Title: **What is the Effect of Climate Change on Belowground Resource Acquisition Strategies in a Boreal Peatland?**

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Project Abstract: Belowground biotic interactions govern the world's largest terrestrial carbon sink: peatlands. Below the peat surface, the finest, most absorptive plant roots interact with mycorrhizal fungi by supplying them with photosynthates in exchange for soil nutrients. Without their fungal symbionts that use carbon and nutrient-degrading enzymes, plants would struggle to acquire enough resources from the saturated organic peat. Yet, much remains to be done to understand the response of this symbiotic interaction to climate change and its impact on peatland carbon cycling. We are examining the functional traits of fine roots and mycorrhizal fungi in the Spruce and Peatland Responses Under Changing Environments (SPRUCE) experiment in Northern Minnesota to detect potential shifts in belowground resource acquisition strategies with warming and elevated CO_2. We used ingrowth cores to quantify the variation in specific root length, root diameter, tissue density, nitrogen concentration, and in ectomycorrhizal (colonization rate, exploration type and enzymatic activity) and ericoid mycorrhizal (colonization rate) functional traits. After three years of warming, we show that a change in resource acquisition strategy of *Larix laricina* and *Picea mariana* occurs when the warming level reaches +4.5 °C. At this warming level, the degree of colonization of fine roots by ectomycorrhizal fungi is relatively high compared to the +0 and + 9 °C treatments, while specific root length slightly increased. This suggests that, with warming, tree fine roots tend to adopt an intensive resource acquisition strategy in which they rely more on mycorrhizal fungi to get soil resources. We are verifying this result with cores collected after four years of warming. We are also analyzing time series of minirhizotron images collected using new, high-resolution automated minirhizotrons. We will discuss preliminary results focused on the abundance and dynamics of fine roots, ectomycorrhizal root tips, and fungal mycelial system.