Conference or Workshop Item

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SPATIAL AND TEMPORAL TRENDS IN HEAVY METAL ACCUMULATION IN MOSSES IN THE UK AND EUROPE

Harry Harmens[1], David Norris[1], Eiko Nemitz[2] and participants of the European moss survey

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The first European moss survey was conducted in 1990/1 and has since then been repeated at five-yearly intervals. The most recent survey was conducted in 2005/6, with mosses collected from over 6,000 sites in 28 countries, including the UK. Samples were collected according to a standardised protocol and concentrations for 10 – 12 heavy metals were determined in the last three years' growth segments. European maps were produced based on the EMEP 50x50 km^2 grid, displaying the mean heavy metal concentration for each cell (Harmens *et al*., 2008).

In 2005/6, the lowest concentrations of heavy metals in mosses were generally found in (north) Scandinavia, the Baltic States and northern parts of the United Kingdom, and the highest concentrations were often found in Belgium and eastern European countries. Antimony concentrations were high in densely populated areas and in eastern European countries with high metal pollution levels.

The decline in emission and subsequent deposition of heavy metals across Europe has resulted in a decrease in the heavy metal concentration in mosses since 1990 for the majority of metals. Europe-wide the concentrations of arsenic, cadmium, iron, lead and vanadium have declined the most (by 45-72%), declines in the concentrations of copper, nickel and zinc were intermediate (20-30%), with no significant reductions being found for mercury (12% since 1995) and chromium (2%). Between 1995 and 2005, the decline in heavy metal concentration in mosses in the UK was generally higher than the decline observed European-wide.

Heavy metal deposition maps for the UK based on the metal concentration in mosses were produced for the years 2000 and 2005 (Ashmore *et al*., 2008) and compared with deposition maps based on the rural heavy metal deposition monitoring network (Fowler *et al*., 2006).

This study has relevance to Defra policy as:

- Identifying hotspots of heavy metal deposition in the UK;
- Monitoring the effectiveness of heavy metal emission abatement strategies.

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