



Assessing historical soil temperature data from northern Sweden to understand past and potential climate change impacts on soil-freezing characteristics

Background:

Frost and freeze-thaw cycles can be a key factor for various soil processes and functions such as carbon storage and water movement in soils. However, soil-freezing characteristics like freezing depth and duration are undergoing change in Sweden and around the world, in response to the warming climate. This change is more rapid in higher latitudes and therefore particularly pronounced in the Boreal regions, such as northern Sweden. To quantify this change and to assess potential consequences for soil processes and thus ecosystem functioning, time-series of soil temperature and soil frost are required. For this reason, historical soil temperature recordings represent invaluable information with respect to the study of climate change and its consequences.

Objective:

The aim of the project is to digitalize and analyse a unique time-series of historical (1960-1964) soil temperature data from northern Sweden. The digitalized data should be evaluated statistically and compared with more recent soil temperature recordings from the area to infer changes in soil freezing characteristics in response to climate change. In the end, this work may benefit researchers across disciplines such as soil science, hydrology and ecology, who study the Boreal regions.

The project can be either done as an individual course project or developed as a MSc Thesis.

Contact: Tobias Klöffel (Group of Agricultural Water Management)

E-Mail: tobias.kloffel@slu.se