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Most students enrolled in my geology courses may never take a science class ever again, yet I find it likely that they will discuss a scientific topic at some point in their life. Therefore, I feel very strongly that students gain experience communicating moderately technical information to a variety of audiences. One challenge with my courses is that it is not until the latter third of the semester that we focus on more charismatic aspects of geological processes and phenomena more obviously related to everyday life beyond igneous, metamorphic and sedimentary rocks. In response to maintaining students' interest and understanding of fundamental geologic principles and their broader implications to Earth processes, I've created an earthquake monitoring project that lasts for several weeks and culminates with a final paper. By the time the assignment is delivered, students have learned about minerals, rock forming processes (including the three major rock types) and Plate Tectonics, and they are starting to delve into learning about earthquakes. This project requires students' interpretations to be built upon the information covered earlier in the semester, to compile information regularly from the United States Geological Survey, and to practice communicating technical information to a range of audiences.

The project starts by students accessing the USGS Earthquake monitoring website and choosing any area in the world that they wish to monitor for seismic activity for two to three weeks. Their monitoring area must be a 10x10-degree map area. Twice a week, students access their 10x10 map area and record any earthquakes that have occurred since the last time they checked in. Information about each event (including magnitude, depth, and date) is entered into an "Earthquake Log", which should be a Word (or similar format) document. Once a week, students post a summary of their area's seismic activity on a discussion board. For full-credit, they must reply to another student's post with a thoughtful reply.

The monitoring, discussion board posts, and documentation of earthquake activity comprises half of the project. The final portion of the project requires students to write a paper that requires background research on the tectonic history of their area, summarizes the earthquake activity that occurred during their monitoring period, and speculates on what sort of tectonic setting their area will be in the future (at specified time intervals of 1Ma, 10Ma, and 100Ma). Furthermore, students must predict what types of rocks they would expect to find in their area based on their understanding of the tectonic environment and association of rock forming processes specific to tectonic settings.

This paper serves as a sort of capstone project by requiring students to incorporate content covered previously in the semester. For example, they use empirical information about earthquakes and identification of physiographic features to resolve the tectonic setting of their monitoring area (covered during our study of Plate Tectonics). Identification of lithospheric composition and plate motion is married with their prior understanding of rock forming processes to predict what rock types they would expect to find within their environment.

Students gain earth science literacy by reading through a variety of pages within the USGS website. The assignment requires gathering general and technical information, which is easily accessible via the USGS. Two goals for this project are for students to realize how easy it is to obtain this range of information and to become more familiar evaluating reputable and authoritative online resources.

In addition, I challenge students to further develop their earth science literacy by fostering an ability to clearly communicate technical scientific information with family, friends, and classmates. The project accomplishes this goal by requiring the final paper to be written in two distinct styles: some portions (for instance, the introduction) should be written at the level that the general public could understand and other portions are communicated at a more technical level. In the words of a committee member on one of my theses, a good thesis should include “a grandma paragraph”. That is, the paragraph that your grandma could read and leave with an understanding of what you have worked on for the last 4 years. Although my students may have only spent three to four weeks on this assignment, I feel strongly that they practice summarizing a multi-step project with technical information to a non-scientific audience.

My experience with this assignment has been quite rewarding. I find that students who seemed dormant for most of the semester commonly become quite engaged in monitoring their areas and keen on applying previous course content. I also tend to find students asking me questions more frequently; trying to clarify information they’ve read during their monitoring or research. By not assigning monitoring area’s students are more vested and interested in learning about their region and this is easily documented in their initial discussion board post which includes an explanation about why they choose their area. The final products clearly speak for themselves in terms of providing a meaningful experience accessing and interpreting data, learning technical information about earth processes, and attempting to communicate technical information to non-scientific audiences.