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Understanding Worldwide Geologic Activity Using GIS

Kathyrn Zuroski

The College at Brockport

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Kathryn Zuroski
July 30, 2006

Note: Attached is an example of a map that might be used in this lesson.

Lesson: Understanding Worldwide Geologic Activity Using GIS

This lesson is created as an Earth Science laboratory. It will take approximately 1 – 2 class periods.

Objectives:

Students will use ArcGIS Arc Map to plot latitude and longitude coordinates to pinpoint earthquake epicenters on world map

Students will describe the pattern that earthquake activity displays around the earth

Students will compare the location of earthquakes to that of volcanoes, plate boundaries, and ridge/trenches using ArcGIS Arc Map

Scientific Concept:

- Students will understand and apply scientific concepts, principles, and theories pertaining to the physical setting and living environment and recognize the historical development of ideas in science.
- Students will use ArcGIS Arc Map computer system to collect and display data.

This lesson would require basic student and teacher knowledge of the Arc GIS computer system. Maps could be created by teacher and/or student depending on resources and knowledge of the system.

Procedures:

In this lesson students will use the Arc GIS system. Using this system students will create a world map that plots the location of earthquake epicenters. In order to do this students will use coordinates of latitude and longitude of the epicenters. This information would be provided by the teacher or found on websites from the internet. Students will also use the Arc GIS computer to create maps that will model ridge and trench systems, plate boundaries, and volcano locations worldwide. This information would have to be found on the internet and used to create mapping systems in the Arc GIS system. Once students and/or teacher have created all necessary maps, students would complete laboratory summary questions using the maps created on the Arc GIS system. All of the maps created could be overlayed so that students could compare and contrast locations of earthquakes, volcanoes, plate boundaries, and ridge/trench systems.

Student Questions:

1. Describe at least two zones where you find a pattern of earthquake activity on the world map.
2. By referring to your maps, compare how the locations of earthquakes is related to the location of volcanoes (students will overlay maps in order to answer this question).
3. By referring to your maps, compare how the locations of earthquakes is related to the location of volcanoes and ridge/trench systems found on the earth.
4. Using your map of plate boundaries, compare how volcanoes, earthquakes, and ridge/trench systems are related to the plate boundaries.
5. Is it likely that the Rochester area could experience earthquakes and volcanoes? Why or why not?
6. Explain what may cause movements along the plate boundaries.
7. List the name of three major types of plate boundaries.