UNRAVELLING THE SOURCES OF LEAD IN THE URBAN SOILS OF GREATER GLASGOW

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Abstract

Lead (Pb) is toxic to all life and even low blood Pb levels can have neurological effects, especially in children <6. With two thirds of the world's population projected to inhabit urban areas by 2050, elevated Pb levels in urban soils is of especial concern due to the high number of children exposed. This project aims to design a model to predict soil Pb values in urban areas, in order to guide future remediation of Pb polluted soils. Such models require in depth understanding of the sources of Pb in urban soils. Subsequently, the factors influencing soil Pb levels were extracted from the literature and tested in Greater Glasgow using the British Geological Survey (BGS) Geochemical Baseline of the Environment (G-BASE) dataset. 9 factors were found to significantly impact soil Pb levels, namely soil organic matter content, historic industry density, building age, land use, soil texture, historic industry type, population density, historic industry distance, and elevation. Additionally, traffic density, building distance, soil pH, road distance and artificial ground had a very weak or no influence on soil Pb levels. The importance of these factors, and the spatial variability of Pb, will be examined on a smaller scale by collecting soil samples from 2 areas in Greater Glasgow. In these samples total Pb concentrations and Pb isotopic ratios will be measured to determine Pb provenance. These results will help improve the accuracy of models predicting soil Pb levels.