

Interactive comment on “Impact of water table level on annual carbon and greenhouse gas balances of a restored peat extraction area” by J. Järveoja et al.

Anonymous Referee #1

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This paper evaluates the effect of the restoration of peat extraction site on carbon and greenhouse gas emissions. The authors compared three sites, one non-restored and two restored sites having contrasting water tables. Considering the importance of limiting the release of greenhouse gases from such impacted ecosystems the chose topic is very interesting and falls well within the scope of this journal. The main message from this study is that peatland restoration is an effective way to reduce GHG emissions from these areas. Overall the paper is well written and the results are worth of publication.

Specific comments: P80 L23-25. “No study has investigated the impact of contrasting

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WTLs” I find this claim too strong, for example Tuittila et al. (1999) also looked at different water table and the effect on CO₂ at the same restoration site.

Section 2.6. Were the measurements always carried out at the same time of the day? Did you check for diurnal variations, especially for CH₄ at the vegetated sites.

Section 2.7. Can you specify how many fluxes were discarded after “filtering” of the data?

P89 L26. Did you use the mean fluxes over the year (or growing period) or the individual fluxes? I think the percentage vegetation cover (which is only one measurement) should be related to the annual fluxes only and not to the individual fluxes.

P94 L11 typo, “was lower”

P97 L18-20 The mean WTL in res-H and res-L was -24 and -31cm so I don't find it surprising to measure such low CH₄ fluxes. It is likely that most of the CH₄ produced was oxidized by methanotrophs in the upper layer of the soil. How does the water level in the restored area compare with natural peatlands? Was the restoration successful to restore natural hydrological patterns?

Fig. 3. Do you have an explanation for the peak in methane emission in December 2014? Strange considering that the temperature was close to zero.

Fig. 5. So the minimum VWC was recorded at Res-H? How do you explain that?

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