

Preface

This special issue of *Geochemistry: Exploration, Environment, Analysis* is on Environmental Geochemistry and contains selected papers presented at the 'Workshop on Environmental Geochemistry: Site Characterization, Waste Disposal, Data Analysis, Case Histories', held in Napoli (Italy) on 4–5 May 2006. Participants from private and public institutions from Canada, Finland, Greece, Italy, the UK and USA took part.

The theme of the workshop was multidisciplinary methods of characterizing contaminated sites using modern geochemistry, with examples from countries in Europe and North America. Special themes included soil, surface and ground water contamination, environment pollution and human health, and data interpretation and management.

During the workshop sampling methods, methods of chemical analyses and quality control, database management, evaluation of background/baseline values, trace metal speciation and bioavailability were discussed, with particular reference to geochemical mapping at the urban, regional and continental scales and to the role of geochemistry in the environment and in human health. At the more local scale, site characterization and site remediation technologies in soil were considered, as well as sewage sludge disposal. Case histories of brownfield sites in Italy, UK and USA were also presented.

The professional papers and those for teaching purposes are to be published by Elsevier in a special volume entitled *Environmental Geochemistry: Site Characterization, Data Analysis, Case Histories*. Nine of the research papers arising from the conference are included in this special journal issue. They are briefly summarized below.

Lima, Plant, De Vivo, Tarvainen, Albanese & Cicchella compare different methods of preparing baseline geochemical maps using the new Forum of European Geological Surveys (FOREGS) data of As in water. The Alkemia interpolation method based on moving weighted median, a map prepared by kriging, and a map of As in water, prepared with a new multifractal inverse distance weighted interpolation method using GeoDas™ software are compared.

Cicchella, De Vivo, Lima, Albanese & Fedele report the results of research on urban soils of the Campania region, based on multielement analysis of c. 2000 topsoil samples, with particular reference to the potentially harmful elements.

Cicchella, De Vivo, Lima, Albanese, McGill & Parrish discuss the distribution of heavy metals in the urban soils of Napoli, and combine Pb isotope measurements with R-mode factor analysis to differentiate natural from anthropogenic sources of metal.

Albanese evaluates the bioavailability of some potentially harmful elements in urban soils in five main cities in the Campania region of Italy by comparing the results of aqua regia leaching and ammonium acetate–EDTA extraction.

Cicchella, Fedele, De Vivo, Albanese & Lima discuss the results of a detailed study of the platinum group elements (PGEs) in topsoils from the urban areas of Avellino, Benevento, Caserta and Salerno in the Campania region, Italy.

Colombo, Oates, Monhemius & Plant discuss the interactions of Pt, Pd and Rh with different inorganics based on thermodynamic calculations. Eh–pH diagrams for the PGEs in aqueous systems under ambient conditions are presented. The results suggest that the PGEs occur as aqueous complexes that can be transported in environmental and biological systems and may be able to enter the food chain.

Fedele, Plant, De Vivo & Lima investigate the distribution of rare earth elements (REE) over Europe using new geochemical data prepared by FOREGS, to estimate baseline values and to identify anomalous levels attributable to anthropogenic sources. Three-component colour maps of REE ratios are used to identify the major plates of the Variscan orogeny in Europe.

Foley & Ayuso discuss mineral sources and transport pathways for As release in a coastal watershed (Maine, USA). The results show that As contents of soils and groundwater reflect the predominant influence and integration of a spectrum of primary mineral reservoirs and that cycling of As through metasedimentary bedrock aquifers may depend on consecutive stages of carbonation, oxidation and reductive dissolution of primary and secondary arsenic host minerals.

Ayuso & Foley report the results of a study in Maine (USA) to determine whether Pb isotopes in Fe-hydroxides in sulphide-rich bedrock could be linked to coexisting sulphides or to Pb derived from human activities.

B. De Vivo, J. A. Plant & A. Lima