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'Understanding volcanoes and society: the key for risk mitigation'

The role of a single seismic station in estimating the state of volcanic activity: An example from several volcanoes in Indonesia

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The main goal of volcano monitoring is to mitigate risk caused by volcanic activity. A multidisciplinary monitoring approach has been used and developed at volcanoes to achieve the goal, although a complete understanding of the dynamic processes inside the volcano remain difficult. However, there are many densely populated volcanoes in Indonesia monitored by limited instruments (only seismometers) and in some circumstances we can only use a single seismic station. During an alarming condition – an increase in volcano seismic activity, we are forced to analyze the available data rapidly and correctly to make a good estimate of the state of volcanic activity as well as the areas of potential hazards. This estimate will be translated into a recommendation for the local government and community around the volcano. This implies that failure in making a good recommendation may lead to a catastrophe. Here we present several examples on the contribution of a single seismic station in decision making during several volcanic crises in Indonesia through several seismic signals processing techniques. We demonstrated that in a circumstance where we can only use a single seismic station, with relevant signal processing techniques, we may estimate the state of volcanic activities and therefore contribute to volcanic risk mitigation efforts.