# Monitoring volcanoes in Iceland: an update

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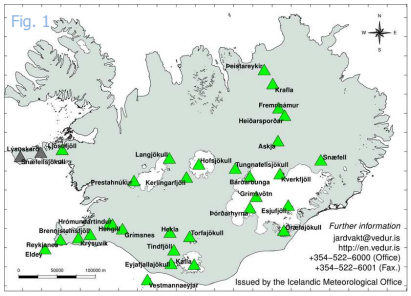
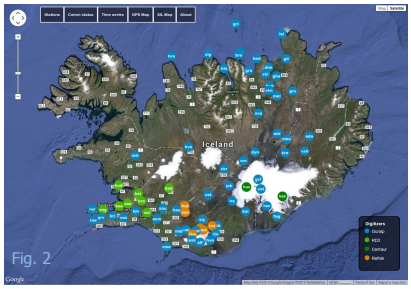
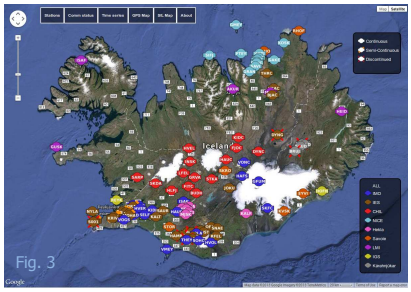
## Pre-eruptive monitoring

The Icelandic Meteorological Office is responsible for monitoring pre- and syn-eruptive volcanic activity, monitoring volcanic emissions in the atmosphere, and disseminating information. There are ~32 active volcanic systems in Iceland (Fig. 1).

Pre-eruptive monitoring has emphasized seismic- (Fig. 2), GPS- (Fig. 3), strain-, tilt- and hydrological measurements (Fig. 4). These networks are being expanded and gas and infrasound measurements are now included. .



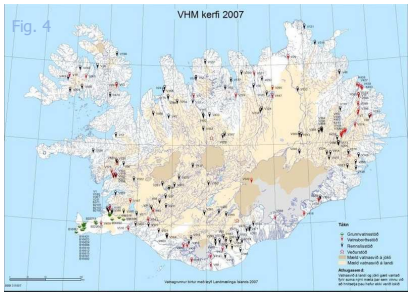




Fig. 1: Map showing aviation color codes for the Icelandic volcanoes (2013.11.14).
Fig. 2: Map showing the seismic network (2013.11.14).
Fig. 3: Map showing the GPS network (2013.11.14).
Fig. 4: Map showing the hydrological guaging stations (2013.11.14).

## Air-borne eruption product monitoring

The atmospheric monitoring system includes ~210 weather stations, a mobile sounding station (Fig. 5), and lightening detectors (Fig. 6) to provide meteorological properties inside and outside of an eruption cloud. Two fixed C-band weather radars and two mobile dual-polarization X-band radars (Fig. 7) are operated. Radars provide information on the maximum height and location of the eruption cloud, indicate emission rate, and may provide experimental products such as columnar ash concentration. Two scanning Lidars will arrive in November 2013. One will be fixed at Keflavík airport and one mobile. These may provide information on the location of air-borne ash, sphericity of particles, and cloud thickness. Seven ceilometers will retrieve cloud base height.

Two particle counters will measure the concentration and ash size distribution at the ground. Fixed and mobile DOAS (Fig. 8) and MultiGas (Fig. 9) instruments may provide information on the emission rate of $SO_2$ and the ratios of $H_2S$, $CO_2$, and $H_2O$. UV, visible and IR cameras will provide information on maximum cloud height and particle velocities within a cloud. Satellite products based on SEVIRI, AVHRR, MODIS and GOME-2 instruments will be used for determining the location of an eruption cloud and deposited products and to provide information about the ash and SO2 mass loading, cloud height, and ash effective radius.. .






Fig. 5: Experimental launch of the moble sounding system. 2013.10.22. Photo by Þ. Arason.
Fig. 6: Lightening observed in the Eyjafjallajökull.eruption cloud. 2010.04.17. Photo by Þ. Arason.
Fig. 7: One of the mobile radars preparing for an eruption from Grímsvötn. 2013.09.09. Photo by H. Arngrímsson.
Fig. 8: Installing an improvement to one of the scanning $SO_2$ DOAS instruments at Hekla. 2013.06.13. Photo by Þ. Ingvarsson.
Fig. 9: The first attempt at installing a quasi-continuous MultiGas station at Hekla. 2012.08.02. Photo by B. Bergsson.

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