

Bárðarbunga update 21082014

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Bárðarbunga update

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Based on

Seismic, GPS, water samples

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

No eruption. Daily measurements of water samples from Upptyppingar on Jökulsá á Fjöllum have shown a stable conductivity of ~200 $\mu\text{S}/\text{cm}$ since Sunday.

Conditions at eruption site

No eruption.

Seismic tremor

No sign of harmonic (volcanic) tremor detected.

Earthquakes

Intense earthquake activity continues at the Bárðarbunga volcano – a situation that has persisted since 16 August. Since midnight, over 900 earthquakes have been detected in Bárðarbunga. There are no signs that the seismicity is decreasing. Seismic and GPS measurements reveal a 25 km

long dyke being formed in the crust under the Dyngjufjökull glacier at 5 - 10 km depth. The dyke has not propagated to the north-east, nor has it progressed to shallower depth. Today three earthquakes exceeding three in magnitude have occurred on the caldera rim of Bárðarbunga (M 3.7 at 10:29, M 4.0 at 10:58 and M 3.4 at 13:02). These earthquakes were at depths around 2 - 5 km. They are interpreted as possible adjustments of the caldera due to changing magma pressure – they are not assumed to be the precursor to an imminent eruption.

GPS deformation

Seismic and GPS measurements reveal an approximately 25 km long dyke being formed in the crust under the Dyngjufjökull glacier east of Bárðarbunga. The results of the GPS measurements also indicate a decrease in pressure in the magma chamber below the Bárðarbunga caldera, which might suggest migration of melt from the Bárðarbunga magma chamber to the dike intrusion east of Bárðarbunga. A new GPS station was installed in Kverkfjöll on the 21st of August 2014. This station will measure continuously and transmit data automatically to scientists of the Icelandic Meteorological Office and of the Institute of Earth Sciences at the University of Iceland, in a similar manner as other continuous GPS stations do near Bárðarbunga. The new GPS measurements will provide scientists with an improved understanding of how the magma is moving within the crust.

Overall assessment

There are no measurements to suggest that an eruption is imminent. Previous intrusion events in Iceland have lasted for several days or weeks, often not resulting in an eruption. However an eruption of Bárðarbunga cannot presently be excluded, hence the intense monitoring and preparation efforts. The ongoing monitoring and assessment effort is necessary in case a volcanic eruption occurs. Hazards in the event of an eruption are being assessed, including a glacial outburst flood and dispersal of volcanic ash. Additional seismic, GPS and hydrological stations have been installed in the Bárðarbunga region. Likewise, mobile radars capable of monitoring ash dispersal have been moved to the region. The aviation colour-code for the Bárðarbunga volcano remains unchanged at 'orange', signifying that the volcano is exhibiting heightened levels of unrest.