Studying the effects of decreasing snow cover on trees and soil

Tree physiology	Frost damages
Snow cover	Root growth

Who?

This research is carried out by Anna Lintunen and Lauri Lindfors together with many collaborators.

What and Why?

- Snowfall during winter is decreasing and the period of snow cover shortening with climate change affecting the coupling between soil and air temperature and humidity.
- Snow cover isolates the ground and decreases the soil frost.
- Lack of snow cover may lead to deeper soil frost, and soil can remain frozen after the start of growing season, which prevents the water and nutrient uptake of trees.

Scientific questions/methods/data

- We study the effects of decreasing snow cover on trees and soil in Hyytiälä in winters 2020-21 and 2021-2022.
- This autumn, massive skeletons for snow shelters have been built in Hyytiälä.
- Control plots are around the new tree tower at SMEAR and the treated plots are next to the container area
  - 6 control and 6 treated plots
  - Includes 3 pines, 3 birches
- We use continuous measurements of
  - Sap flow in trees
  - Root temperature
  - Stem diameter changes
  - Soil aerosol emissions (NAIS)
  - Soil and air temperature
- We make measurement campaigns monthly
  - Soil respiration
  - Root water content
  - Root damages
  - Soil humidity
  - Root growth (in end of the experiment)
  - Hydraulic conductance (twice per season)

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Results and next steps

- We look forward to see the first results next spring
- Other people involved and helping: Alessandro Zanetti, Kira Ryhti, Juho Aalto, Pauliina Schiestl-Aalto, Lauri Ahonen, Yann Salmon, Pekka Kaitaniemi…
- The work is part of University of Helsinki funded 3 year's research project.
- *If you are interested to measure something under the shelter, be in contact!*