Geophysical Research Abstracts
Vol. 14, EGU2012-12154-1, 2012
EGU General Assembly 2012

What makes a primary tephra fall?

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Two recent explosive eruptions in Iceland have raised the thought about what makes a primary tephra fall and how will that be presented in the geological record? Eyjafjallajökull erupted in 2010, an eruption lasting for about 2 months. Fall of tephra fell more or less around the volcano during that time. Grimsvötn erupted in 2011, an powerful eruption lasting for about 7 days, with a main tephra producing phase during the first 3 days. Not only where the two eruptions different in intensity, Eyjafjallajökull being much lower producing about half the volume of Grimsvötn in about 2 months time and a plume not reaching higher than about 10-12 km, Grimsvotn on the other hand needed only 3 days to double the production of Eyjafjallajökull, and sending the ash plume up to about 20 km in the atmosphere. During Eyjafjallajökull atmospheric winds where gentle, leading to tephra precipitation under ideal conditions, tephra blanketed the surrounding land and mountain slopes. During the spring 2011 on the other hand lower atmospheric winds where strong from north, while stratospheric winds where westerly carrying ash in two directions. During the Grímsvötn explosive phase, winds where strong, leading to a peculiar deposition of the tephra. While the Eyjafjallajökull tephra shows typical characteristics of volcanic material falling from the sky in gentle weather, like dogs-paw snow, leading to wide area equal layering, the Grimsvötn tephra came to a rest under high wind showing primary cross bedding, primary erosion surfaces and a complied depletion of fines. Further differences observed are that despite the difference in preservation potential of the tephra from the two eruptions, both have high preservation potential in the near vent field while the smaller eruption has higher preservation potential in the far field of the volcano, due to more favourable weather conditions. In this talk we shall also address the preservation potential of explosive eruption in the geological record and address possible indicators for a major explosive eruption when in a volcanic area.