

Response to Referee #1

We thank the reviewer for reassessing the manuscript, for the corrections and for the supportive comments. We have addressed the comments and remarks (in italics), and the responses are listed below.

I thank the authors for putting the work in and taking on board my suggestions. It has definitely improved the manuscript immensely.

Minor comments:

Line 389: I would provide latin name for big-leaved bog bean here for clarity - you use latin names everywhere else.

We thank for the suggestion, the name was changed to latin.

Line 399: The word decomposing is awkward in this context. I suggest changing it

The word was changed to “partitioning”.

Lines 405-406: Awkward sentence structure.

The authors thank for the remark, the sentence was modified.

Line 412: Change to 'Our results imply that northern peatland vegetation is capable of quick growth following a cold spring'

The authors thank for the suggestion, the sentence was modified.

Response to Referee #2

We thank the reviewer for reassessing the manuscript, for the corrections and for the supportive comments. We have addressed the comments and remarks (in italics), and the responses are listed below.

I thank the authors for their responses and adaptations to the manuscript. I have read the revised manuscript again. In my opinion it is ready for publication, and only have the following minor observations (line numbers relate to track changes version):

- L41: "verified" is a strange word to use here. Rather something like: "various studies have found a strong relationship between ..." (in fact, I would combine this sentence with the next and write a single clear point).

The authors thank for the suggestion, the sentences were modified and combined.

- L44: "has been suggested" is vague. I believe that based on many studies we can say that it "is" a key driver?

The sentence was modified and "has been suggested" was corrected as "acts".

- Although I read the response to my general comment #2 in the previous round, looking at Figure 1 I still wonder how these ROIs (even if here the "general ROI" was used) may relate to the EC footprint. For example, on Figure 1 and 2 I see trees (forest) around the Lompolojänkä site as well (and in fact even nearby branches of the Betula tree, which is not in the "general" ROI of Figure 1b). Possibly the authors could provide a little more confidence to the readers in explaining how the ROI links to the footprint, for example by adding something in Section 2.4 on the heights of the flux towers, and predominant wind direction.

More information about the flux measurement systems and data processing was added to Section 2.4, including the measurement heights and filtering of the flux data. These amendments indicate that the measurement data accepted for the present analysis are not significantly affected by surrounding forests, i.e., at each site, the flux footprint predominantly covers the open peatland area around the flux tower, which coincides with the target area included in the general (larger) ROIs.

- L163: up to editor also, but usually in this case numbers until 10 are written as words in scientific text: "five to ten days".

The authors thank for the remark, this was corrected.

- L193: "eliminated" or "reduced"? "Differences" or "derivatives"?

"Eliminated" was changed to "taken into account", but indeed differences were used in the transformation.

- Table 2: are those p-values correct? I would expect a minus sign in the exponent? Now these are

very large values... Rather than such precise numbers, the authors could also indicate commonly used p threshold levels like <0.001 (which authors also use later in text to indicate significant differences in GCC).

The authors thank for the remark and suggestion, the p-values were corrected.

- L232/255/258/267 and elsewhere: I think authors can leave out "material". Just "Supplementary Table S3 and S4". Check with other papers in this journal.

The authors thank for the remark, these were corrected.

- L422: "of" should read "by"

The authors thank for the remark, this was corrected.

- L475/477: "oblique" instead of "angled"?

The authors thank for the suggestion, this was corrected.

- L520: "input" instead of "material"?

The authors thank for the suggestion, this was corrected.