

TER 2145



OBSERVATIONS OF A LARGE (Ms=7) INTERPLATE EARTHQUAKE IN THE CENTRAL NEW HEBRIDES ISLANDS

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On July 15, 1981 a magnitude Ms=7.0 earthquake occurred in the forearc region of the central New Hebrides (Vanuatu) Islands about 85 km from the Cornell/ORSTOM instrument network on Efate Island. The one km aperture benchmark array, leveled every few months since 1975, was releveled 15 days before the mainshock and immediately following it. Preliminary analysis of the tilt data indicates that no clear precursory or coseismic tilt (to within one microradian) could be resolved by either the borehole tiltmeters, the long-baseline (100 m) water-tube tiltmeters, or the releveled array. Preliminary analysis of first motion data indicates that the earthquake was an interplate thrust event. This event was located near three moderate-sized (Ms=6) earthquakes which occurred in the preceding three years (1 Sept. 1978, 17 Aug. 1979, 26 Aug. 1979), but it appears to have occurred at a shallower depth along the interplate thrust zone than the others. Months before each of these events clusters of smaller magnitude (M=3-5) earthquakes occurred near the epicentral regions of the eventual mainshocks. The aftershock zone of the 1981 earthquake exhibited interesting relationships to the 1978 and 1979 earthquakes and to major features in the descending and overriding plates. The aftershocks filled a gap in seismic activity that has persisted at least since the network began. In addition, the aftershocks activated the region of the 1978 and 1979 (August 26) aftershock zones south of the gap and also activated a region north of the gap. Later aftershocks were located beneath the trench and indicate that the descending Australian plate became active.

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