

Interactive comment on “Water use strategies and ecosystem-atmosphere exchange of CO₂ in two highly seasonal environments” by A. Arneeth et al.

Anonymous Referee #1

Received and published: 23 May 2006

General Comments The paper is quite difficult to read and comprehend what is going on - as it skips back and forth between the sites in Siberia and Africa. Having said that, I could not think of another method that would make comprehension easier - it's just a facet of these type of papers. The figures provide a good method (of course) of comprehending what is going on. But the content is largely sound and the paper is quite acceptable for publication with just a few minor textual corrections. The diagrams on the pdf copy are very small for the amount of information shown. If this is the size of the final copy - then I find the diagrams unacceptable with some of the detail illegible. This is not the authors fault as the diagrams would be perfectly acceptable at a decent size. I would hope that these figures are expanded to a full page width. Figures 1 and 2 will also not photocopy well in Black and White as the symbols are all the same,

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the differences between the data points being shown by colour alone. The authors can use symbols as evidenced in the rest of the figures. I would recommend that the authors be asked to use symbols for the different data sets on Figures 1 and 2. Specific Comments:

P=Page, L=Line - changes in CAPITAL include insertions, replacements, etc. The CAPITALISATION is to indicate where and how the changes are to be made - as this webpage does not seem to allow Bold or Italics to be used.

P348L8 Effects of climate change ARE likely TO... P349L3 ...several months LONG period of drought. P349L22 ...in northern Botswana, a few km (I would prefer the exact number of kms to be given) P349L23 Colophospermum mopane COMPRISE the typical WOODLAND of southern Africa,... P350L9 March. A few Acacia erioloba.... (here a new sentence is begun) P350L22 BUT is somewhat higher along the hills..... P351L1 proximity TO each other P351L18 ...atop a tower A few metres above the respective... (I would like to know the average height and extent of the forest and the exact height above the forest that the measurements were made - this is extremely important for the correct measurement of the fluxes). P352L3 ...by applying a u^* -threshold. What was the threshold used to demarcate stable from neutral or unstable conditions (e.g. $u^* > 0.1 \text{ m s}^{-1}$ is typically used). P352L26 ...at the REMOTE sites,..... P352L28 Since over a day, time integrated storage.... (i.e. Insert a , between day and time) P353L8. ...Penman Monteith equation (Kelliher et al. 1993). I would prefer the original Monteith paper to be cited as it is unclear whether Kelliher et al. used the original form or some variation of it. P353L9. The authors use two different methods to estimate LAI at the different geographical sites. Did they do any comparisons between the methods at any of the sites to see what differences the methods gave? P353L22 ...but comparison revealed similar trends. Can the authors supply some information as to the absolute differences between the methods. There are many completely decoupled datasets that show "similar trends". P354L9 ..season, WHERE "ACTIVE" REFERS to the period P354L10 ...during the more balmy parts

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of the.... Most readers would understand “temperate” better than balmy. P356L7 ...until mid-May, AVERAGE AIR TEMPERATURES MAY fall below..... P356L23 In THE case of the pine forest,..... P357L13 ...(Fig 5 inset, arrow), PROVIDING evidence to THIS RISE in R being..... P357L14 ...activity I.E. THE GROWTH RESPIRATION OF THE NEW LEAVES AS WELL AS ENHANCED TREE ROOT AND FUNGAL OR MICROBIAL ACTIVITY, rather than by warming temperatures alone. P357L17 ...mmol m⁻² d⁻¹. FOR the major part..... P357L29 ...The sharp respiration increase thus IS MOST LIKELY limited. P359L17 2004) and they CONCEAL the respiration-temperature..... P361L28There, THE stomata of vascular..... P362L1strongly varying and ARE often a small proportion..... P362L2carbon assimilated. A sizeable percentage..... (Start new sentence) P363L16rainy season. IN other words, the high..... P364L8 ... between year was EVIDENT right from the onset..... P364L9 ... eddy flux tower, THE variation in stem..... P366L11 ...forest to respond IN A RESILIENT WAY in terms of their water use... (I understand what the authors wish to convey - I just think resilient is a better word). References I could not find references in the body text to the following: P367L4 Arneth et al. 1998 P369L1 Orr, 2001

Interactive comment on Biogeosciences Discuss., 3, 345, 2006.

BGD

3, S217–S219, 2006

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