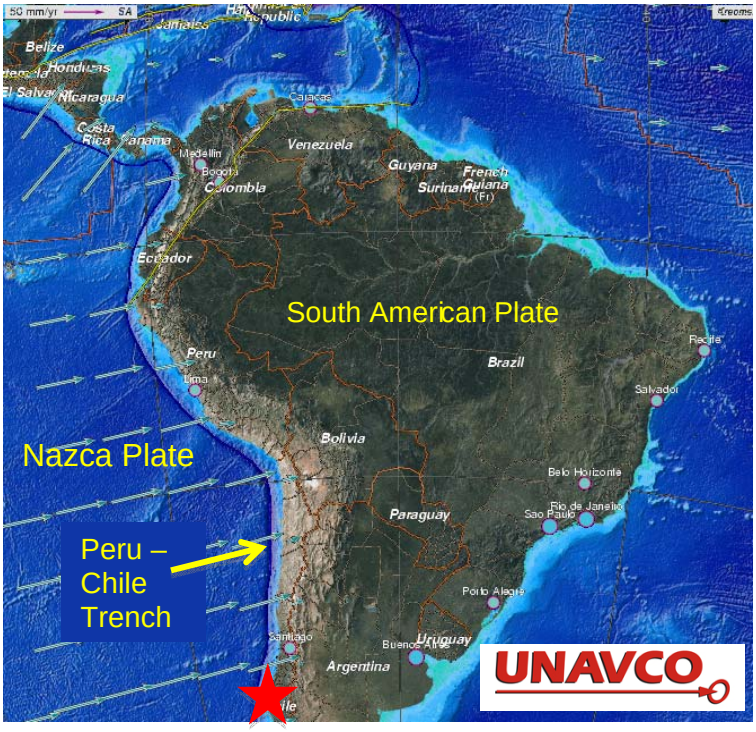
Magnitude 7.1 Earthquake in Central Chile
Sunday, January 2, 2011 at 20:20:16 UTC (12:20:16 PM PST)
05:20:16 PM Local time in Chile
Epicenter: Latitude 38.360°S, Longitude 73.281°W Depth: 17 km

Earthquake Summary:

As reported by the US Geological Survey National Earthquake Information Center (NEIC), a major earthquake occurred beneath the central coast of Chile at 5:20 PM local time Sunday January 2. This earthquake occurred on the subduction zone plate boundary where the oceanic Nazca Plate subducts beneath the continental South American Plate. The red star on the left-hand map below shows the epicenter of the earthquake while the arrows show the motion of the Nazca Plate toward the South American Plate. Near the epicenter of this earthquake, the two plates converge at a rate of about 8 cm/yr. The map on the right shows historic earthquake activity near the epicenter (star) from 1990 to present. Earthquakes are shallow at the Peru - Chile Trench and increase to > 300 km depth (blue dots) towards the eastern portion of this map area as the Nazca Plate dives deeper beneath the South American Plate.

The January 2, 2011 earthquake is in the southern part of the rupture zone of the M8.8 great Chile earthquake of February 27, 2010. It is possible that the January 2, 2011 earthquake resulted from changes in stress along the Nazca – South America plate boundary resulting from the great earthquake on this segment of the plate boundary less than a year ago. The epicenter of the M7.1 earthquake is 70 km (45 miles) northwest of Temuco, a city of 240,000 people, and several smaller towns with populations up to 20,000 are closer to the epicenter. There have been no immediate reports of major damage, injuries, or deaths produced by ground shaking from this event. Earthquakes of this magnitude are generally too small to produce damaging tsunamis beyond the immediate area of the epicenter and no tsunami warnings were issued.



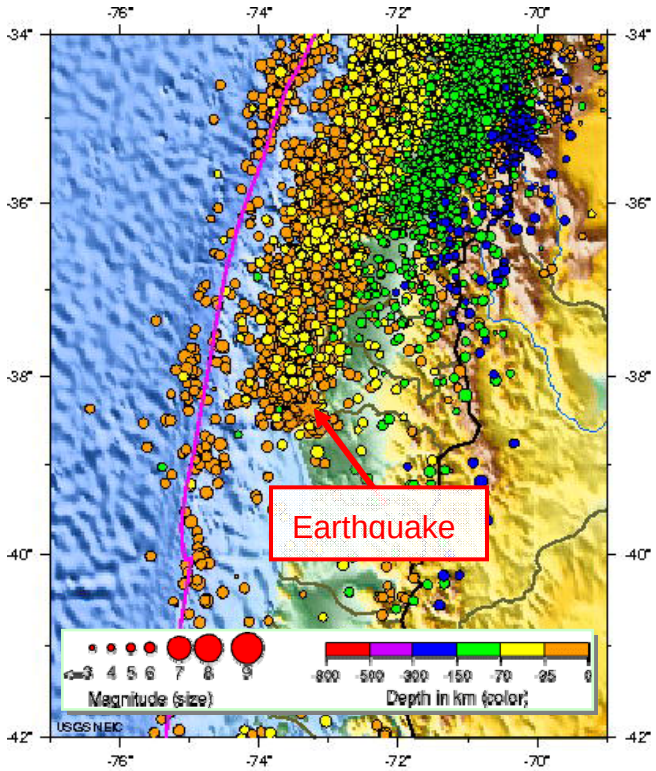


Image courtesy of the US Geological Survey

Description of Seismogram:

The record of the M7.1 Chile earthquake on the University of Portland seismometer (UPOR) is illustrated below. Portland is about 10503 km (6526 miles, 94.62°) from the location of this earthquake. Following the earthquake, it took 13 minutes and 18 seconds (798.56 seconds) for the compressional P waves to travel a curved path through the mantle from Chile to Portland. PP waves are compressional waves that bounce off the Earth's surface halfway between the earthquake and the seismic station. PP energy arrived 17 minutes and 6 seconds (1026.53 seconds) after the earthquake. S and SS are shear waves that follow the same paths through the mantle as P and PP waves, respectively. The S waves arrived 24 minutes and 29 seconds (1469.84 seconds) after the earthquake while SS waves took 30 minutes and 54 seconds (1854.66 seconds) to travel from the earthquake to Portland. Surface wave energy required approximately 40 minutes (2401.61 seconds) to travel around the perimeter of the Earth from Chile to Portland, Oregon.