



Investigations into seismic source locations of mass flow events during the 18 March 2007 Mount Ruapehu, New Zealand lake breakout event.

Braden Walsh (1), Jonahan Procter (1), and Arthur Jolly (2)

(1) Volcanic Risk Solutions, Massey University, Palmerston North, New Zealand (b.walsh@massey.ac.nz), (2) GNS, 1 Fairway Drive, Avalon, Lower Hutt 5010, New Zealand

The 18 March 2007 Ruapehu lake breakout event occurred due to extreme overfilling of the crater lake that led to overflowing and the weakening of the surrounding tephra, which eventually collapsed at ~11:18 NZT (GMT +12). The 1×10^4 m³ of tephra was accompanied with a total amount of 1.3×10^6 m³ of water from the crater lake forming a large lahar. The lahar traveled along the Whangaehu River channel where it journeyed all the way to the ocean, some 200 km away from source. The collapse of the tephra dam also created a large landslide, which very little details are known that occurred on the eastern flank of Mount Ruapehu. To better constrain the events that occurred on the night of March 18th 2007, we use an amplitude source location (ASL) technique to locate the runout of the lahar, as well as, the location and timing of the landslide. Our results show that the ASL minimal residual error locations follow the lahar down channel starting at the onset of the tephra dam break, and at approximately 11:50 NZT (GMT +12) the ASL results move out of the Whangaehu channel and locates higher up on the volcano along the eastern flank, indicating the potential onset of the landslide. Later the ASL minimal residual errors locate back in the Whangaehu channel, but further down the channel where the lahar front continued to flow toward the sea.