

Interactive comment on “Non-additive effect of day and night warming on soil respiration in a temperate steppe” by J. Xia et al.

Anonymous Referee #2

Received and published: 8 June 2009

General Comments

The manuscript describes results of a comprehensive warming study in a grassland, looking specifically at the differential effects of daytime versus nighttime warming. Critically, the authors consider ecosystem responses in this work, rather than just soil respiration, which adds to the quality of these results. Day vs. night warming studies have been conducted in a range of ecosystems before, so this is not ground breaking, but I find the results in the way they were analysed (additive day and nighttime effects vs. diurnal warming) very instructive, and this study merits publication in Biogeosciences.

The language of the manuscript is generally good or even very good. However, it should be proof-read by a native speaker to straighten out some remaining sentence constructions that are not entirely clear, but this should be a small issue only. There are

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a number of further points I list below, that need to be addressed before this manuscript should be accepted, but again I think that these amount to minor revision only.

Specific Comments

4389, 17 “3 x 4 m”, not “3 x 4 m²”.

4390, 19 I think that “GEE” is not a meaningful term, and GPP (Gross Primary Productivity) is more appropriate. An exchange (as in NEE) is necessarily a net flux, as it constitutes opposing flux directions, while here you refer to only C uptake, which is GPP.

4390, 21 and 23: As above, the units are always m, not m³ or m²; if you stated the actual volume or area instead of dimensions, the units you propose would be correct.

4391, 13: Give the periods over which you integrated GPP.

4391, 18: “*S. krylovii*” (lower case k)

4393, 6-9: The bars in Fig. 5 are slightly confusing; you show increases in GEP as positive values, which can be confusing as increases in uptake are conventionally shown as negative fluxes of C, while net losses of C are shown as positive values. You should clarify which convention you follow in the diagrams and keep the direction of the flux consistent (For example in Fig. 2, positive fluxes are gross respiration from soil). Further, the relative change in GEP by all three warming treatments is more than 5

4395, 8-10: Increase in soil T has been shown to increase GPP? I'm not aware of this being the case, and the citations you give certainly don't support this claim.

4396, 9: “stimulated” rather than “simulated”.

4396, 25: Most of the evidence has been produced in the last ten years, rather than “recent decades”.

4397, 11: You should give examples of models using the respective warming scenarios

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here, in order to substantiate this claim.

4397, 26-29: You do not describe any sugar and starch content analysis in the methods or in the results. Either add these or leave out this line of evidence here.

Fig. 1 and 6: Why are there no error bars in these figures?

Interactive comment on Biogeosciences Discuss., 6, 4385, 2009.