Geophysical Research Abstracts
Vol. 13, EGU2011-11546, 2011
EGU General Assembly 2011

High levels of particulate matter due to ash plume and ash re-suspension following the Eyjafjallajökull eruption

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The dangers to people living near a volcano due to lava and pyroclastic flow, and, on ice or snow covered volcanoes, jökulhlaup (floods) are well known. The level of risk due to ash fall is, however, not as well known.

The eruption at Eyjafjallajökull, 14 April to 20 May 2010 (last day of visible plume), produced abundant particulate matter (PM). After the volcanic activity ceased high PM concentration has been measured on several occasions, due to re-suspended ash.

The particulate matter (PM_{10}) concentration in the small town of Vík, 38 km south-east from the erupting Eyjafjallajökull volcano, reached levels that are 25 times the recommended health limit of 50 μg m^{-3} averaged over 24 hours, on 7 May 2010, with 10-min values reaching 13000 μg m^{-3}. Even after the eruption, values as high as $>$8000 μg m^{-3} (10-min average), and $>$900 μg m^{-3} (24-h average), were measured.

In Reykjavik, 125 km WNW of the volcano, the PM_{10} concentration reached over 2000 μg m^{-3} (10-min average) during an ash storm event on 4 June 2010. The annual concentration in Reykjavik is about 25 μg m^{-3}, and the only previous events of comparable magnitude are peaks during New Year's Eve celebration.

The eruption at Eyjafjallajökull posed a potential health risk to the inhabitants in the regions hit by severe ash fall. However, preliminary studies indicate that the ash has had minor short term health effects. Studies show that the crystalline silica content of the ash is negligible, so that the persistence of deposited ash in the soils and environment should not present a significant silicosis hazard. During periods of PM_{10} concentration over about 5000 μg m^{-3}, most residents stayed indoors, or wore protective air filters and goggles when they had to go outside.

A study is ongoing to examine the potential long term health effects of the volcanic eruption, including the high concentration of PM_{10} during and after the eruption due to re-suspended ash in the area.