



**Project acronym:** Hydro-AM

**Project title:** Hydro-Climatic Change and Arctic Mining Impacts: Linking field observations with model interpretations

**Project leader:** Jerker Jarsjö, Stockholm University, Sweden

**Discipline:** Earth Sciences & Environment: Water sciences/Hydrology

**Station(s):** Khibiny Educational and Scientific Station (Russia)

Hydro-climatic change is currently impacting large parts of the Arctic, which has been subject to about twice the global average rate of warming. This can have profound impacts on the spreading of metals from Arctic mining regions to settlements and downstream ecosystems. Previous results from the proposing team have demonstrated how spatial gradients in hydroclimate and geochemistry can impact bioavailability of metal(loids) in river systems. We have thus far conducted field investigations at several locations, including mining regions of Siberia, Mongolia, Northern Sweden and the Kola Peninsula. However, in contrast to our multi-year investigations in Siberia and Mongolia, the investigations of the Kola Peninsula only started in the present year (August 2017) and hence mainly reflect snapshot conditions. Methodologically, we here depart from the fact that hydro-climatic data series extending over more than one year are needed in order to investigate long-term dynamics of on-going Arctic changes. We address this scientific shortcoming by proposing a novel field campaign (August 2018) that uses the Khibiny research station as a base, and which comprises sampling for sulphur isotopes, basic hydrogeochemical parameters, organic carbon, and metal concentrations. We think that the planned measurements will provide a unique opportunity to test hypotheses regarding relations between meteorological / hydrological conditions and geochemical/ contaminant mass load conditions in different years (2017 and 2018). We expect that this will considerably advance our knowledge about representative conditions and inter-annual differences of the study region, with respect to transport pathways of released metals and their bioavailability.