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Biogeosciences Discussions

Interactive comment on "Estimating carbon emissions from African wildfires" *by* V. Lehsten et al.

Anonymous Referee #2

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This manuscript presents a new method for estimating carbon emissions from wildfires in Africa that uses the L3JRC burned area product and LPJ-SPITFIRE-DGVM.

Overall, this is a thorough and interesting analysis of the factors that influence the magnitude and variability of carbon emissions. However, it would benefit from significant shortening. (For instance, the first paragraph of the abstract could be deleted.)

Specific Comments

1) Section 2.3: For the sake of brevity, Fig. 1 could be removed as the concept illustrated in it can be stated simply in text.

2) Section 2.4: It may be interesting if you can tie these correlations to large-scale phenomena, such as ENSO.

3) Sections 3.2 & 3.3: I believe that the paper needs a discussion of the seasonal and interannual variation of emissions for specific regions as estimated by their technique.

4) p. 3109, line 21: The MOPITT sensor does not detect CO near the surface in general. It best detects CO at around 500 mb. Therefore, CO is generally not detected until it is lofted to the middle troposphere by convection. As most biomass burning occurs in the dry season, in anticipation of monsoonal rains, the CO may remain undetected by MOPITT for weeks until the pollution builds regionally and encounters convection. Exercise caution when using this dataset to evaluate the timing of your estimate. In fact, I suggest that you remove this discussion as it does not add clarity.

5) p. 3099, line 2: This is not a complete sentence.

6) Section 3.4: This analysis is interesting, but you should make the reader understand that precipitation, leaf litter, and burned area are oftentimes non-independent variables. Therefore, your coefficients of determination may be biased by cross-correlation.

7) Conclusions: The conclusions are weak. For example, I would suggest that you justify your work in the context of possible future climate change, as you hint at in the second paragraph. What do other studies says about possible climate impacts on Africa, for instance? You have done a lot of interesting work, so please take the time to expand the conclusions.

Interactive comment on Biogeosciences Discuss., 5, 3091, 2008.