Project acronym: snow2ice

Project title: From snow to wedge ice – tracing recent ice-wedge genesis

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Discipline: Earth Sciences & Environment

Station(s): Station Samoylov, Russian Federation

Ice wedges are a unique archive for past winter climate conditions and have been increasingly utilised over the last years. However, there are still knowledge gaps that prevent a reliable calibration of ice-wedge stable-isotope data to temperatures.

The proposed research aims at an improved understanding of how modern wedge-ice formation is related to the snow-cover development and how the stable-isotope signal is transferred from snow into ice. To achieve this goal, the proposed fieldwork on Samoylov Island will focus on late winter (mid of April to mid of May) studies of both snow cover and frost cracks.

The spatial and temporal variability of the winter snow cover (i.e. stratigraphy, depth hoar proportion, temperature, density) towards the melt season will be studied during repeated surveys (regular intervals) with a focus on polygon rims. Moreover, samples for the analysis of stable-isotope compositions of different snow layers will be taken and analysed later. The state (open, closed, filled, plugged) and features (widths, depths) of frost cracks in polygon rims will be tackled by surveys that will be repeated in regular intervals. It is assumed that the snow cover will be melted completely and frost cracks will be filled by snow melt by the end of the proposed fieldwork.

The intended research will provide valuable results that will be published in peer-reviewed journals and presented at international conferences. Upon publication data will be made available to scientific community and interested public.