

Tellus Border: regional geochemical surveys of the northern region of Ireland

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Regional-scale environmental baseline geochemical surveys of the northern region of Ireland are in progress, operated by the Geological Surveys of Ireland and Northern Ireland. A survey of Northern Ireland was completed in 2007 and multi-element analytical data are available for topsoil, subsoil, stream sediments and stream waters geochemistry. The *Tellus Border* project is a continuation of these surveys and is currently undertaking fieldwork and analyses across the border region of Ireland, and newly-acquired data are expected to be ready in 2012–2013. The aim is to produce integrated datasets and interpretations of the regional geochemistry of the northern region of Ireland, improving understanding of key element distributions and to distinguish geogenic element sources from anthropogenic signatures and near-surface geochemical cycling.

The authors shall present an overview of some of the geochemical results of the survey of Northern Ireland, for example, elements that have a significant role in environment and health. Anomalies identified in Northern Ireland may be of interest in the border

region of Ireland. Potentially harmful elements, including As, Cd, Pb and Zn, reveal strongly geologically controlled distributions in soils and sediments, and naturally elevated baseline signatures are associated with known mineralisation occurrences, particularly in western Northern Ireland [1]. An extension of the data capture over the border is hoped to further reveal the geological control on the sources of these elements.

Multi-media analytical data on the geochemical distribution across soils, sediments and waters of catchments gives unique insights into element behaviour and mobilities across this geologically diverse region. For example, anomalies observed in stream sediments that are more apparent than in systematic soil surveys, can reveal spatially defined geological sources. Arsenic distributions in different sample media in Northern Ireland are in unusually close agreement previously not observed in comparable European-wide and national geochemical surveys [1].

Documented challenges related to trace element distributions in the near-surface environment shall be

better investigated in the context of regional geochemical data. The project shall investigate elements of interest for human and animal health in the border region of Ireland, such as apparently elevated concentrations of Mo and Cu in soils resulting in potential toxicity and affects on pastoral agriculture.

Tellus Border is co-funded under the Environment theme of the EU Regional Development Fund INTERREG IVA Programme (managed by SEUPB*), and by the Department of the Environment, Community and Local Government (RoI), and the Department of the Environment (NI). It is anticipated that improved understanding of the regional geochemistry in this region of Ireland will aid land-users and policy makers alike. The focus is on environmental rather than exploration geochemistry, and developing and communicating positive societal benefits for alternative

sectors such as agriculture, water management and environmental health.

References

[1] Ander, E.L., Breward, N., Flight, D.M.A., Lister, T.R., Smyth, D. and Young, M.E. Regional geochemistry of Northern Ireland: environmental and health implications. In Press: *Geochemistry: Exploration, Environment, Analysis*, 2012.

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