The geochemical atlas of Sweden – a new national geochemical baseline dataset

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This project was initiated in 2011 in order to create a harmonized countrywide database with modern baseline geochemical data and resulted in the recent publication of the Geochemical Atlas of Sweden. The work 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. When the last ice sheet melted about 10 000 years ago, large parts of the bedrock in Fennoscandia were covered by several generations of glacial deposits with till as most important. Till reflects best the underlying bedrock with its billion years old history and records soil-formation processes such as weathering style during variable climate conditions.

Chemical analyses (aqua regia digestion by ICP MS) were carried out at the ALS laboratory in Luleå and at the SGU laboratory in Uppsala following strict quality control routine which included sample randomization and use of various in-house and international standards. As a result, 67 maps of elements and pH in till were produced. In addition, 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 been included in this project.

The interpretation of the elemental maps and statistics has revealed several groups of factors influencing the observed spatial trends in the geochemical patterns with 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 freely available to the public (http://www.sgu.se/en/products/data/use-data-from-sgu/) and may 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.