

Interactive comment on “Carbon balance assessment of a natural steppe of southern Siberia by multiple constraint approach” by L. Belelli Marchesini et al.

L. Belelli Marchesini et al.

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We thank the referee for the very careful reading of the manuscript and the detailed comments. We agree with all technical comments on the text formulation, and we will modify the text accordingly. In the following we respond individually to the specific comments. Whenever the referee is cited, the text has been written inside quotation marks.

Specific comments

2.1 “I missed some specific explanation of NEP estimation from inventory method, I guess it comes from NPP(results section 3.1) minus Rh (heterotrophic respiration measured in trenched plots, results section 3.2) but I could not find it in the methods

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section and it is not mentioned in results section 3.5 when its value is given for first time.”

2.1 The NEP estimation from inventory is obtained from the difference between net primary productivity (NPP) and heterotrophic respiration (Rh). This is stated in the objectives of the paper only (page 169 line 26). The methods section will be modified in order to explain how the NEP is retrieved according to the ecological inventory approach.

2.2 “In Methods section 2.5 (soil CO₂ fluxes, page 180) indicate frequency of clipping and time between clipping and soil CO₂ efflux measurements.”

2.2 The frequency of aboveground biomass clipping was every 2 weeks as specified in section 2.2 (page 171 line 12), while it was once every month for belowground biomass (page 171 line 16). The frequency of soil respiration measurements was measured at weekly frequency (page 180 line 19). Operations of soil respiration measurements and biomass clipping were generally performed on the same day or were separated by 1-2 days.

2.3 “Results section 3.5, I do not think is worth to discuss quantitatively about the difference between both methods (ecological inventory and EC) as uncertainty of inventory method is too large (130%).”

2.3 The comment is right. Given the large uncertainty of the inventory approach the difference from the EC method cannot be argued on a quantitative basis. The paragraph will be reformulated accordingly.

2.4 “Different values for NEP (EC-method) in different sections: 's30.1 gC m⁻² in the abstract and in results (page 188 line 12); 's16.9 gC m⁻² in conclusions (page 192, line 12), and 's31.6 gC m⁻² in table 1.”

2.4 The correct value of NEP uncertainty by eddy covariance method in the submitted version of the manuscript for BGD is 31.6 gCm⁻². Other values were mistyped. How-

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ever, a revised assessment of the uncertainty of the eddy covariance method differing in the approach for the gapfilling uncertainty evaluation, will be changed in a corrected version of the paper to be submitted.

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