

Interactive comment on “Carbon accumulation in a drained boreal bog was decreased but not stopped by seasonal drought” by Kari Minkkinen et al.

Anonymous Referee #1

Received and published: 30 January 2018

General comment: The authors present a convincing dataset and sound reasoning in a comprehensive study which will be without doubt controversially discussed. The results are convincing, but I still find it puzzling to read about C accumulation rates of this magnitude without seeing a moss or shrub layer developing. Therefore, I think that the authors should spend more effort in discussing possible remains of the stored soil carbon. Is there possibly a reallocation of rhizosphere or subsoil organic carbon? Is the bulk density increasing? Are soil pores being filled with particulate organic matter? Is the assumption that export of DOC/POC is negligible, reasonable? Specific comments: I appreciate that, for site and methods information, the reader is referred to Lohila et al. (2011). However, even if this means repeating things, I suggest adding ba-

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sic information on a couple of things: When and how was the stand set up? How deep and how strongly decomposed is the peat? Please give some basic information on peat properties. This is important for the discussion that, I think should be somewhat enhanced. Were chamber measurements done with opaque chambers to prevent photosynthesis by shrubs? How high were the chambers to make shrubs fit inside them? 2.2.3 How can you be sure that 7 CH₄ flux calculations in a 6 month period are sufficient to derive a correct estimate for CH₄ efflux? How can you assume that CH₄ fluxes reported by Lohila (2011) can be applied to a later time? I think that it is not correct to apply measurements done at an earlier time for other time periods, unless properly modelled. This is not decisive for the main message of the manuscript but should still be described some more. P 7, L 16: A “high NEE” implies a high CO₂ uptake, but this is not the case here. Please avoid this expression here. You could say “lower net CO₂ uptake”, if this is what you mean to say. P 14, L9: “making up”, not “making” P11, L24-25: I am not so sure that, when trees die, root carbon becomes part of the soil C pool. After harvest, there is usually large C release from this C pool. P12, L7: That depends whether you assume root carbon to remain in the soil following harvesting. Last paragraph on page 12: Exactly, this remains to be seen! P13, L3-4: I don’t think that your data justifies saying that the drained peatland stores AT LEAST as much C as undisturbed peatlands. Are you referring to the mean long term C storage of all peatlands here? You are able to conclude that, in a very limited time of the lifecycle of the rotation, there is a soil C sink, even under meteorologically variable seasons. Figure 2: Please don’t display precipitation by drawing straight lines between the months. A bar graph is much more adequate.

Interactive comment on Biogeosciences Discuss., https://doi.org/10.5194/bg-2017-530, 2018.

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