Geophysical Research Abstracts
Vol. 18, EGU2016-4465-2, 2016
EGU General Assembly 2016

Medium term ecohydrological response of peatland bryophytes to canopy disturbance

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Canopy disturbance in northern forested peatlands is widespread. Canopy changes impact the ecohydrological function of moss and peat, which provide the principal carbon store within these carbon rich ecosystems. Different mosses have contrasting contributions to carbon and water fluxes (e.g. *Sphagnum fuscum* and *Pleurozium schreberi*) and are strongly influenced by canopy cover. As a result, changes in canopy cover lead to long-term shifts in species composition and associated ecohydrological function. Despite this, the medium-term response to such disturbance, the associated lag in this transition to a new ecohydrological and biogeochemical regime, is not understood. Here we investigate this medium term ecohydrological response to canopy removal using a randomised plot design within a north Albertan peatland. We show no significant ecohydrological change in treatment plots four years after canopy removal. Notably, *Pleurozium schreberi* and *Sphagnum fuscum* remained within respective plots post treatment and there was no significant difference in plot resistance to evapotranspiration or carbon exchange. Our results show that canopy removal alone has little impact on bryophyte ecohydrology in the short/medium term. This resistance to disturbance contrasts strongly with dramatic short-term changes observed within mineral soils suggesting that concurrent shifts in the large scale hydrology induced within such disturbances are necessary to cause rapid ecohydrological transitions. Understanding this lagged response is critical to determine the decadal response of carbon and water fluxes in response to disturbance and the rate at which important medium term ecohydrological feedbacks are invoked.