

## Lab 1: Earthquake Resources & Plotting Epicenters

**Overview:** Students will access global earthquake database information and plot the epicenter locations on a world map.

**Objective:**

- (1) Access and interpret online data information
- (2) Plot the longitude and latitude of an earthquake on a map.
- (3) Identify the depth at which an earthquake occurs

**Time:** Introduction & practice plotting (15 mins)  
Internet database introduction & plotting (30 mins)  
Challenge Worksheet & group plotting (30 mins)

Daily plotting activity: 10-15 mins (when time available)

### Materials:

- Instruction sheet/Challenge Worksheet
- 11x17 global map (x 20)
- Red, blue, green colored pencils (x 20)
- Large wall-sized classroom map
- Colored adhesive dots (lots)
- Computer access
- Printing access

**Teacher Prep:** Students will use large wall-size map and daily earthquake data (downloaded from the Internet) to plot locations of earthquakes. This will be a daily activity occurring during the last 15 minutes of Lecture (or whenever time available). Each student will be responsible for plotting an assigned list of earthquakes on the classroom map. However, before plotting on the classroom map, students will first be introduced to the plotting task by practicing plotting skills using a small individual map and a simple earthquake list. Once students feel comfortable with this task, they will then be free to plot their real-time list of earthquakes on the classroom map.

Plotting earthquake epicenters requires locating specific points on the map using coordinates (longitude and latitude). In order to locate and plot these points accurately, students must understand the Earth's geographic coordinate system, represented by longitude and latitude. Students should also be familiar with two-dimensional interpolation so that earthquake epicenters that do not occur exactly along marked lines of longitude and latitude may also be easily plotted. Brief descriptions of longitude, latitude, and 2-D interpolation will be provided.

*Small map activity:* Each student will be provided with an 11x17 in. world map and will be given instructions on how to use the Internet to obtain earthquake data. Students (groups of 2) will be directed to <http://www.iris.edu/quakes/eventsrch.htm> and shown

how to enter the appropriate search entries to obtain a list of earthquakes. Using the longitude, latitude, magnitude, and depth of each earthquake, students will plot the epicenter on their individual maps with a small dot. Dot size should vary: 1mm for magnitude < 3.5, 3mm for magnitude 3.6-6.5, 1cm for magnitude 6.5 and greater. Students should also color-code each dot according to earthquake depth using blue (0-50km), green (50-100km), and red (100+km) colored pencils.

*Large map activity:* Students will gather and plot earthquake data on a regular basis during the COSMOS program. For each class meeting, one group of two students will be given the assignment (the night before) of assembling 2 lists of earthquakes from the above website:

List 1: Yesterday's earthquakes

List 2: A previous week's earthquakes

The student group will be responsible for *printing* out both lists of earthquakes. They will also be responsible for *plotting* List 1 on the classroom map. In addition, they will be responsible for evenly distributing the plotting responsibilities of List 2 to the remaining students by assigning each student a specific list of earthquakes. Student names will be identified on the list (by indicating earthquakes to plot with a bracket); this list will be posted next to the classroom map each day. Each group of students is responsible for making sure that all earthquakes get plotted on the map for their assigned task. The previous student group will help train the new student group in the necessary computer data access procedure if needed.

The goal of this exercise is for students to collect data, observe, and analyze the patterns of earthquakes as they progressively appear on the map. Expect students to begin asking questions about the data and interpretations. We will address these questions during lecture and lab #4.

**Notes:**

- go over basics of latitude, longitude, depth
- go over +/- and NESW
- make sample to first show how to plot (one of each size, color)
- provide detailed instructions and pictures on how to access database
- make sure printing works! (maybe make backup copy before class)
- let students practice finding earthquakes on query (separate challenge wksht?)
- students will be given a 'Who's Responsible When' list that tells them their assigned dates of data compilation (also post this list on the web?)