



## **HazArctic – Geo-Bio Hazards in the Arctic Region**

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In Finland, more metals are released into the environment from acid sulfate soils than from the entire Finnish industry. Occurrences of acid sulfate soils in Finland and Sweden have been mapped for several years and it has been shown that extensive areas are located on the coastal plains of Finland and Sweden. Information about their presence in the Barents region is still, however, quite scarce. In the Barents region of Russia, acid sulfate soils formed due to acid rain have since the 1930's been a major environmental problem. In Norway, the occurrence of acid sulfate soils has not been studied previously.

In addition, microbes play important roles in acid and metal release from sulfate soils but the extent or mechanisms of the environmental risks are poorly understood as only recently has it been possible to study the structure and functions of diverse microbial communities by utilizing next generation sequencing and other modern molecular methods. The impacts of microbiota in geochemical processes of the sub-Arctic soils have not been investigated and the effect of low temperatures with long periods of sub-zero soil temperatures are poorly understood.

Also in the mining sector the environmental issues plays a significant role throughout the life cycle of every mine. However, problems still occur at the different levels and stages of mining and know-how with the best practices has to meet more actors in the field of mining industry and research.

Kolarctic CBC project “HazArctic – Geo-Bio Hazards in the Arctic Region” will study areal extension, mechanism and risk for oxidation of two kinds of environments which can produce hazardous acid substances: (1) man-made mining areas and (2) potentially hazardous sulfur bearing Litorina clay sediments which can oxidize due to descent of ground water level. Also the role of microbes in the geo-bio interaction in possible hazardous environments will be studied. In addition, studies related to the mine environment (stability of closed and open mines and their water quality, mine tailings reuse and assessment of the actual state of territories in the vicinity of closed mines) will be carried out.

HazArctic is a co-operation project between Geological Surveys from Finland, Sweden and Norway (GTK, SGU, NGU), Natural Resources Institute Finland (LUKE) as well as Geological Institute and Mining Institute from the Federal Research Centre “Kola Science Centre of the Russian Academy of Sciences”. It is funded by Kolarctic CBC 2014-2020 program with the contribution from the project partners. Total budget is approx. 1,29 M€ and implementation period is 2019-2021.