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Parameterization of Stomatal Conductance in a Subarctic Deciduous Shrub

Astrid Vatne[1], Ane Victoria Vollsnes[2], Norbert Pirk[1], and Lena Merete Tallaksen[1]
[1]University of Oslo, Department of Geosciences, Oslo, Norway (astrid.vatne@geo.uio.no)
[2]University of Oslo, Department of Biosciences, Oslo, Norway

Plants play an important role in regulating the land-atmosphere water and carbon flux through stomata control. To avoid excess water loss, the stomatal conductance is reduced during low soil water availability or high water demand from the atmosphere. Atmospheric evaporative demand is projected to increase through an increase in vapour pressure deficit (VPD) in response to global warming. Stomatal conductance models used in earth system models often rely on empirical parameters. However, since VPD and soil moisture content often are correlated, it can be difficult to disentangle the effect of each driver in studies using field data. In this study, we evaluate the effect of VPD and soil moisture on stomatal conductance independently by conducting an experiment in controlled growth conditions. In the experiment, we will subject groups of dwarf birch (*Betula nana*) to increasing VPD in both well-watered and drying soil conditions and measure the effect on stomatal conductance and leaf scale water and carbon gas exchange. Dwarf birch is selected as it is widespread in high latitutes and our study focuses on land-atmosphere exchange in this region. The experimental design allows us to evaluate existing parametrizations of stomatal conductance and test hypotheses on how sensitive the parameters are to drought history. The experiment will provide important knowledge on how to improve parameterization of water and carbon exchange in high latitude ecosystems. This presentation will show the first results of the experiment. This work is a contribution to the Strategic Research Initiative 'Land Atmosphere Interaction in Cold Environments' (LATICE) of the University of Oslo and the EMERALD research project.