

ABSTRACT

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For the Geochemical Atlas of Northern Europe, primary data from 28 (8 international and 20 national) regional geochemical mapping projects carried out in 1980-2005 were merged into one database. In the first phase, a meta-database including all relevant information about the projects was compiled. The projects covered NW Russia, Finland, Sweden, Norway, Estonia, Latvia and Lithuania. The project data base includes information on 58,311 samples. Sampling materials varied from project to project, representing surficial deposits such as minerogenic and organic soil, minerogenic and organic stream sediment, stream water, and terrestrial moss. Data from some 90,000 analyzed sub-samples include determinations after total, aqua regia or ammonium acetate extraction for more than 50 parameters such as heavy metals, major and trace elements, pH, and EC.

The Atlas includes 296 geochemical maps showing the spatial distribution of a wide range of elements, their associations, and different combinations of anomalous geochemical fields (AGFs). 233 single element maps and 63 derivative maps are included. Additionally, accessory maps illustrating natural conditions and features of human activity in Northern Europe were prepared.

The collected geochemical information was used to assess the mineral potential and environmental status of the region. Element concentrations in surface water are primarily controlled by regional landscape properties such as the type of relief, climate-vegetation zones and the influence of marine aerosols. The chemical composition of minerogenic soil horizons, stream sediment and the fine fraction of till reflects mineralogical features of bedrock and mineralizations. Land use and anthropogenic pollution have a strong effect on moss, the organic soil horizon and, in some cases, on the uppermost soil layer. Surface waters and stream sediments are only locally affected by anthropogenic influences in or close to urban and industrially active areas.

The results, presented on the map of ore-related geochemical anomalies, revealed among others 30 new districts recommended for the exploration of diamonds, Cr, V, rare metals and rare earth elements, bauxites, celestine and apatite ores.

KEYWORDS: geochemical maps, ore-related geochemical anomalies, ecogeochemical anomalies, integrated anomalous geochemical fields (AGF), landscape taxon, summary index of pollution, digital model, Northern Europe.

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