

Characteristics of the slope failures in Izu-Oshima Island on Oct. 16, 2013, inferred from seismic waveform records

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On Oct. 16, 2013, large-scale slope failure took place due to extreme rainfall in Izu-Oshima Island in Japan. The precipitation reached over 90 mm per hour from 1:00 to 5:00 before and during the period when the failures took place. Through geological surveys by us and Natural Disaster Research Council, piping holes were observed on the collapsed slopes, which suggested that the ground water spouted due to high water pressure. It is important to grasp the detailed behaviors of water and sediment movement in order to reduce the slope disaster in the volcanic regions.

Signals of failures and their related sediment movements were recorded many times by several seismometers installed around by Oshima Volcano Observatory of ERI, Univ. of Tokyo. The seismic signals were observed almost at the same time at several stations. Four major signals were detected from 2:00-3:00, while at least a few tens were observed from 3:00-5:00. These signals had unclear initial phases and long (several minutes) durations. The amplitudes increased almost at the same time at the beginning among the stations, while the times when they attained the maximum values were earlier at the stations located in the upper side of the slope. These facts indicate that the vibrations were firstly generated in the upper side of the slope, then moving toward the downside.

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