

Project acronym: CHECOMSCHA

Project title: Stream water chemistry in crystalline headwater areas in Finland and Poland

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Discipline: Earth Sciences & Environment

Station(s): Kilpisjärvi Biological Station (Finland), Kevo Subarctic Research Institute (Finland), Oulanka Research Station (Finland)

The main aim of the project is to compare stream water chemistry in selected headwater areas in Finland and Poland. The research was conducted in the natural environment. In the first step, we intend to determine stream water chemistry at several sites in streams in catchments with various types of crystalline bedrock and different types of plant cover (forested/non-forested) in the vicinity of the Kilpisjärvi Biological Station, Kevo Subarctic Research Station, and Oulanka Research Station in northern Finland.

In the next step, we intend to compare obtained results with existing data from studies conducted in Poland. In order to determine water chemistry in streams, we collected water samples in headwater catchments (surface area: <2 km<sup>2</sup>) with different plant cover (forested and non-forested) at three study sites in northern Finland. We took water samples for a total of 87 sampling sites in selected catchments for laboratory analysis. In the field, we also measured fundamental physical and chemical properties of spring and stream water (temperature, conductivity, pH) and water flow.

Laboratory methods include the determination of total nitrogen and phosphorus contents by using a Lachat FIA analyzer, along with the concentrations of main ions using ion chromatography (DIONEX ISC-2010) and dissolved organic carbon (DOC) content. The total nitrogen and phosphorus contents analysis were performed at the Oulanka Research Station in Finland and main ions and DOC analysis are made in laboratories in Poland.

The assumed hypothesis of differences in stream water chemistry between catchments with different plant cover (forested vs. non-forested) and different climate conditions will be tested using a number of statistical methods. Understanding the natural hydrochemical background in areas not affected by human activity is important for the prediction of ecosystem responses to future changes in the climate (according to ICARP III priorities).