

New Mexico State University

Detailed Assessment Report 2014 - 2015 Geological Sciences Graduate *As of: 5/14/2016 08:36 PM MDT*

Mission / Purpose

Department Mission Statement:

The Department of Geological Sciences is committed to field-based and lab-based teaching and research. We are dedicated to a greater understanding of Earth processes through research, service to the geosciences, and outreach to the general public and K-12 classrooms.

Department Vision Statement:

We strive to be one of the top departments in the nation at which to earn undergraduate and MS degrees in the geological sciences as a foundation for a career in industry, government, or academia. We will undertake innovative geologic research and provide scientific leadership at the national and international levels.

Department Value Statement:

The Department of Geological Sciences will orient its activities around ten valued concepts and activities. These are our collective values; each faculty member is involved in many of them, but no one faculty member is expected to be involved in all of them. We value:

- Field-based, lab-based, and innovative classroom teaching.
- Undergraduate and graduate student learning through student research experiences.
- Incorporation of faculty research in teaching.
- Activities that promote awareness and understanding of Earth processes and resources in the general public.
- Research on significant geologic problems world-wide.
- Research on the geology of New Mexico as part of the land grant mission of New Mexico State University.
- Functional analytical laboratories in our department.
- Communicating research results to other scientists.
- Service to the geologic community that supports research and publication.
- Service within the department, college, and university that moves us towards mission.

Goals/Objectives

G 1: Conduct geologic research

Students have the ability to identify and solve a research problem and to present the results of that research to other geologists.

G 2: Fundamental Geologic Knowledge

Students attain a fundamental knowledge in the field of geological sciences.

Connected Document

[Thesis and Defense Faculty Questionnaire](#)

G 3: Positive experience

Students will have an overall positive experience in the NMSU MS Geology program.

Connected Document

[Graduate Student Exit Questionnaire](#)

Student Learning Outcomes, with Any Associations and Related Measures, Targets, Findings, and Action Plans

S 1: Complete thesis

Students will successfully defend a thesis that outlines a research problem, presents data collected by the graduate student, and interprets the data. Here, we track simply the number of students who complete and successfully defend a thesis. The writing itself is not specifically assessed; however, the thesis advisor and committee do not accept theses that do not pass a minimum standard. The minimum standard is that a thesis must: 1) outline a research problem; 2) present data collected by the graduate student; 3) interpret the data, and 4) be written in acceptable scientific English.

Strategic Plan Associations

Arts and Sciences College

1.1 Goal 1: Provide students with a high quality education in the arts, humanities, social sciences and sciences, at the Bachelor's, Master's and Doctoral levels.

1.2 Goal 2: Promote discovery through scholarship and creative activity, encourage innovation and dissemination, spark economic advancement, and inspire a culture of excellence.

New Mexico State University

1.1 Academics and Graduation: Provide stellar programs, instruction, and services to achieve timely graduation

Related Measures

M 1: Percent of completed theses

Number of students who successfully defend their thesis.

Source of Evidence: Benchmarking

Target:

90% of incoming students will successfully defend their thesis.

Finding (2014 - 2015) - Target: Met

This graph shows the percentage of graduate students that complete the MS program in geology. Each cohort consists of the students who first enroll in a given fall semester. Each cohort consists of 5-7 students. Since the 2002 cohort, we have not always met the goal of 90% of students graduating from each cohort. The stories of students who did not complete the program since 2008 are as follows:

2008: One student did not complete the thesis.

2009: One student was not able to take courses at the graduate level.

2010: One student failed thesis defense.

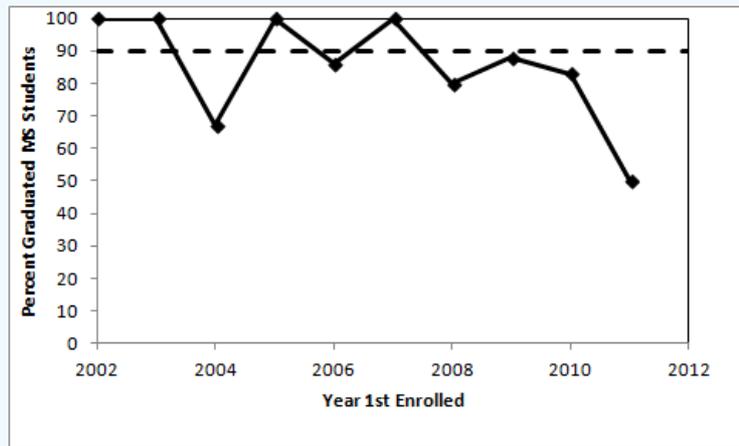
2011: One student left because spouse took a job in another state; two students followed a professor from NMSU to another university.

However, assuming that it takes 6 semesters for a graduate student to complete the geology MS, we can consider the F2012 cohort as a measure of our success in Spring 2015. In the 2012 cohort of six students, four have graduated and two will defend their theses in Fall 2015. So in the short term (2012-2015), we have met the target.

Looking forward, it appears that the graduation rate will increase.

In the 2013 cohort (n=5), one has graduated and the other four are on track to graduate.

In the 2014 cohort (n=5), all are on track to graduate.



S 2: Geologic Knowledge

Student knowledge, as assessed by faculty at the defense, will be reasonable for the MS level.

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[Thesis and Defense Faculty Questionnaire](#)

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Related Measures

M 2: Thesis committee questionnaire

Faculty questionnaire at thesis defense, covering: definition of thesis problem, data collection, interpretation, quality of writing, overall thesis quality, organization of defense presentation, visual aids in defense presentation, overall defense presentation quality, general geologic knowledge, scientific progress while at NMSU.

Source of Evidence: Focus groups on teaching, learning, program value

Connected Document

[Thesis and Defense Faculty Questionnaire](#)

Target:

80% will earn average scores equal or better than 3 (on a five-point scale, where 1 is high). A score of 3 is "minimal acceptable."

Connected Document

[Thesis and Defense Faculty Questionnaire](#)

Finding (2014 - 2015) - Target: Partially Met

Four graduate students defended theses in the calendar year 2014. The percent of students who scored an average of 3 or better on the faculty questionnaire is reported below.

Geologic problem was defined.	100
Appropriate data were collected.	100
Data were appropriately interpreted.	75
Information was appropriately expressed in writing, figures, maps, tables, etc.	75

Overall thesis quality	75
Defense presentation was organized.	100
Visual aids were of high quality.	50
Defense presentation was given in professional manner.	100
Overall presentation quality.	75
Student's general knowledge of geology	75
Scientific progress during time at NMSU.	75

These data suggest that faculty feel better about the definition and data collection in the theses than in the interpretation and presentation, both in the thesis and in the oral defense. The four graduate students includes one student who failed the thesis defense.

Related Action Plans (by Established cycle, then alpha):

For full information, see the *Details of Action Plans* section of this report.

Communication skills

Established in Cycle: 2014 - 2015

To enhance our graduate students' written and oral communication skills, the department will offer a 1-credit Geoscience Communi...

S 3: Positive Experience

Students will have an overall positive experience in the NMSU MS Geology program.

Connected Document

[Graduate Student Exit Questionnaire](#)

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Related Measures

M 3: Student Questionnaire

Questionnaire given to students who successfully complete thesis defense, covering: classes, thesis advisor and committee members, field and lab experiences, balance of work areas, thesis project, teaching assignments, departmental resources, preparation for career, what was best, what was worst, would you recommend program to others?

Source of Evidence: Exit interviews with grads/program completers

Connected Document

[Graduate Student Exit Questionnaire](#)

Target:

Aggregate qualitative data will be used to evaluate the graduate experience in our department.

Connected Document

[Graduate Student Exit Questionnaire](#)

Finding (2014 - 2015) - Target: Met

Five students submitted the graduate student questionnaire. The written comments were read and summarized by the department head.

Note that the target is that we will collect and ponder this information.

Results:

1. Please comment on your graduate classes. Include the classes you found the most beneficial, the least beneficial, and those you wish you had taken. Why do you feel this way about each class?

<u>Most Beneficial</u>	<u>Least Beneficial</u>	<u>Wish Had Taken</u>
Isotope Geochemistry	Geophysics	Mineralogy
Geochronology	General Geochem	Hydrogeology
Global Geochem Systems	Analytical Geochem	Geophysics
Basin Analysis	Geomorphology	Ore Geology
Mineralogy		
Tectonics of N Am		
Paleoclimate		

Petroleum

Geosci Comm

2. Please comment on your field and/or laboratory experiences. Were these experiences beneficial?

- field and lab experiences good

3. Please comment on the balance of taking classes, teaching labs, and working on your thesis research. Was there sufficient time for all of these activities?

- good balance
- almost impossible to take classes, teach labs, and work on thesis, but OK after classes were finished
- first year difficult

4. Please comment on your thesis experience. Was your project too challenging, not sufficiently challenging, appropriately challenging? Did you have sufficient resources to complete the work?

- no problems here
- frustrated while trying to define the problem addressed in the thesis

5. Please comment on your teaching assistant assignments. Were they fairly distributed? Were you able to complete them adequately?

- some TAs had less work during some semesters, but it balanced out OK in the end
- teaching assignments are more time-consuming than intellectually challenging
- make-up GEOL 111G lab should be worth more than a regular GEOL 111G lab
- overall, teaching assignments are OK

6. Please comment on departmental resources (field equipment, vehicles, computers, lab instrumentation and equipment, number of faculty, number of staff, space). Were resources available for your MS education?

- do not sell the suburbans
- sufficient resources
- no resource problems
- grad office is too noisy to work effectively

7. On a scale of 1 - 10, with 10 being the highest, rate how prepared you feel for the next step in your career. Explain.

- 5. NMSU is not a petroleum school, which is my career choice. However, I was prepared to learn all I needed to learn once I started my job.
- 10. deficiencies in my education have been filled
- 8.
- 8. Need hands-on experience with software used in different careers.
- no comment

8. What was best about your experience in our graduate program?

- the people
- the camaraderie
- conferences
- see so much exposed geology in the field
- writing the thesis made me grow to a whole new level
- small department is great
- professors willing to help

9. What was worst about your experience in our graduate program?

- the drama; everyone gets too involved in everyone else's business
- writing the thesis
- getting up early to teach lab

10. Would you recommend this program to other students?

- yes, if all classes were directly applicable to career choice
- yes

Details of Action Plans for This Cycle (by Established cycle, then alpha)

Communication skills

To enhance our graduate students' written and oral communication skills, the department will offer a 1-credit Geoscience Communication class in Spring 2016. The class will cover writing from the sentence to the thesis, poster presentations, map and diagrams, and oral presentations.

Established in Cycle: 2014 - 2015

Implementation Status: Planned

Priority: High

Relationships (Measure | Outcome):

Measure: Thesis committee questionnaire | **Outcome:** Geologic Knowledge

Projected Completion Date: 05/2016

Responsible Person/Group: Nancy McMillan will teach the class

Analysis Questions and Analysis Answers

1. Engagement: How did you engage faculty, administrators, staff, students and/or other stakeholders in discussing results of the assessment and determining the effectiveness of the assessment in measuring the identified outcome(s)? Include meeting dates, topics of discussions, audience and any decisions made.

Faculty discussed the results of the graduate outcomes assessment on 6 May 2015 in our annual assessment faculty meeting. The results of the retention data and the faculty questionnaire are consistent with individual faculty members' observations. Two changes that resulted from the discussion are: 1) slight changes to our expectations of graduate student TA duties that should simplify their work load, and 2) consensus that McMillan should repeat the Geologic Communication course taught in Spring 2014.

2. Impact: Discuss the impact of your assessment. Does the data collected answer the question you had about the intended outcome? If not, why? Did you learn anything about the intended outcome you did not anticipate? If so, what? Did the assessment provide sufficient information about the outcome that you can now make informed decisions about programs/practices or specific, directed improvements to programs/practices?

The data are very helpful because they bring our observations and feelings back to reality. For instance, it is easy to ignore the impact of graduate students who don't complete the program because we get tired of advising them when they don't respond to us. But seeing the numbers make it clear that we need to think through this problem. Similarly, the data collected from the faculty questionnaire helps us focus on what we realize is our students' weak point--written and oral communication.

3. What specifically did your assessment show regarding proven strengths or progress you made on outcomes/objectives? (Strengths)

The completion percentage was quite low in 2011, mainly because two students followed a professor who moved to a different university. However, the completion percentage appears that it will increase for the 2012 cohort (projected completion in 2015), and the 2013 and 2014 cohorts look strong so far. Retention and graduation is a strength of this program.

4. What specifically did your assessment show regarding opportunities for improvement. Describe how you intend to address those issues over the next year. If you met all targets, what specifically do you intend to do in the next assessment cycle to promote continuous improvement in your area?

Areas for improvement include:

- oral communication (including graphics)
- written communication
- moving from one large graduate student office to several smaller (and quieter) offices

5. Specifically, what have you learned about your program, and/or your students' learning?

From the graduate student questionnaire, we learned the following:

- graduate students do not seem to be feeling the shortage of resources experienced by faculty
- overall, graduate students feel prepared for the next step in their careers
- graduate students feel that the best things about the program are the people, the geology in the region, and the professors.
- graduate students feel that the worst things about the program are the drama in the graduate student population and getting up early to teach lab.

6. Provide a brief summary of your program, department, or unit's activities in the current assessment cycle. You might want to describe a major accomplishment or explain how your area contributed to Baccalaureate Experience learning, or to Vision 2020. Alternatively you may want to discuss how your program is using this assessment to inform decisions and actions for improvement. This summary should be appropriate for broad audiences.

NMSU geology graduate students either enter the workforce in the areas of energy, environmental protection, or mineral exploration, or they go on to PhD programs. We have alumni who are professors in universities across the nation, and we have alumni working in petroleum companies of all sizes (some own petroleum companies). Others work in the environmental field, as consultants or in governmental positions. In this way, the graduate program supports the Vision 2020 goals in Economic Development. Because all of our graduate students write a thesis involved in some aspect of their advisor's research program, the MS Geology also supports Vision 2020 goals in Research and Creative Activity.