

Spatial distribution of trace metals in urban soils and road dusts - GIS and the identification of contaminated areas, Manchester, UK.

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Urban soil quality is of concern under current UK contaminated land legislation in terms of potential impacts on human health and the need for sustainable development. Another environmental media that is a likely source of potentially harmful substances (PHS), with possible deleterious health effects in urban populations, is road dust sediment (RDS). Studies of PHS in RDS and soils of urban areas have been published; yet little is known about the spatial, geochemical and mineralogical linkages between these two different media. The aim of this research is to define these linkages and produce novel mineralogical data on the PHS-particulate relationships within these media.

For this, 72 RDS samples (in winter and in summer) were collected over 75 km<sup>2</sup> in central Manchester and compared to an existing dataset of 300 soil analyses from the British Geological Survey's Geochemical Baseline Survey of the Environment (G-BASE) project. The RDS samples were analysed (<2mm fraction) for major and trace elements by XRF compatible with the G-BASE soil samples. Initial GIS-based interrogations of these datasets show that maximum and average concentrations of PHS are generally higher in soils than in RDS - most significantly for Cr, Ba, Cu, As and Cd. The spatial distribution of trace elements in soil highlights four broad areas showing systematically high concentrations of As, Sb, Cd, Cr, Cu, Pb, Mo, Ni, and Zn at levels in excess of the regional 90th percentile. In RDS, localized sources appear to be most important as concentrations vary considerably even over short distances.