

UltraLIM - Ultra low-impact exploration methods in the subarctic

Pertti Sarala and Vesa Nykänen

The UltraLIM project compares several ultra light geochemical methods and sampling techniques and aims to find the best practices for sampling and assaying samples from very sensitive subarctic regions. Sample media used in this project are the sediments of the upper parts of soils, organic layers, plants and snow. The research will be conducted on known mineral deposit targets given by GTK and the industry partners of the project. Research partners of the project are the Geological Survey of Finland and the University of Oulu.

There is an increasing demand to develop effective methods for exploration in poorly exposed and deep-seated mineralized bedrock sources, under thick sediment cover which are often characterized by complex glacial dispersal patterns. The exploration methods should be applicable particularly in environmentally sensitive, subarctic areas and therefore the methods should have a very low impact on the nature.

The study is divided into three modules: 1) Weak leach techniques, 2) Biogeochemistry, 3) Snow geochemistry. The sampling and assaying is repeated twice in subsequent years in order to evaluate the repeatability, accuracy and precision of the methods. Also a number of quality control samples will be used.

The target areas include variable mineral occurrence types (e.g. Au, base metals, REE etc.) and variable Quaternary geological conditions (e.g. thick glaciofluvial deposits, moraines, peatlands).

Deviations from standard sampling procedure may occur due to geological conditions. The number of sampling points will be ca. 250 in total.

Duplicate sampling (5%) and repeated sampling in subsequent years (50% of sampling sites) will be used for quality control.



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- Needs
 - New mineral discoveries
 - Mineral exploration in the subarctic areas covered by thick glacial deposits, peat bogs and weathered bedrock
 - Practical knowledge and experimental results of exploration methods for environmentally sensitive areas
- Approach
 - Use of upper parts of the mineral soils, organic layers, plants and snow as the sample media for exploration
 - Comparison of sampling and assay techniques
 - Find the best practices for sampling and assaying samples in very sensitive subarctic regions
- Benefits
 - New applications and knowledge for the mineral exploration with minimum impact on environment
- Users
 - Mining and exploration companies
 - Scientific community



Contact: pertti.sarala@gtk.fi, vesa.nykanen@gtk.fi, vesa.peuraniemi@oulu.fi

UltraLIM / Pertti Sarala



www.gtk.fi



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Results

UltraLIM project produces research information of several low impact geochemical techniques for mineral exploration within previously glaciated terrains. This research gives reliable and practically tested benchmarks for the use different geochemical sampling and assay techniques in mineral exploration within the subarctic. The project aims to find the best geochemical practices for locating mineral deposits under thick soil cover. The project also aims to promote the use of methods and results in exploration in Finland.



Geochemical sampling methods for plant, top soil and snow provides environment-friendly way to mineral exploration.
Photos P. Sarala

Geological Survey of Finland, P.O. Box 77, 96101 Rovaniemi, Finland
pertti.sarala@gtk.fi



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