

Distinguish between very low frequency earthquakes and landslides signal.

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Almost every year, large typhoons strike Taiwan, which bring a huge rainfall sometimes up to 4000 mm in a few days. Such enormous rainfalls induces large landslides and submarine slumps in and around Taiwan. A series of landslides and submarine slumps due to the Typhoon Morako were identified and located by Lin et al. (2010) using band-pass filtered (0.02-0.05Hz) seismograms recorded at broadband stations of the BATS. This technique can be applicable to a real-time monitoring of landslides and submarine slumps. However, east of Taiwan and south of Ishigaki and Yonaguni islands near the trench axis of the Ryukyu subduction zone, a number of very low frequency earthquakes (VLFs) occur at shallow depths (Ando et al., 2012) where 600-700 VLFs occur every year and recorded at broadband even at the BATS stations. Although VLFs have not been found beneath Taiwan, there is a possibility that VLFs occur there from the point of view of tectonic situations. Nevertheless, the bandpass filtered (0.02-0.05 Hz) waveforms of the landslides and VLFs are quite similar; both contain a spectral peak between 0.03 and 0.08 Hz. It is very hard to distinguish the two different phenomena on the seismograms alone. To distinguish landslide events from VLFs and ordinary earthquakes, we take a method to identify landslides as follows: 1) Applying a bandpass filter (0.02 -0.05Hz) to raw broadband seismograms. 2) Picking up low frequency events from the filtered seismograms, 3) Removing ordinary earthquakes using an identification technique of P and S waves and surface waves, and hypocenter catalogues unless it is a real-time determination. 4) Locating the events with an inversion technique. 5) If the location of the event is at shallow depths beneath Taiwan or in submarine valleys, and if heavy rain-fall happened over the days, we assume the events a landslide. Our experiment with this method is still preliminary and further studies are required.

Keywords: VLFs, landslides, broadband seismic system