

Interactive comment on “Carbon dioxide fluxes at an intensively cultivated temperate lowland peatland in the East Anglian Fens, UK” by R. Morrison et al.

Anonymous Referee #2

Received and published: 24 April 2013

General comments

The topic of the paper is interesting and important. Overall, the paper is clear and well written. However, the duration of the study and the fact that the weather conditions during the study were very unusual are significant shortfalls of this study. This should be mentioned in the introduction somewhere, where it is indicated that the goal of the study was to assess the temporal trends in CO₂ fluxes; the unusual conditions leave the question of how representative were these measurements of typical emissions from this ecosystem? Especially, as it is well known that rewetting after a dry period leads to higher CO₂ loss. Can the authors add some additional data? Are these measurements

C1209

still ongoing? Also, additional effort should be done to place this study into the “bigger picture”, for example a major question that came to my mind reading the paper was: if cultivation on peatland soil emits so much C, how this emission compare with the same cultivation on other kind of soils (including miner soils)? It would help understanding if this is something we really need to avoid. This information would be highly relevant for policy makers, and potentially support restoration of peatlands in the UK, making the manuscript very relevant.

Specific comments

Page 2 Lines 15-16: it would be interesting to compare these losses with conditions previous to disturbance Page 3 Line 27: if this was the wettest, was it representative of the usual CO₂ emission from this ecosystem? Page 9 Lines 6-9: What percent of the time did you measure Net Radiation? Fig.4 & Fig. 6: sign convention: the usual sign notation is for GPP to be always positive is the ecosystem is uptaking C, the central part of the curve of Fig. 6 (when NEE is negative, so there is C uptake) shouldn't GPP be positive here? Page 11 Line 24: nocturnal, typo? Page 13 Line 19: why do you sue u* here? Didn't you say it was not needed? Mention this in the methods Page 13 Lines 21-22: what less conservative refer to? Specify in more details the filtering criteria used Page 13 Lines 24-24: are these uncertainties of NEE or of GPP & ER? The source of uncertainties in each of them is different, it requires to be mentioned Page 14 Lines 21-23: this is not the main point of the paper, remove footprint estimation from the discussion and focus on the big picture implications Page 15 Lines 20-25: it would be interesting to mention the difference in C content of the soils in the UK and Finland, and the temperature regimes in each of them, to be able to understand the source of this difference. Page 18 Line 18: indicating this reference as (Taft et al., 2013) is not really appropriate, as it is not published (not even in revision); more appropriate to indicate it as unpublished data or personal communication