

Title: SCanning Of mineral system signatuRES (SCORES)

This project will produce a feasibility study of setting up diamond drill core scanning facilities in Europe. The aim of the project is to define mineral system signatures by scanning drill cores, using different mineral identification techniques. Methods include such as hyperspectral sensing, on-line elemental XRF analysis, Light Detection and Ranging, magnetic susceptibility and gamma radiation measurements. Project will provide information on techniques suitable for near real-time data acquisition during drilling. This is a pilot project that creates the knowledge base for defining architecture for virtual drill core library from data acquisition into data delivery.

Project tests which of these techniques are adequate for detecting mineralogy and which of information can be acquired in mineral exploration. Drill core scanning would be performed prior to drill core logging. This allows automatic detection of mineralization signatures, i.e. mineralogy, grade and concentrations.

The data will be used to build a virtual drill core library for data delivery to allow rapid recognition of mineral potential signatures of specific ore types. The national libraries would be available for exploration companies and research organizations.

Well known mineralizations will be selected for case studies. E.g. in Finland the Pampalo orogenic gold deposit with an alteration halo and known mineral paragenesis will be used as an example site.

The project is composed of the following work packages:

- 1) Testing of various scanning techniques
What scanning techniques would be most useful for detecting signatures of different types of deposits. Preliminary evaluation of the technical requirements for national scanning facilities will be made.
- 2) Data analysis
Data mining techniques will be utilized to process the data for mineral interpretation. The most efficient data processing chain will be developed to reveal a variety of different indications of mineral deposit types.
- 3) Virtual drill core library
The purpose of the national drill core data would be efficient delivery of the scanned raw data for the purpose of mineralization system signatures. Ideally the data would be to interpreted as prospectivity of a certain ore element to be viewed in a web based service. The purpose is the define the requirements for the library.

Research partners:

Geological Survey of Finland, coordinator

Aalto University, School of Electrical Engineering, Department of Automation and Systems Technology

Industry partners: