

Student Learning Outcomes Assessment Summary

Geology, MS

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. MS graduates 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. MS 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 11 students who reported during the AY14-16 period, 2 students (18%) reported at least one peer-reviewed publication and 8 students (73%) reported a published conference abstract. Two students (18%) also report receiving grants and 2 students (18%) reported internships. 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 most MS Geology students develop adequate technical ability and knowledge to present their work at national and international professional meetings by the end of their program. A small number of students are even able to prepare manuscripts for publication in peer-reviewed literature.
- B.** As indicated above, 80% of MS Geology students who reported had published a conference abstract and given an oral or poster presentation at a national or international professional meeting. 20% of MS Geology students reported a publication in a peer-reviewed journal. This indicates that MS Geology students are producing research that is making contributions to their field. Furthermore, of the 11 MS Geology students who graduated in AY14-16, 2 students (18%) prepared their theses as a set of two manuscripts which were submitted for publication at the time their theses were submitted to the Dept. Chair for review (Table 2). The majority of MS Geology students continue to prepare theses in traditional thesis format. 10 of 11 MS theses were assessed by the Dept. Chair using the written work rubric. None of the theses were rated inadequate in any of the categories on the rubric. Areas that were weakest on average, although still adequate, were discussion of the significance and/or implications of the students' research, and the overall writing quality. This suggests that, although all of our students can produce a written thesis which is at least up to adequate professional standards, some continue to need assistance in framing their own research within the broader significance of a larger problem, and some have only adequate writing skills.

- 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). Seven of 11 MS Geology students who defended during AY14-16 were evaluated using this rubric and no students scored below adequate on the overall evaluation of their presentation (Table 5). Two students' presentations were rated very good overall, 2 were rated very good to excellent, and 2 were rated excellent. All but one student scored at least adequate in every category on the rubric. These data indicate that MSGeology students can make at least an adequate professional oral presentation by the end of their program, and most students (86%) are making very good or excellent presentations.
- D.** Of the 11 students who graduated from the MSGeology program in AY2014-16, 5 (45%) are employed by industry (mining, oil and gas, environmental), 2 (18%) are teaching science at the K-12 level, 2 (18%) are working for state or federal government agencies, and 2 (18%) are enrolled in Ph.D. programs (Table 6). Thus, 100% of our graduating MS Geology students during this period have either found employment within geoscience-related fields or continued their education in graduate programs.

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), 35% of graduating MS/MA Geology students had accepted a position in a geoscience-related field, while in the 2015 survey (Table 9), 41% of graduating students had accepted a geoscience position. Our student employment data compares very favorably to these national trends, with 100% of our students placed in a geoscience-related field. As with the national survey, the majority of our students were employed by industry.

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 MS Geology 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' MS 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 MS Geology 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 MS Geology program are highly successful in finding employment within their field (82%) or continuing their education (18%). 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.

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/