



## The April 2010 eruption of the ice-capped Eyjafjallajökull, South Iceland

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The 1660 m high, ice-capped Eyjafjöll volcano has experienced unrest in the form of intrusive activity repeatedly over the last 16 years. An intense seismic and intrusive event culminated in a small basaltic fissure eruption on the eastern flanks, lasting from 20th March to 12th April. In the early morning of 14th April, a summit eruption, preceded by an intense seismic swarm, commenced at the volcano. During the first few hours activity was subglacial but a visible plume was observed at 6 AM and was followed by onset of meltwater discharge onto the glacial river plains to the north of the volcano. A small flood also occurred on the south side. Phreatomagmatic activity intensified during the course of the day with a dense, black plume rising up from the main vents shortly after 19:00 on 14th April. A sustained explosive eruption followed, supporting a 5-9 km plume and lasting until 24:00 on 17th April. The average magma discharge was several hundred tonnes and the eruption produced unusual amounts of fine-grained ash of trachyandesite composition. Prevailing winds carried the ash-rich plume towards southeast and south and in over Europe. The style of eruption changed from phreatomagmatic to largely magmatic on 18th April. Subsequently marked decrease was observed in the intensity of the explosive activity and the magma discharge dropped by an order of magnitude. Lava emerged from the eruption site on 21st April, slowly melting its way through the ice on the north flank of the volcano in the direction of Gígjökull outlet glacier. The Eyjafjallajökull eruption is already the largest explosive eruption in Iceland since that of Hekla in 1947. In the last forty years, eight eruptions have occurred in Iceland with explosive phases leading to tephra dispersal over parts of Iceland. Four were magmatic and four, including the present eruption, were phreatomagmatic at the time of peak activity. In six out of eight cases tephra dispersal was towards north and northeast. The phreatomagmatic eruptions in particular, which includes future eruptions in Katla volcano, have potential for considerable disruption to air traffic. However, the high proportions of very fine to fine ash produced in the first 3 days of the current Eyjafjöll eruption facilitated extremely wide dispersal and slow atmospheric removal rates of the erupted material.