

GLY 47/511 - Plate Tectonics

Homework - Recent Earthquakes and Plate Boundary Types, 2/6/12

The US Geological Survey hosts a website that catalogs global earthquakes (earthquake.usgs.gov). A wealth of data can be obtained from this and the allied National Earthquake Information Center (neic.usgs.gov).

Part A) Global Seismicity

The following web address contains a map and listing of earthquakes in the last 30 days (minus the last 7 days). Listed are all U.S. earthquakes of magnitude 2.5 and larger and all global earthquakes of magnitude 4.5 and larger.

<http://neic.usgs.gov/neis/qed/>

- 1) What is the deepest earthquake that occurred during that 3 week period?
- 2) What can you say about the proportion of earthquakes that were shallow (70 km deep or less) vs. intermediate and deep earthquakes (70 km or deeper)?
- 3) How many potentially damaging earthquakes of magnitude 5.8 or above occurred

Now, click on the “Real-time USA” link on the side (U.S. earthquakes of the last 7 days).

- 4) Where have most earthquakes in the U.S. occurred in the last 7 days? Why?

Part B) Earthquakes, Fault Types, Plate Boundaries

For the following 3 earthquakes (from the global earthquakes last 30 days list) Determine the type of plate boundary (divergent, convergent, transform) and the type of fault that slipped (thrust, normal, strike-slip). For the Peru earthquake, find the focal plane solution under the “Scientific and Technical” tab. Four separate calculated solutions (moment tensor solutions) are shown, plus “Historic Moment Tensor Solutions” showing determinations from previous earthquakes in the area. For the other 2, smaller earthquakes, scroll down to “Historic Moment Tensor Solutions” and assume earthquakes 2 & 3 are the same type as the previous earthquakes on those faults. Note earthquakes 2 & 3 are shown as the star on the respective maps.

- 1) Magnitude 6.3, Central Peru Coast, Jan 30, 2012

<http://earthquake.usgs.gov/earthquakes/eqinthenews/2012/usc0007tml/#details>

- 2) Magnitude 4.8, East Pacific Rise, Jan 19, 2012

http://neic.usgs.gov/neis/bulletin/neic_vyau.html

- 3) Magnitude 5.0, Northern Mid-Atlantic Ridge, Jan 29, 2012

http://neic.usgs.gov/neis/bulletin/neic_wibk.html