

## ***Interactive comment on “CO<sub>2</sub> exchange and Carbon balance in two grassland sites on eutrophic drained peat soils” by E. M. Veenendaal et al.***

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Received and published: 9 July 2007

This manuscript presents a nice case study in which two grasslands sites that differ mainly in management are confronted. I already liked the first version of this manuscript, and have mainly minor comments and suggestions (see below).

General comment.

It continues to amaze me how our research community abuses the temperature response presented in the Lloyd and Taylor paper (1994). The Eo presented in that manuscript is valid for large scales, yet many researchers simply adopt this Eo to represent the Eo in their particular study site. The implication is, of course, that seasonality

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within an ecosystem must have exactly the same effect on respiration as the difference in climate between boreal and tropical ecosystems. This is nonsensical. Further, I do not see how fixing  $E_o$  could have resulted in the most optimal fit. Varying both  $R_{10}$  and  $E_o$  would probably have resulted in a better fit. Given that many people follow this approach, I will not hold it against the authors. Nonetheless, I wanted to express my opinion on this.

Specific comments.

P1634, line 16: insert space between  $CO_2$  and  $m^{-2}$

P1634, line 17: insert comma after periodically

P1634, line 22: one bracket too many

P1634, line 25: you are mixing regional scales in this sentence, which is a bit confusing. I would replace the 5% of the European land area by 3% of the global land area, because the  $1/3^{rd}$  of the terrestrial C pool is also global. I would further specify that it is  $1/3^{rd}$  of the terrestrial soil C pool.

P1635, line 2: replace “a sink strength” with “a carbon sink”

P1635, line 11: I would use ton instead of  $10^3$  kg; you are using ton later on in the manuscript

P1635, line 14: you need a more accurate assessment compared to what? Compared to subsidence-based estimates?

P1635, line 21: I do not object the use of  $kg\ ha^{-1}\ a^{-1}$ , but later in the manuscript you are using mol per  $m^{-2}\ a^{-1}$ . Please try to be consistent.

P1635, line 29: delete the words: estimates, for, and losses. These are redundant.

P1636, lines 21 and 25. It might be mistaken, but I believe wind directions are not capitalized.

P1639, line 24: referred to as the . . .

P1635, line 16

P1641, line 12: ton dry matter, not tones (twice)

P1642, line 9: comparable to what average period. I assume you mean the long term average?

P1646, line 17: you report a difference in winter, but according to the graph this difference occurs in April. . .

P1646, line 19-20: Looking at the graph, I agree that there is a difference, but the way you phrase this paragraph, I thought that R at Oukoop was 33% higher than in Stein during mid-summer, while in reality this difference is ephemeral. Instead, I would rather raise the argument that the time series are remarkably similar, with the exception of April and around day 190.

P1646, line 27- P1647, line 2: Did you test the sensitivity of this strong statement to the assumption of a constant R10 and Eo with time?

P1647, lines 5 & 7: units are incomplete.

P1650, line 17: grammatical error.

P1650, line 25: units incomplete.

P1653, line 24: grammatical error.

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Interactive comment on Biogeosciences Discuss., 4, 1633, 2007.

**BGD**

4, S789–S791, 2007

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