



**Project acronym:** WIN2

**Project title:** Woody expansion in sub arctic permafrost peatlands: interactive effects of permafrost degradation, plant facilitation and herbivores

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**Discipline:** Earth Sciences & Environment: Ecosystems & Biodiversity

**Station(s):** Kevo Subarctic Research Station (Finland)

Arctic, subarctic and boreal ecosystems show discontinuities in tree cover distribution that suggest critical transitions between treeless, woodlands and forest states maintained by positive feedbacks. Recent work is starting to elucidate the underlying processes that could explain these transitions. For instance, forests can shift to open woodlands and treeless states triggered by climate-induced insect outbreaks and fires whereas treeless peatlands can become increasingly woody as shrubs facilitate tree establishment. In this proposal, we aim to assess the bottom-up and top-down mechanisms that can control woody plant colonization in subarctic permafrost peatlands. We will conduct field surveys and experiments to evaluate the effects of permafrost degradation, plant facilitation and reindeer browsing on the establishment of shrubs and trees on subarctic peatlands. We propose to work in sites around the Kevo Research Station to build on previous research and an ongoing field experiment.