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Biogeosciences Discussions

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.

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General Comments

This manuscript describes the results of a study that captured year-round greenhouse gas (GHG) emissions from a restored peatland in Estonia, subject to different levels of post-extraction restoration treatments and including N2O, a GHG that has previously been rarely evaluated in similar ecosystems. The topic, research questions, and experimental design are clearly explained, the results are interesting and presented well, and the discussion includes reasonable analysis and comparison to other, related studies. Overall, this manuscript is of high quality and I think it meets the criteria for publication

in Biogeosciences.

Specific Comments

The measurement of autotrophic respiration for a chamber position (Ra) is accomplished by subtracting the heterotrophic respiration (Rh) as measured at an adjacent chamber cleared of vegetation (pg 10, Section 2.5). This assumes no root contribution to the cleared chamber, though vegetation cover at the two restored sites includes shrubs and small trees that may have roots that spread horizontally below ground. Was the absence of roots that might have contributed to unmeasured autotrophic respiration at cleared chambers confirmed? When those heterotrophic-only plots were cleared, were the roots of vascular plants removed?

Scientific significance: Does the manuscript represent a substantial contribution to scientific progress within the scope of Biogeosciences (substantial new concepts, ideas, methods, or data)?

Yes. The manuscript presents results covering full-year net emissions of the three major biogenic greenhouse gases, CO2, CH4, and N2O across a restored peatland with different restoration treatments. This represents interesting and useful new data because most previous studies in similar systems have not included full-year measurements, and few previous studies have measured N2O in peatlands.

Scientific quality: Are the scientific approach and applied methods valid? Are the results discussed in an appropriate and balanced way (consideration of related work, including appropriate references)?

Yes. The objectives and methods are well described and clearly related. The results are fairly interpretted and discussed, with appropriate reference to related work.

Presentation quality: Are the scientific results and conclusions presented in a clear, concise, and well-structured way (number and quality of figures/tables, appropriate use of English language)?

Yes. Figures and tables are clear and well-designed. English-language use is good, with a few minor corrections (see below)

Technical Corrections

Many of these corrections are suggestions to improve – in this reviewer's opinion – the readability of the text, rather than errors per se.

Pg 6 L15: the wording is awkward: "A section in the size of approximately 0.24 ha within"... Better might be: "A section approximately 0.24 ha in size within"...

Pg 6 L17 – "aiming" is in present tense, but the rest of sentence is in past tense – "aimed"

Pg 8 L10 "In addition" Pg 8 L13 "In addition" Two sequential sentences start this way.

Pg 9 L5 "accuracy" perhaps should be "precision"

Pg 9 L16 & L26 – model / manufacturer information for IRGA should immediately follow first statement of "IRGA"

Pg 10 L21 – change "was cleared from living" to "was cleared of living"

Pg 21 L27: "Further noteworthy" could be changed to "Also of note", "Also noteworthy", or "Furthermore" (and remove "is that")

Pg 22 L3: "could considerable increase" to "could considerably increase"

Pg 24 L13/14: insert word "the" before "few"

Pg 24 Ln15: remove "that"

Interactive comment on Biogeosciences Discuss., 12, 17177, 2015.