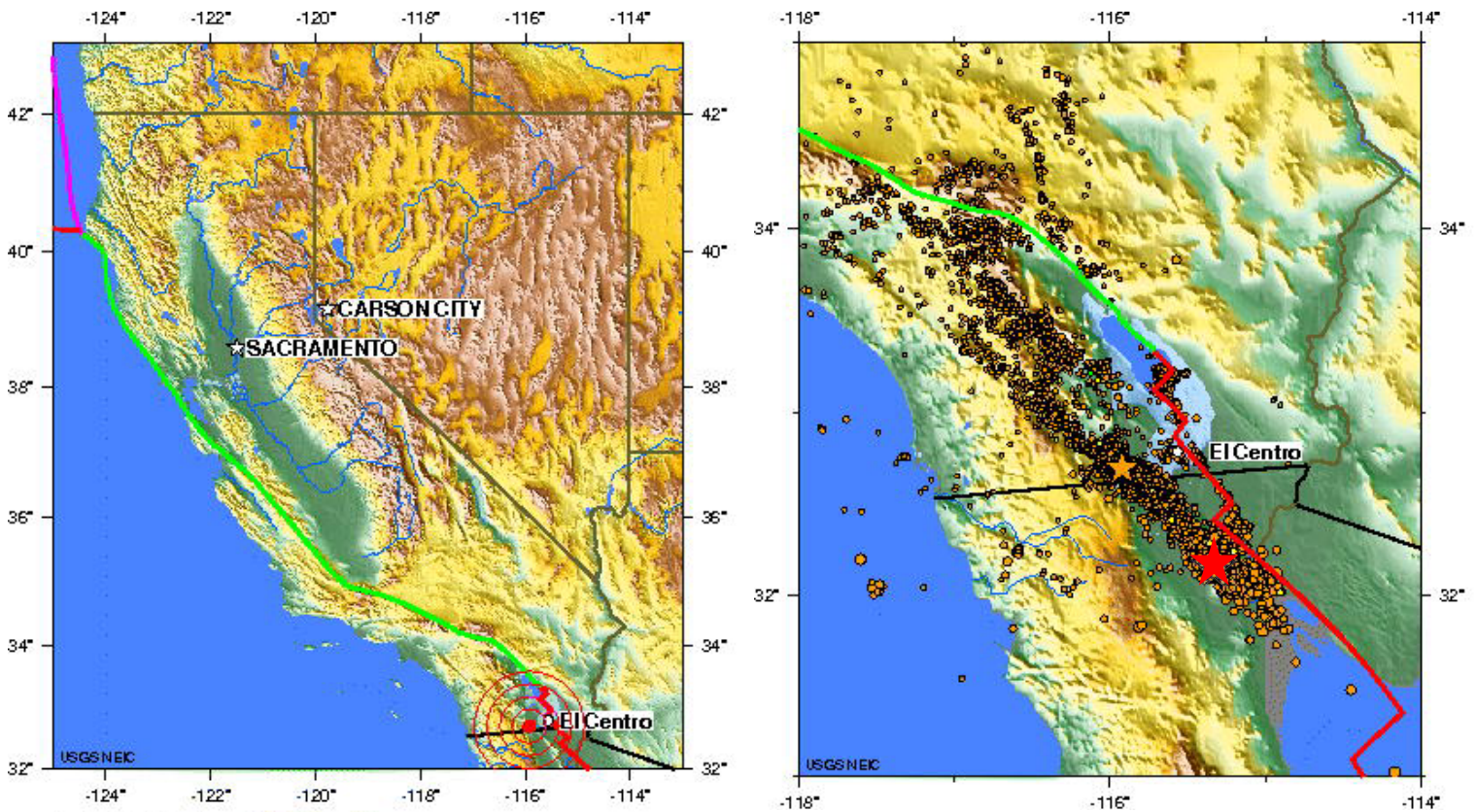
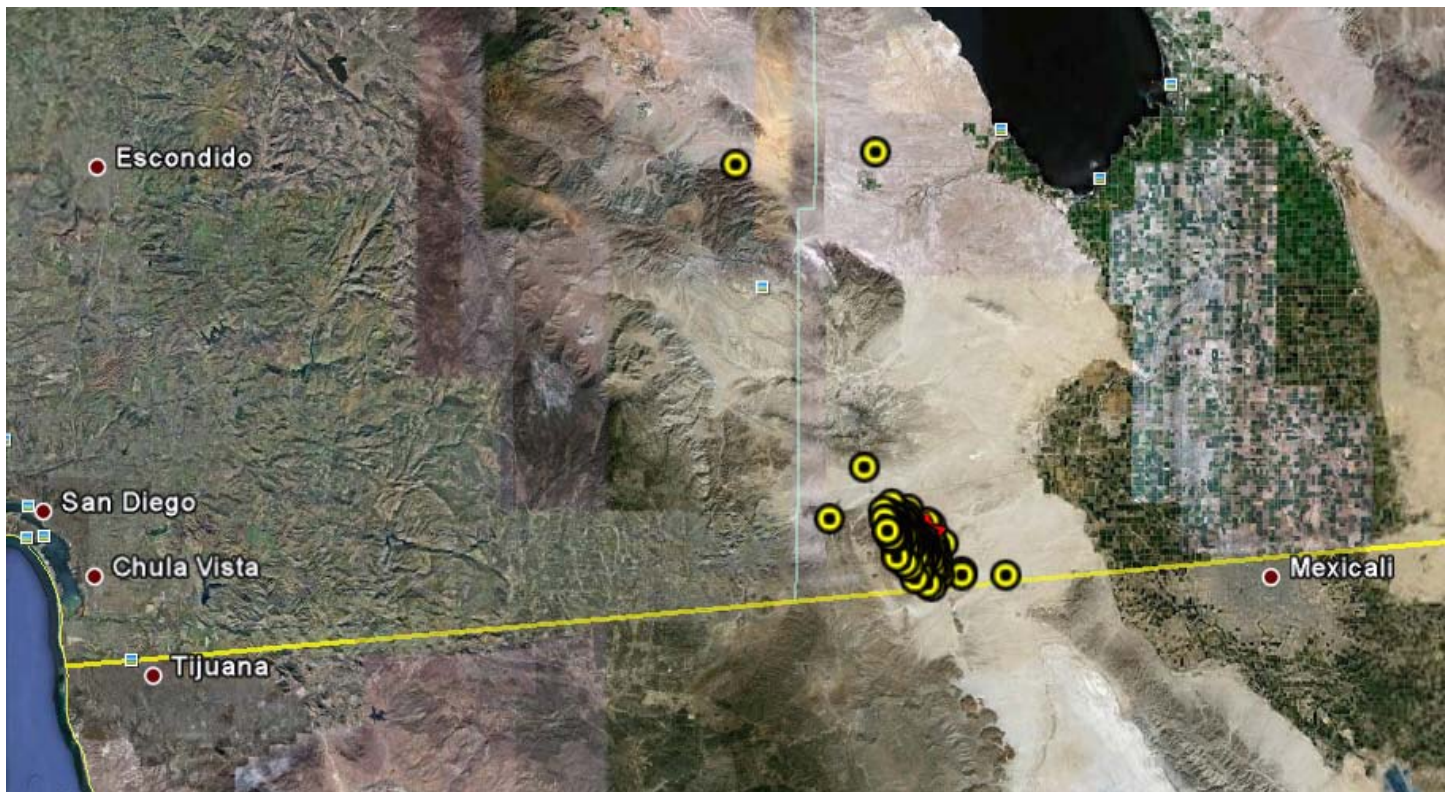


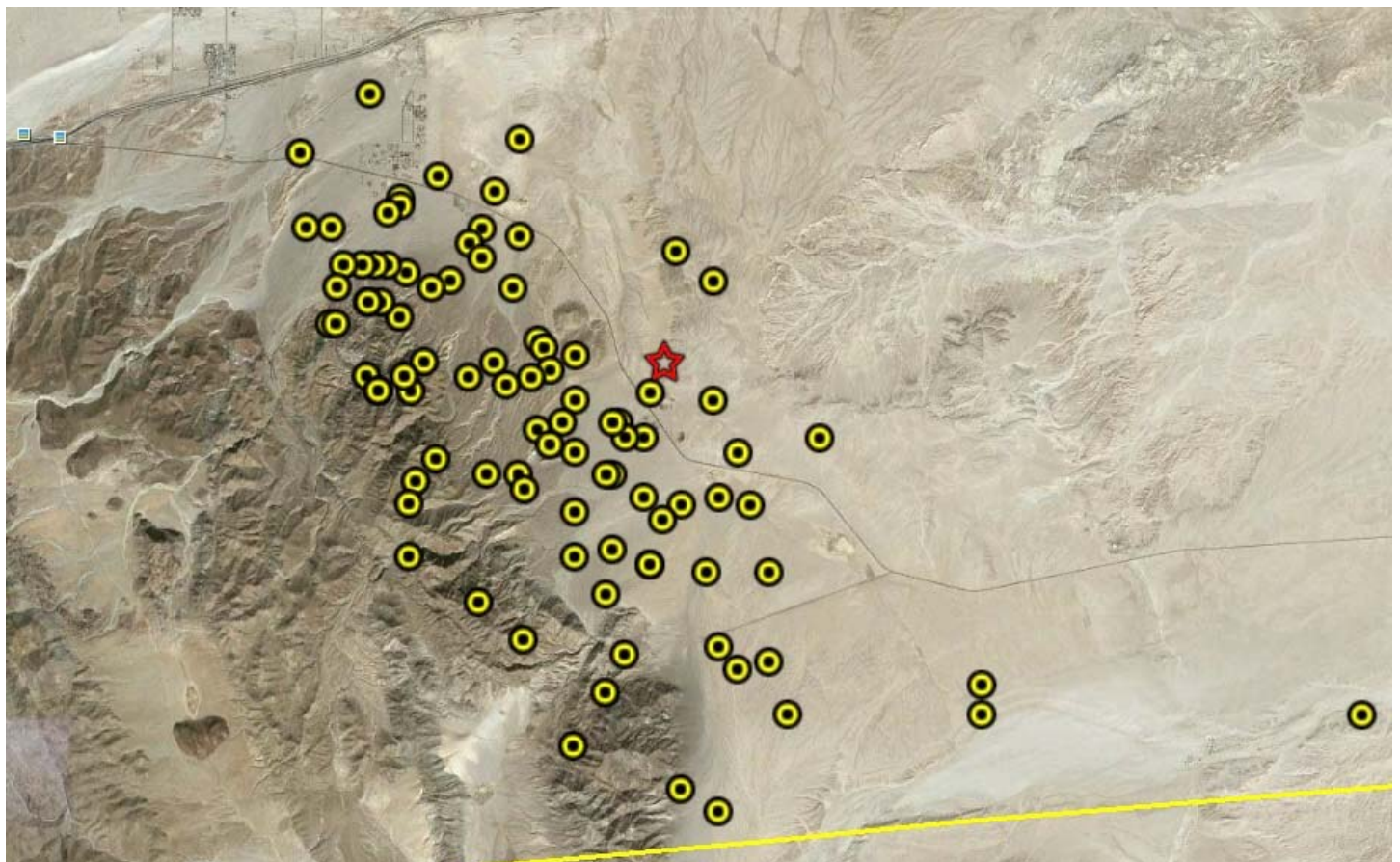
Magnitude 5.7 Moderate Earthquake in Southern California
Tuesday, June 15, 2010 at 04:26:58 UTC
Monday, June 14, 2010 at 9:26:458 PM Pacific Daylight Time
Epicenter: Latitude 32.698°N, 115.924°W. Depth: 6.9 kilometers.

A moderate earthquake occurred Monday evening Portland time in southern California about 36 km (22 miles) west-southwest of El Centro. There were no reports of significant damage but ground shaking was felt across a large portion of southern California. 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 earthquake activity during 2010 near the epicenter of the June 15 event (yellow star). The red star on the seismicity map shows the epicenter of the major M 7.2 earthquake in northern Baja California, Mexico that occurred on April 4 of this year. The M 5.7 earthquake appears to be located on the same line of seismicity as the M 7.2 earthquake and is likely an aftershock of that major earthquake. The red lines on the seismicity map show the set of spreading ridges offset by longer transform faults between the North American and Pacific plates in the Gulf of California while the green line shows the location of the San Andreas Fault. The relative motion between the North American and Pacific plates is distributed over a set of northwest-southeast oriented strike-slip faults in southern California rather than concentrated on the San Andreas Fault alone. Both the April 4 M 7.2 and the June 15 M 5.7 earthquakes are located on the Laguna Salada fault system southwest of the San Andreas Fault. Essentially all earthquakes in this region are shallow with depths less than 30 km as expected for earthquakes on transform plate boundaries.





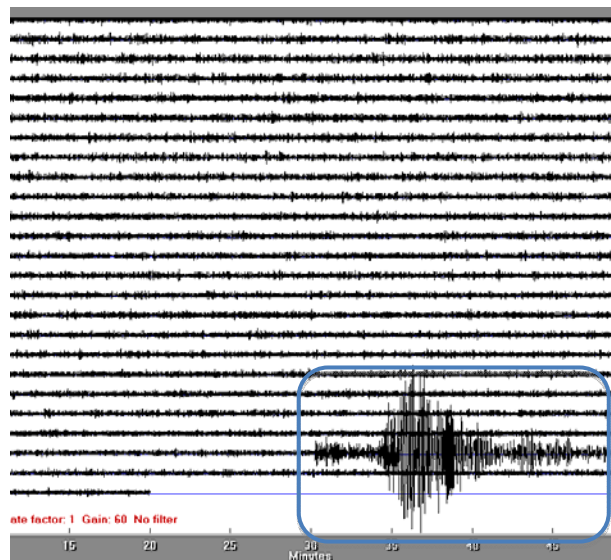
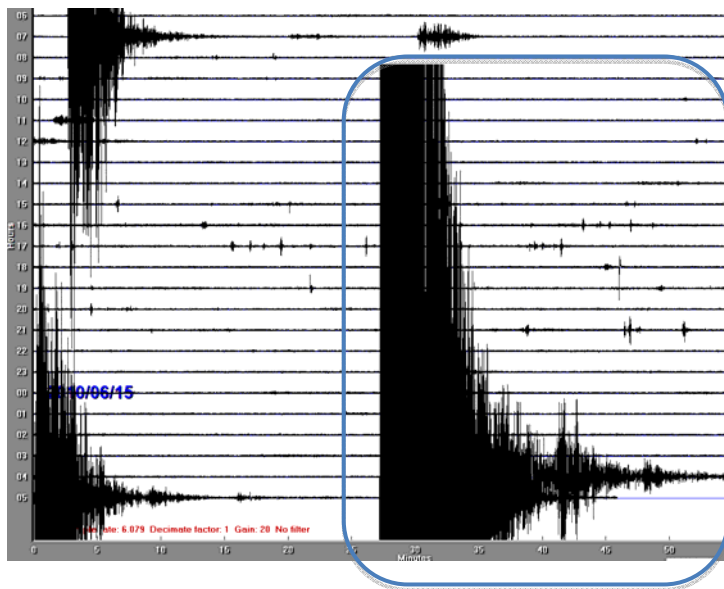
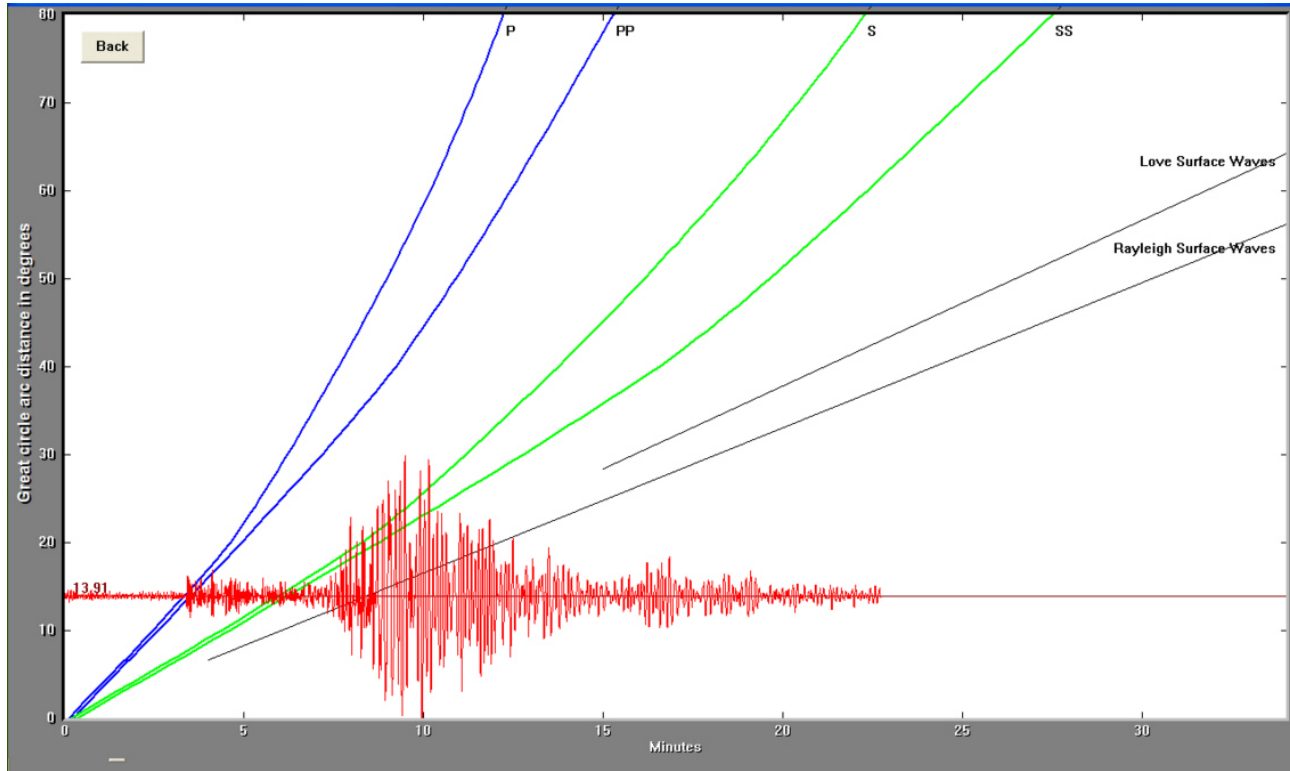
There have already been approximately 100 aftershocks of the M 5.7 earthquake. The locations of these aftershocks are shown on the map above. Notice that the aftershock distribution is spread out along a northwest to southeast orientation consistent with these earthquakes occurring on the Laguna Salada fault system. An expanded view of the aftershock region is shown below.



The epicenter of the June 15, 2010 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 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 June 15 M 5.7 earthquake is typical of shallow earthquakes on this transform plate boundary.



The record of the June 15, 2010 earthquake on the University of Portland seismometer is illustrated below. This magnitude 5.7 earthquake occurred 13.89 degrees (1542 km) away from the recording station UPOR in Portland, Oregon. The first P wave energy arrived as Pn, 197 seconds (3 minutes 17 seconds) after the earthquake occurred. Pn is a wave only seen for earthquakes that are near 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. Traveling the same path as the Pn wave energy, Sn is the first S wave energy to arrive at 353 seconds (5 minutes 53 seconds) after the earthquake but is not a significant arrival on this seismogram.



The educational seismometer helicorder records of the June 15, 2010 earthquake at Yuma, Arizona (AHAZ left) and Portland, Oregon (UPOR right) are illustrated above. The Yuma instrument is located only about 100 km from the June 15, 2010 earthquake and was driven off scale by the body waves from this earthquake.