Lesson Plans   CMST Institute

8-7-2006

Plate Tectonics with GIS

Nate Ruder
The College at Brockport

Nate Ruder
Earth Science

Lesson Plan #4
GIS Model Activity

Objective ~ The concept of Plate Tectonics involves piecing together a wide variety of evidence to build a picture. This includes the location of earthquakes, volcanoes, mountains, fossils, and other paleoclimate data. The theory of Plate Tectonics is driven by information that is attached to a location. Even further, the theory is driven by looking and analyzing all these pieces of information together.

Science Concepts ~

1. The theory of continental drift strongly indicates that the Continents have moved as observed through the location of fossil and paleoclimate data.
2. Patterns of crustal activity mark the weaknesses in the outer crust which are boundary of plates.
3. Sea Floor Age provides strong evidence that the plates are moving.

Lesson Steps ~

Lesson Note – Our Science Department will be purchasing *My World GIS* for us in the upcoming school year. This program provides the ability to view and analyze geospatial data. It is extremely user friendly, especially in the education setting. Unfortunately, I do not have the actual software, so I can not yet build a meaningful lesson around it. Further, GIS Map that was used for training at CMST is not available off campus, due to licensing issues.

So given these constraints, I will only be able to give a general idea of what the lesson would look like. Here are some ideas, based off of data sets that I have previewed…

Sea Floor Age – It would be great to do a lab that looked at the age of the sea floor in relation to the mid Atlantic Ridge. Sea Floor age increases as distance from the ridge increases.

Continental Drift – This lab would examine the evidence that Alfred Wegner looked at to develop the theory of Continental Drift.

Occurrence of Crustal Activity – Plate Tectonics is an important theory, because it unifies seemingly disparate events of crustal activity. *My World GIS* is an excellent tool to unify these geospatial relationships to create an easily interpreted pattern.

These labs would involve manipulating and analyzing geospatial data. The labs would probably be done in the classroom using laptops. Keeping the students in the classroom would make it much easier to give direct instruction and consistency in classroom management. I am also thinking of training "expert" students on the software before the

lesson. These students can help other students to troubleshoot as the lesson progresses.
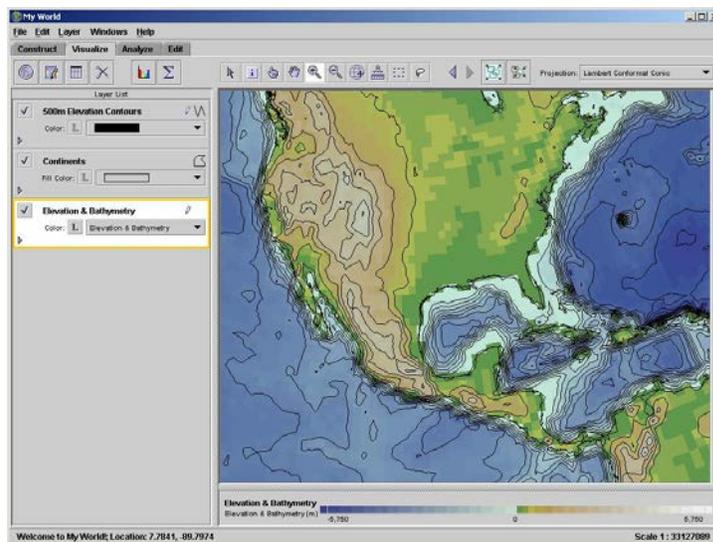Most likely this unit and GIS would culminate in my final Challenge Project.

Some Screen Shots from *My World GIS*
(taken from http://myworldgis.org/myworld/screenshots/)
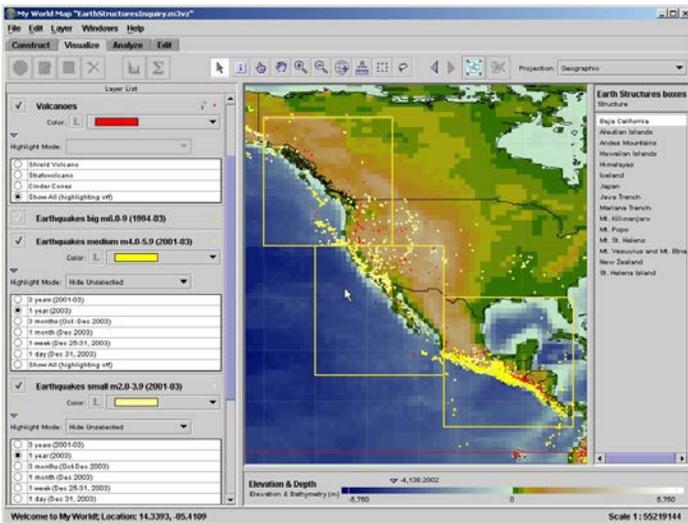
Earthquake and Volcano Data
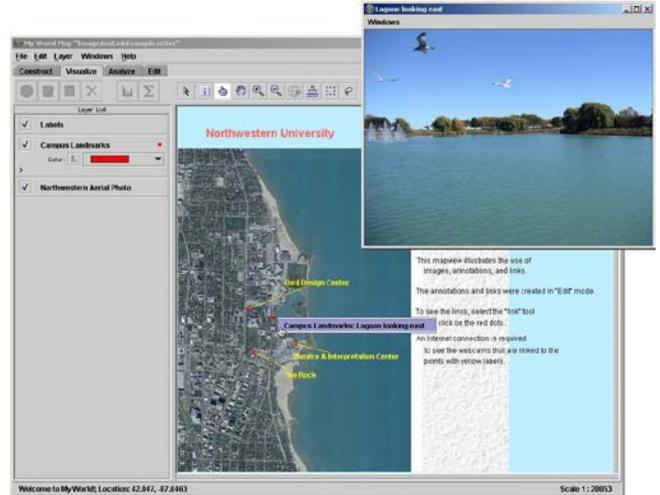
Linking Images with GIS data

Contour Lines