Project acronym: EcoROOT

Project title: EcoROOT – How do changes in reindeer grazing and winter climate influence root dynamics in boreal ecosystems?

Project leader: Gesche Blume-Werry, University of Greifswald, Germany

Discipline: Earth Sciences & Environment: Ecosystems & Biodiversity

Station(s): Oulanka Research Station (Finland)

Roots are key players in biogeochemical cycles but notoriously understudied, mainly due to methodological difficulties. Recent studies have demonstrated that belowground plant responses to global change factors deviate from the aboveground ones, illustrating the need for a thorough understanding of root dynamics. Our goal is to study how herbivory and changes in snow cover influence root dynamics within the EcoClimate Experiment at the Oulanka Research Station in Finland. We will be able to contribute to the experiment by measuring root dynamics (production, phenology, mortality, turnover) non-destructively and in-situ. This will be done with minirhizotrons (transparent tubes and a scanner for repeated root imaging), which have been successfully installed in the fen site in 2019. This will fill important gaps in our understanding of drivers of root phenology, especially in the combination with the other background data collected in the EcoClimate Experiment. In addition, we will sample root biomass and N-uptake both in forest and fen sites (outside of the EcoClimate Experiment). For this project, we will combine the expertise of local and international collaborators: Dr. Gesche Blume-Werry (group leader, University of Greifswald, Germany) is an expert in plant root dynamics in tundra, boreal forest and fens, while Dr. Maria Väisänen (University of Oulu, Finland) is an expert in herbivore effects on northern ecosystems. Prof. Juergen Kreyling (University of Greifswald) is a leading expert in winter ecology and experimental plant ecology. This team is complemented by Bo Peters (PhD student, University of Greifswald), who is developing automated analysis of minirhizotron images.