

Testing plate tectonics in the Gulf of California

The purpose of this homework is to use real data from the plate boundary in the Gulf of California in Mexico to test if the plate tectonic theory works in that setting.

You will be given a bathymetry map of the southern half of the Gulf of California made of a few cruises in the past few years.

You will then look up all earthquakes of magnitude ≥ 5 or greater for the past 5 years at the Harvard Seismology web site:

<http://www.globalcmt.org/CMTsearch.html>

You must add the information to properly search for the quakes – the latitude and longitude of your region is on the map. Search for quakes south of a latitude of 27 degrees north.

Once you have the list of earthquakes, then plot the location of each with a long bar with a dot at the center. Place the dot over the exact epicenter of the earthquake. Then draw the bar along the azimuth of the fault plane of the earthquake. There are 2 choices for the fault plane, and you should choose the one that is northwesterly for strike-slip earthquakes as we talked about in class. For normal fault earthquakes you should choose the more northerly fault plane.

Write a short essay on whether the earthquakes of the past 5 years in the central and southern Gulf of California are behaving as we discussed for a plate tectonic boundary with transform faults and spreading centers. Include in your essay discuss whether you think these are likely to be right-lateral or left-lateral transform faults? Also discuss if all active faults are along the main plate boundary?