation skills improve throughout the program, we have developed two new rubrics; a written work rubric (Table 3) and an oral presentation rubric (Table 12). The written work rubric will be used to assess the students' PhD proposal and their final thesis. The oral presentation rubric will be used at annual committee meetings, at the thesis proposal defense, and at the final thesis defense.
- C.** Our assessment of final theses and thesis defense presentations indicates that graduating PhD Geophysics students have obtained communication skills that are consistent with professional standards. The future use of our new written work and oral presentation rubrics will ensure that students improve upon these skills as they move through the program.
- D.** Graduates from the PhD Geophysics program are very successful in finding employment within their field (75%). Based upon student comments in the annual student feedback survey we will be revising the catalog so that it accurately reflects courses offered, and the timing of those offerings. We will also conduct a survey prior to each semester to find out which courses students plan on enrolling in and what, if any, specialized courses students would like to have offered. If there are a critical number of students (e.g. at least 6) interested

in a specific new course being offered then we will attempt to have that course offered.

4. Identify the faculty members involved in reaching the conclusions drawn above and agreeing upon the curricular changes resulting

SLOA committee: Rainer Newberry, Sarah Fowell, Elisabeth Nadin, Erin Pettit, Paul McCarthy.

Additional Geophysics faculty: Doug Christensen, Carl Tape.

Student feedback seminar assessment committee: Rainer Newberry, Sarah Fowell, Jochen Mezger, Cathy Hanks, Paul McCarthy.

Suggested curricular changes will be voted on by all faculty at our first fall faculty meeting, September, 2016.

Tables referred to in this report can be found at:
www.uaf.edu/geology/downloads/