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# An environmental impact of sediment-hosted Cu deposits in Alta-Kvænangen Tectonic Window, northern Norway: An insight from stream sediments

**LAURA HULJEK**[1], HANA FAJKOVIĆ[2], JOHAN BANG HILMO[3], ŽELJKA FIKET[4] AND SABINA STRMIC PALINKAS[5]

[1]University of Zagreb, Faculty of Science
[2]Faculty of Science, University of Zagreb
[3]UiT—The Arctic University of Norway
[4]Ruđer Bošković Institute
[5]UiT The Arctic University of Norway

Presenting Author: laura.huljek@geol.pmf.hr

The Paleoproterozoic Alta-Kvænangen Tectonic Window (AKTW) in northern Norway is characterized by a presence of numerous sediment-hosted Cu deposits. The Cu-mineralization predominately occurs in a form of quartz-carbonate veins that cross-cut the Storviknes sedimentary sequence and the underlaying Kvenvik volcano-sedimentary complex. The ore paragenesis consists of chalcopyrite, bornite, and digenite associated with minor amounts of galena, covellite, molybdenite and wulfenite. Pyrite has been found only in the Kvenvik formation. The Kåfjord area, located in the NE part of AKTW, was subjected to extensive mining activities back in the late 19$^{th}$ century and several tailing piles from that period are still present. The area is characterized by an abundant snow cover almost all year round and snow-melting period in June to July significantly affects the stability of sulfide mineral assemblages both *in-situ* and in the abandoned historical tailing piles. The purpose of this study is to determine the environmental impact of the sediment-hosted Cu mineralization on the quality of the stream sediments in the Arctic climate conditions. In total 44 stream sediment samples from three streams in the area were collected. The sediments were sampled in 150 - 250 m intervals. The analyses carried out on the < 63 μm fraction involved bulk lithogeochemical analysis, 7-step sequential extraction and analysis of 27 elements in extracts, and mineral characterization by X-Ray powder diffraction. The statistical analysis carried out on the untransformed chemical analysis data showed that Cu shows positive correlation with Pb, Ag, Mn, Sb, Bi, Ca, Mg, Hg, and Te. This shows a clear connection of Cu with pathfinder elements characteristic for sediment-hosted Cu deposits. The correlation on *clr*-transformed data showed positive correlation of Cu only with Mn. However, further the PCA analysis on *clr*-transformed data showed the correlation of Cu with Pb, Mn, Sb, Bi, Ca, As, Zn, Ni, and Fe, i-e- with most of previously mentioned pathfinder elements. Further data processing will link the chemical characteristics of stream sediments with their phase composition and give an insight into bioavailability of toxic metals and metalloids in the streams that drain sediment-hosted Cu deposits of the Kåfjord area.