Bárðarbunga update 26082014

2014-08-26 14:30 UTC
Bárðarbunga update

Compiled by

Icelandic Met Office (Melissa Pfeffer, Sara Barsotti, Hildur María Friðriksdóttir, Benedikt G. Ófeigsson, Þorsteinn Þorsteinsson, Sigþrúður Ármannsdóttir) University of Iceland (Þóra Árnadóttir, Sigrún Hreinsdóttir, Michelle Parks, Ásta Rut Hjartardóttir, Stéphanie Dumont, Freysteinn Sigmundsson, Magnús Tumi Guðmundsson, Páll Einarsson, Elías Rafn Heimisson)

Based on

Seismic, GPS, Hydrology

Eruption plume

Height (a.s.l.)

No eruption and no eruption cloud.

Heading

No eruption and no eruption cloud.

Colour

No eruption and no eruption cloud.

Tephra fallout

No eruption and no eruption cloud.

Lightning

No eruption and no eruption cloud.

Noise

No eruption and no eruption cloud.

Meltwater

The discharge of rivers draining from Vatnajökull regions affected by the unrest is normal for this time of the year. At the Upptyppingar hydrometric station on Jökulsá á Fjöllum, discharge has averaged 180 m3/s in recent days and conductivity is close to 180 uS/cm. A sensor in Rjúpnabrekkukvísl (Skjálfandafljót water divide, NW part of Bárðarbunga) shows 60 uS/cm today and Köldukvísl (receiving meltwater from W-Bárðarbunga) shows 90 uS/cm.

Conditions at eruption site

No eruption.

Seismic tremor

No harmonic (volcanic) tremor observed.

Earthquakes

Intense seismicity continues. Seismicity continues to migrate northward. Seismicity is now concentrated on the portion of the dike by the edge of the Dyngjujökull glacier. Most of the dyke-related events are at 8-12 km depth. A magnitude 4.6 earthquake, the largest detected in the dyke until now, was detected today just before noon. At 01:26 this morning an earthquake of magnitude 5.7 (USGS network) was observed beneath the Bárðarbunga caldera at 6 km depth (IMO network).

GPS deformation

The most recent GPS measurements indicate continuation of magma flowing into the dike under Dyngjujökull, and that it is still propagating north of the ice edge. This is supported by the current seismic activity in the past 24 hours. Model calculations, based on GPS data suggest that a total volume of up to 350 million cubic meters have intruded into the crust since the activity started.

Overall assessment

There are no indications that the intensity of the activity declining. Currently, three scenarios are considered most likely: 1) The migration of magma could stop, attended by a gradual reduction in seismic activity. 2) The dike could reach the surface of the crust, starting an eruption. In this scenario, it is most likely that the eruption would be near the northern tip of the dike. This would most likely produce an effusive lava eruption with limited explosive, ash-producing activity. 3) An alternate scenario would be the dike reaching the surface where a significant part, or all, of the fissure is beneath the glacier. This would most likely produce a flood in Jökulsá á Fjöllum and perhaps explosive, ash-producing activity. Other scenarios cannot be excluded. For example, an eruption inside the Bárdarbunga caldera is possible but presently considered to be less likely.