

## ***Interactive comment on “Greenhouse gas flux measurements in a forestry-drained peatland indicate a large carbon sink” by A. Lohila et al.***

**Anonymous Referee #1**

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### 1. General comments

This is a well-written and well-structured manuscript. The subject and motivation of the study have been summarised appropriately; the authors seem however intent on demonstrating the novelty of their study which doesn't seem wholly necessary as this work complements previous NEE assessments taken at other peatlands in the northern hemisphere. The conclusions are succinct but clear. In particular, care was taken not to extrapolate the findings to other sites, which is important at this stage as the mechanisms of C uptake are not fully established. This manuscript is on the whole of good scientific quality but certain areas could benefit from clarification (see further sections for details).

### 2. Specific comments

C1956

Page 4, line 100: is it reasonable to assume that the pH remained constant over the 2-3 years between studies?

Page 4, line 105: how were the dimensions of the transects chosen? Did you use footprint estimates?

Page 5, lines 134-141: provide more details of the corrections applied and discuss how the storage term was calculated.

Page 7, line 186: how was the  $u^*$  threshold obtained?

Page 8, second paragraph: is there any sense in using all available data, regardless of the goodness of fit? You seem to prioritise quantity over quality. Since fluxes were small, you could instead select good fit data and discuss how these compare with the dataset as a whole.

Page 11, line 310: specify what the “different 365-day periods” were.

Page 12, line 346: is the peat depth variable throughout your site?

Page 13, lines 369-70: insert range (e.g. SD) of CO<sub>2</sub> uptake and C accumulation in tree biomass for ease of comparison.

Page 14, paragraph 2: does this mean that your site isn't fully drained?

Page 16, paragraph 2: I'm not sure I understand what you mean by the “development stage” of the two forest considering that you later state that the one at Hyytiälä is “younger thus growing faster”. As I see it, you aren't comparing like with like although the ballpark figures are worth mentioning.

Page 17, paragraph 2: provide the modified equation.

### 3. Technical corrections

Page 5, lines 129-30: what was the tube diameter?

Page 9, paragraph 1: could you summarise all this data in a graph?

C1957

Page 9, line 239: do you mean deepest or shallowest by “lowest average WTL”?

Page 12, line 336: is the “radiation-response model” eq. 3?

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Interactive comment on Biogeosciences Discuss., 8, 5787, 2011.