

Interactive comment on “Global fire emissions and the contribution of deforestation, savanna, forest, agricultural, and peat fires (1997–2009)” by G. R. van der Werf et al.

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[Reviewer] 1. Abstract: line 18: I would add "Globally" the the sentence currently begins with "Emission" as "Globally, emission during 2000-2007..." and modify the sentence in line 21 as "Regionally, emissions during 2002-2007 were highly variable..."

[Reply] This has been changed

[Reviewer] Also in abstract, I don't understand why the 2002-2007 period was singled out, even though the paper deals with 1997-2009 period.

C8922

[Reply] We had not singled out this timeframe, but merely noted the relatively low interannual variability on a global scale. By changing the sentences according to the remark above we hope to have this clarified.

[Reviewer] 2. Introduction: This section should be significantly shortened to briefly summarize previous studies (instead of reviewing) and highlight the new approaches/improvements in this study. And, most importantly, it should point out that this is the GFED version 3, and mention what improvements it has over GFED version 2. This can provide readers with a context of this work.

[Reply] This comment overlaps substantially with the other two reviewers and we have added text in several occasions to highlight the different GFED versions, with table 3 dedicated to improvements. We have decided to not shorten the abstract as we feel this is a personal preference without agreement among the reviewers on this point.

[Reviewer] 3. Tracer emissions: The emission factors from Andreae and Merlet (2001) with some recent updates were used to scale the carbon emission to the tracer emissions (other than CO₂). However these emission factors do not vary with soil moisture, RH, and other environmental conditions. The uncertainties associated with tracer emissions should at least be discussed.

[Reply] We fully agree, please see section 4.2.3: "Both combustion completeness and emission factors vary to a large extent based on geographical and meteorological conditions as well as fuel composition (e.g. Kortontzi et al., 2003; Shea et al., 1996; Andreae and Merlet, 2001). While our combustion completeness values as well as depth of burning in peatlands and organic soils were scaled based on soil moisture conditions, this should be seen as a simple approach to incorporate spatial and regional variability; more work is needed to better represent this variability. This may be feasible for emission factors because of a relatively large body of research providing ground measurements (Van Leeuwen and van der Werf, 2010),"