

Effect of 2018 drought on methane and carbon dioxide fluxes from northern mire ecosystems

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Northern mire ecosystems are characterized by two considerable counteracting greenhouse gas (GHG) fluxes, carbon dioxide uptake and methane emission. These fluxes have generally been observed to be related to e.g. plant productivity, temperature and water table position. Especially, lowered water table has been observed to hinder carbon dioxide uptake but also lead to reduction in methane emission. During summer of 2018, North-Western Europe experienced exceptional drought and heatwave, affecting also Fennoscandian mire ecosystems. The hydrological status of each mire was altered depending on the geographical location and hydrological features of the mire.

In Sweden and Finland, greenhouse gas fluxes are observed at several mire ecosystems using eddy covariance technique, mostly by national networks of Integrated carbon observation system (ICOS-Sweden and ICOS-Finland). Appropriate environmental parameters are also measured at each site. In addition, boundary layer mixing ratios of methane are measured at several tall tower observatories. Using data from these measurement stations we synthesize the effect of this drought on the counteracting GHG fluxes from mire ecosystems, in relation to changes in driving environmental parameters. Also effect to radiative forcing will be discussed.