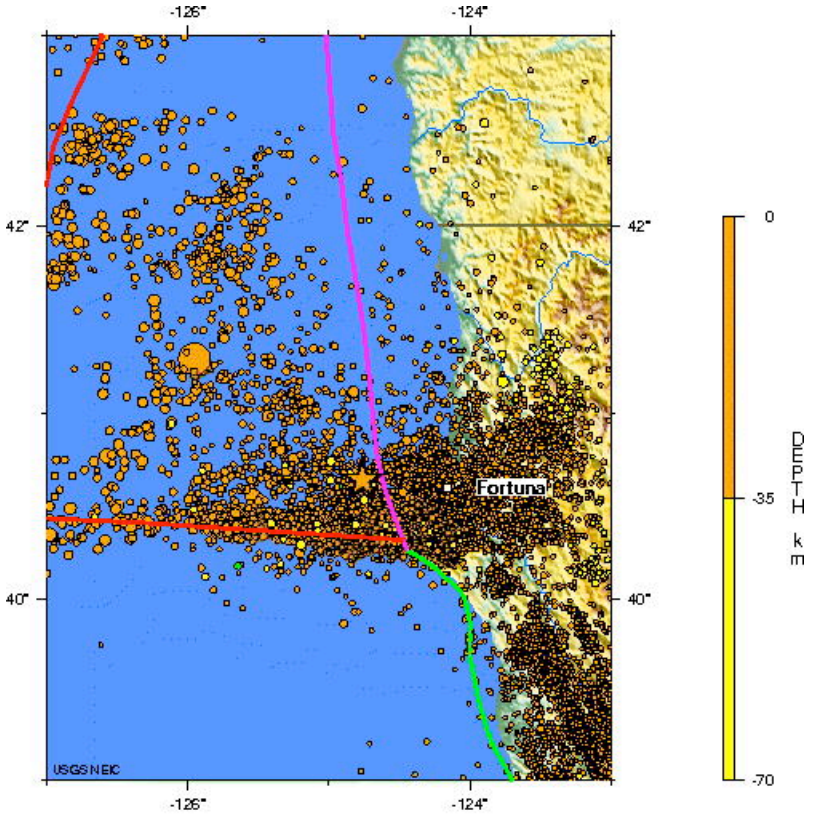
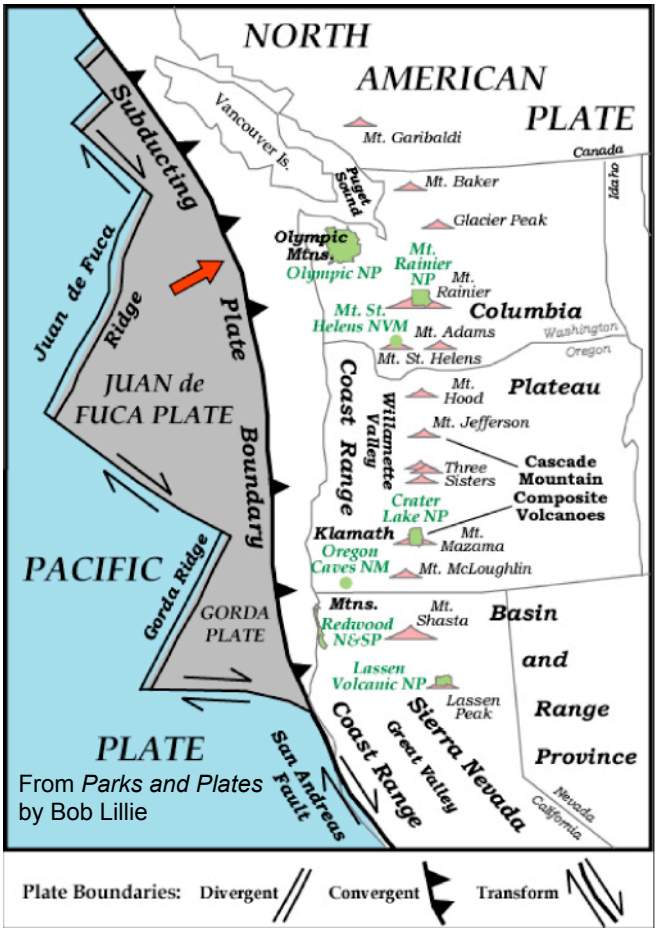
Magnitude 6.5 Earthquake Off Coast of Northern California
Saturday, January 9, 2010 at 4:27:38 PM Pacific Standard Time
Sunday, January 10, 2010 at 0:27:38 AM Universal Time
Epicenter: Latitude 40.645 °N, Longitude 124.763 °W
Depth: 21.7 kilometers.

A strong earthquake occurred Saturday afternoon (local time) off the northern California coast. The star on the left-hand map below shows the location of the epicenter as determined by the US Geological Survey, National Earthquake Information Center. Circles on this map show earthquakes that have occurred in this region from 1990 to present. The configuration of the Juan de Fuca, Gorda, Pacific, and North American plates is shown on the right-hand map. Notice that the San Andreas Fault, the Mendocino Fault, and the Cascadia subduction zone intersect at a point along the coast of northern California. This is the Mendocino Triple Junction where the Pacific, North American, and Gorda plates meet. The Gorda Plate is the southern portion of the Juan de Fuca Plate that subducts beneath North America along the Cascadia Subduction Zone. The earthquake that occurred Saturday afternoon was within the distribution of earthquakes that surround the Mendocino Triple Junction. Although this earthquake was near the southern part of the Cascadia subduction zone, the faulting motion during the earthquake was strike-slip (side-by-side like the San Andreas Fault) rather than thrust faulting that one would expect on a subduction zone boundary. According to the US Geological Survey: "The Gorda plate is subjected to intense compressive stresses by oblique-convergence of the northwestward migrating Pacific Plate as well as localized eastward spreading at the Gorda Ridge. The resulting internal deformation of the Gorda plate is manifested primarily by intraplate strike-slip events on vertical NE-oriented faults." Such horizontal displacement does not generate tsunamis because the ocean floor is not offset vertically during the earthquake and no tsunami warning was issued following this earthquake.



OFFSHORE NORTHERN CALIFORNIA
2010 01 10 00:27:38 UTC 40.64N 124.76W Depth: 21.7 km, Magnitude: 6.5
Seismicity 1990 to Present



From *Parks and Plates* by Bob Lillie

This January 9, 2010 magnitude 6.5 earthquake occurred 573 km (5.16 ° of arc) away from the recording station UPOR in Portland, Oregon. Two seismograms recorded by station UPOR are shown in the illustrations below. The first P-wave energy arrived at UPOR as P_n at 1 minute and 16 seconds (76 seconds) after the earthquake. P_n is a compressional wave only seen in earthquakes that within several hundred kilometers from the recording station. While P-wave energy travels a curved path through the mantle, P_n travels in the upper mantle just below the Mohorovicic discontinuity (Moho) at the base of the crust. Traveling the same path as the P_n wave energy, S_n is the first S-wave energy that arrived 2 minutes and 16 seconds (136 seconds) after the earthquake. For an earthquake within several hundred kilometers of the recording station, there is no clear separation between the arrivals of the S waves and the later-arriving surface waves that produced the largest ground oscillations.