**Atmospheric
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Interactive
Comment

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.

Anonymous Referee #2

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This paper describes a major update of the widely used global fire emissions database (GFED) and is thus an important contribution to the literature - i certainly recommend publication. The paper is well written, the methods and results are in general very well described with excellent supporting documentation in the Supplementary File, and there is a good discussion of uncertainties and limitations.

In summary i fully expect GFEDv3 to become the default standard for the majority of users wishing to access estimates of global fire emissions over the past decade+, and this paper offers and excellent description of the methodology used to compile the database, and a decent summary of its contents. It will therefore very likely become a

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key reference for users of GFEDv3 in the future.

Some comments and suggestions for possible improvement in the manuscript are below:

1) Since the paper describes the GFEDv3 methodology and results in detail (and GFEDv2 is widely used currently) i think the title and abstract would benefit from explicit mention of GFEDv3.

2) In Section 2.1 I would again remind the reader of the prior versions of GFED e.g. incl GFED v2 - and state that this description of the methodology is relevant to the new GFEDv3 inventory (downloadable at [where])

3) Section 2.3.1. Whilst you do mention "vegetation index" I would perhaps mention more explicitly that the burned areas are now mapped using optical remote sensing measurements that primarily are aimed at directly identifying "burned areas" on the landscape. Active fire observations are now mainly used just to identify the appropriate detection thresholds that discriminate "burned areas" in the landscape, based on changes in a vegetation index derived using [which spectral bands] from MODIS. Then refer to the Giglio et al paper for more detail. Basically i think you want to really get over to the reader that optical remote sensing is now used to map most of the burned area - rather than the more direct "hotspot count" approach used previously.

4) Section 2.3.1 - can you detail how the "monthly climatology" was derived. Does this imply that the pre-2001 results are basically not going to show a realistic interannual variability since the burned area will be the same for all years? If this is the case perhaps more should be made of the fact that the more "trustworthy" emissions estimates in terms of absolute magnitude come from the post-2001 era?

5) Section 2.4.1 - more detail is needed on how "fire persistence" was derived.

6) Section 2.4.4 - Where does equation (3) and the parameter values it contains come from? For example what evidence is there that 60% tree mortality in fires occurring in

areas of 70% or more tree cover? Past work in the boreal region suggests that average mortality figures are probably greater in regions of the Canadian boreal forest (where crown fires predominate) than in regions of the Russian boreal forest (where more surface fires predominate). Is this difference reflected in your tree mortality results?

7) Section 3.1.1. You talk here of 1998 etc being peak emissions years (probably due to ENSO effects etc) but as far as i understand it these pre-2001 years only use the "climatological values" for burned area..please make this clearer.

8) Section 4.1 - I think the paragraph on "Agricultural Waste Burning" contains some repetition from the previous paragraphs on this topic.

9) In "forest fires" section - Harden et al seems not to be in the reference list.

Interactive comment on Atmos. Chem. Phys. Discuss., 10, 16153, 2010.