

Project acronym: ECOTONE

Project title: Ecohydrology of Peat Interface Zones

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Discipline: Earth Sciences & Environment

Station(s): Svartberget Research Station (Sweden)

Northern peatlands are a large net sink for atmospheric carbon and are a vital component of the global carbon cycle. They are also vulnerable to climate change, given that their hydrology, biogeochemistry and ecology are tightly coupled to climate. Establishing water flow and water retention in peatlands is vital to understand how they, and their associated ecological communities, respond to climate change.

Much of the research on northern peatland ecohydrology has focused on large, isolated peatlands. However, there is a growing recognition that interfaces between peatlands and other landscape units provide a vital function, which is currently poorly understood. The landscape scale role of peatlands will depend on their exact scale and position and may be conceptually designated as either the interface (ecotone) between hillslopes and freshwater, or alternatively a discrete landscape unit, which itself has interfaces with freshwater and hillslopes. Detailed studies of water balance in interface peatlands will begin to elucidate the scale of the interface zones and the extent to which these are discrete areas.

We will take advantage of an existing lake level manipulation experiment at Krycklan catchment to monitor the ecohydrological response of an interface mire to changing water levels to understand the connectivity and direction of water flow between the mire, lake and adjacent hillslopes. Through a combination of field measurements and modelling we will develop a conceptual model for interface peatland ecohydrology under changing climate conditions. This model will aid in information landscape management and conservation policy in northern landscapes around the world.