

Precursory eruptions of the 2011 Shinmoedake eruptions, Kirishima volcanoes

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It is important for us to have knowledge of what takes place in the pre-eruption stage of plinian or sub-plinian eruptions on the surface. We also need such information for hazard maps and the forecasting of eruptions in which new vents are opened. We therefore consider the vent position and small precursory eruptions of the 2011 Shinmoedake eruption. Sub-plinian eruptions occurred without a prior distinct increase in earthquakes or land deformations from January 26 to 27, 2011 at Shinmoedake volcano. Therefore, we need to know how to quickly evaluate unusual preliminary phenomena and eruptions for the forecasting for sub-plinian eruptions.

We were able to take fresh ashfall samples generated by the January 19, 2011 eruption, which occurred just 7 days before the January 26 to 27 sub-plinian eruptions. The ashfall deposit was characterized by a low bulk depositional density, with an increase in absorbed water and very fine grains. It is important information of bulk density of deposit meaning fragmentation degree and absorbed water content meaning altered fragments content for earlier signal of plinian and sub-plinian hazard information in addition. We must search carefully for likely signs of the January 19 ashfall, because we did not find an increase in earthquakes or preliminary signals of the sub-plinian eruption on January 26. For this reason, we need both summaries and detailed discussion of information regarding such precursory or unplugged ashfalls that follow plinian or sub-plinian eruptions, as provided by geological and paleogeographical surveys in the world. In addition, we need to develop tools or methods to help in the identification of deposit characteristics, e.g., thickness, bulk density, grain size, etc.

In addition, we need information indicating where new craters are being formed, not only for forecasting but also for developing hazard maps. The August 2008 eruption generated some fissured craters paralleled 1959 fissure craters. Then, seven small eruptions occurred in a continuous sequence from March to August 2010 along the August 2008 craters. In the Shinmoedake volcano, adjacent of time to the generations of craters or fumaroles, we consider one of the sources of important information for the next crater locations.