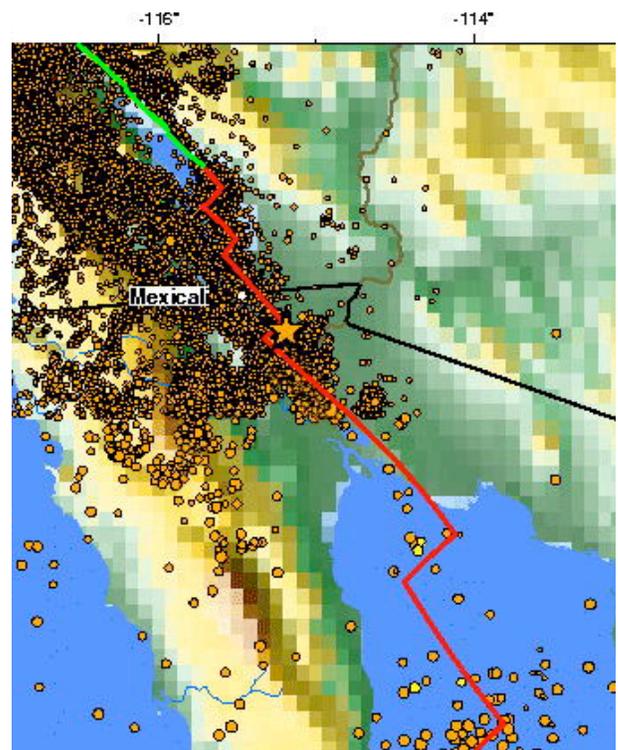
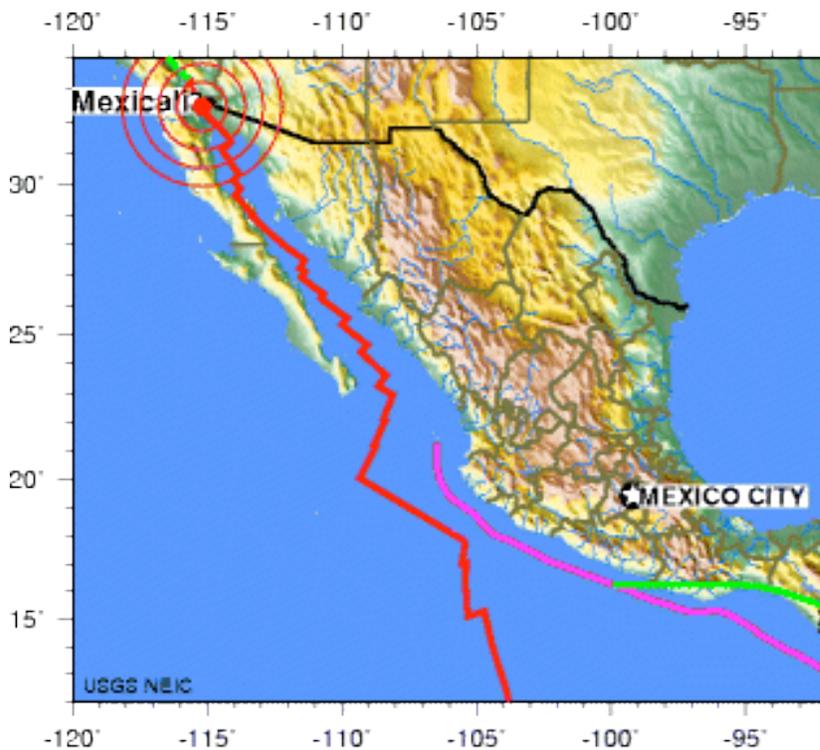
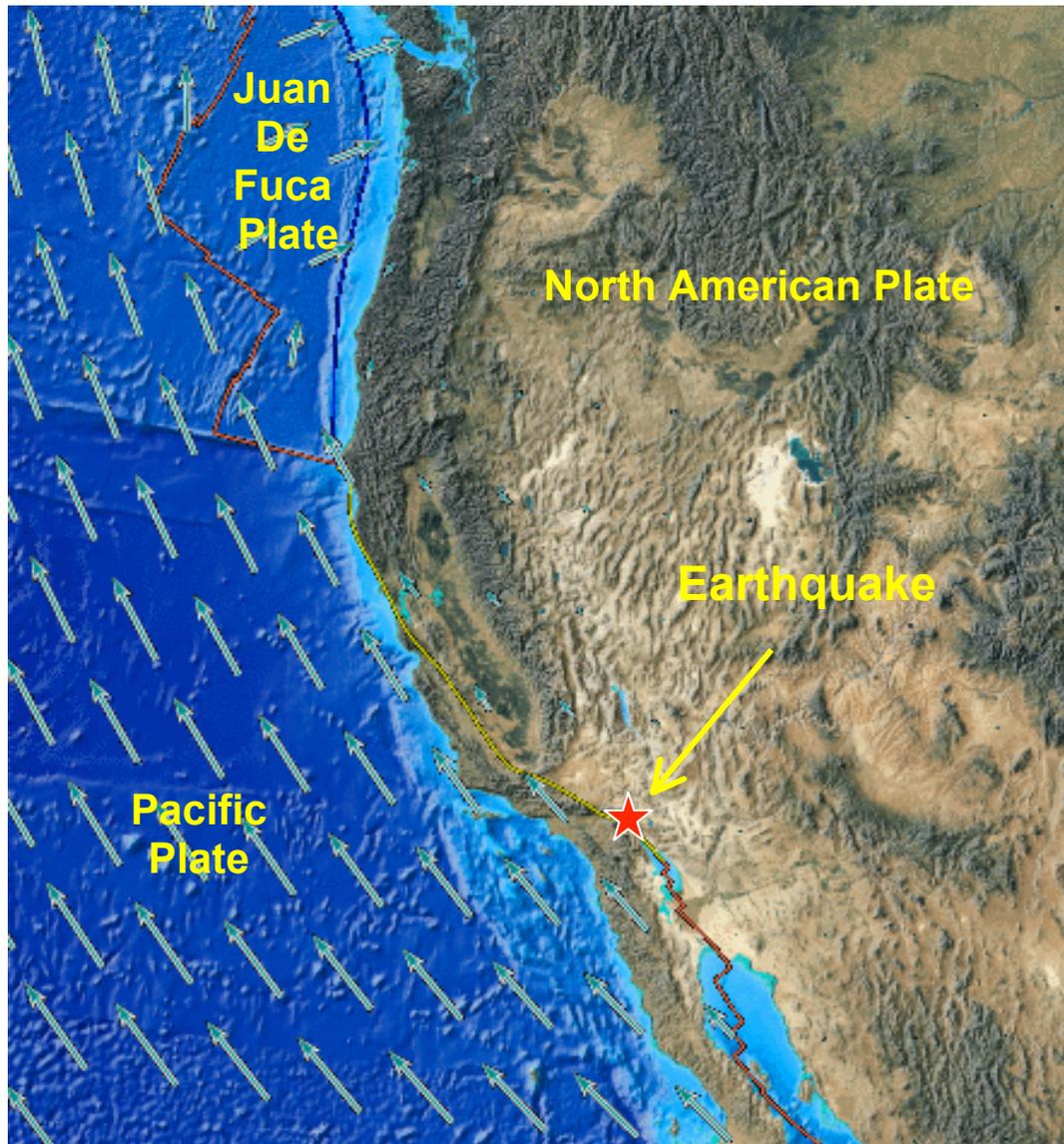


Magnitude 5.8 Moderate Earthquake in Baja California, Mexico
Wednesday, December 30, 2009 at 18:48:57 UTC
Wednesday, December 30, 2009 at 10:48:57 AM Pacific Standard Time
Epicenter: Latitude 32.464°N, 115.189°W. Depth: 6 kilometers.

A moderate earthquake occurred Wednesday morning Portland time in Baja California, Mexico about 21 miles southeast of Mexicali and 107 miles east of Tijuana. The circle with surrounding rings on left-side map below illustrates the epicenter of this earthquake as determined by the US Geological Survey. The map on the right below shows historic earthquake activity near the epicenter (star) from 1990 to present. The earthquake of December 30, 2009 occurred on the transform plate boundary between the North American and Pacific Plates. Northwest of the M 5.8 event, this transform boundary connects to the northwest – southeast oriented San Andreas Fault that is shown by the green line on the map of historic earthquake activity. Essentially all of the earthquakes in this region are shallow with depths less than 30 km as expected for earthquakes on transform plate boundaries. Notice that there are many earthquakes distributed southwest of the North America – Pacific plate boundary on strike-slip faults that are parallel to the San Andreas Fault. This indicates that some of the relative motion between the North American and Pacific Plates occurs across this zone of distributed deformation. It is not all concentrated on the San Andreas Fault. There were no immediate reports of significant damage or injuries produced by this earthquake.



The epicenter of the December 30, 2009 earthquake is indicated by the red star on the map below. This map also shows the rates and directions of motion of the Pacific and Juan de Fuca plates and with respect to the North American Plate. The rate of transform motion between the Pacific and North American plates is about 55 mm/yr (5.5 cm/year). The M5.8 earthquake that occurred Wednesday December 30 is typical of moderate and shallow earthquakes on this transform plate boundary. For comparison, the rate of subduction of the Juan de Fuca Plate beneath the North American Plate at the Cascadia subduction zone is about 35 mm/yr (3.5 cm/year).



The record of the December 30, 2009 earthquake on the University of Portland seismometer is illustrated below. This magnitude 5.8 earthquake occurred 14.33 degrees (1591 km) away from the recording station UPOR in Portland, Oregon. The first P wave energy arrived as Pn, 203.26 seconds (3 minutes 23 seconds) after the earthquake occurred in Baja, Mexico. Pn is a wave only seen for earthquakes that are nearby to the recording station. While P-wave energy travels a curved path through the mantle, Pn travels in the upper mantle just below the Mohorovicic discontinuity (Moho) at the base of the crust. For this earthquake, the P wave energy arrived at 210.53 seconds (3 minutes 31 seconds), slightly after the Pn wave arrived. Traveling the same path as the P wave energy, Sn is the first S-wave energy to arrive at 363.63 seconds (6 minutes 4 seconds) after the earthquake but it is difficult to distinguish on this seismogram. Surface wave energy began to arrive at the station UPOR approximately 462.26 seconds (7 minutes 42 seconds) after the earthquake.

