

## PRINCIPAL NEW ZEALAND EARTHQUAKES IN 1980

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The largest earthquake in New Zealand during 1980 occurred on 23 December, just north of Tauranga, but no reports have been received of its being felt there or in Whakatane. Intensities were apparently highest in Gisborne, and it was felt as far south as Wellington. The reason for the lack of strong shaking near the epicentre of a large earthquake (its magnitude was 6.3) is that the focal depth was about 300 kilometres. The Benioff Zone under the North Island, region of occurrence of the deep earthquakes, meets the surface along the East Coast, and dips under the volcanic region and the Bay of Plenty.

Attenuation of seismic energy is apparently very slight within the zone, and this explains the high intensities experienced in the East Coast area. Directly above the zone, however, there is a region of high attenuation, and the result is markedly reduced ground motion near the epicentre, as evidenced in this case by the lack of felt reports from Tauranga and Whakatane.

The earthquake which caused the most damage during the year occurred very close to the city of Napier at 3.30 a.m. on October 6. It was of magnitude 5.9. Goods were shaken off shelves in shops throughout the city, and windows were broken in a few buildings. Windows were also reported cracked in Hastings, and the strong rolling motion woke people as far away as Gisborne and Wanganui. The Earthquake and War Damage Commission has received some 2000 claims which, though mostly minor, indicate that intensities reached MM VIII in isolated places. The claims do show, however, that the microzoning phenomenon was particularly marked. Intensities appear to vary significantly within short distances.

This earthquake was the largest of a number of moderate shocks which jolted the North Island during the year but left the South Island largely untouched. Nelson and Marlborough, subjected in the past to some of New Zealand's major historical earthquakes, were relatively quiet during 1980 while the East Coast of the North Island experienced several moderate shocks. Napier city had earthquakes of magnitude 5.2 and 5.0 on July 3 and 4, and there was another of magnitude 5.3 off the mouth of the Porangahua River on July 3. A further shock, much smaller, shook Napier again on November 25.

Inland and further south, a magnitude 5.6 earthquake occurred near Hunterville at 4.45 a.m. on Tuesday, June 24. It was felt over much of the Central North Island, waking people from New Plymouth to Napier. Two smaller shocks, both about magnitude 4.5, occurred near Kapiti Island on July 15 and 20, causing some alarm in the Wellington area and north to Wanganui.

There was a swarm of small earthquakes near Palmerston North from late August to mid-September. About a dozen were felt, and many more were detected by the sensitive seismograph which operates continuously at Mangahao Dam, in the Tararuas. Earthquake swarms are a common phenomenon, characterized by there being no clearly definable major event in the sequence. They are very common in volcanic areas, but also occur in other parts of the country.

There has been only very limited volcanic activity throughout the year. White Island ash and steam eruptions have declined from 1979, and the volcanoes of the central North Island have been quiet.

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