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# ***Status Report of Weather Radars in Iceland***

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Keflavík

Gunnarsholt

Klaustur

Fljótsdalsheiði

100 km

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# Keflavík C-band Radar - iskef

## Logbook Jan 2016 – Feb 2017

- 2016-10-03 – Lightning damage
- 2016-11-24 – Serviced and calibrated
- 2016-12-15 – Lightning damage



Keflavík SW-Iceland C-band radar.  
Photo Þórður Arason 9 August 2011

## Logbook Jan 2016 – Feb 2017

- 2016-06-05 – Power supply broken
- 2016-07-08 – Power supply problems
- 2016-08-12 – Power supply broken again
- 2016-09-22 – Serviced and calibrated
- 2016-11-11 – Recalibrated
- 2017-01-18 – Restarted after power outage



Fljótsdalsheiði E-Iceland C-band radar.  
Photo Hermann Arngrímsson 8 July 2016



Specially adapted truck to take mobile radar off road. Photo Geirfinnur S. Sigurðsson 25 September 2012

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# Two Mobile X-band Radars

## isx1 & isx2

### isx1: Jan 2016 – Feb 2017

- 2016-01-14 – Deployed at Gunnarsholt
- 2016-01-27 – Moved to Klaustur
- 2016-04-29 – Moved to Reykjavík, **calibrated**
- 2016-05-26 – Deployed at Gunnarsholt
- 2016-08-26 – Moved to Klaustur
- 2016-10-12 – Moved to Reykjavík, **poor internal data connection**
- 2016-10-20 – Deployed at Klaustur
- 2016-11-11 – **Slip ring broken**
- 2016-12-02 – **New optical slip ring**
- 2016-12-10 – **Calibrated**
- 2016-12-23 – Deployed at Klaustur
- 2017-01-04 – Moved to Gunnarsholt, **comms fixed**

### Isx2: Jan 2016 – Feb 2017

- 2016-01-01 – At Klaustur
- 2016-01-16 – **Strange data**, refl. problems
- 2016-01-27 – Moved to Reykjavík, **new magnetron installed, calibrated**
- 2016-03-02 – Deployed at Gunnarsholt
- 2016-04-29 – Moved to Klaustur
- 2016-05-01 – **Comms/disk problems**
- 2016-08-26 – Moved to Reykjavík
- 2016-08-30 – Deployed at Gunnarsholt
- 2016-12-02 – Moved to Reykjavík, **dome leakage, wave guide arching, calibrated**
- 2017-01-04 – Deployed at Gunnarsholt
- 2017-01-25 – Moved to Klaustur



Mobile radar isx1 installed with clear view over Bárðarbunga before the 2014-2015 volcanic eruption.  
Photo Þorgils Ingvarsson 22 August 2014

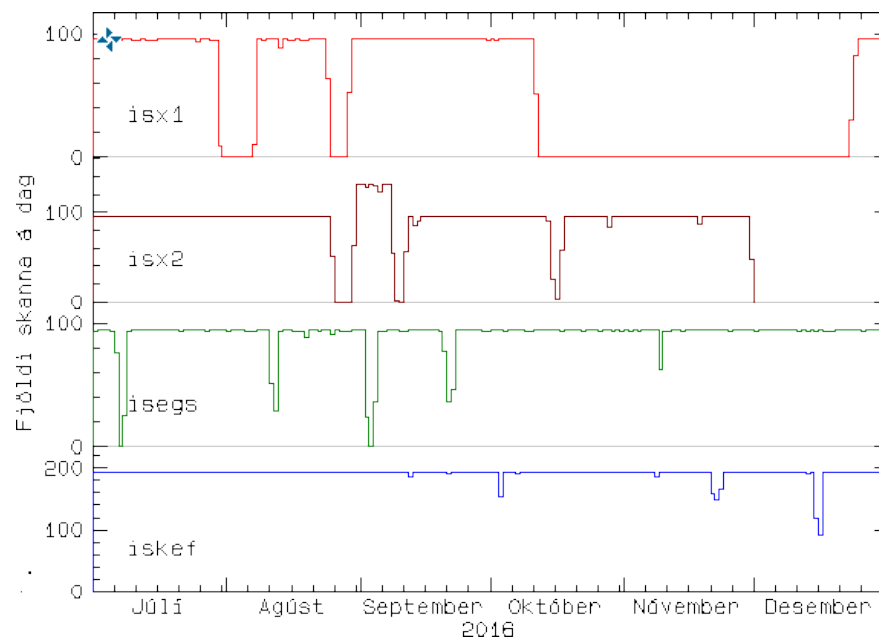
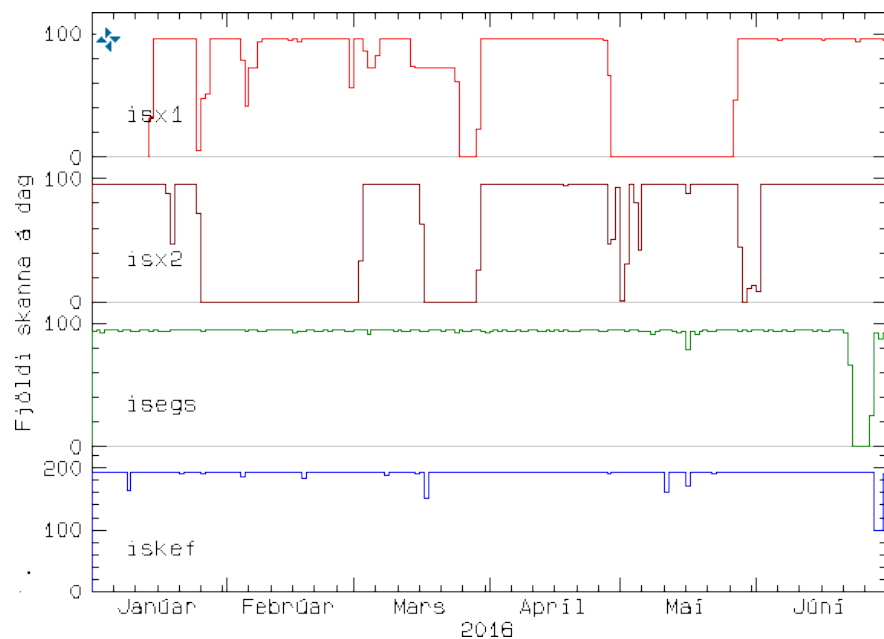


Martian landscape?



# Radar Data Retrievals

## Number of scans per day in 2016



## Retrievals 2016

isx1	61%
isx2	73%
isegs	95.1%
iskef	99.1%

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# Timeliness of Data to Odyssey

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**Icelandic data arrive too late: iskef 10 min, isegs 14 min**

**Example for iskef scan on 2 March at Noon, 2 rpm, 12 elev:**

- 12:00:00 Nominal time – iskef scan initiated
- 12:00:18 Start of first (lowest) elevation scan
- 12:06:25 Start of last elevation scan
- 12:07 Scan finished
- 12:07 Data processed and archived at IMO-HQ
- 12:08:02 Data transfer completed to <ftpweb.metoffice.gov.uk>
- 12:10 Data arrival at Odyssey – **Too late !**



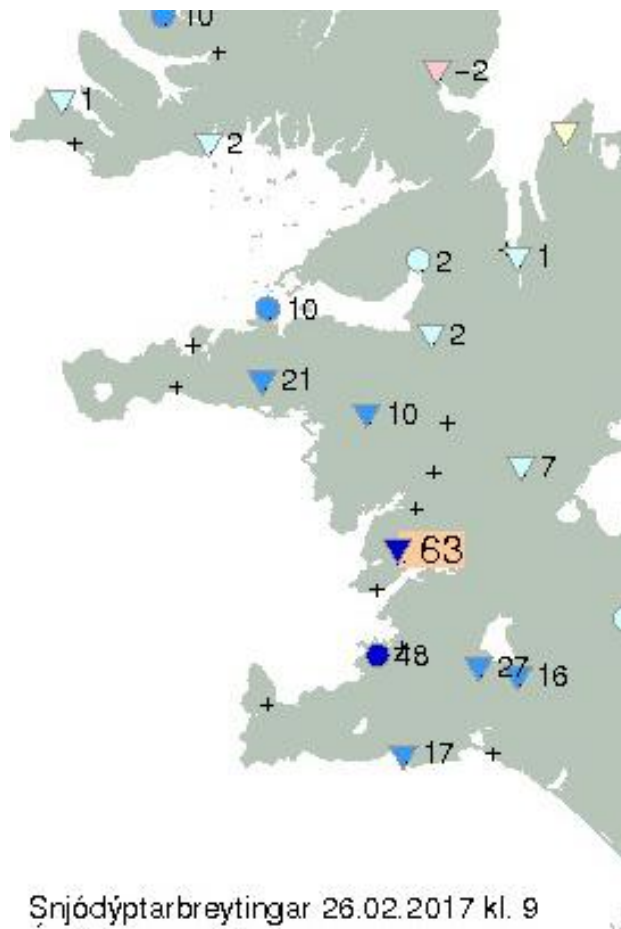
The day after a snowstorm in Reykjavík. Photo EGS 26 February 2017.

# Snowstorm 25-26 Feb 2017

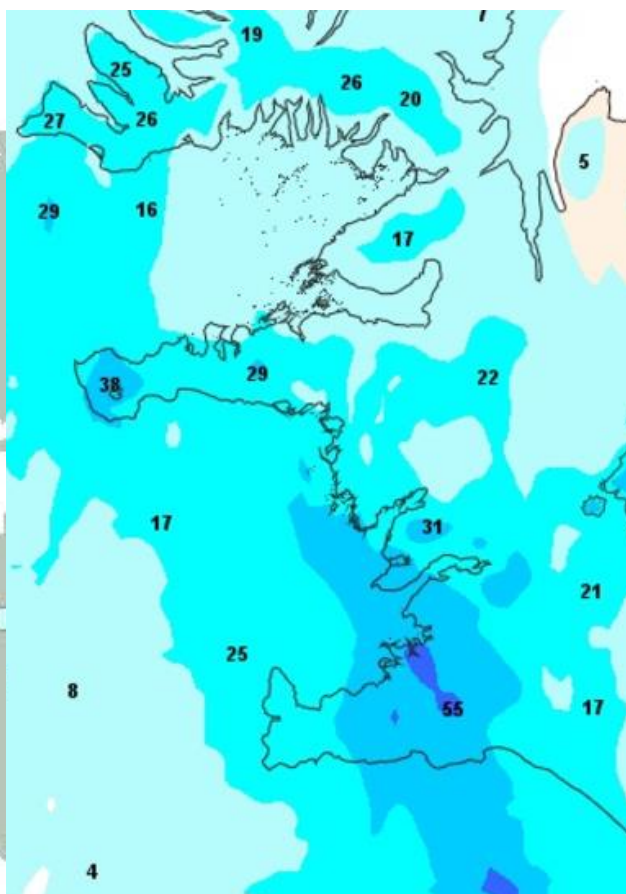
25 Feb at 18:00 to 26 Feb at 09:00

Reykjavík: 48 cm of snow = 36 mm water equivalent

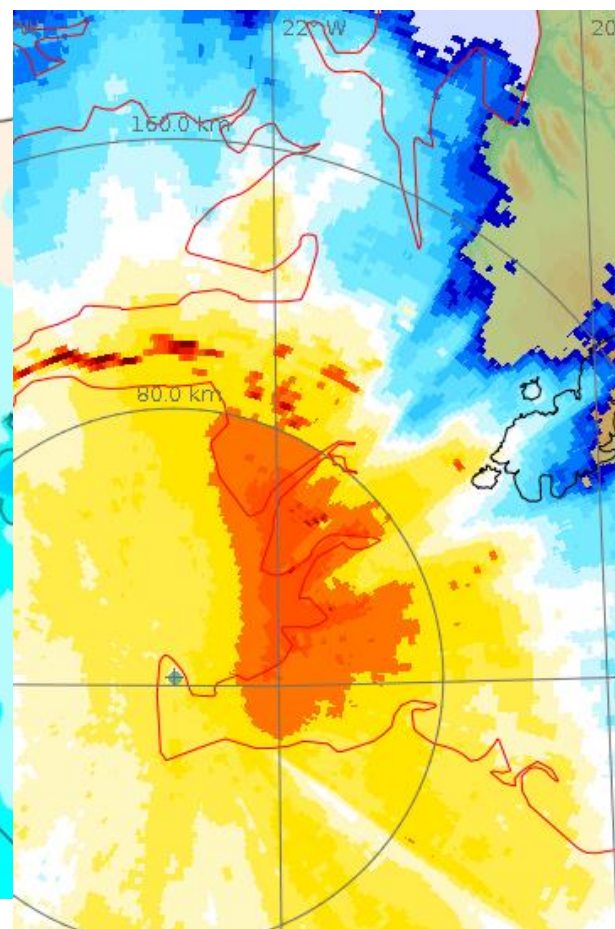
Obs. snow depth (cm)



NWP acc. precip (mm)



Radar PAC acc. precip



Snjódýptarbreytingar 26.02.2017 kl. 9

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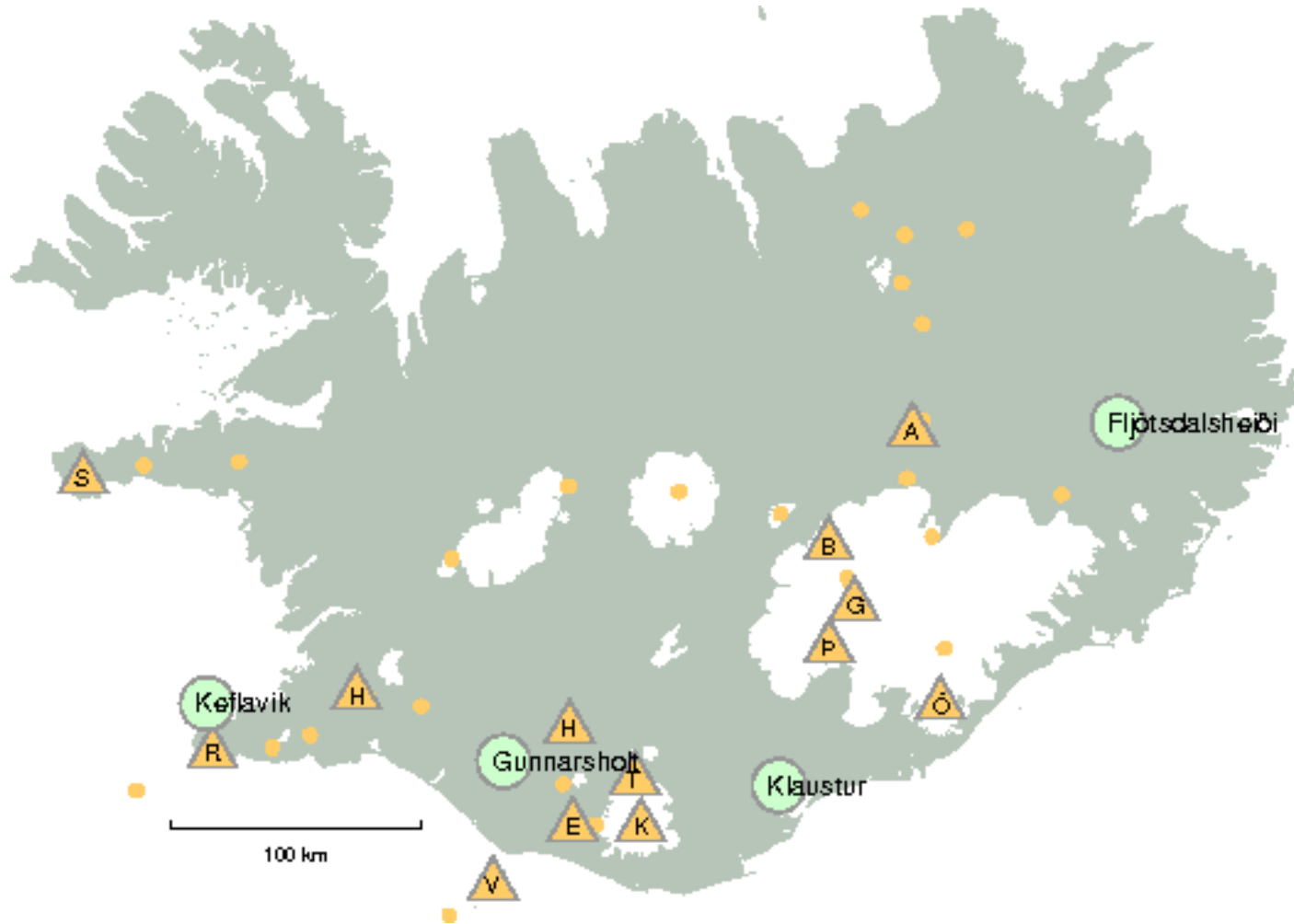
# Automatic Volcano Monitoring and Ash Dispersal Forecast

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## Development of an Automatic System

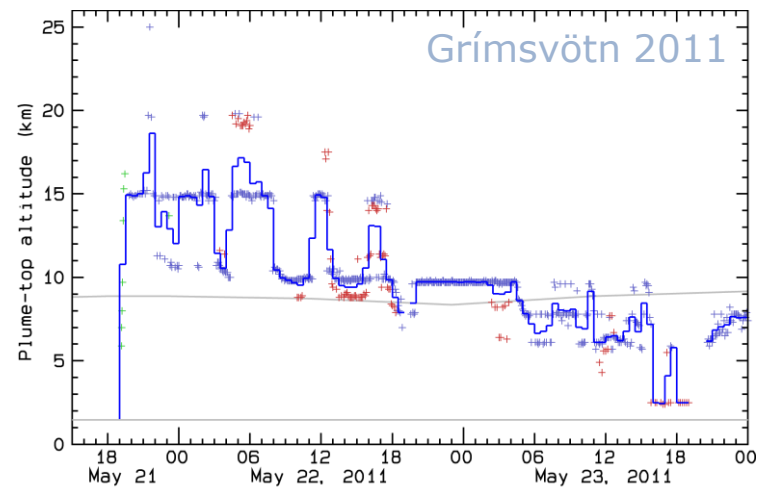
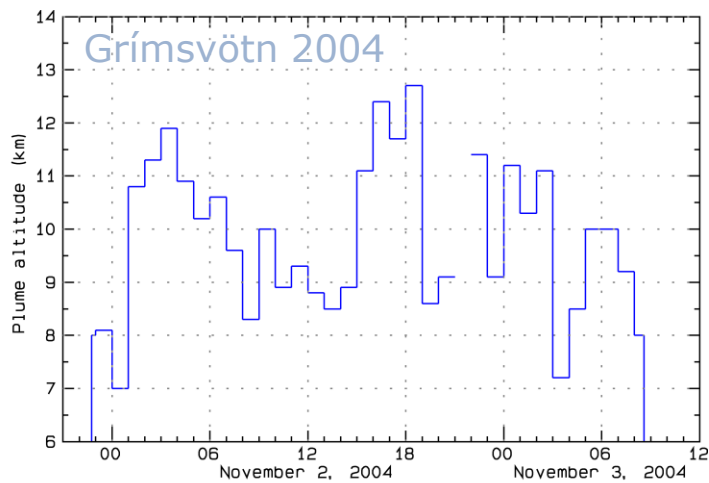
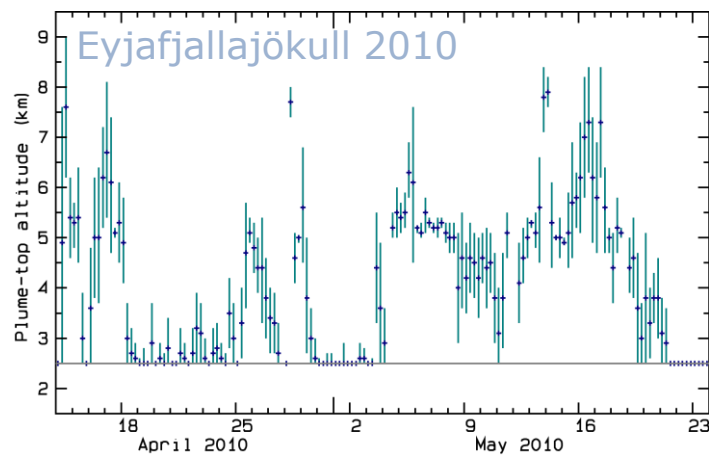
1. Radar data used to estimate plume height over volcano
2. Inversion for volcano source parameters in a plume model using plume height and status of atmosphere
3. Estimates of source parameters, height of plume and weather model used to forecast ash dispersal

# Radar Monitoring of Volcanoes



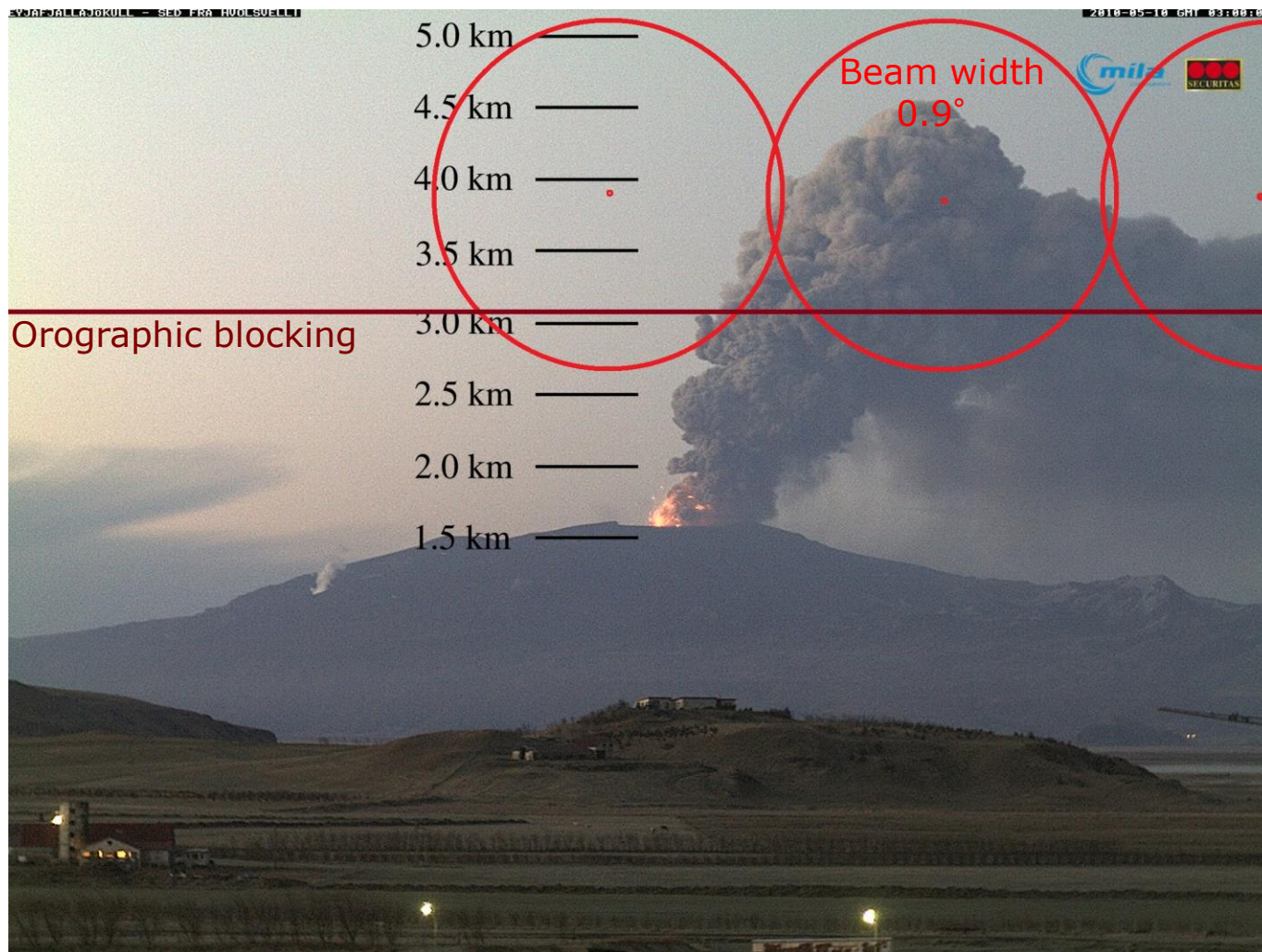
# Plume Heights

## Manually estimated from radar images



# Wide Radar Beam

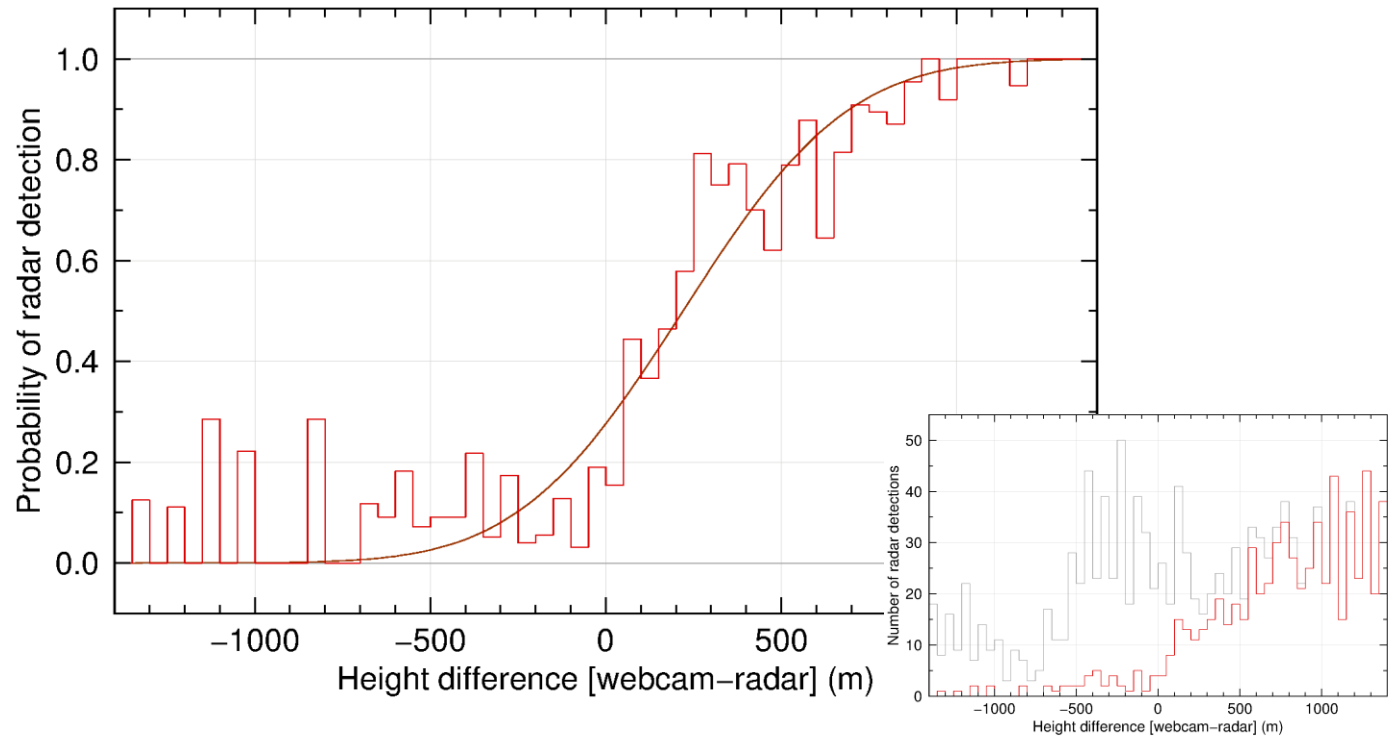
## Keflavík radar beam at Eyjafjallajökull 2010 (155 km)



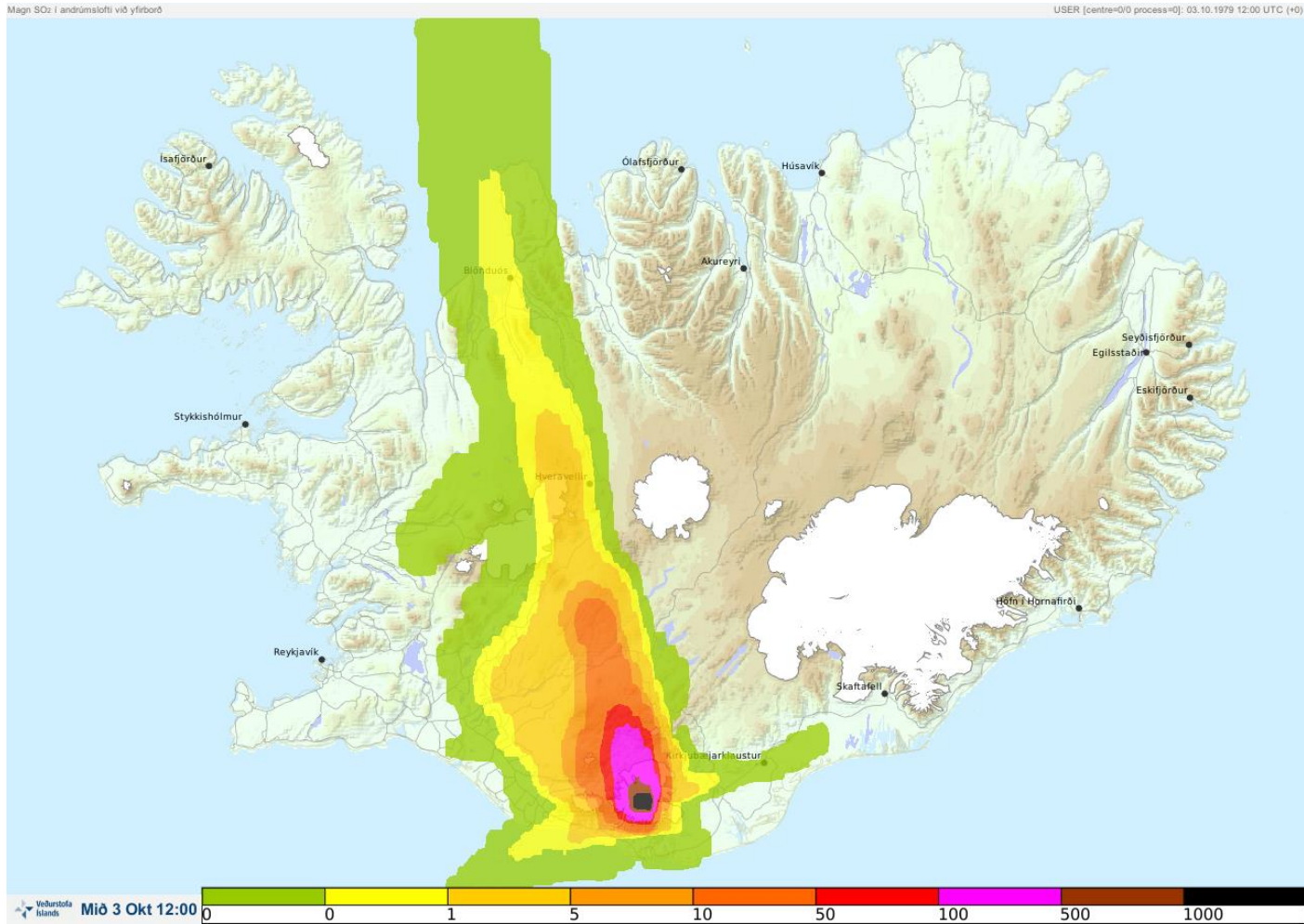
View of Eyjafjallajökull from a web camera at Hvolsvöllur, 10 May 2010 at 03:00.



# Validation of Radar Estimated Plume Heights



# Ash Dispersal Forecast





Arctic Tern (Kría) in Flatey island, W-Iceland. Photo Þórður Arason, August 2016.