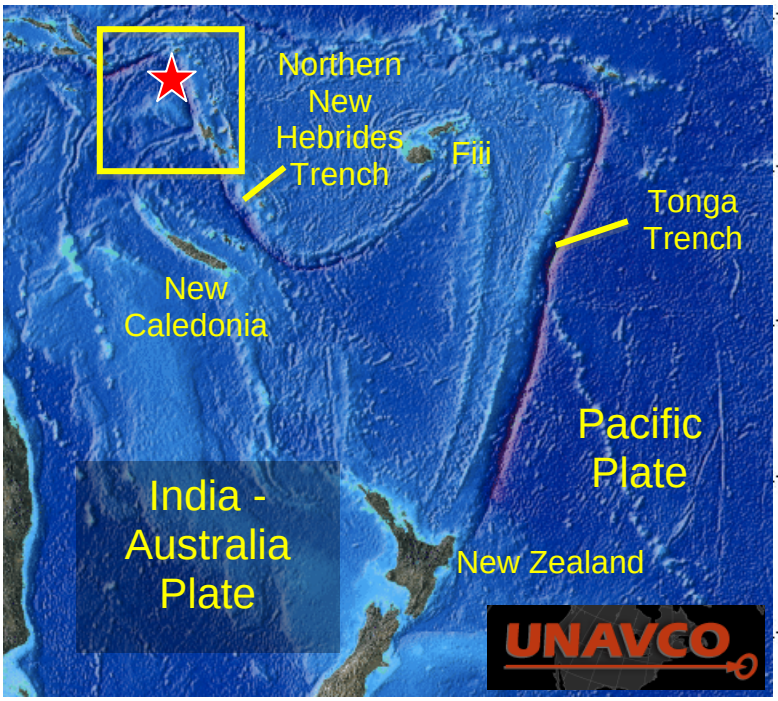
Magnitude 7.2 Earthquake Near Vanuatu
Thursday, May 27, 2010 at 17:14:48 UTC
10:14:48 AM Pacific Daylight Time

Epicenter: Latitude 13.710°S, 166.597°E (indicated by star on maps below).

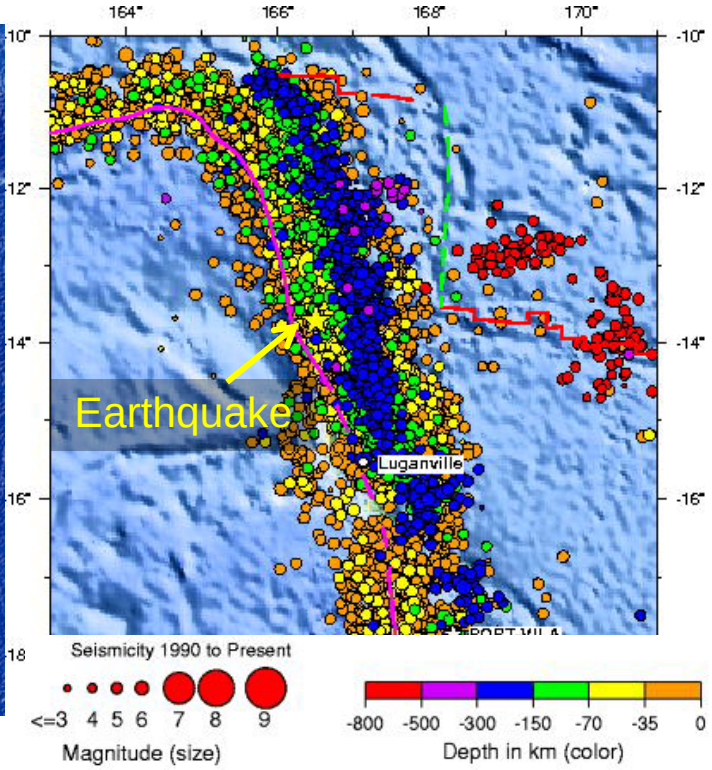
Depth: 36 kilometers.

As determined by the US Geological Survey National Earthquake Information Center (NEIC), a magnitude 7.2 earthquake occurred Thursday morning Portland time in the Northern New Hebrides Trench between Vanuatu and the Solomon Islands. At this trench, the northeastern corner of the India-Australia Plate subducts beneath the Pacific Plate (Map A below). At this plate boundary, the convergence rate is 90 mm/year (9 cm/yr). The M7.2 May 27 earthquake occurred about 340 km south-southeast of Lata, Santa Cruz Islands and 215 km north-northwest of Luganville, Espiritu Santo, Vanuatu (Map B). The 1990-to-present earthquake history within the yellow square of Map A is shown on Map B where the yellow star indicates the location of the May 27 earthquake. As illustrated on Map A, earthquake depths generally increase from southwest to northeast across this boundary between the India-Australia Plate and the Pacific Plate. The relatively shallow depth of the May 27 earthquake indicates that the focus was on or near the plate boundary. The Northern New Hebrides Trench has been quite active in the past year with a M7.8 earthquake occurring on October 7, 2009 followed just 15 minutes later by a nearby M7.7 earthquake. The magnitude of the May 27, 2010 earthquake was initially estimated at 7.4 and a tsunami warning was issued but was soon cancelled when the magnitude was downgraded to 7.2.

Map A



Map B



The record of the M7.2 Vanuatu earthquake on the Corona del Sol High School seismometer in Tempe, Arizona is illustrated below. Tempe, Arizona is about 10,050 km (6245 miles, 90.54°) from the location of this earthquake. Following the earthquake, it took 12 minutes and 58 seconds for the P waves to travel from the Vanuatu earthquake to Tempe, Arizona. P waves are body waves, compressional waves that travel through the Earth's mantle. PP waves are P waves that bounced once off the Earth's surface between the epicenter and Tempe, Arizona. PP waves are expected to arrive 16 minutes and 33 seconds after the earthquake. The S waves started arriving 23 minutes 51 seconds after the earthquake occurred. S waves are also body waves, but they travel as shear waves through the Earth's mantle. The surface waves traveled from the earthquake to Tempe, Arizona around the perimeter of the Earth. Because the distance around the perimeter is longer than the distance through Earth's mantle and the speed of surface waves is slower than body waves, it takes surface waves much longer than body waves to travel from an earthquake to a distant seismic station. In this case, the first surface waves from the Vanuatu earthquake started arriving at the Corona del Sol High School about 38 minutes after the earthquake occurred.