Geophysical Research Abstracts
Vol. 14, EGU2012-7325-2, 2012
EGU General Assembly 2012

Grímsvötn 2011 tephra in the UK: public sampling, air quality and comparison with model predictions.

J.A. Stevenson (1), S.C. Louglin (2), C. Rae (3), C. Witham (4), M. Hort (4), T. Thordarson (1), and A. MacLeod (5)

(1) School of Geosciences, University of Edinburgh, Grant Institute, West Mains Road, Edinburgh, EH9 3JW, UK (john.stevenson@ed.ac.uk), (2) British Geological Survey, Murchison House, West Mains Road, Edinburgh, EH9 3LA, UK, (3) AEA, Glengarnock Technology Centre, Caledonian Road, Glengarnock, KA14 3DD, UK, (4) Met Office, FitzRoy Road, Exeter, Devon, EX1 3PB, UK, (5) School of Geography, Earth and Environmental Sciences, University of Plymouth, Drake Circus, Plymouth, PL4 8AA

The May 2011 eruption of Grímsvötn, Iceland, was short-lived but powerful. Tephra was transported to the UK, where it could be identified in rainwater, sticky-tape samples and air quality data. We present analysis of timings and extent of tephra transport and compare them to predictions from the NAME dispersion model.

Daily rainwater samples collected during the eruption were analysed. Tephra grains were identified in a number of samples and the most common diameter was 20–40 μm.

A nationwide public sampling effort, coordinated by the British Geological Survey, returned over 100 sticky-tape samples. Confident identification of tephra is only possible where mass loadings are high. Samples were labelled with start time, end time and location, which allowed both the timing and location of deposition to be resolved. The results show that most deposition took place during rainfall, 48–70 hours after the onset of eruption, and was restricted to Scotland and further north.

Air quality monitoring data show an increase in surface PM10 concentration as the plume passed over the UK. The highest hourly concentration, $\sim 250\ \mu gm^{-3}$, was measured in Aberdeen on 24 May 2011. Smaller peaks are found at other locations further south.

Predictions by the NAME dispersion model show good agreement with the timing and extent of tephra distribution, however validation of concentration/mass-loading estimates is currently much more difficult.