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Infrasound's capability to detect and characterise volcanic events, from local to regional scale.

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Local infrasound and seismic networks have been successfully used for identification and quantification of explosions at single volcanoes. However the February, 2014 eruption of Kelud volcano, Indonesia, destroyed most of the local monitoring network. The use of remote seismic and infrasound sensors proved to be essential in the reconstruction of the eruptive sequence. The first recorded explosive event, with relatively weak seismic and infrasonic signature, was followed by a 2 hour sustained signal detected as far away as 11,000 km by infrasound sensors and up to 2,300 km away by seismometers. The volcanic intensity derived from these observations places the 2014 Kelud eruption between the intensity of the 1980 Mount St. Helens and the 1991 Pinatubo eruptions. The use of remote seismic stations and infrasound arrays in deriving valuable information about the onset, evolution, and intensity of volcanic eruptions is clear from the Kelud example. After this eruption the Singapore Infrasound Array became operational. This array, along with the other regional infrasound arrays which are part of the International Monitoring System, have recorded events from fireballs and regional volcanoes. The detection capability of this network for any specific volcanic event is not only dependent on the amplitude of the source, but also the propagation effects, noise level at each station, and characteristics of the regional persistent noise sources (like the microbarum). Combining the spatial and seasonal characteristics of this noise, within the same frequency band as significant eruptive events, with the probability of such events to occur, gives us a comprehensive understanding of detection capability for any of the 750 active or potentially active volcanoes in Southeast Asia.