Assessment and Improvement Report: 2013

Department: Geology

Assessment Coordinator: Thor Hansen/Susan DeBari

Departmental Mission: The Geology Department at WWU is committed to excellence in both teaching and research. Our goal is to offer the highest possible quality education in the geological sciences at the undergraduate and graduate levels. The mission of our department is to serve three main populations: graduate students, undergraduate geology majors, and undergraduates from other departments for their general education courses. For all of these students we strive to create excitement about discovery and the process of geologic inquiry. We want to develop in all students an appreciation of how geological processes affect the earth and society so that they will be environmentally responsible, scientifically literate citizens. We strive to produce majors with an interdisciplinary content background in geology and the physical sciences who are competent in the field, who can work collaboratively, conduct original research, and effectively communicate their results.

Department Student Learning Outcomes:

Cognitive outcomes: Our students will have a deep understanding of the following foundational geologic principles:

1. Earth has a history of biological and physical change over billions of years.
2. Earth's surface is affected by dynamic processes on a range of timescales.
3. Earth's composition varies and these compositions provide the raw materials for the rock cycle.
4. Earth's interior is dynamic and drives plate tectonics.
5. Earth scientists use repeatable observations and testable ideas to understand and explain our planet.
6. Geology and society are fundamentally inter-related.

Skills: Our students will have critical skills required by professional geologists. Graduates:

7. Have developed their observational, analytical and quantitative skills.
8. Can create maps and understand what they tell us about the Earth.
9. Will be able to apply physics, chemistry, and mathematics concepts to the study of Earth.
10. Will be able (alone or in teams) to present geological information clearly.

Student Learning Outcomes Assessed This Year:

<table>
<thead>
<tr>
<th>Assessment Measures</th>
<th>SLOs Assessed</th>
<th>Results</th>
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<tbody>
<tr>
<td>Geol 406 lab and field rock classification exercises</td>
<td>3</td>
<td>Integration of more group hand sample work in the lecture part of the class had a significant impact on student confidence, but not necessary on student performance. Average student score was 76.5% on the igneous lab exam and 77.3% on the metamorphic lab exam. I consider 70% on the lab exam to be “meeting standard”. Two of 21 students performed just below standard on the first exam (68.2 and</td>
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65.2%) and three of 21 students performed below standard on the 2nd exam. I hope to scaffold more hand sample work during lecture in future quarters teaching the course. The two to three students that did not meet standards were ones that did not put in the time and effort required to learn the mineral and rock identification.

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<tr>
<th>Humans as geomorphic agents lab in Geol 310.</th>
<th>6</th>
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<tr>
<td>On the “Humans as Geomorphic Agents” Problem Set, my class averaged 10.5/15, but this included two zero scores for students who failed to turn in the assignment. Of those that turned it in, the average score was 11.8/15. In order to improve the student learning associated with this outcome, I plan to provide example calculations in the problem set and ask for a more formal summary discussion of what they learned from the calculations.</td>
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**Changes based on assessment findings:**

2012-2013
Graduation rates had lagged due to increases in the number of Geology majors- for 2012-13 schedule more sections of Geol 212, 213, 306, 310, 318, 352, 406, 415 were added at the expense of GUR courses. We have informally- and in 2013-2014 will formally- placed on hiatus Geol 214, and will/have shifted course sections from GUR/Service courses to courses for the Geology major.

**Changes made in previous years based on assessment findings:**

2011-2012
The ASBOG Exam is a challenging evaluation that covers a wide range of skills necessary for professional geologists. We are pleased with the WWU turnout for this exam and the pass rate.

The improvement in the aerial map exercise may be due to a format change made in the way the lab was administered. The instructor emphasized the model answer that was provided in the assignment and asked students in discussion to describe the characteristics of a high quality description and interpretation. Apparently, clarifying expectations helps students focus their efforts. To test this hypothesis, we will administer the lab in F2012 the same way as F2011 and see if the results are similarly positive.

We eliminated some courses and consolidated requirements across the program to make it easier for seniors to get the courses they need to graduate in a timely manner. We also created a "permanent" schedule for core courses in order to provide greater predictability for students when they schedule their classes.

2010-2011:
Senior exit interviews, alumni contacts, and professional employment statistics all indicated a need for student training in economic geology. This year we added a course in economic geology (Geology 432) to our curriculum.

**2008-2009:**
Senior exit interviews and alumni surveys indicated a need for increased student training in GIS (Geographical Information Systems). This year we created a GIS course (Geology 213) and made it a degree requirement. We also instituted an online course planner to help students and their advisors facilitate their degree progress.

**GUR Assessment:**

GUR academic competencies and perspectives
2. Analyze and interpret information from varied sources, including print and visual media.
3. Use quantitative and scientific reasoning to frame and solve problems.

**GUR Outcomes Assessed This Year:**

<table>
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<tr>
<th>Assessment Measures</th>
<th>GUR-ACPs Assessed</th>
<th>Results</th>
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<tbody>
<tr>
<td>Geol 212 Geological History Final Lab</td>
<td>2</td>
<td>Winter 2013-27 student scores on this lab were evaluated. Low grade = 8, average = 10.5, high grade = 12 (out of 12)-all but one student successfully displayed competence</td>
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<tr>
<td>Show competence interpreting geological processes from multi-channel seismic data</td>
<td>2</td>
<td>The average grade on the homework that focuses on this process was a 77%. However, this includes the grades of two students who had significant grade reductions due to turning in the assignment late; if their scores are removed the class average rises to 82%. This suggests that students have a solid, if not perfect, grasp on this objective.</td>
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**Changes based on assessment findings:**

Will continue to collect and track assessment data for GUR courses. Increased interaction with NTT faculty and graduate TAs will also be implemented by the department