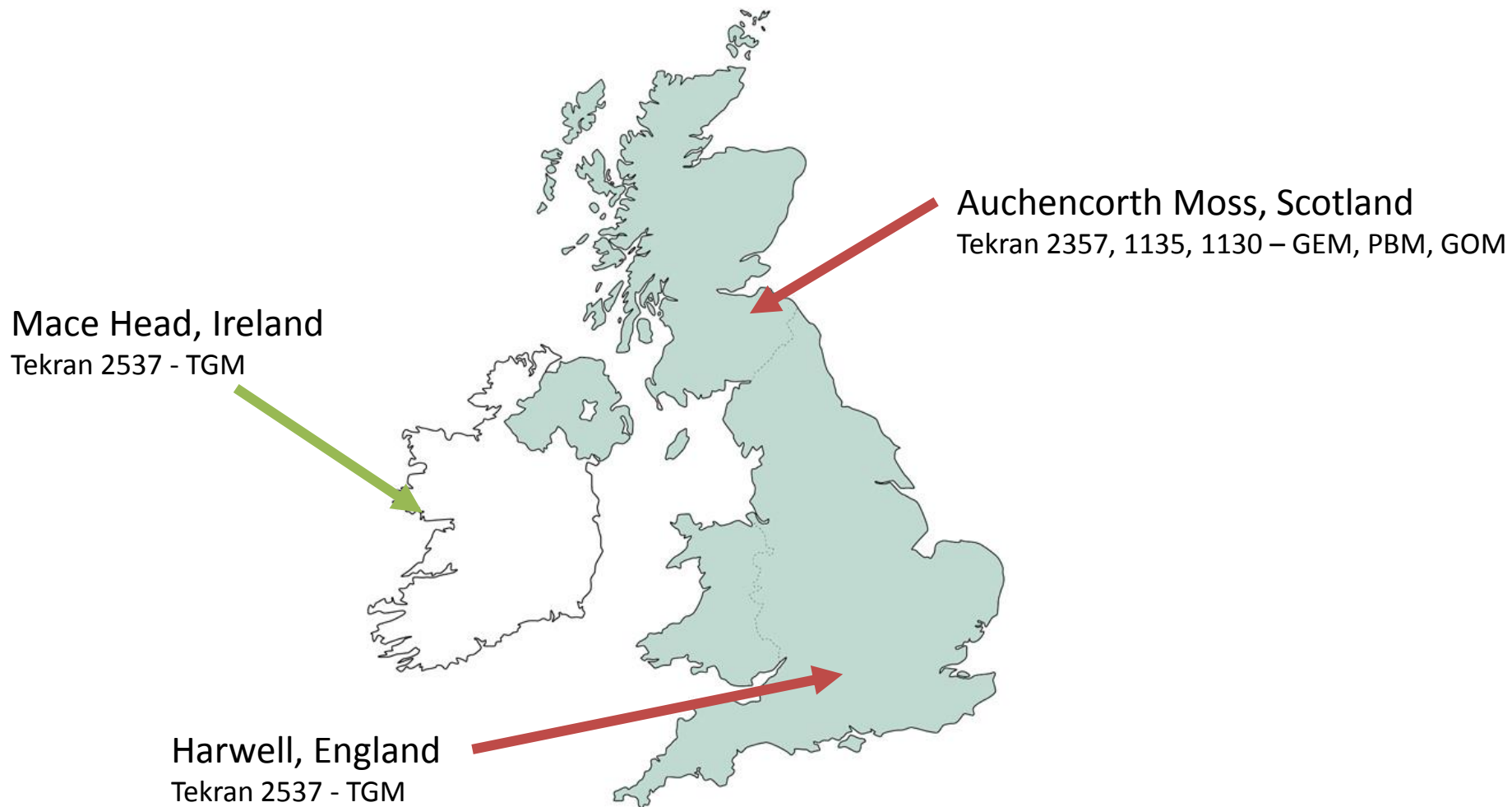


J Kentisbeer, S Leeson, T Clark, M Twigg, M Jones, H Malcolm, C.F. Braban & J.N. Cape

Tracing the mercury in the UK atmosphere – peaks and sources

Monitoring Activities



Site Characteristics



Measurement

Water-soluble gases + particles at PM2.5 & PM10

Black carbon PM2.5

NO/NO2

Meteorology (wind speed, dir'n., temp., RH, precip'n)

Ozone

PM2.5 and PM10 mass (daily)

PM2.5 and PM10 mass (hourly)

PAH (vapour and particle)

PAH (precipitation)

TOMPS (air)

Hydrocarbons (C₂ – C₈)

Particle size and number

Mercury (elemental) in air

Mercury (speciated) in air

Mercury (precipitation)

Heavy metals PM10 (air)

Heavy metals (precip'n)

Ozone, NO_x, SO₂ fluxes

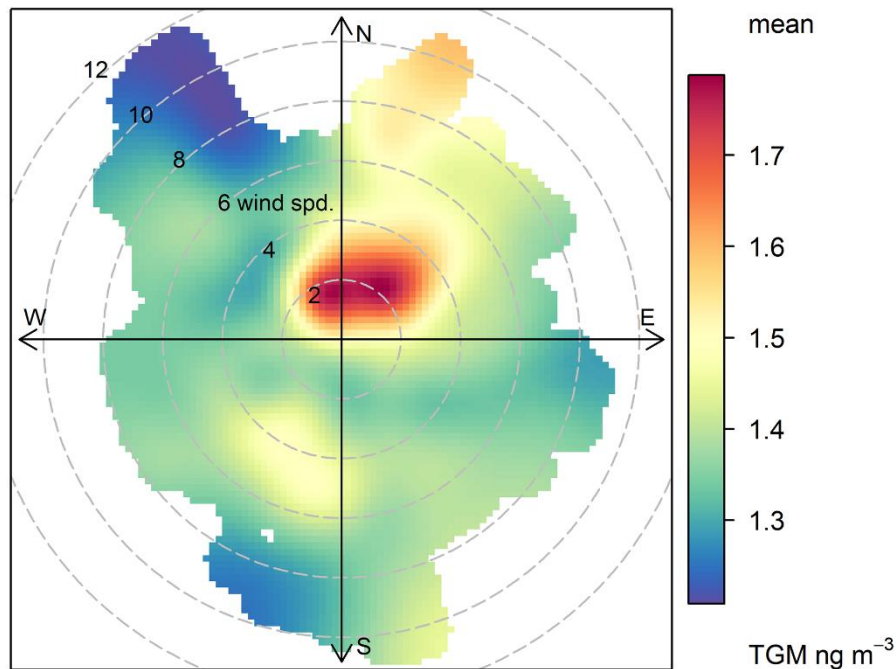
Trace gas fluxes

ECOC (weekly)

TGM at Harwell

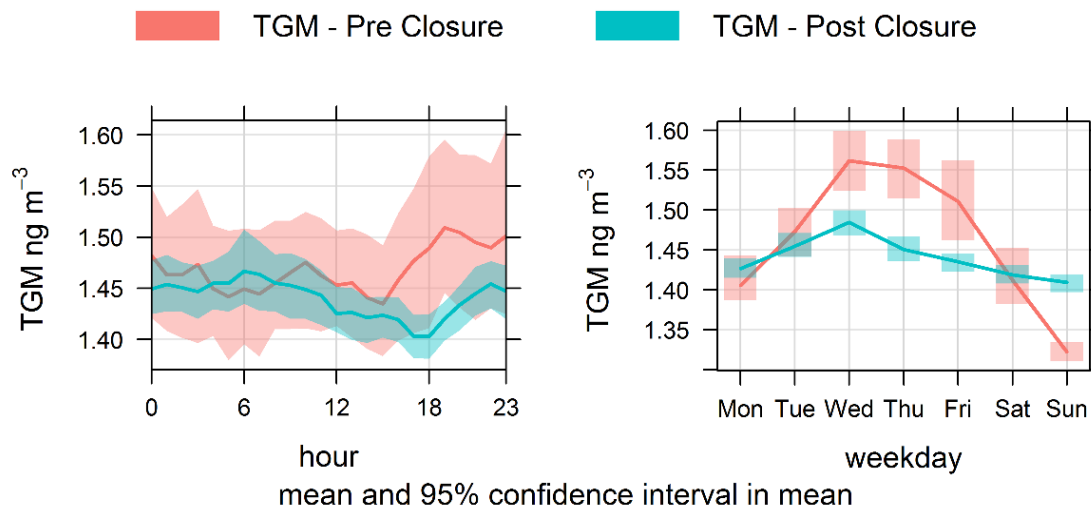
- 2013 average TGM: $1.45 \pm 0.24 \text{ ng m}^{-3}$
- 1995/6 TGM: 1.68 ng m^{-3} (16% Decline)
- TGM largely dominated by Science Campus / Coal-fired power station, Didcot A.
- Didcot A ceased operating on 23rd March 2013.

Didcot A

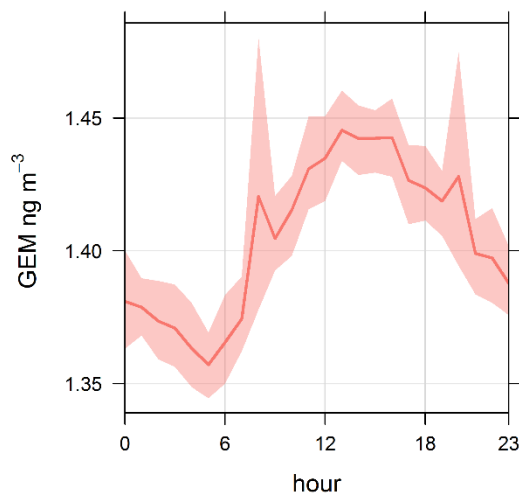


OpenAir Package for R, NERC, Kings College London, Defra, University of Leeds

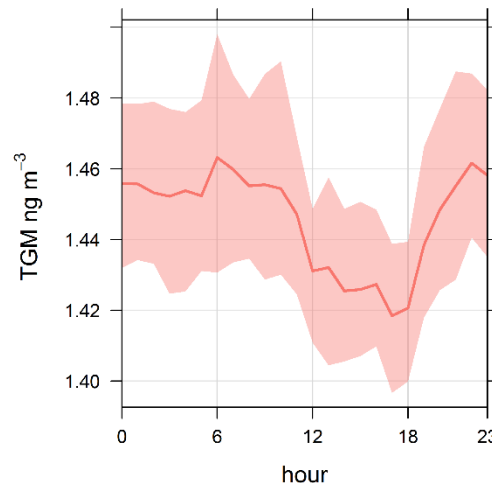
Patterns & Local Influences:

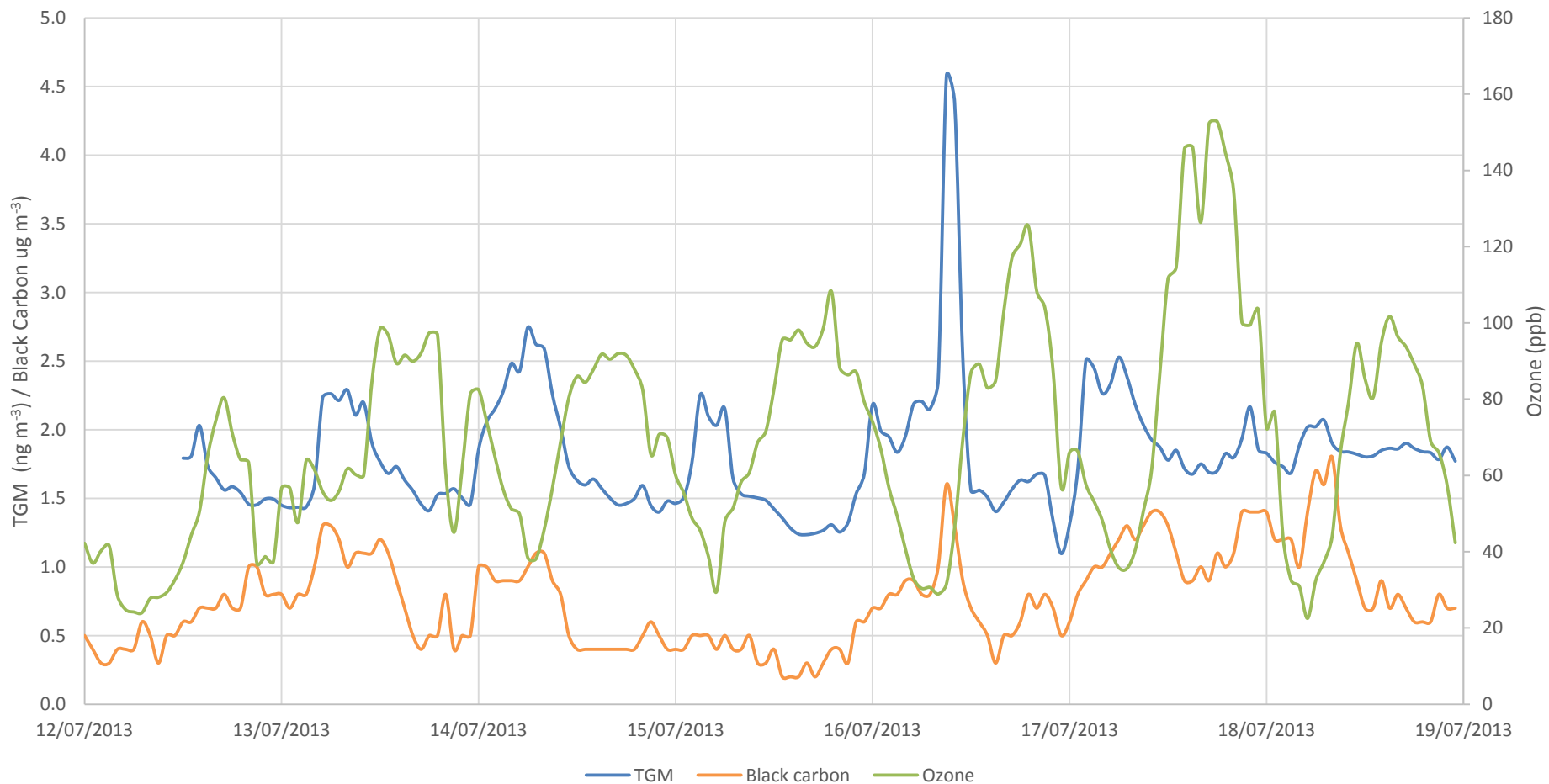


Auchencorth Moss (2009-2011)



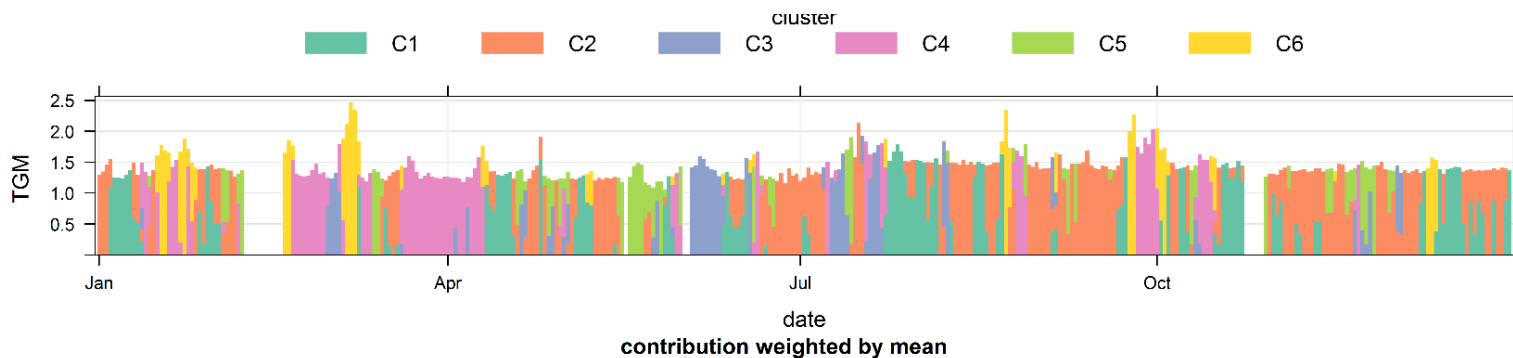
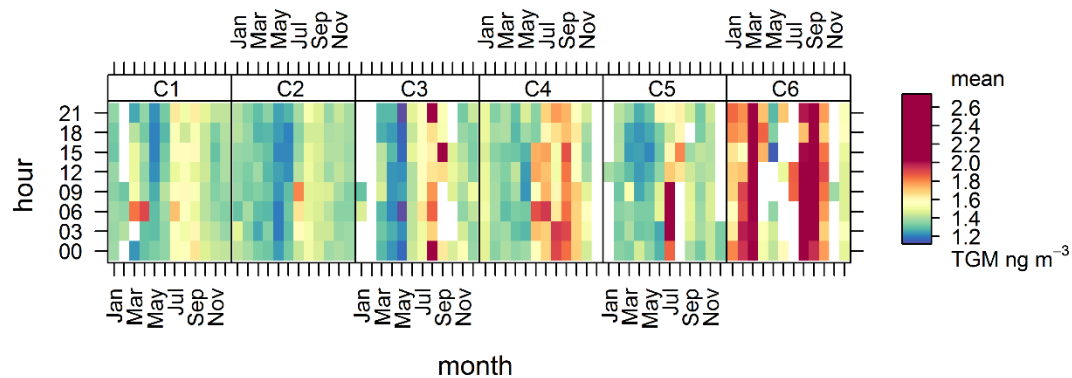
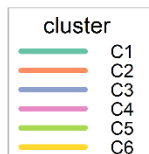
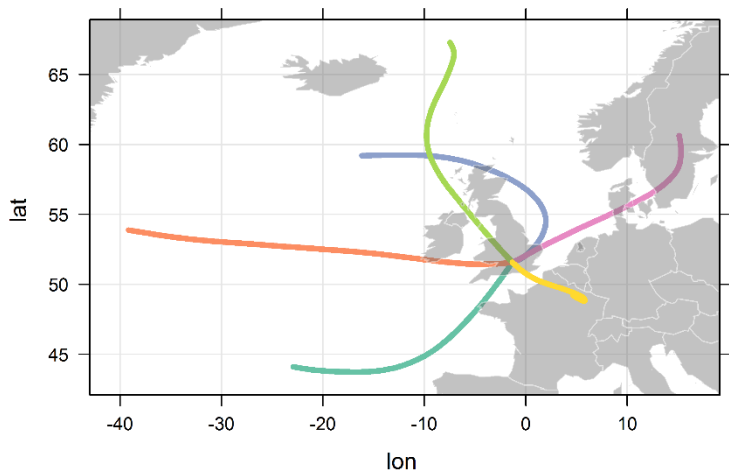
Harwell (2013)





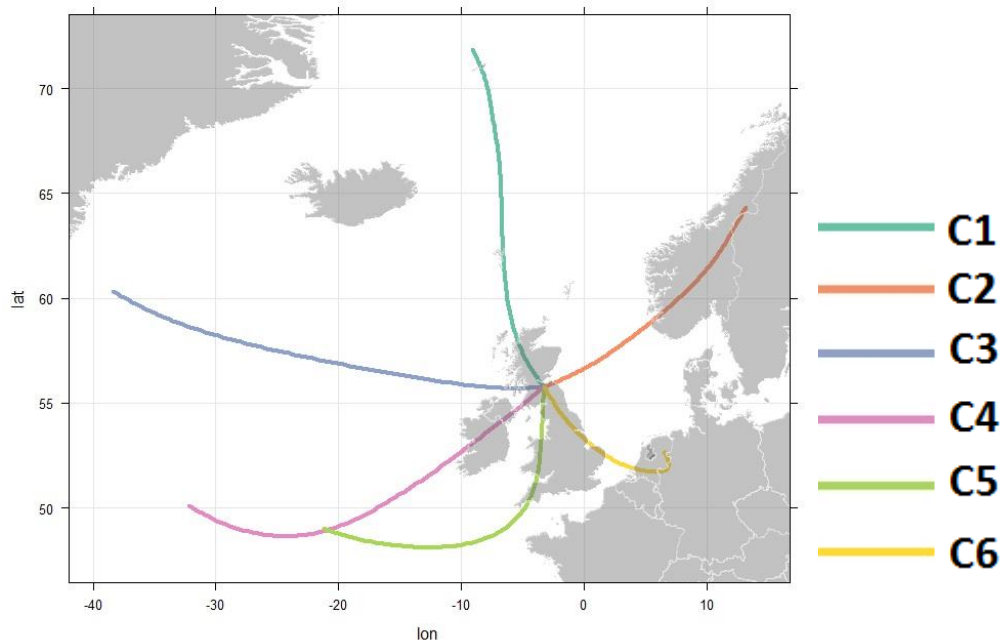
Long-range influences at Harwell

- 2013 TGM data for Harwell
- NOAA Hysplit Reanalysis back trajectories, analysed using OpenAir in R

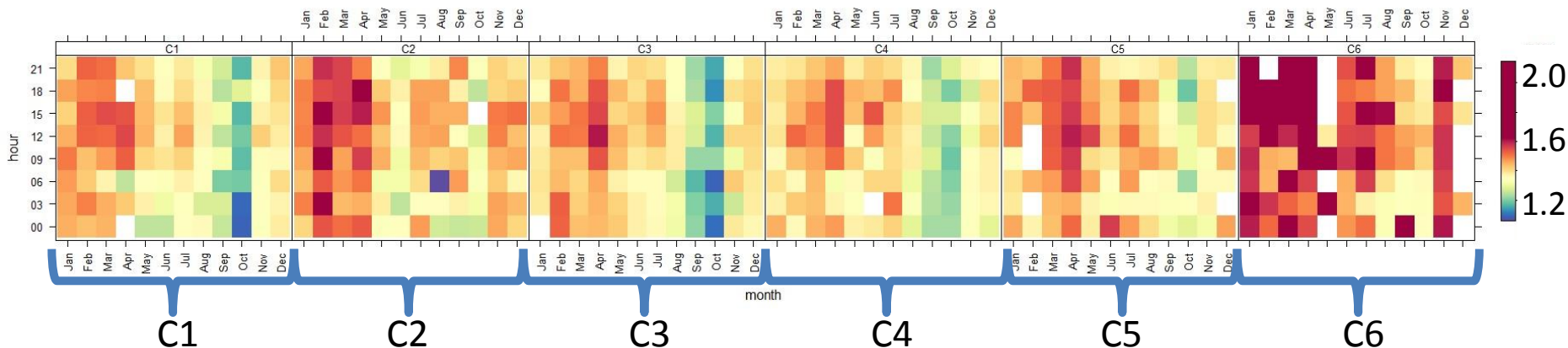


Long-range influences - Auchencorth

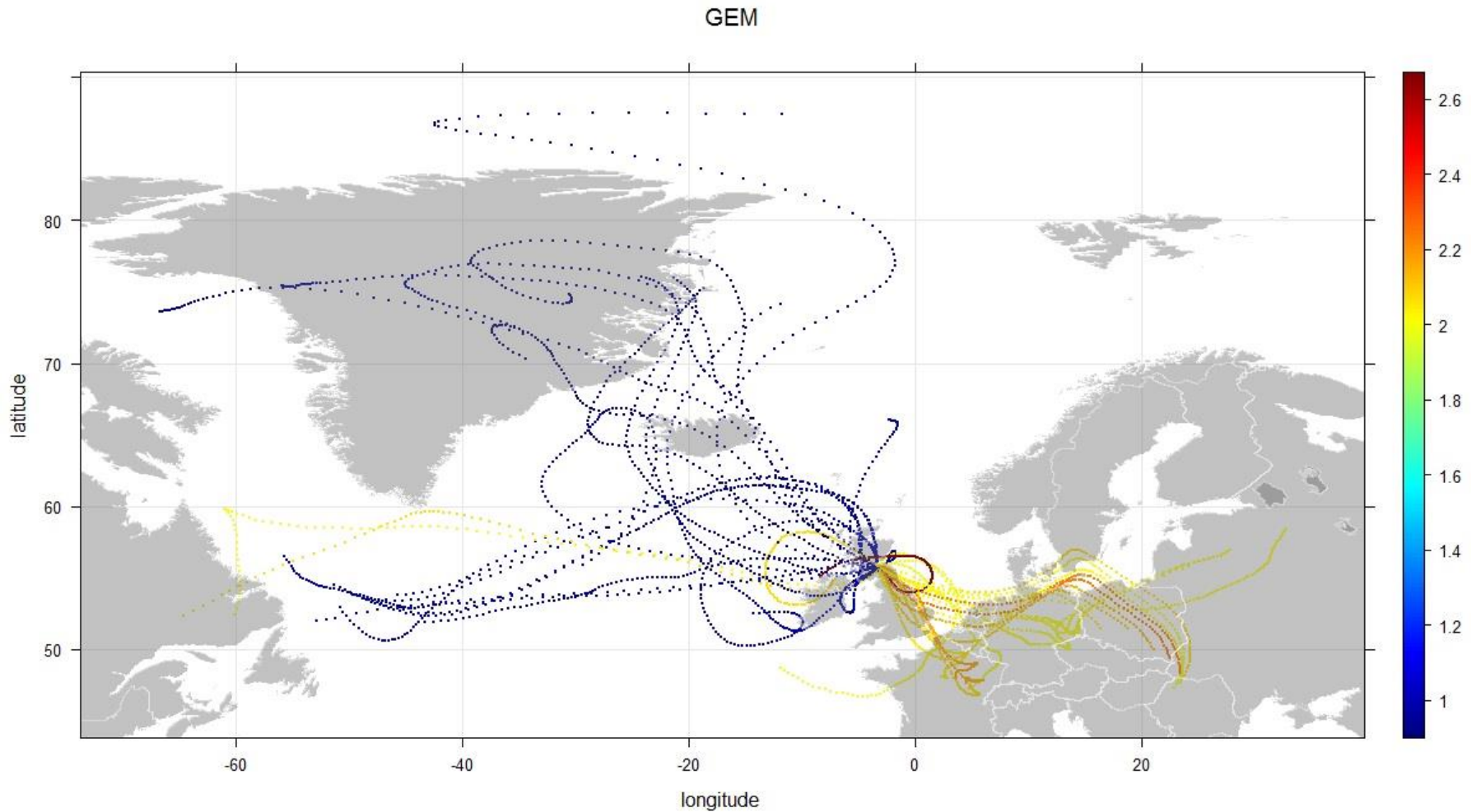
- 2009-11 GEM data



Cluster temporal variations

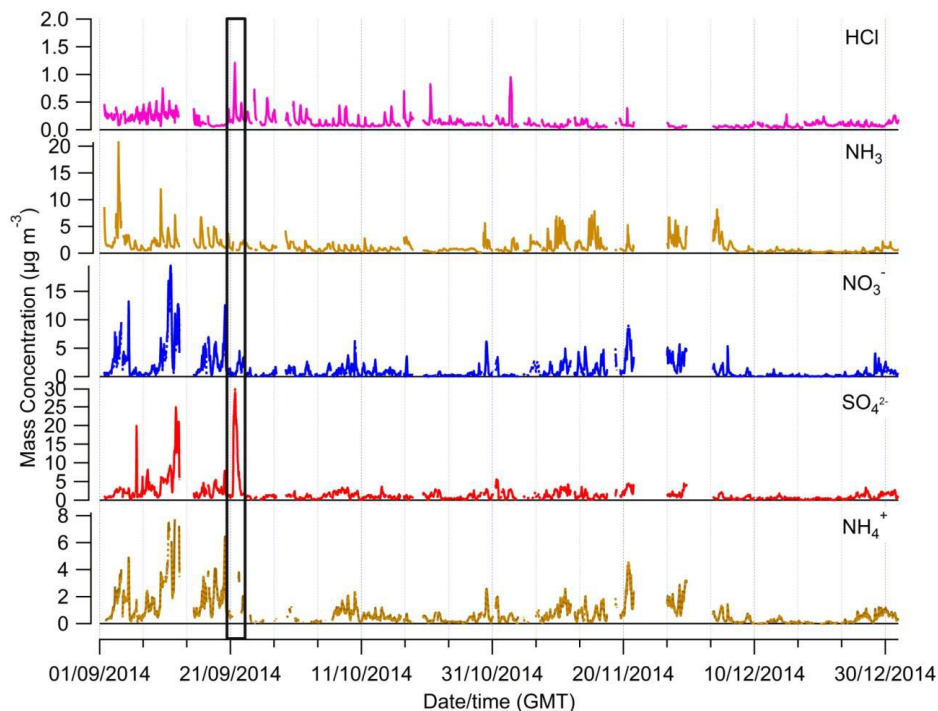


Long-range influences - Auchencorth



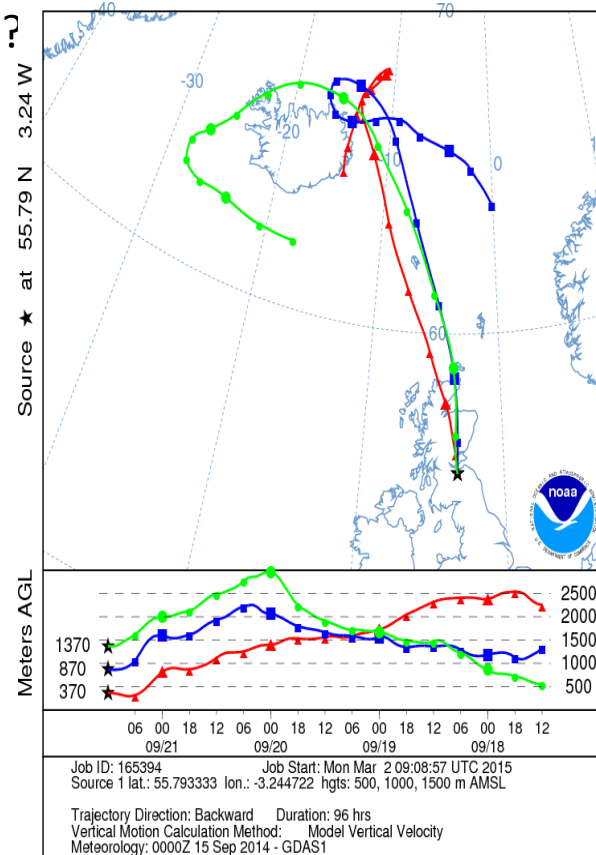
Future work – Peak Events...

- Volcanic eruption in a remote area known as Holuhraun north of Vatnajökull ice cap in Iceland
- MARGA instrument showed a large peak in Sulphate.
- Could we see anything in the speciated mercury data?

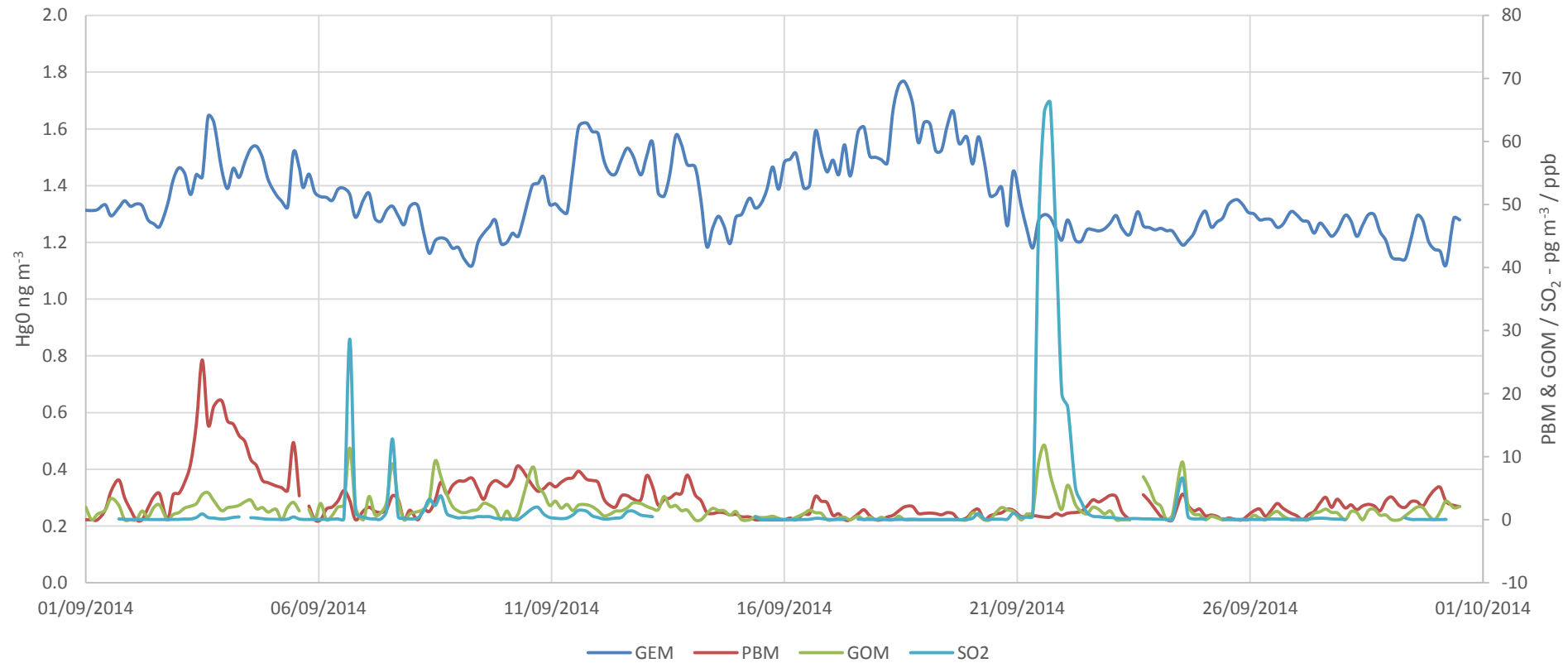


MARGA Instrument data – Sept – Dec 2014

NOAA HYSPLIT MODEL
Backward trajectories ending at 1200 UTC 21 Sep 14
GDAS Meteorological Data



Unfortunately not!



Auchencorth Moss, Speciated Data, September 2014

Future Work

- Auchencorth Moss
 - Cockenzie (2013) & Longannet (2016) coal fired power station closures - what is the impact?
- Harwell
 - EMEP Supersite relocation - what will the spatial and temporal variability be? How will it compare?
- Peaks
 - Are there correlations with other species, if so what are the sources, what is the contribution profile?

Acknowledgements

- UK monitoring activities are carried out by the Centre for Ecology & Hydrology for the Natural Environment Research Council on behalf of Defra and the UK devolved administrations in Scotland, Wales and Northern Ireland.
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