

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

Anonymous Referee #1

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General comments

This paper presents the carbon balance of a natural steppe estimated using different methods. Comparison between NEP estimates from eddy covariance and inventory methods (complemented with chamber measurements) and the uncertainties associated is the main aim of the paper. Both methods are well detailed, with pros and cons, in methods section. Results are adequately shown in figures and add valuable information on grasslands carbon balance estimation. Discussion is correct and does not overlap with results. The coverage of literature is broad and adequate.

Specific Comments

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

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.

2.3 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%).

2.4 Different values for NEP (EC-method) in different sections: 30.1 gC m⁻² in the abstract and in results (page 188 line 12); 16.9 gC m⁻² in conclusions (page 192, line 12), and 31.6 gC m⁻² in table 1.

Technical Corrections

Try to be consistent in the spelling of some words or abreviations through the text:

above-ground or aboveground

below-ground or belowground

E.C. or EC

non-linear or nonlinear

night-time or night time

Names of species authors should not be in brackets (page 171 lines 4 to 7).

Figures and captions

Figure. 2 (page 201) in figure caption line 3: add an hyphen in BGNPP (BG-NPP); line 5 add an space before "Error".

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Figures 4 and 7 are too small and difficult to see.

Figure 6. Beginning of the caption in capitals. Line 2: insert a "e" in "blow". There is no explanation of the solid line.

Figure 7. Line 1: white dots are grey in the figure. line 3: an "et al" and year in brackets are missing in Reichstein 2005.

Text

Page 167 line 17: "Suyker and Verma" instead of "Suyker et al.", year of publication is not consistent with references list, 2003 in the text and 2001 in the list.

Page 167 line 22: add a comma after "al".

Page 168 line 4: add and space after "1996;".

Page 168 line 11: "1975" instead of "1979", there is no "Singh and Joshi, 1979" in the reference list.

Page 169 line 11: "et al." after Conen.

Page 170 line 3: delete "to".

Page 172 line 2: Six algorithms not seven are listed in the paragraph.

Page 172 line 18: "Singh and Joshi (1975)" instead of "Singh et al. (1975)".

Page 173 line 6: Be consistent with equation (2), rag and rbg instead of "AGr" and "BGr".

Page 173 line 8: delete "in".

Page 174 line 18: "Escalante, 1980" instead of "Escalente, 1980".

Page 176 line 4: "Webb et al., 1980" instead of "Webb, Pearman, Leuning, 1980".

Page 176 line 12: add an space before "2000".

Page 177 line 20: "et al." after Flanagan.

Page 178 line 4: "et al." after Falge.

Page 180 line 15: the second "ref" in subscript.

Page 181 line 27: delete GPG, correct citation is (IPCC, 2000).

Page 182 line 15: "et al." after Goulden.

Page 183 line 18: in "ith", "th" in superscript.

Page 183 line 10: add an space before "while".

Page 183 line 15: "et al." after Barfod.

Page 184 line 15: delete "the amount of".

Page 184 line 21: the end of the previous growing season is October 2003, not 2004.

Page 184 lines 25 and 26: insert and "and" between of "AG" "BG", instead of a comma.

Page 187 line 12: insert an hyphen between the two percentage values.

Page 189 line 7: insert a space before "2000".

Page 189 line 15: "et al." after Titlianova.

Page 190 lines 7, 9 and 13: "et al." after Scurlock.

Page 190 line 11: delete space before comma.

Page 191 line 18: insert comma after "Black et al.".

Page 194 line 18: "intercomparison" instead of "intercomaprison".

Page 194 line 24: delete space after "Meteorol.".

Page 195 line 32: delete space after "tropics".

Page 196 line 30: "Grünwald" instead of "Grnwald".

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Page 196 line 32: commas missed between: "J. Rambal"; "S. Rotenberg"; "E. Sanz".

Page 197 line 21: "Stolboboï, 2000" is not cited in the text.

Page 197 line 24: insert a space before "Year".

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