

Interactive comment on “Comment on “Soil CO₂, CH₄ and N₂O fluxes from an afforested lowland raised peatbog in Scotland: implications for drainage and restoration” by Yamulki et al. (2013)” by R. R. E. Artz et al.

L. Kutzbach (Referee)

lars.kutzbach@zmaw.de

Received and published: 18 August 2013

The comment of Artz et al. on the paper of Yamulki et al. (2013) is a very important contribution to the field of GHG fluxes from peatlands. It addresses erroneous assumptions and misleading conclusions made in the paper of Yamulki et al. (2013) in a clear and constructive manner. I agree with all points of the comment paper. I very much like the style of the comment which is very polite and constructive despite the necessary serious criticism, thus laying the basis for an open and objective discussion. In this context, I find also the response of Yamulki and Morison (interactive

C4360

discussion) very honourable as they straightforwardly admit the regrettable errors and give further helpful information on their valuable study. I have not much to add to the very well written comment of Artz et al. and recommend its publication in Biogeosciences. However, I agree with the referees #1 and #2 that a conceptual scheme that illustrates the different terms in the carbon cycle of terrestrial ecosystems (and what can be measured by different methods) would be a valuable addition to this commentary paper. Here, the terms ‘gross primary production’, ‘net primary productivity’, ‘ecosystem respiration’, ‘soil respiration’, ‘autotrophic respiration’, ‘heterotrophic respiration’, ‘net ecosystem exchange’, ‘net ecosystem production’, and ‘net ecosystem carbon balance’ should be clearly defined. A good reference in this context would be: Chapin et al. 2006. Reconciling Carbon-cycle Concepts, Terminology, and Methods, Ecosystems 9: 1041–1050. Also, I would like to support the suggestion of referee #1 to include a discussion about the general suitability of the Global Warming Potential concept to ecosystems. Relevant references to this topic would be: Laine, J. et al. 1996. Effect of water-level drawdown on global climatic warming: northern peatlands. Ambio, 25: 179–184. Minkkinen, K. et al. 2002. Carbon balance and radiative forcing of Finnish peatlands 1900– 2100 – the impact of forestry drainage. Glob. Change Biol. 8(8): 785–799. Frolking, S. et al. 2006. How northern peatlands influence the Earth’s radiative budget: Sustained methane emission versus sustained carbon sequestration. J. Geophys. Res. 111: G01008. doi:10.1029/2005JG000091 Frolking, S., and Roulet, N.T. 2007. Holocene radiative forcing impact of northern peatland carbon accumulation and methane emissions. Glob. Change Biol. 13(5): 1079–1088. Frolking S. et al. 2011. Peatlands in the Earth’s 21st century coupled climate–carbon system. Environmental Reviews 19: 371–396.

Interactive comment on Biogeosciences Discuss., 10, 10271, 2013.

C4361