



Volcanic Gases

Overview

- ⚠ During volcanic eruptions toxic gases may be emitted.
- ⚠ Key gases of concern are sulphur dioxide (SO₂), hydrogen fluoride (HF), hydrogen chloride (HCl) and hydrogen sulphide (H₂S).
- ⚠ Sulphur dioxide is of particular importance as it may be emitted in large quantities and potentially has significant health effects, as both a gas and once converted to sulphate aerosol.
- ⚠ The concentration (µg/m³ or ppm) of the gases and aerosol determines whether they are a hazard.
- ⚠ The transport and dispersion of volcanic gases are controlled by the meteorological situation.
- ⚠ A volcanic gas plume will not necessarily coincide with volcanic ash.

Impacts

Potential impacts from volcanic gases include:

Health impacts including respiratory distress, particularly to sensitive individuals, and irritation of eyes, nose and throat if concentrations exceed guideline levels.

Damage to sensitive ecosystems due to acid deposition.

Localised environmental impact to freshwater systems and aquaculture due to increased acidity.

Aviation passenger discomfort if aircraft encounter the gas plume and sulphurous smells are detected in the cabin. This could lead to aircraft diversion.

Notable volcanic gases events for the UK

Aug 2014 to Feb 2015 - Bárðarbunga-Holuhraun eruption, Iceland

1783 to 1784 - Laki eruption, Iceland

Volcanic gases in the UK

Volcanic eruptions in Iceland pose the greatest hazard to the UK for volcanic gases. On average there is one Icelandic eruption every 5 years, but the amount and ratio of gases emitted will vary considerably depending on the specific volcano, the style and duration of the eruption. In 2014, emissions from the effusive eruption of Bárðarbunga-Holuhraun were detected 2000 km downwind by satellites and sensors in Europe. In the UK sulphur dioxide and sulphate aerosol were detected at the ground by existing monitoring networks. Peaks in concentrations were short-lived (hours) and did not exceed Moderate on Defra's Daily Air Quality Index scale. A modelling study by NHP partners to inform the National Risk Register has shown that even in larger gas eruptions the most likely outcome in the UK is short (hours to days) pollution episodes with surface concentrations at Moderate and High Air Quality Index levels.



More information can be found at: www.naturalhazardspartnership.org.uk/hazards/volcanic-gases