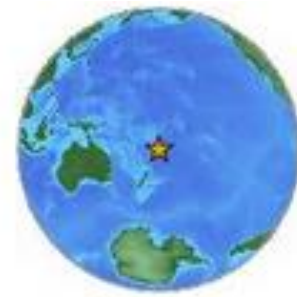


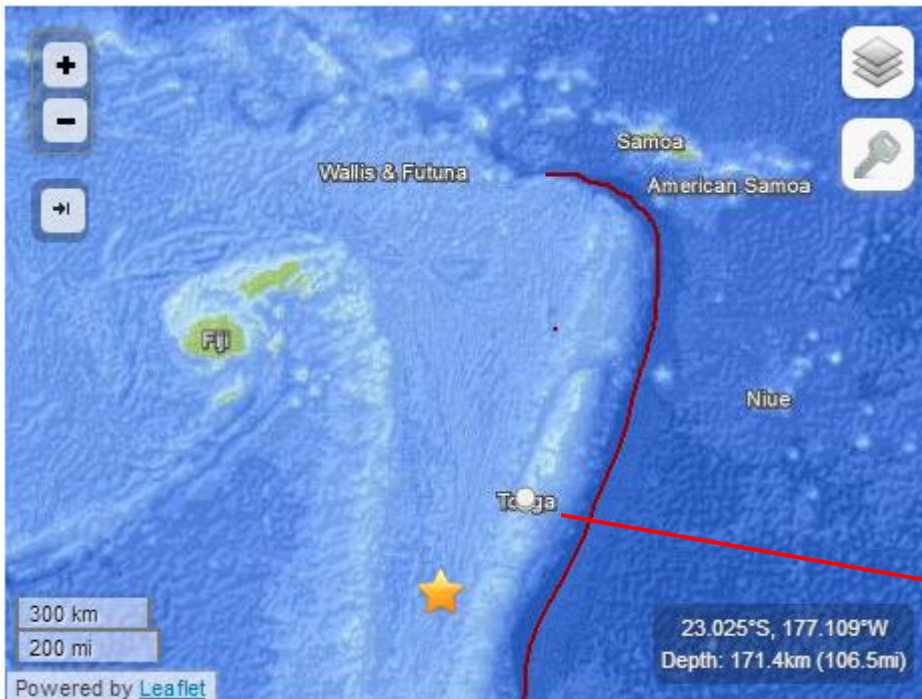
Magnitude 7.4 TONGA

Thursday, May 23, 2013 at 17:19:04 UTC



A magnitude 7.4 earthquake struck 255 km (158 miles) southwest of Tonga, according to the US Geological Survey, but there were no reports of damage.

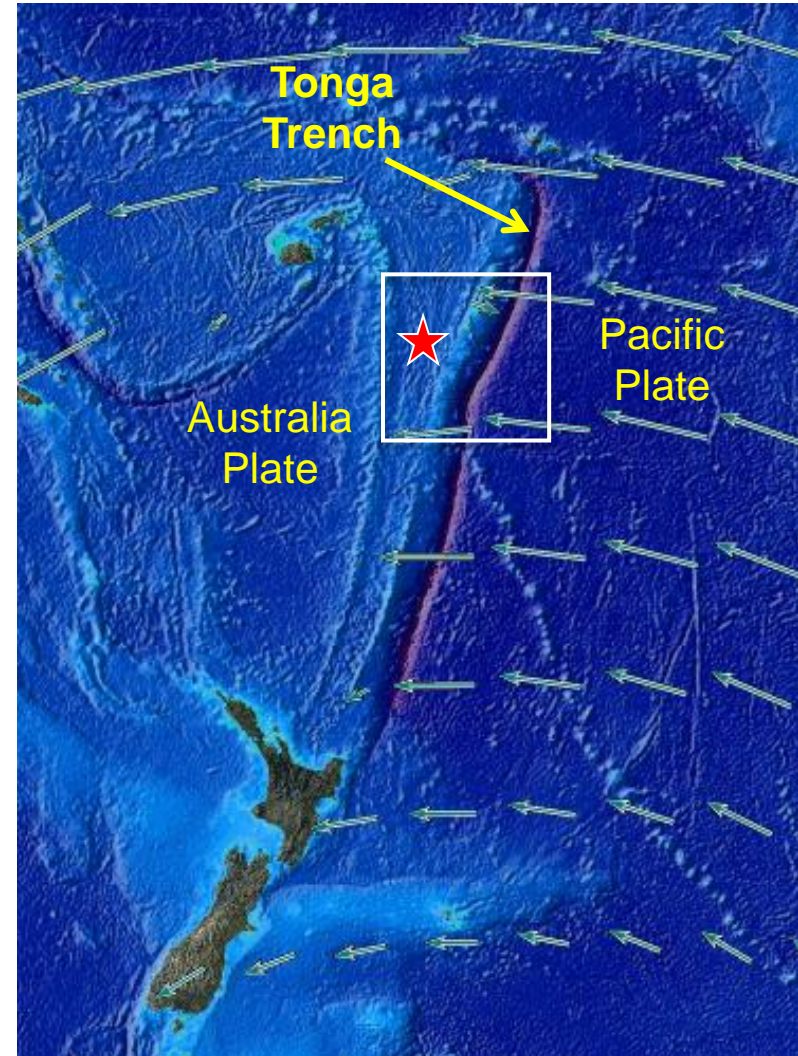
The earthquake hit at 5:19 am local time and was centered 282 km (175 miles) southwest of Tonga's capital Nuku'alofa at 171 km (106 miles) deep.



The blue arrows show the motion of the Pacific Plate with respect to the Australia Plate. The epicenter of the earthquake is shown by the red star while the white square outlines the area of historic seismicity shown on the next slide.

This earthquake occurred within the Pacific Plate where it subducts beneath the Australia Plate at this ocean – ocean convergent plate boundary.

The rate of convergence at the location of Thursday's earthquake is about 73 mm/yr (7.3 cm/yr). Notice that the rate and direction of motion of the Pacific Plate change with distance north from New Zealand. These changes remind us that lithospheric plate motions are actually relative rotations of spherical shells along Earth's surface rather than linear motions of flat plates.

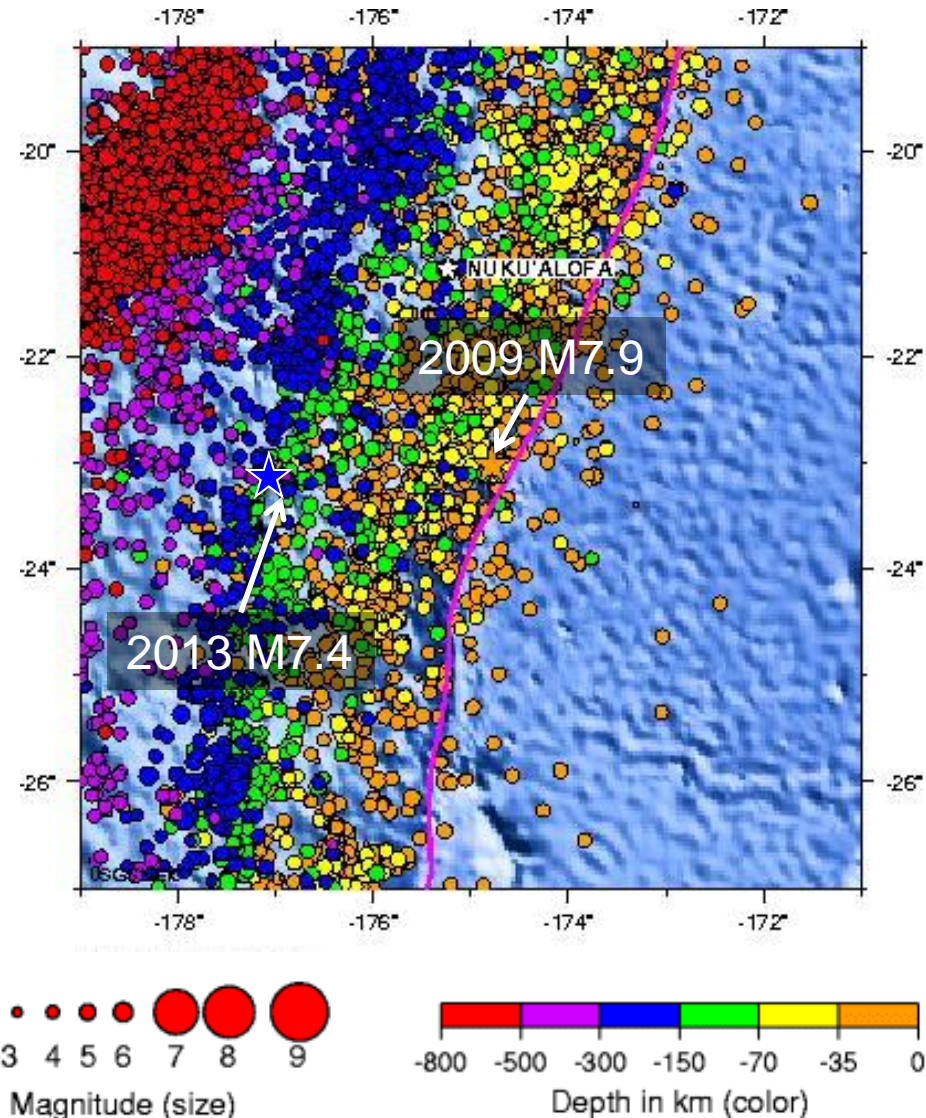


Earthquake and Historic Seismicity

The epicenter of the May 23 earthquake is shown by the blue star on a map of regional seismicity between 1990 through March 2009.

A magnitude 7.9 earthquake occurred in the same area on March 19, 2009 and the epicenter of that event is shown by the orange star.

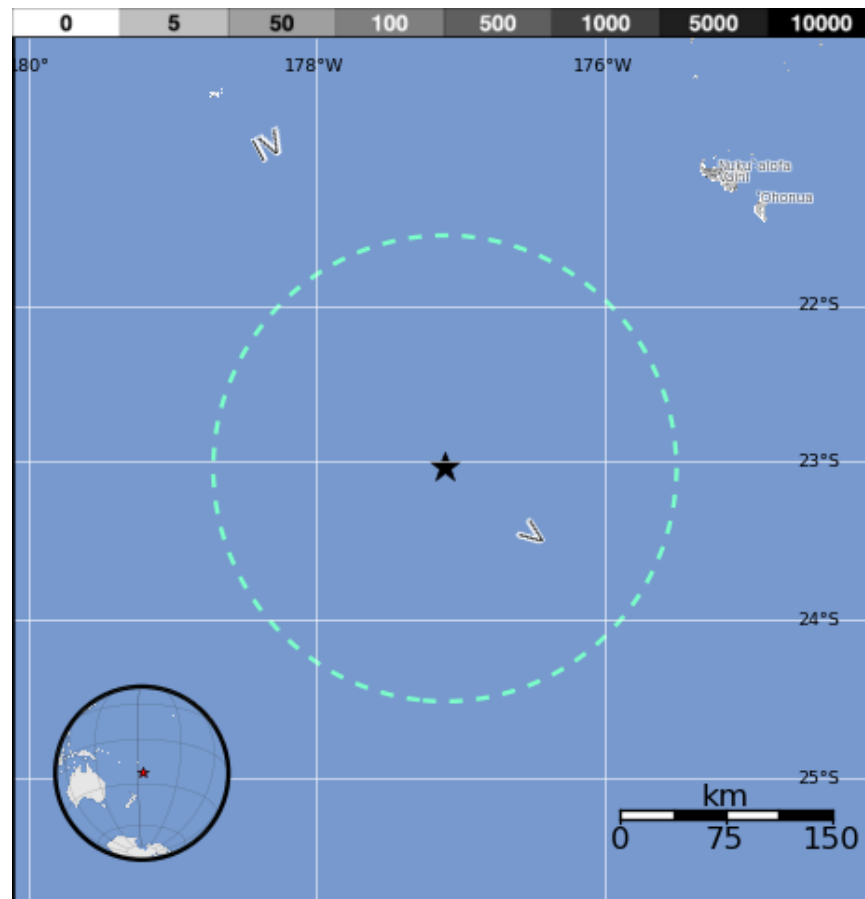
These two earthquakes fit the general pattern of earthquakes on the plate boundary or within the Pacific Plate as it subducts beneath the northeastern portion of the Australia Plate.



The USGS estimates that 96,000 experienced light shaking from this earthquake.

The color coded contour lines outline regions of MMI intensity. The total population exposure to a given MMI value is obtained by summing the population between the contour lines. The estimated population exposure to each MMI Intensity is shown in the table below.

Image courtesy of the US Geological Survey



Estimated Modified Mercalli Intensity	I	II-III	IV	V	VI	VII	VIII	IX	X
Est. Population Exposure	--*	--*	96k	0k	0k	0k	0k	0k	0k
Perceived Shaking	Not Felt	Weak	Light	Moderate	Strong	Very Strong	Severe	Violent	Extreme

Magnitude 7.4 TONGA

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The record of the earthquake on the University of Portland seismometer (UPOR) is illustrated below. Portland is 9380 km (5830 miles, 84.51°) from the location of this earthquake.

