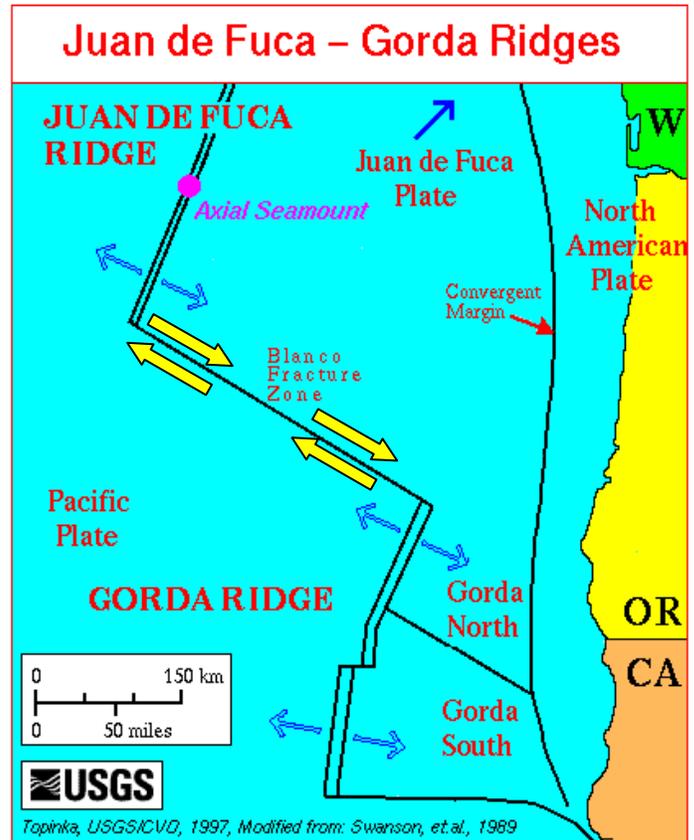
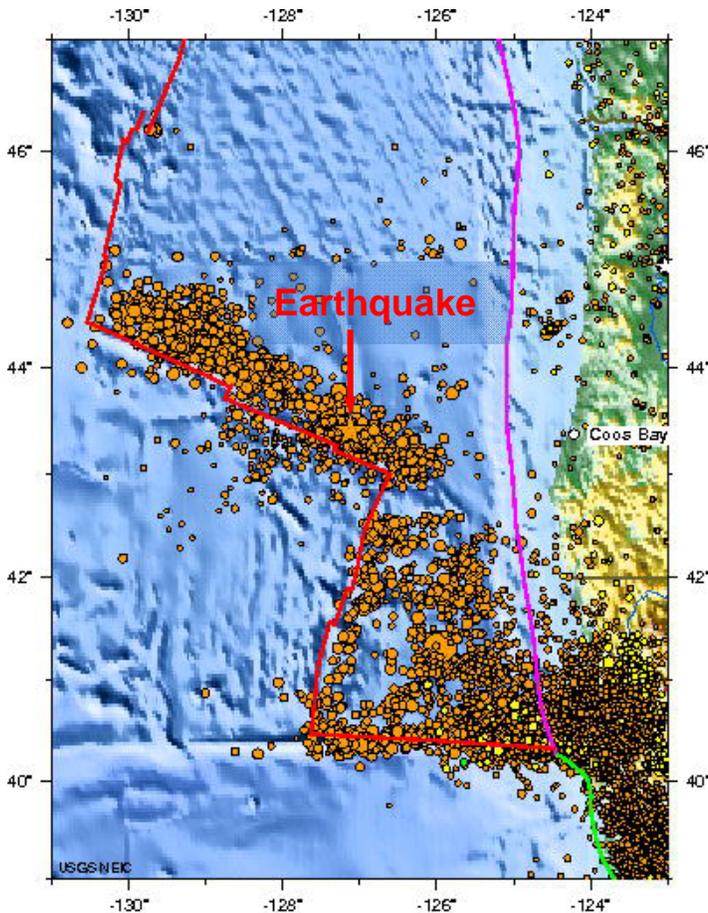


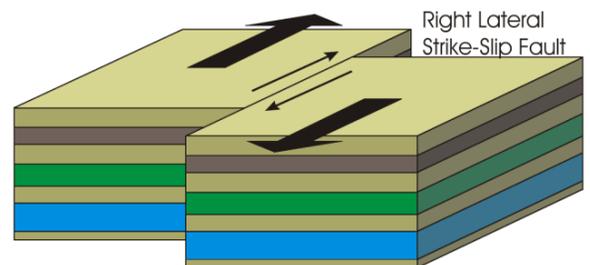
Magnitude 5.2 Earthquake Off the Coast of Oregon
Tuesday, February 8, 2011 at 22:02:01 UTC (2:02:01 PM PST)
Epicenter: Latitude 43.405°N, Longitude 127.119°W Depth: 10.1 km



Images courtesy of the US Geological Survey

The star on left-side map above shows the epicenter of this earthquake as determined by the US Geological Survey along with historic earthquakes from 1990 to present. The February 9, 2011 earthquake occurred very near the location of a larger M6.4 earthquake that occurred January 10, 2008.

The configuration of the Juan de Fuca, Pacific, and North American plates off the Pacific Northwest Coast is shown on the right-side map. All of these events probably occurred on the Blanco Fracture Zone that is a transform boundary between the Juan de Fuca and Pacific plates. The direction of relative motion between these plates along the Blanco Fracture Zone is (right-lateral) horizontal (strike-slip) as shown by the yellow arrows on the map.

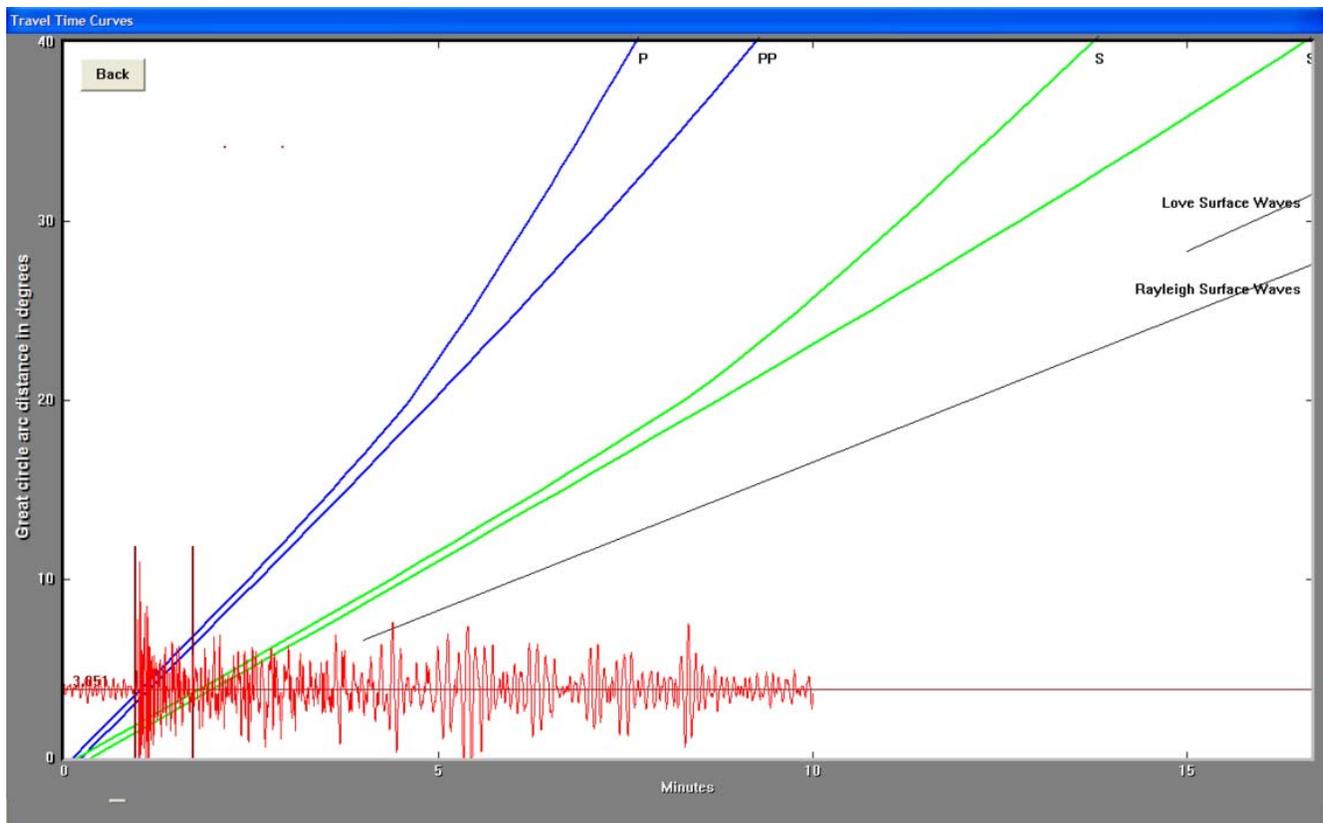


Although earthquakes occur frequently along the Blanco Fracture Zone, they are rarely felt in Oregon or Washington because they are moderate magnitude and a significant distance from the coast. Earthquakes on transform plate boundaries do not produce tsunamis because the horizontal motion of the plates does not raise or lower the seafloor as is required to produce a tsunami.

Seismogram Description:

The magnitude 5.2 earthquake that occurred off the coast of Oregon, recorded on the University of Portland seismometer is illustrated below. Portland is about 425 km (~264 miles, 3.83 degrees) from the location of this earthquake.

The first P wave energy arrives as Pn, 59 seconds after the earthquake, and is marked on the seismogram. Pn is a phase only seen in earthquakes that are nearby to the recording station. While P 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 P wave energy, Sn is the first S energy to arrive 105 seconds (1 minute 45 seconds) after the earthquake, and is marked on the seismogram. Since the earthquake was close to the recording station, the seismic wave arrivals are packed tightly together (including other reflections and refractions) making it difficult to clearly distinguish the different kinds of waves.



Teachable Moments are a service of the University of Portland and IRIS Education and Outreach