

The Eyjafjallajokull Volcanic Ash Cloud and its Effects on Scottish Air Quality. Update 06 May 2010

The volcanic ash cloud from the Eyjafjallakull volcano once again grounded flights from Scottish airports on May 5th. Figure 1 shows a graphic issued by the Volcanic Ash Advisory Centre at midday on 5th May showing the predicted extent of the ash cloud.

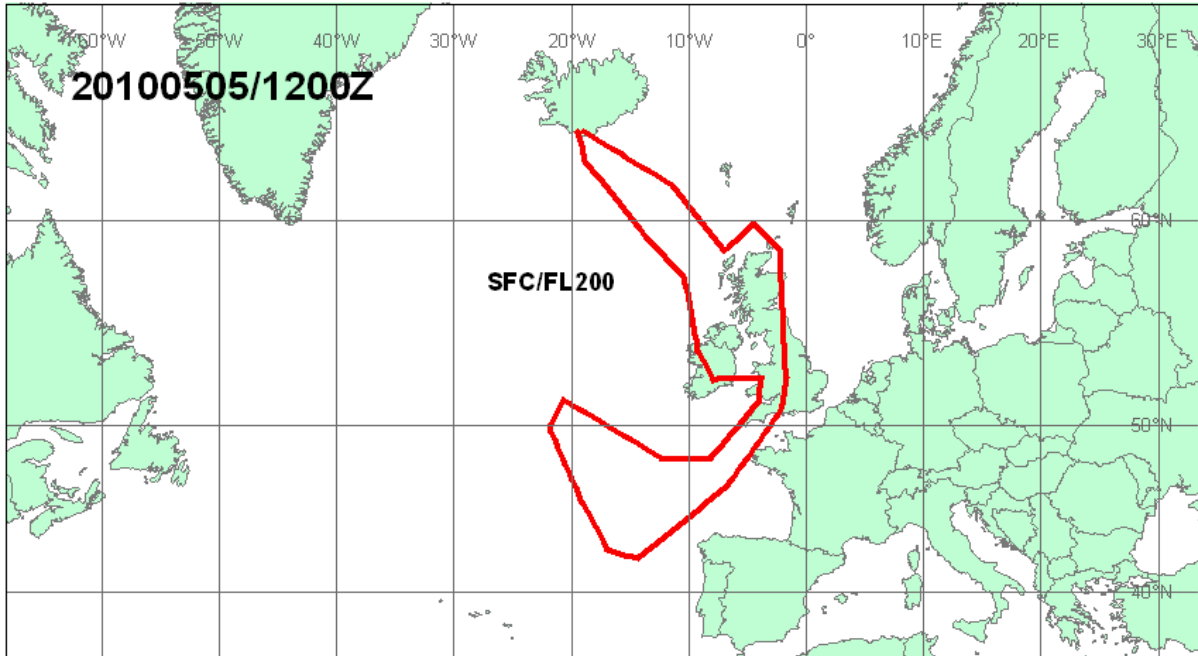


Figure 1. VAAC graphic showing the extent of the Volcanic Ash Cloud as of 12:00Z 5th May 2010.

The volcano has continued to erupt with varying degrees of ash release since 20th March 2010, airspace over the Scotland receives the ash intermittently depending upon meteorological conditions and the extent of ash released by the volcano. On May 4th the Icelandic Metrological Office (IMO) released an update stating that the eruption had become more explosive and was producing more ash this coupled with the metrological conditions at the time were responsible for transporting the ash cloud over Scotland. Figure 2 shows an area of high pressure situated to the south of Iceland on May 5th which created an anti-cyclonic effect. Areas of high pressure in the Northern Hemisphere create clockwise wind patterns and this is exactly what occurred during 4th and 5th May transporting the cloud of ash over the UK. Corresponding Airmass back trajectories from May 5th, Figure 3, support this. Figure 4 shows the volcanic ash plume as captured by NASA's Earth Observing-1 satellite on May 2nd 2010.

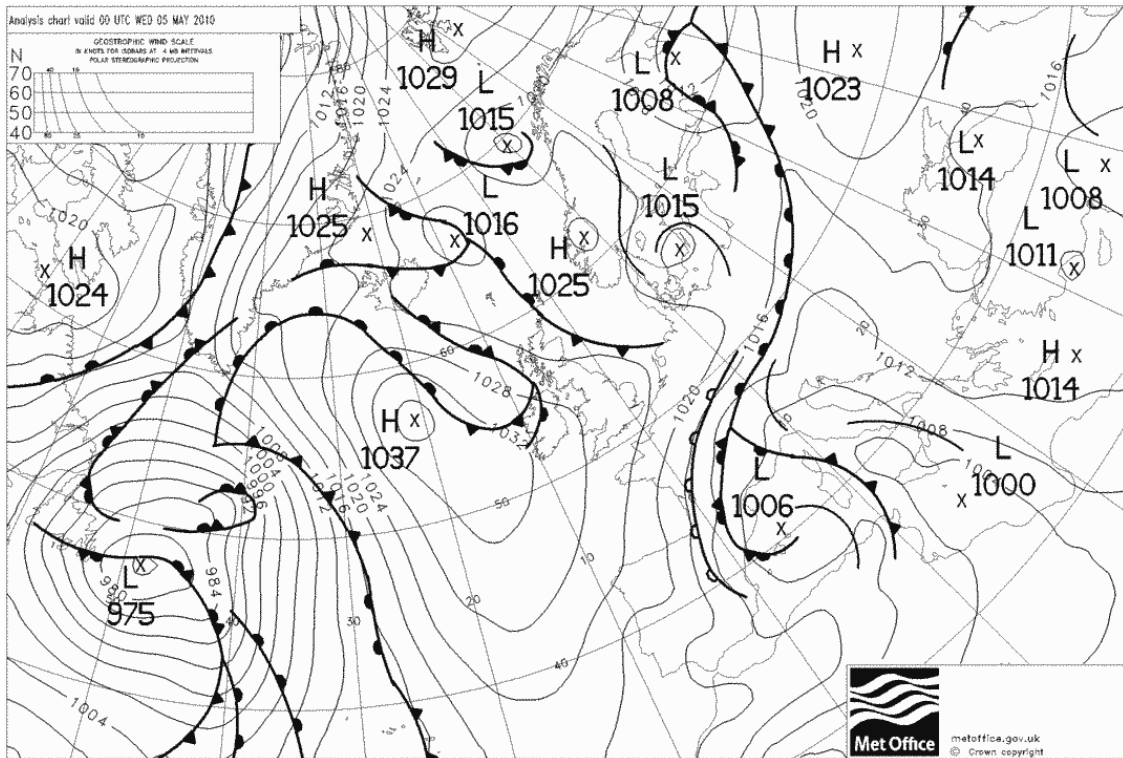


Figure 2. Synoptic Chart showing the area of high pressure south of Iceland on 5th May 00:00

Airmass back trajectories for 96 hours
upto 12:00 Wednesday 05-05-2010

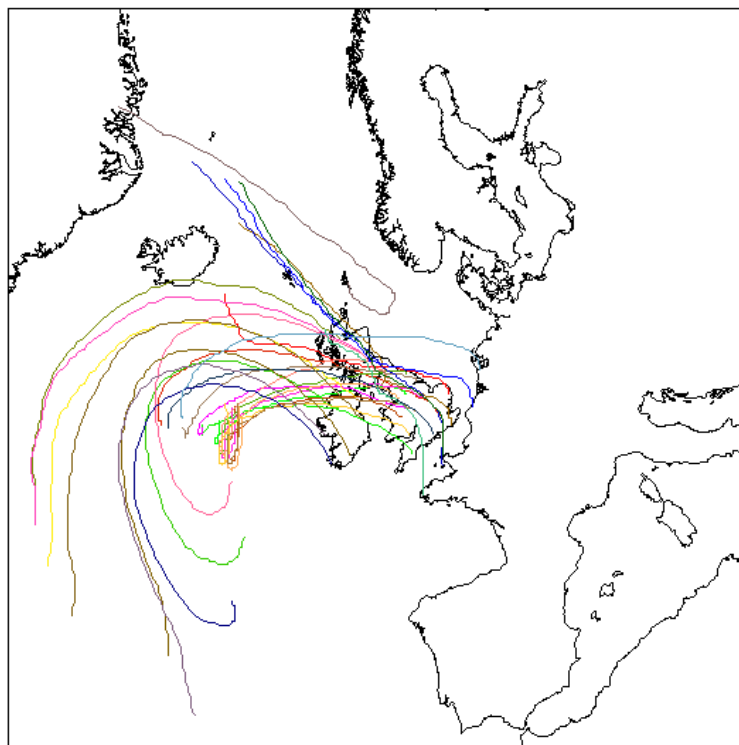


Figure 3. Airmass back trajectories for 5th May 2010

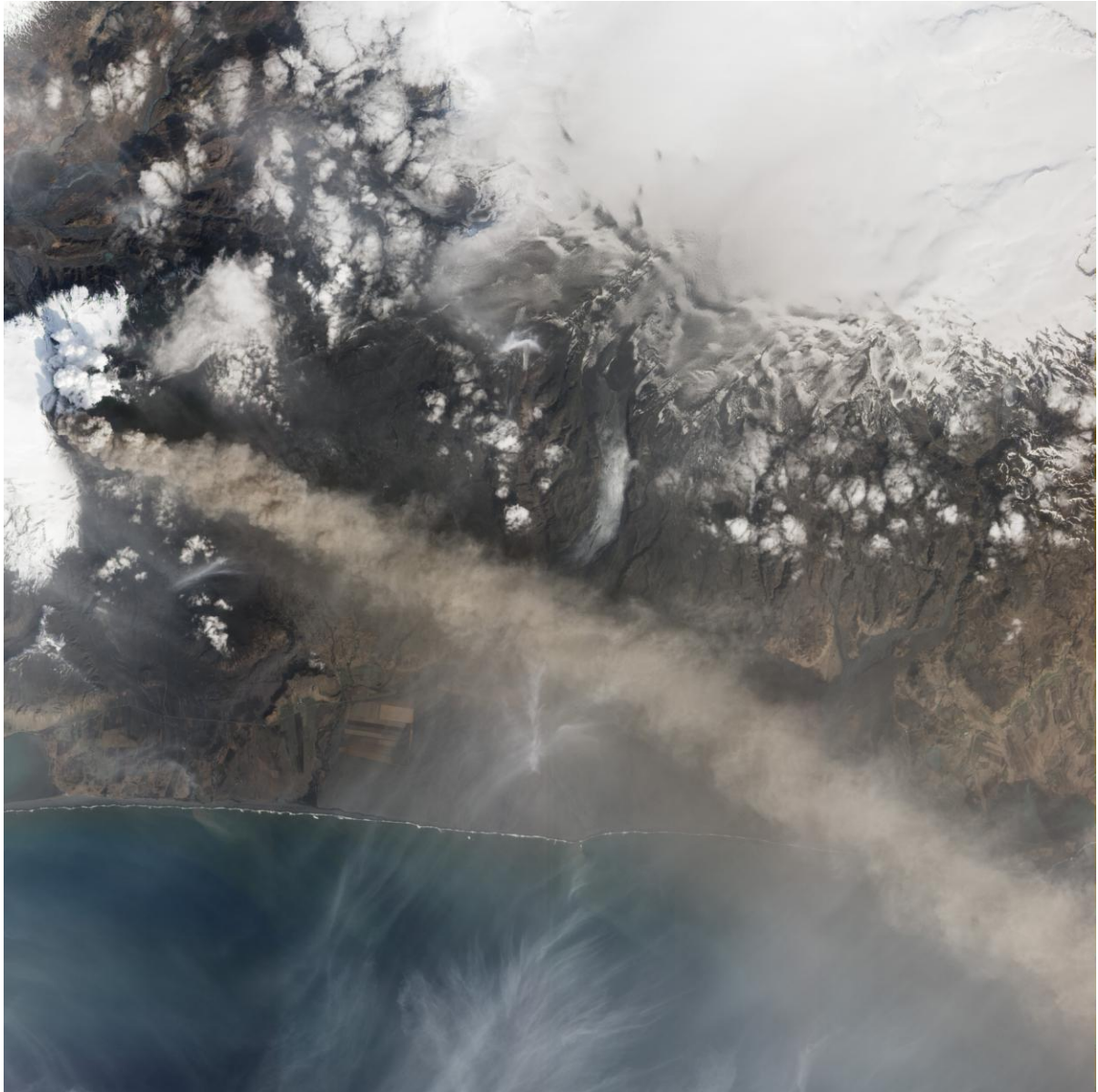


Figure 4. Satellite image of the volcanic ash plume taken on May 2nd.

As of writing this report there has been no significant effects on ground level pollutants that are associated with volcanic plumes (PM_{10} and SO_2) as measured by analysers in the Scottish Government Network. Figures 5 and 6 show graphs of hourly PM_{10} and SO_2 concentrations respectively as measured by analysers in the network, the thick red line represents the average of all the sties.

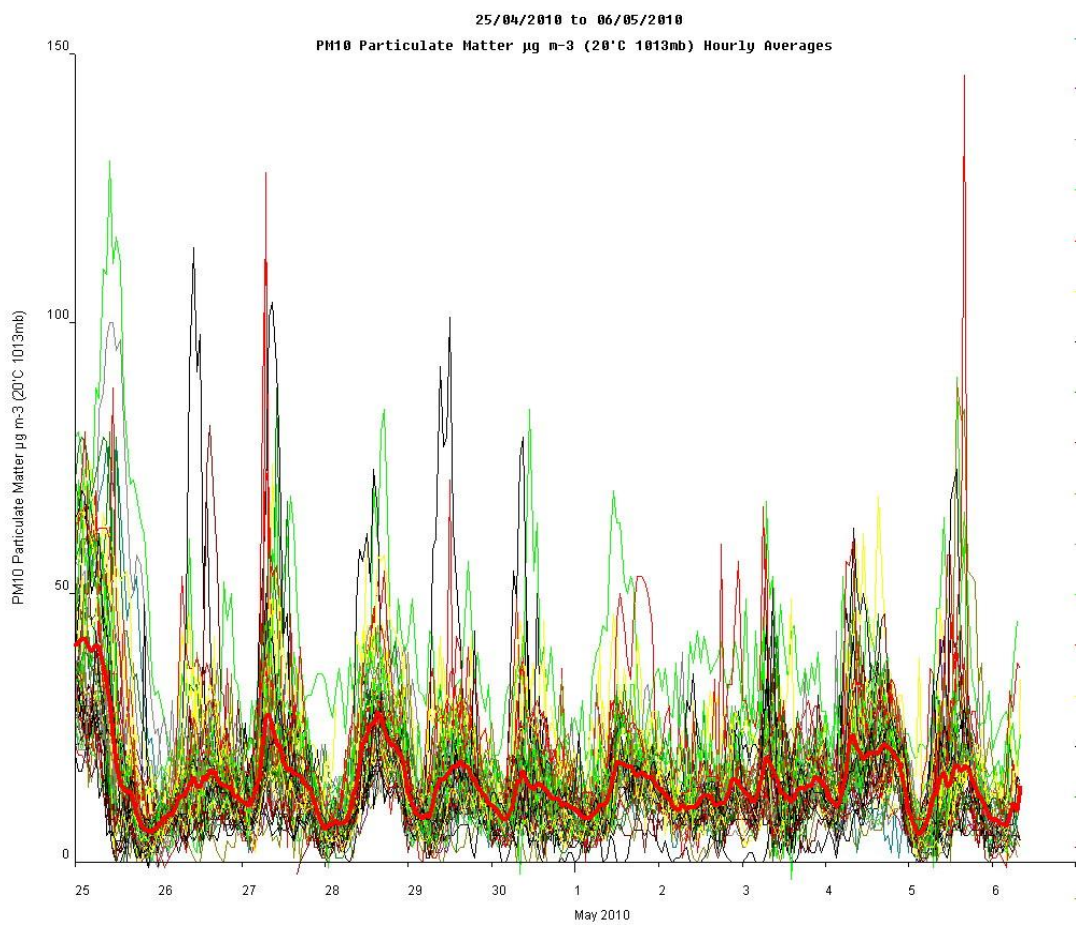


Figure 5. PM₁₀ concentrations as measured between 25th April and May 6th 2010

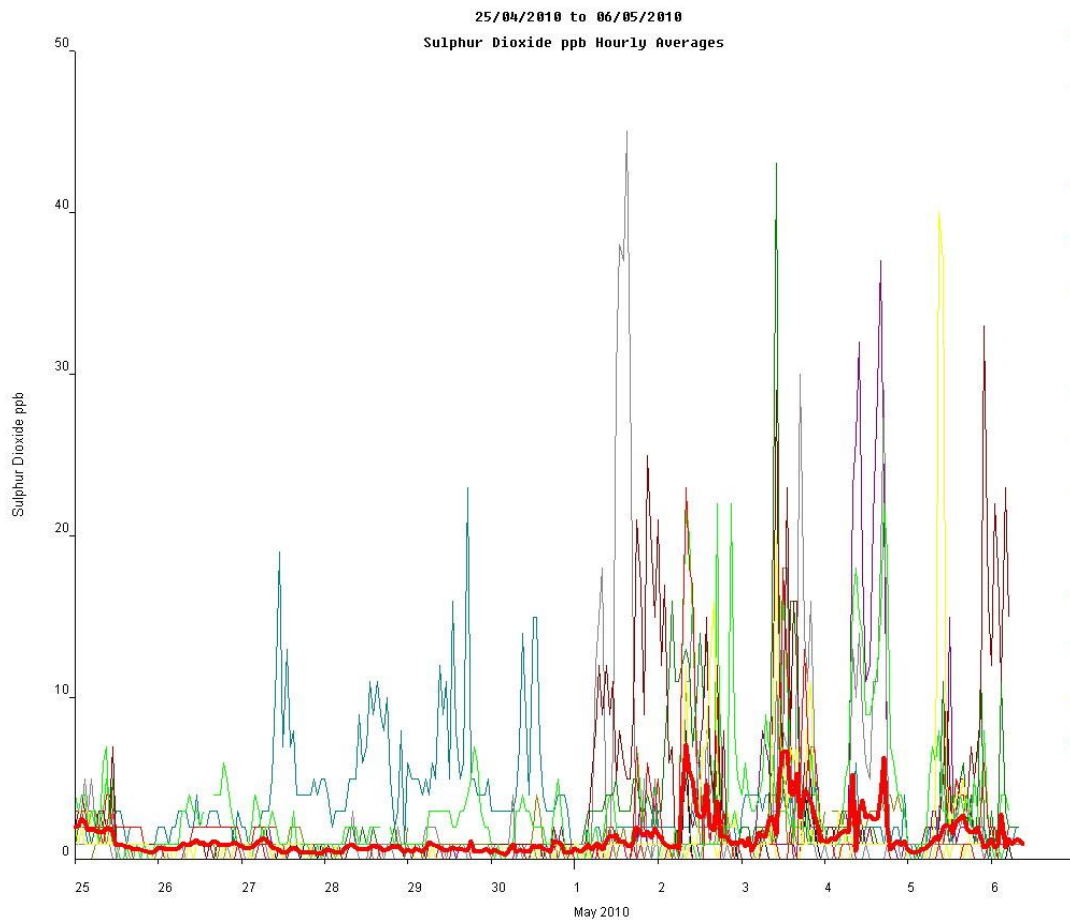


Figure 6. SO₂ concentrations as measured in ppb between 25th April – May 6th 2010

Figure 5 shows that there has been no significant increases in PM₁₀ over the past couple of days. Figure 6 shows some slight increases in concentration for the days preceding May 5th but these are due to local industrial sources. Interpreting the current data there is no evidence of the volcanic ash having had any effect on air pollution as measured by the Scottish Network.

Likely Ongoing Impact of the Eruption?

Figure 7 shows forecasted air mass forward trajectories showing the predicted path of the ash released at midnight each day until May 9th.

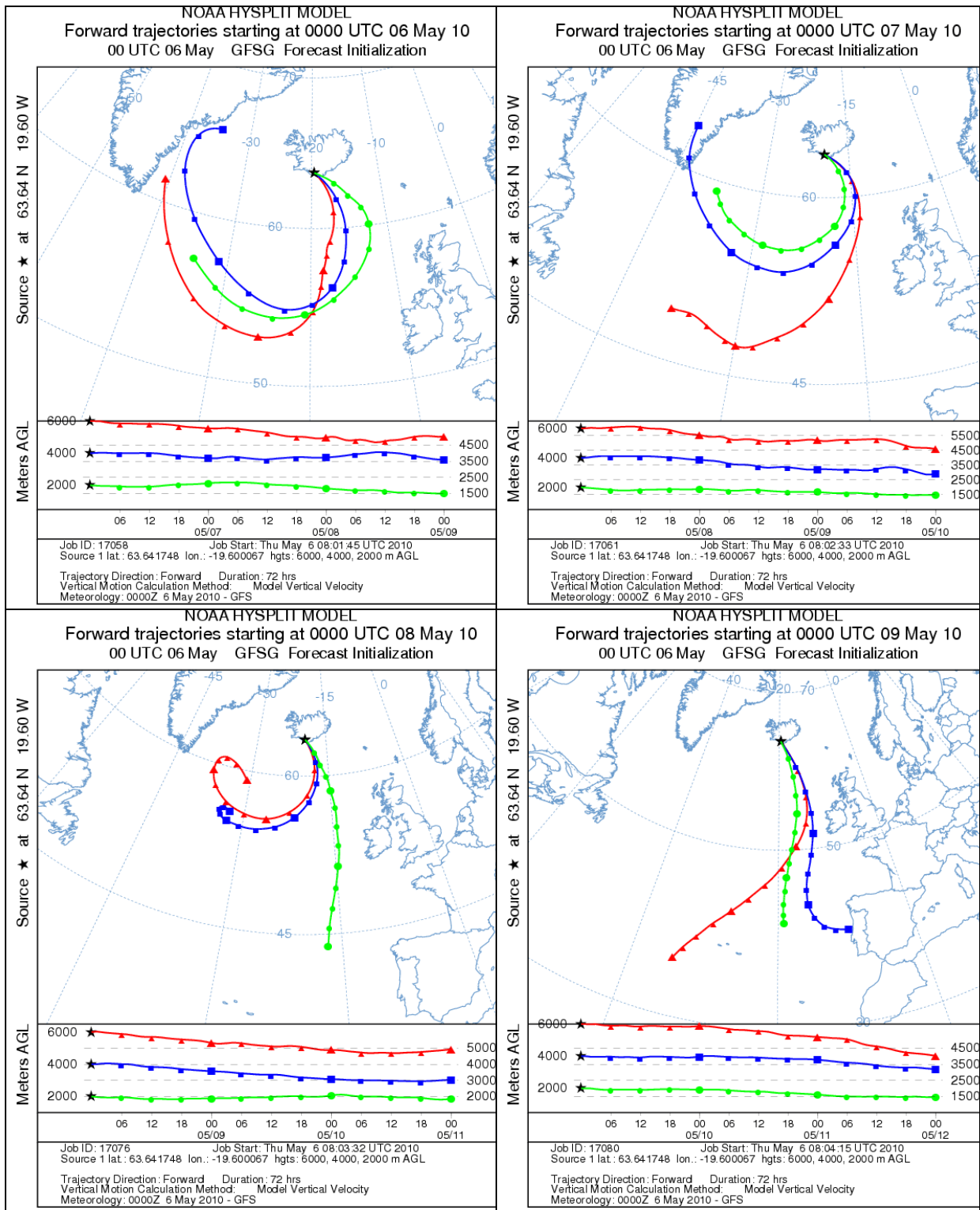


Figure 7. Forecasted airmass forward projections for ash released by the Eyjafjallajökull Volcano between 6th – 10th May.

Figure 7 shows that ash released by the volcano between 6th and 8th May 8th will circulate Eastwards of the volcano and will not significantly enter Scottish airspace. On May 9th trajectories start to begin edging back towards Scotland but Figure 7 shows that the plume is very unlikely to ground over Scotland.

Conclusions

There continues to be no significant effects on Scottish air quality due to the volcanic ash cloud.

Airmass back trajectories suggest that any new ash released from the volcano up until May 9th will not enter Scottish airspace and is therefore unlikely to impact on Scottish Air Quality.

AEA will continue to monitor the situation and keep the Scottish Government up-to-date regarding air quality issues and the volcanic ash cloud.