

**ASSESSMENT REPORT
AY 2020-2021**

Environmental Geology
(Instructional Degree Program)

B.S.
(Degree Level)

Environmental Science, Environmental Geology, and Water Resources
(Concentrations)

Geographic Information Systems
(Certificates)

Program Mission:

The mission of the Environmental Geology B.S. Program is to provide students with a rigorous, high-quality education in natural resources management with concentrations in Environmental Science, Environmental Geology, and Water Resources.

Student Learning Outcome 1:

Classify and identify earth materials, including soils, minerals, and rocks.

NMHU Traits Specifically Linked to Student Learning Outcome 1

- Mastery of Content Knowledge and Skills

Earn $\geq 75\%$ cumulative laboratory exercise grade from GEOL 2110: Earth History. Laboratory series emphasizes hand specimen description and identification.

Summary of Data (Note: includes both Spring 2020 and Spring 2021):

Number of Students Meeting Criterion:	8	Number of Students Not Meeting Criterion:	0
Total Number of Students Assessed:	8	Percent of Students Meeting Criterion:	100%

Second Means of Assessment for Outcome 1:

Earn $\geq 75\%$ cumulative laboratory exercise grade from GEOL 3030: Environmental Geology. Laboratory series emphasizes hand specimen description and identification.

Summary of Data:

Number of Students Meeting Criterion:	5	Number of Students Not Meeting Criterion:	1
Total Number of Students Assessed:	6	Percent of Students Meeting Criterion:	83%

Interpretation of Results for Outcome 1:

A high percentage of geology students met the mineral and rock identification criterion. The Environmental Geology faculty recognizes the importance of field application of classroom knowledge. They work diligently to plan and implement hands-on in-the-field laboratories throughout the curriculum. The NRM Department will continue to include the provision of field experiences in its unit Strategic Plan and campaign for more budget monies and more dispensation of time to its faculty to develop and execute field experiences.

Note that the individual who did not meet the SLO1 missed by one percentage point. The student did very well in his laboratory exercises, but had reduced grades for several labs because of late submissions. The Environmental Geology faculty will work to improve time management among its students to increase student efficiency, work productivity, and learning outcomes.

Student Learning Outcome 2:

Read and evaluate relevant professional literature.

NMHU Traits Specifically Linked to Student Learning Outcome 2

- Critical and Reflective Thinking Skills

First Means of Assessment for Outcome 2:

Earn $\geq 75\%$ on reading assignment summaries in GEOL 3170: Depositional Environments.

Summary of Data

Number of Students Meeting Criterion:	6	Number of Students Not Meeting Criterion:	0
Total Number of Students Assessed:	6	Percent of Students Meeting Criterion:	100%

Second Means of Assessment for Outcome 2:

Earn $\geq 75\%$ on reading assignment (newspaper articles, journal papers, book chapters) in-class summaries in GEOL 4350: Watershed Dynamics.

Summary of Data:

Number of Students Meeting Criterion:	8	Number of Students Not Meeting Criterion:	0
Total Number of Students Assessed:	8	Percent of Students Meeting Criterion:	100%

Interpretation of Results for Outcome 2:

Environmental Geology majors do well (100% of students assessed meets expectations) with reading and reporting on advanced topics in geology. Geology faculty invests a considerable amount of time researching topics, identifying literature, assigning papers, and providing clear and detailed grading metrics in advance of writing assignments. Geology faculty also provides timely feedback and opportunities for re-submissions for writing assignments. Scientific literacy has long been a hallmark of the Environmental Geology Program and continues to set the students apart from their peers.

Student Learning Outcome 3:

Effectively communicate scientific ideas, information and results, both verbally and in writing that (1) demonstrate consistent logic; (2) are well organized; (3) state and defend a thesis; and (4) demonstrate competent use of language.

NMHU Traits Specifically Linked to Student Learning Outcome 3

- Effective Communication Skills

First Means of Assessment for Outcome 3:

Earn $\geq 75\%$ on collection of writing assignments in GEOL 4120: Geologic Resources, Law & Environmental Policy that relay a student's viewpoints and demonstrate the student's understanding about natural resources management law and environmental policies.

Summary of Data:

Number of Students Meeting Criterion:	6	Number of Students Not Meeting Criterion:	2
Total Number of Students Assessed:	8	Percent of Students Meeting Criterion:	75%

Second Means of Assessment for Outcome 3:

Earn $\geq 75\%$ in summary report on GEOL 4350: Watershed Dynamics project.

Summary of Data:

Number of Students Meeting Criterion:	8	Number of Students Not Meeting Criterion:	0
Total Number of Students Assessed:	8	Percent of Students Meeting Criterion:	100%

Interpretation of Results for Outcome 3:

Environmental Geology majors do well with communicating scientific ideas, information, and results. Geology faculty invests a considerable amount of time in structuring deadlines (submission of topic, preparing a detailed outline, submitting references and drafts, etc.) and meeting regularly with students to review work and provide editorial improvements. This year's and longitudinal data indicate that consistent and structured academic support are key to student's writing success.

Again, students who did not meet the criterion actually showed writing proficiency, but had reduced points because of late submissions. The Environmental Geology faculty will work to improve the productive management of time among its students so that they are better at de-procrastinating tasks and prioritizing workflow.

Student Learning Outcome 4:

Competently use appropriate tools from geology, chemistry, physics, and mathematics to solve discipline specific problems.

NMHU Traits Specifically Linked to Student Learning Outcome 4

- Mastery of Content Knowledge and Skills
- Critical and Reflective Thinking Skills
- Effective Use of Technology

First Means of Assessment for Outcome 4:

Earn $\geq 75\%$ in course grade from GEOL 4900: Independent Study and/or GEOL 4990: Independent Research.

Summary of Data

Number of Students Meeting Criterion:	4	Number of Students Not Meeting Criterion:	0
Total Number of Students Assessed:	4	Percent of Students Meeting Criterion:	100%

Interpretation of Results for Outcome 4:

Environmental Geology majors do extremely well in applying various tool and techniques (for example, total station data, water chemistry measurements, gravity and magnetic surveying values, remote sensing data, calculus, linear algebra, redox reactions, and buffering equations) to complete homework and laboratory exercises. The Environmental Geology Program will continue to use multivariate datasets and instruments from geology and from outside disciplines throughout the curriculum. The NRM Department will continue to prioritize student opportunities for hands-on cutting-edge analytical instrument usage in the study of natural resources management in its unit Strategic Plan.

Student Learning Outcome 5:

Competently use appropriate laboratory and field methods and instrumentation.

NMHU Traits Specifically Linked to Student Learning Outcome 5

- Mastery of Content Knowledge and Skills
- Critical and Reflective Thinking Skills
- Effective Use of Technology

First Means of Assessment for Outcome 5:

Earn $\geq 75\%$ in course grade from GEOL 4950: Senior Geology Applications course demonstrating proficiency in using a Brunton compass, Jacob staff, and hand-held GPS unit for field data collection, as well as abilities in stereographic projections, geologic mapping, and report writing.

Summary of Data (Note: includes both AY 2019-20 and 2020-21):

Number of Students Meeting Criterion:	4	Number of Students Not Meeting Criterion:	0
Total Number of Students Assessed:	4	Percent of Students Meeting Criterion:	100%

Interpretation of Results for Outcome 5:

Environmental Geology seniors each earned grades of B or above in the Senior Applications course that included geologic mapping exercises, material synthesis, water quality monitoring, and resource management prescriptions. The Environmental Geology Program will continue to implement numerous field experiences, from afternoon outings to extended immersive learning experiences, and integrate field data collection, natural resources mapping (bedrock, soil, and water), and data interpretation within the curriculum.

Student Learning Outcome 6:

Attain employment in geology, environmental science, or related fields and/or obtain admission to graduate school.

NMHU Traits Specifically Linked to Student Learning Outcome 6

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

First Means of Assessment for Outcome 6:

All (100%) of graduates from the Environmental Geology Program will find placement in geology-related jobs or graduate school within 3 months of graduation.

Summary of Data

Number of Students Meeting Criterion:	3	Number of Students Not Meeting Criterion:	0
Total Number of Students Assessed:	3	Percent of Students Meeting Criterion:	100%

Interpretation of Results for Outcome 6:

The Environmental Geology Program boasts 100% placement in career paths or graduate programs of its students. In 2020-21, 3 students graduated from the program and went on to work at environmental consulting firms or enter Master's degree programs. The Environmental Geology faculty considers this an important measure of the success of its program. Students are well prepared for a career or advanced course work in the geosciences.