

14 April-ongoing eruption at Eyjafjöll volcano, S-Iceland – A short note.

Preliminary estimates on tephra volume, grain size and magma effusion rates.

Here we present rudimentary estimates on tephra volume and magma effusion rates for the first 72 hours (14-16 April) of the eruption. It is based on preliminary thickness data obtained from measurements made in the field by Guðrún Larsen and Ármann Höskuldsson on 17 April and is underpinned by thickness of the tephra fallout at two sites, which give 8 cm at 20 km and 0.5 cm at 50 km to the east of the volcano as well as extrapolated maximum thickness of 80 cm at the vent site. We stress that these preliminary numbers have not been corrected for vesicle content of the tephra grains (are not DRE¹ corrected), hence represent value and the estimated uncertainties are ±50%. Our estimates are as follows:

Tephra volume	0.1 ± 0.05 km ³
Mean effusion rate	4-500 m ³ /sec
Max effusion rate	~1000 m ³ /sec

Grain size of the tephra fall out

The grain size distribution of a tephra sample collected on Mýrdalssandur (~50 km east of the volcano); analyzed and reported on by The Environment Agency of Iceland (www.ust.is) shows that the tephra fallout during the first days of the ongoing eruption at Eyjafjöll volcano is very fine grained (Figure 1). About 24% of the sample is smaller than 10 µm (i.e. in the size range of aerosols), ~33% between 10 and 50 µm; 20% between 50 and 146 µm and ~23% in the fraction 146-294 µm.

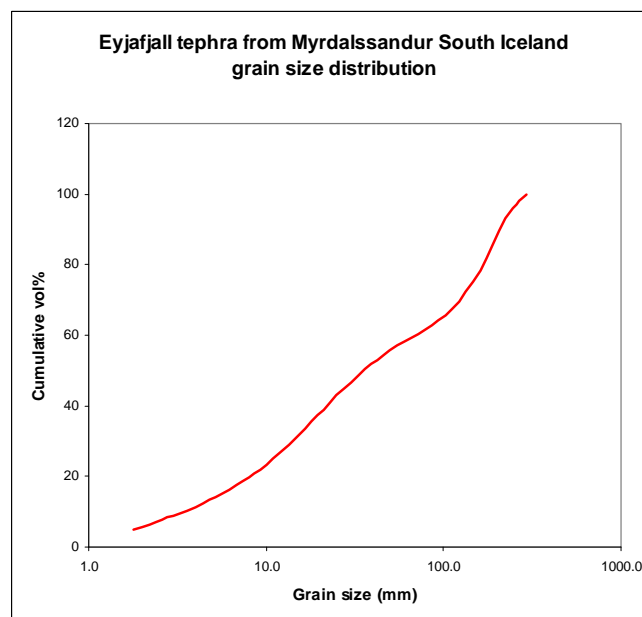


Figure 1. Grain size distribution in a sample from the 14-16 April tephra fall (after Environment Agency of Iceland).

¹ DRE = dense rock equivalent; volume/mass of tephra calculated on vesicle-free basis.

² Effusion rate is the instantaneous volumetric flux of magma from the vent and by definition is based volumes obtained from magma may be highly inflated with exsolving gases. Depending on the degree of inflation, effusion rates can have considerably higher values than eruption rates (= magma discharge), calculated from the volume of solidified and degassed lava (DRE).