

GHG fluxes in restored young fens

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Primary mire formation is an on-going phenomena in the Finnish land uplift coast of Gulf of Bothnia. Unique young fens occurring in the region are extensively drained for forestry purposes, however. In our study we investigate impacts of restoration and experimentally increased temperature on vegetation composition and GHG fluxes in young fens. The aims are 1) to bring information on the impacts of water-level and temperature on the regime shifts between mire and forest ecosystems, and 2) to give information on the implications of peatland restoration to C gas exchange.

We selected six fens, which are estimated to be approximately 200 years old and represent the same successional stage. The experiment forms a factorial design of three water level treatments and two levels of warming treatment. Two fens are undrained, two had been drained during the 1960's, and two were drained in the 1960's and restored in 2008 by blocking ditches and removing trees. Warming treatment was applied by setting seven open-top chambers (OTC) and seven unwarmed control plots on each fen. Vegetation composition was studied before the start of the experiment and regularly afterwards. CO<sub>2</sub>, CH<sub>4</sub> and N<sub>2</sub>O flux measurements were made during growing season 2011 using the closed chamber method.

Preliminary results indicate that the photosynthesis is at lower level and ecosystem respiration at higher level at drained sites than in pristine sites, while restoration has returned the functions close to the pristine level. Further results will be shown in the congress.