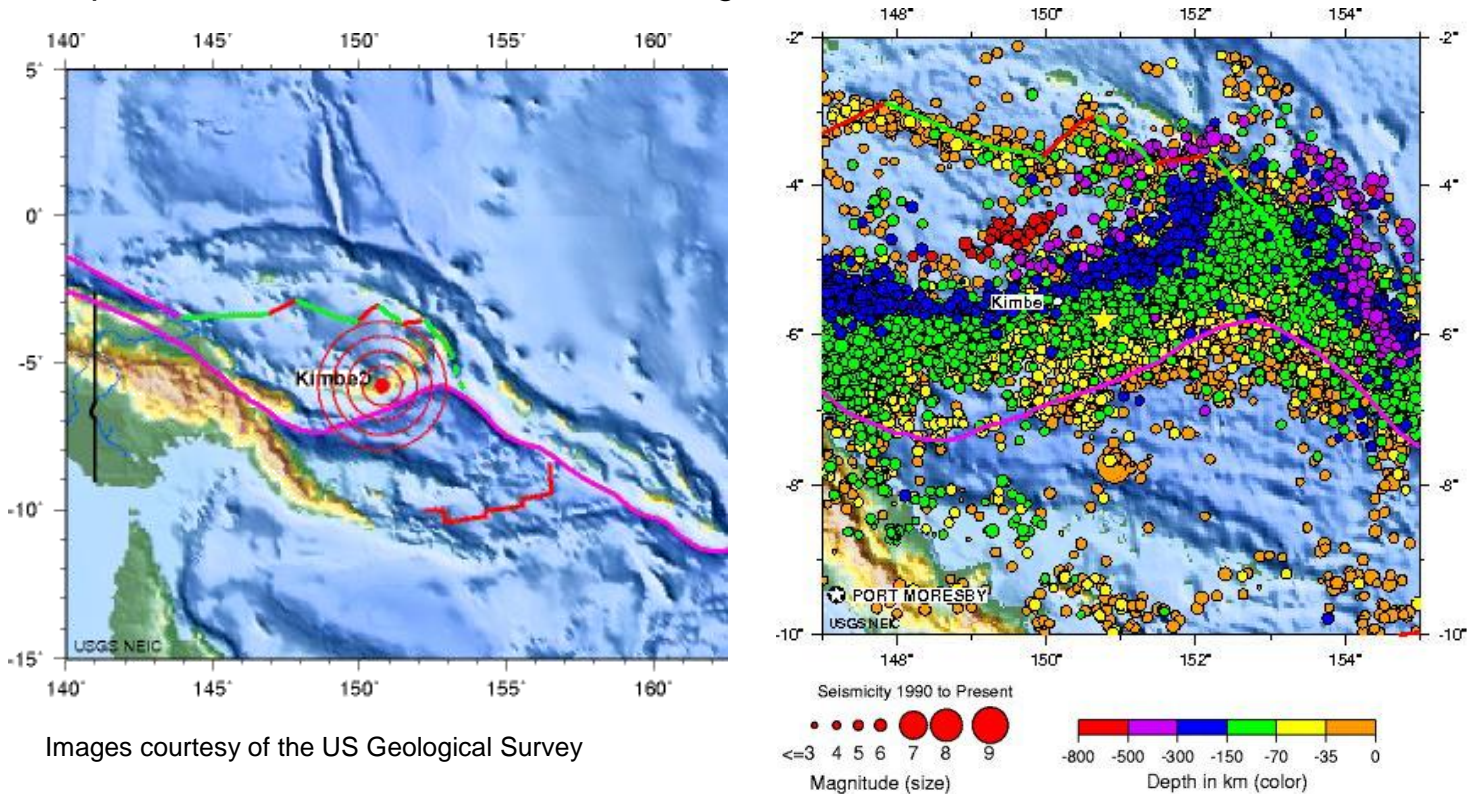


Major 7.0 Earthquake New Britain Region of Papua New Guinea
Wednesday, August 4, 2010 at 22:01:45 UTC
Wednesday, August 4, 2010 at 3:01:45 PM PDT
Epicenter: Latitude 5.804°S, 150.767°E. Depth: 54 kilometers.

A magnitude 7.0 earthquake occurred Wednesday afternoon Portland time beneath the New Britain region of Papua New Guinea. The US Geological Survey National Earthquake Information Center (NEIC) determined the epicenter location indicated by the red star on the left-side map below. The map on the right shows historic earthquake activity near the epicenter (yellow star) from 1990 to present. This earthquake occurred in the complex zone where the Pacific Plate subducts beneath Papua – New Guinea at the northern fringe of the India-Australia Plate.



Images courtesy of the US Geological Survey

An interesting feature of earthquakes in the New Britain region is observations of sequences of events closely grouped in time. As reported by the NEIC: “The New Britain region experiences a high level of earthquake activity, with 16 events of magnitude 7 and larger having been recorded within 3 degrees (336 km) of this (August 4, 2010) event since 1973. The region also has a history of large earthquakes occurring close together in time; of those 16 events, 12 occurred within several days-to-months of another nearby large earthquake. On July 18, 2010 two earthquakes (M6.9 and a M7.3) struck about 25 km to the southwest of the August 4, 2010 earthquake. In November 2000, three earthquakes of M7.8 or larger occurred over a two day period approximately 275 km to the northeast of the August 4, 2010.”

The record of the August 4, 2010 Papua New Guinea magnitude 7.0 earthquake on the University of Portland seismometer is illustrated below. Portland is about 10,172 km (91.64 degrees) from the location of this earthquake. Body waves travel through Earth's mantle from an earthquake to a distant station along paths that curve upwards because the velocity of seismic waves generally increase with depth in the mantle. The first arrival is the direct P wave that took 13 minutes and 2 seconds to travel from the earthquake to the station. The wave labeled PP is a compressive body wave that traveled through Earth's mantle and bounced off the Earth's surface midway between the epicenter and Portland. It took about 16 minutes and 41 seconds for the PP waves to travel from the earthquake to Portland. The S waves (shear body waves) traveled from the earthquake through the Earth's mantle to the station in approximately 23 minutes and 59 seconds. Additionally, the SS wave is clear on this record arriving 30 minutes 8 seconds after the earthquake; SS is a shear body wave that traveled through Earth's mantle and bounced off the Earth's surface midway between the epicenter and Portland. Surface waves travel 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, surface waves did not arrive in Portland from the earthquake until almost 43 minutes after the earthquake occurred beneath Papua New Guinea.

