



Project acronym: BYOSOIL

Project title: Effects of BRYOphytes changes on belowground SOIL microbial ecosystems under long-term experimental warming in Norway

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Discipline: Earth Sciences & Environment: Global change & Climate observation

Station(s): Finse Alpine Research Centre (Norway)

Our project will be conducted at Sanddalsnuten, near Finse, in Norway. The study area is located in a *Dryas octopetala* heath on a south-west facing slope close to the top of Sanddalsnuten, approximately 1520 m above sea level. To examine the effects of climate change, an experiment with open top chambers (OTCs) was established in July 2000. Open top chambers can be used in quite inaccessible locations, which makes them a widely used tool for climate effects research. They raise the temperature, minimizing secondary experimental effects, such as changes in atmospheric gas concentrations and ambient precipitation, although they might reduce wind (Hollister and Webber 2000). This OTCs experiment is part of the International Tundra Experiment (ITEX), which is trying to predict how arctic and alpine plant communities cope with global warming. The specially designed structures act like open-topped greenhouses, increasing the internal temperature by an average 2.5 °C. In this site, bryophytes communities are sensitive to increasing temperature, called, for this reason, indicators of climate change. A meta-analysis addressing experimental warming studies from tundra sites world-wide shows that the cover of bryophytes decrease in most alpine and arctic sites when the vegetation is exposed to warming (Elmendorf et al., 2012a). Also in this site, Dahle (2019) reported a decrease in cover of bryophytes and a higher competition from vascular plants species because of decrease of moisture availability for evaporation under warming treatment, but how warming will affect belowground microbial community structure and functions remains an unanswered question. This site turns out to be essential to investigate the belowground soil microbial communities structure and function responses to warming, comparing the OTC and the counterpart control plots. We would use metagenomics and metatranscriptomics analysis, spectrophotometric extracellular enzymes and culture isolations to have a complete view of these soil microbial communities and their responses to warming.