

The Geochemical Atlas of Sweden — element background concentrations in till

M. SADEGHI^{1*}, M. ANDERSSON¹, A. LADENBERGER^{1*}, M. CARLSSON¹, J. UHLBÄCK¹, G. MORRIS¹

¹*Geological Survey of Sweden, Box 670, S-751 28 Uppsala, Sweden (*correspondence: martiya.sadeghi@sgu.se; anna.ladenberger@sgu.se)*

Till reflects the underlying bedrock with its billion years old geological history and records soil-formation processes such as weathering style during variable climate conditions. The Geochemical Atlas of Sweden provides a harmonized countrywide database with modern baseline geochemical data on till from the C horizon. The work was carried out between 2011 and 2014 and has been based on till samples from the SGU archive as well as on new sampling of till conducted mainly in the mountainous areas of western Sweden.

Chemical analyses (aqua regia digestion by ICP MS) were carried out at the ALS laboratory in Luleå and at the SGU laboratory in Uppsala with strict quality control routines. As a result, 67 (element and pH) maps in till were produced. 53 element maps of grazing land soil chemistry (from the GEMAS project), and 14 biogeochemical maps (based on geochemistry of aquatic plants from earlier SGU campaigns) have also been included in this project.

The interpretation of the elemental maps and associated statistics has revealed several groups of factors influencing the observed spatial trends in the geochemical patterns. The most important being bedrock geology, the presence of ore deposits, the soil type and its properties, and climate zone controlled by the latitude and altitude.

The results of this survey are available free to the public and can be used for university education, mineral exploration, environmental monitoring, in forensic studies and epidemiology as well as for policy making and spatial planning by local authorities. The geochemistry of till in northern European countries is an excellent proxy for groundwater quality assessments and risk evaluations. To allow broad use of the Atlas both on the national and international level, Swedish and English languages have been used simultaneously throughout the book.

References:

Andersson, M., Carlsson, M., Ladenberger, A.,
Morris, G., Sadeghi, M., Uhlbäck, J., 2014:
Geochemical Atlas of Sweden (Geokemisk atlas över Sverige)
Sveriges Geologiska Undersökning, 210 pp.