

ASSESSMENT REPORT 2021-2023

Natural Sciences

(Instructional Degree Program)

M.S.

(Degree Level)

Concentration

Geology

Program Mission:

The mission of the M.S. Natural Sciences-Geology Concentration is to provide students with pre-professional and post-graduate education in the management of natural resources with a geology emphasis through engagement in graduate-level coursework, practice in teaching undergraduate geology laboratory sections, and participation in thesis research.

Student Learning Outcome 1:

Competency in graduate level coursework.

NMHU Traits Specifically Linked to Student Learning Outcome 1

- Mastery of Content Knowledge and Skills

First Means of Assessment for Outcome 1:

Maintenance of a 3.0 GPA for graduate level coursework.

Summary of Data:

Number of Students Meeting Criterion:	5	Number of Students Not Meeting Criterion:	0
Total Number of Students Assessed:	5	Percent of Students Meeting Criterion:	100%

Interpretation of Results for Outcome 1: *M.S. Natural Sciences-Geology graduate students consistently do well in their graduate-level coursework. The Natural Resources Management Department faculty selects a relatively small pool of qualified applicants into the graduate program with undergraduate academic records and/or applied experiences that demonstrates the candidate's potential to succeed in graduate level coursework. Rigorous review of application materials and maintenance of program pre-requisites factor into student success.*

Student Learning Outcome 2:

Competency in teaching assistantship.

NMHU Traits Specifically Linked to Student Learning Outcome 2

- Mastery of Content Knowledge and Skills
- Effective Communication Skills
- Critical and Reflective Thinking Skills

First Means of Assessment for Outcome 2:

Success in delivering lab introductions, grading and returning student materials, maintaining office hours, and making meaningful contributions to laboratory section, as reported by faculty instructors.

Summary of Data:

Number of Students Meeting Criterion:	5	Number of Students Not Meeting Criterion:	0
Total Number of Students Assessed:	5	Percent of Students Meeting Criterion:	100%

Interpretation of Results for Outcome 2: *M.S. Natural Sciences-Geology graduate students consistently do well in their teaching assistantships. The Natural Resources Management Department faculty meets regularly with and mentors graduate students in aspects of teaching (lecture preparation, material delivery, one-on-one student interaction, and grading) to help with teaching assistantship professional development. The faculty also prepares a “Teaching Assistant Contract” at the beginning of the academic year that delineates teaching assistant expectations, including maintenance of office hours, laboratory session preparation, and one-week turn-around-time for grading. Also noteworthy is the Natural Resources Management Department’s idea for, and final implementation of, graduate student professional development with the Center for Teaching Excellence. The one-day graduate assistant training is now in its fifth year. The workshop covers a variety of topics, including sexual harassment reporting, classroom behavior, academic misconduct, responding to accessibility, communicating, and overall professionalism. This training added value to the M.S. Natural Sciences-Geology graduate students’ classroom compartment and professional growth.*

Student Learning Outcome 3:

Progress and proficiency in thesis research, including the design, defense, and execution of a thesis project.

NMHU Traits Specifically Linked to Student Learning Outcome 3

- Mastery of Content Knowledge and Skills

- Effective Communication Skills
- Critical and Reflective Thinking Skills

First Means of Assessment for Outcome 3:

Writing of a thesis proposal, defense of the thesis proposal, and progress in the thesis research as reported by graduate thesis advisors.

Summary of Data:

Number of Students Meeting Criterion:	5	Number of Students Not Meeting Criterion:	0
Total Number of Students Assessed:	5	Percent of Students Meeting Criterion:	100%

Interpretation of Results for Outcome 3: *M.S. Natural Sciences-Geology graduate students consistently do well, in collaboration with their graduate thesis advisors, designing, defending, and executing their thesis research projects. In fact, most students receive mini-grants, such as New Mexico Water Resources Research Institute or New Mexico Geological Society, to support them in their research.*

Student Learning Outcome 4:

Successful completion of a Master’s thesis within 3-year (6-semester) timeframe.

NMHU Traits Specifically Linked to Student Learning Outcome 4

- Mastery of Content Knowledge and Skills
- Effective Communication Skills
- Critical and Reflective Thinking Skills

First Means of Assessment for Outcome 4:

Completion of a M.S. thesis project and paper within a 3-year (6-semester) timeframe.

Summary of Data

Number of Students Meeting Criterion:	4	Number of Students Not Meeting Criterion:	1
Total Number of Students Assessed:	5	Percent of Students Meeting Criterion:	80%

Interpretation of Results for Outcome 4: *Most students under Geology faculty mentorship complete their thesis research in 4 to 6 semesters. One student in the assessment period did not meet that criterion. Field work restrictions during COVID-19, as well as limited lab access, stalled the individual’s ability to collect and analyze samples,*

then interpret and write-up the findings. The student is doggedly working to reduce data, interpreting results, and write the thesis.

The Natural Resources Management Department faculty is stretched extremely thin in teaching, research, and service commitments and has campaigned for 5+ years for an additional tenure-track faculty member to assist with delivering graduate courses and mentoring graduate students. The Natural Resources Management Department has been asking specifically, based on incoming student interest, regional needs, and career trends, for permanent tenure-track faculty member with surface hydrology, water science, water resources, and geographic information science expertise. The request has consistently been denied. At this time, the department's programs are threatened not only by a staff shortage but by the Forestry Department's proposal to develop a graduate degree that has >85% overlap to the current M.S. Natural Sciences degree program. Instructional programs under the Natural Resources Management Department's purview (Water Resources Science and Geographic Information Systems) are being moved, by way of instructional resources, into the Forestry Department. The marginalization of the Natural Resources Management Department impacts its ability to teach classes and support students in meeting the program learning objectives.

Utilization of Results: (Indicate your plans for using the results in this report to improve your program. All programs are required to complete this section.)

Based upon the 2021-23 outcomes data as well as longitudinal data from the last 5+ years, student learning outcomes have been maintained at a consistently high level (100% for most student learning outcomes) in the M.S. Natural Sciences-Geology Concentration. Academic areas to continue to reinforce throughout students' graduate careers include time management and writing proficiency. Early intervention and provision of writing support (such as appointments with the Writing Center, enrollment in a technical writing class) will be provided to graduate students stalling in their thesis research writing.

Changes to Program Based on Results:

- *Develop a Graduate Student Exit Survey to gain the students' perspective of their graduate experience and better assess student needs.*
- *Consider the addition of a technical writing requirement for graduate students.*
- *Build guest speakers from industry and research (water resources managers, economic geologists, hazard mitigation specialists, etc.) so that students see the application of geology to natural resources management issues and learn about career tracks.*

Retention Strategies

- *Gain budgetary approval for 2 additional tenure-track Natural Resources Management faculty member with geographic information science and water resources science expertise to provide additional learning experiences, research opportunities, and individualized attention to Geology graduate students.*
- *Continue to coordinate field and laboratory experiences among senior- and graduate-level classes to build larger student cohorts and increase academic integration.*