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Discussions

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Interactive comment on "Greenhouse gas emissions from rewetted bog peat extraction sites and a *Sphagnum* cultivation site in Northwest Germany" *by* C. Beyer and H. Höper

Anonymous Referee #1

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Review of Beyer & Höper "Greenhouse gas emissions from. . ." General comments: The BGD paper reports valuable data from an understudied ecosystem type. Data quality and most modeling is sound and, in the end, the manuscript should be accepted for publication in BG. However, some modeling and parts of the introduction and discussion chapter require major revisions. Throughout the text, there are many awkward expressions that, in some cases, corrupt the content. I recommend accepting the manuscript only after serious language editing. Nowadays, there are affordable offers for this service. Therefore, and in order not to turn this into a language review, I attempt to keep the number of comments related to language issues low. Specific comments: Title: I suggest renaming the contribution in a way that reflects the fact that

the uptake of CO2, even its NET uptake is one if it's main issues. Why not "Greenhouse gas turnover. . ." General language comment: Check tenses. On quite a few occasions, "was" is given when "has been" or even "had been" might be a better choice. 4494, 4-5: Please try to avoid expressions as "available data is scarce", which is too unspecific. 4494, 13-14: delete "using automatically monitored climate data" 4494, 21 and throughout the text: Check the use of "yearly" against "annual", which is much more adequate. 4495, 20: "Tremendous" is inadequate in this context. How much? 4495, 23: What do you mean by "increasing tendency?" 4496, 3-7: Delete this paragraph 4496, 8-9: Please rephrase the two awkward lines. 4496, 12: "Climate relevant" is a literal translation from the German language that should be avoided. 4496, 13: Which data is scarce? There are quite a few GHG papers from bogs. 4496, 24-25: Who is "examination area" defined? If it is defined locally, any data paper will be sorely needed. Even in the in General comment on the intro chapter: I suggest some restructuring. You are presenting GHG fluxes from differently evolved, previously cutover sites as well as a recent Sphagnum farming one. I suggest starting out by saying the different after-uses following peat extraction are being considered and that long-term GHG data from rewetted cutover sites is scarce AND a new alternative could be Sphagnum farming. Please explain Sphagnum farming more closely, large parts of the audience might not know how it is supposed to work. And please don't ignore GHG papers from cutover sites in Canada, Ireland, Finland, even when from boreal sites. 4497, 12: Is 2005 recent? Has there been no progress since? Please delete between "The advantages. . . to . . .appropriate estimates (Drösler, 2005)", which belongs to the methods section. 4498, 6-17: Please italicize plant species, give the name f the first descriptor at their first mention, and only use scientific names (no mushrooms) 4498, 23 and elsewhere: "Decomposition status" sounds much better that "decay degree". The von-Post scale is well known internationally, so it might be a good idea to say how it relates to the humification index in the German soil classification. 4499, 4:Probably samples were not analyzed for C and N following 550°C thermal treatment. Please clarify. 4500, 9: Drösler (2005) and Beetz et al. (2013) didn't use exactly the same flux calculation

procedure. Neither one employed the general technique for the first time. Are you refereeing to a general principle or a specific procedure? 4500, 28 to 4501, 5: I can't quite follow you. Please explain a little more thoroughly. 4501, 10: I don't see how CH4 or N2O exchange was modeled and I think the you should have modeled CH4 exchange, as you noticed a dependency of CH4 exchange on water table and temperature. 2.5: In this subchapter, language quality corrupts content. Please rephrase in a longer paragraph. 3.1: How about "Environmental controls" instead of "site factors"? I suggest general restructuring of the subchapter. 4503, 6-7: Better: "Peat at LM was highly decomposed (h 10, on the von post scale)... 4503, 16-17: Is the C stock of the site important? If yes, why is it not given for the other sites, if no, why not omit it? 4504, 12: Are you sure that that result is going to be accurate? Please rephrase. 4505, 13: What is "not satisfactory"? Please give more specific reason. 4505, 21-14: I don't understand. As I understand it, there are no independent datasets. So how can you compare measured with modelled data? What sense does Fig. 2 make? 4505, 13: "CO2" instead of "gas" 4506, first paragraph: Repeatedly mentioning "net" shouldn't be required here. 4506, 18-19: Again: If there is a relation between CH4 fluxes and these parameters, why don't you use them for a better depiction of annual CH4 flux? Discussion: This chapter required the most additional work, therefore my comments are not as specific: I don't agree with the idea of a meta-analysis for several reasons: 1) It is not a meta-analysis, but a collation of publications from the "region". I don't see which criteria were used to include work from Bavaria, but not Ireland, not Southern Sweden and not the UK. Even if one agrees that boreal sites shouldn't be part of that "meta-analysis", they might still be useful for a more general discussion. The way the discussion is currently structured doesn't do the valuable data any justice. Most importantly, it is necessary compare your data with data on more recently restored sites. Another issue to be discussed is the dominance of time passed since restoration over vegetation cover. 4511, 9-10: Does the content of these lines imply that a) your sites were not representative or b) that you have no idea about spatial variability. This would be a grave problem; so please give the reader some confidence why you believe that

this is not the case. Fig. 5: Not required.