

Interactive comment on “On the use of ATSR fire count data to estimate the seasonal and interannual variability of vegetation fire emissions” by M. G. Schultz

M. G. Schultz

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text changes in response to reviewers' comments:

inserted page 1161, l. 17 [comment ref#2]: The first global assessment of the seasonal variability of fire occurrence was made by Dwyer et al., 1999. [also added reference to Cooke et al., 1996]

changed page 1161, l.18: ... have investigated the variability of burned areas and the resulting emissions ... (instead of "this variability")

changed page 1161, l. 21 [comment ref#2]: The only study, which has addressed the interannual and seasonal variability of fire emissions on the global scale so far,... (instead of "The only study, which has addressed this problem on the global scale so

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far, ...")

inserted page 1162, l. 27: [availability] of a consistent data set [of global fire count data]

inserted page 1163, l. 16 [in response to coments from ref#1]: This study does therefore not try to improve existing estimates of the absolute magnitude of vegetation fire emissions, but rather attempts to lay out a conceptually simple approach that can be used for sensitivity and variability experiments in global modeling.

moved page 1164, ll.13-27 to page 1167 (top) and changed page 1164, ll. 11ff.: [...], which generally attribute little to the large-scale regional burned area. The validity of this assumption is discussed in section~\ref{sec:results}.

changed page 1166, l. 19 [comment ref#3]: [with the] base [inventory ...] (instead of "standard inventory") {the base inventory is described on page 1163, l.16 ff.}

changed section titles: removed "Discussion" and changed "Results" to "Results and Evaluation"

rewritten former "Discussion" on pages 1167 and 1168. merged with paragraph from page 1164 and reformulated to express a little more caution and to better stress the point that this study only deals with variability, not with absolute emission estimates.

added a brief discussion on the fire situation of 1998: The reasons of this significantly increased fire activity are not clear yet, but several news reports indicate that 1998 has been an exceptionally dry year. From the ATSR data set, it becomes clear that enhanced fire frequency was not limited to one region and season, but affected several areas of the world at different times.

changed page 1168, l. 22: The use of ATSR fire count data to derive scaling factors for a global biomass burning emission inventory is a simple approach that allows for a more realistic description of particular large-scale fire situations compared to the present use of average emissions in global chemistry transport modeling.

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changed page 1169, ll.12-17: New satellite products giving estimates of the burned area, such as GLOBSCAR, GBA 2000 \citep{bb:gregoire2002} or the Vegetation Cover Change product from the Moderate Resolution Imaging Spectroradiometer (MODIS) will be augmented with high-resolution vegetation data. This will allow for a more quantitative estimate of emissions in individual years by allowing to reprocess the inventory from scratch for each year instead of scaling an existing inventory.

- additional replies (extending beyond the short author's comment published on ACPD):

ref#1: ("These results [...] could help to complete such a dataset.") I think it would be too dangerous to combine data sets that are derived from different satellite sensors with very different characteristics. In order to obtain better products with long-term coverage, the community will have to await reprocessing of archived data to obtain burnt area estimates in a consistent fashion. These efforts are under way e.g. for the AVHRR data set and the METEOSAT data.

(include daytime fires in Africa): While the inclusion of daytime fires for Africa might be a worthwhile undertaking, it clearly goes beyond the scope of this study, which focuses on a one-sensor approach. Furthermore, I have not seen a consistent longer-term data set on daytime African fires between 1996 and 2000 that is readily available to the community.

(false detections): the paper does deal with false detections using a screening technique based on the seasonal fire behaviour. It is shown that this method detects fake heat sources where they are to be expected. Given the uncertainty of the scaling approach in general and the positioning of this method as a first step, I don't think it would be worthwhile to spend more effort on refining the technique of false detection screening.

(scaling by 1.2 globally): from the rewording in the "Method" and "Results" sections it should now be clearer that the application of the scaled emission inventories is mostly

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for global sensitivity and variability studies. Such modeling studies require a baseline scenario, which is in this case given by a "reference run" made with the "climatological" inventory. Because of the non-linearities in the chemical equations, it makes sense to ensure that the average emissions of the "scaled run" match those of the "reference run", which has been evaluated with a variety of chemical trace gas observations. As (now) stated several times in the paper, this study does not aim at obtaining a better absolute estimate of vegetation fire emissions.

(Barbosa study does not bring new conclusions in this paper) I now reworded this paragraph to make it again clear, that I compare the variability of the Barbosa results with the variability obtained from the scaling approach, not the mean values. This may have been misleading before (the text read "statistics" instead of "variability").

ref#2: (add reference Dwyer et al., 1999): done

(measure of fire activity) I agree that the design of the ATSR sensor is not ideally suited to obtain a robust statistics of active fires; nevertheless, it is the only longer time series we have got available at present. As the title of the paper indicates, this study attempts to discuss it's suitability for the purpose of deriving emission estimates. And as stated in the conclusions, I fully agree that we will see great progress when the new burnt area products will become available for several years. However, this will not be tomorrow.

ref#3: (where does standard inventory come from?) reworded as base inventory. This is described at the beginning of section "Method".

(reason for 1998 increase and its significance) see above.

(wrong conclusion) now reworded.

- editing comments:

1. I had to change the `\hhline` commands into `\hline` in order to run pdflatex. The original `\hhline` commands are commented out, so it is very easy to find them.

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2. I added a few references - these changes are all marked with comments

3. In the tar file, the figures have remained unchanged, but I adopted the names I found in the tex file.

Interactive comment on Atmos. Chem. Phys. Discuss., 2, 1159, 2002.

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