

Interactive comment on “Screening the ESA ATSR-2 World Fire Atlas (1997–2002)” by B. W. Mota et al.

J. Gregoire (Referee)

jean-marie.gregoire@jrc.it

Received and published: 10 August 2005

Review manuscript Mota et al.

Screening the ESA ATSR-2 World Fire Atlas (1997-2002) B.W. Mota et al.

General comments:

Interesting and really useful work dealing with the quality check and screening of one of the most frequently used fire inventory in support to atmospheric chemistry studies. Strange enough, the first research papers based on the use of the WFA product are from the end of the 90'. But it is only now in 2005, with this work by Mota and colleagues, that a systematic screening of the dataset is done. The "improved multian-

Full Screen / Esc

Print Version

Interactive Discussion

Discussion Paper

nual global fire activity dataset", as proposed in this manuscript, is therefore extremely wellcome. The manuscript is well structured and the methodology clearly presented. The results are really interesting. The implications for atmospheric chemistry studies could have been discussed more in depth, as the manuscript is proposed to ACPD ! In summary: congratulations to the authors

Specific comments:

- Introduction: the ATSR sensor does not provide daily data (as mentioned by the authors) as the revisiting period is at least 3 days (at the equator). Moreover, the revisiting period is changing with latitude.

- Introduction: the list of references, related to studies that used the WFA product, could be limited to only those done at global and continental level, without mentioning the analysis performed at local level.

- Section 2.1 The World Fire Atlas - first paragraph: the authors mention a revisiting period of 3 days at the equator. It would be interesting to know what is the revisiting period at other latitudes (such as 40 North, 50 North, 10 to 20 South), as a large portion of the vegetation fires are known to occur at these latitudes.

- Section 2.1 The World Fire Atlas - second paragraph: the authors did not use the WFA data provided by the AATSR sensor after December 2002. Why ? Is-it linked to changes in the characteristics of the sensor (from ATSR-2 to AATSR) ? It would have been interesting to see the screening effect for the year 2003 (known for its very high level of fire activity globally).

- Section 2.1 The World Fire Atlas - paragraph #6: 1)The authors should provide more information on the magnitude of the location accuracy errors. 2)Is-it correct to say that these location errors are acceptable for most atmospheric chemistry applications ? Probably not, as it is the combination "location of fire event + type of vegetation burnt" which provides the user with the proper information. Depending on the location

[Full Screen / Esc](#)[Print Version](#)[Interactive Discussion](#)[Discussion Paper](#)

error, the type of vegetation (and therefore the amount of fuel) might be totally wrong. 3)What could be the effect of these location errors on the quality of the screening done by the authors ?

- Section 2.1 The World Fire Atlas - page 4647: the last two paragraphs of this section (discussion of the main limitations/advantages of the WFA product) call for the following remarks, which could be commented by the authors in the final version of their manuscript:

- o The authors say that the "night time ATSR overpass samples a moment of reduced activity in the diurnal fire cycle and that many short duration fires are not observed". True, and it is a serious limitation of the WFA for the inter-tropical belt, as most of the tropical savannas fires have a duration of few hours and occur mainly during day time. However, one could make the hypothesis/interpretation that these night-time fires and/or long lasting fire events (included in the WFA database) correspond mainly to fires affecting forest and woodland cover types. If this hypothesis is correct, a limitation of the WFA would become an advantage for fire ecology studies
- o "They may be too restrictive to capture active fires that affect only a small fraction of the area of a pixel". See previous work by Belward et al., (ref. below) that showed that a 50 m long fire front was detectable in a 1 km² AVHRR pixel in a wet savanna region (Côte d'Ivoire). Belward et al., 1993, In-Situ, real time fire detection using NOAA/AVHRR data. proceedings VI AVHRR Data User's Meeting, Belgirate, Italy, published by EUMETSAT, Darmstadt, Germany, EUM P 12, ISSN 1015 9576, 333-339

- Section 2.3 Screening based on land cover: "É all WFA observations falling on these land cover classes were classified as false alarms or non-vegetation fires". What is the impact of the low location accuracy (of the WFA product for the years 2000 & 2001) on the quality of this screening based on the GLC2000 map ?

- Section 2.4 Screening non-vegetation fires: the Nighttime Lights of the World data product offers more than one inventory of stable lights observed at night: for instance, one would see a large increase of stable lights, for some regions of the globe, when comparing the 1992 and the 2000 DMSP products. Does that mean that the screening

[Full Screen / Esc](#)[Print Version](#)[Interactive Discussion](#)[Discussion Paper](#)

of the WFA, for non-vegetation fires, should take into account a probable increase of the number of stable lights and/or gas flares during the period covered by this study ? A comment from the authors would be wellcome.

- Section 2.5 Additional data screening - first paragraph: "Some of the clusters exhibited regular geometric shapes, such as triangles and lines etc. and were labeled false alarms." This assumption is not correct for some regions where fire management is done in such a way that it results often in geometric clusters: southern edge of the Amazon Basin and Northern Territory of Australia, for instance.

- Section 3.1 Temporal analysis. Figures 2a,b,c show that the time-series of non-vegetation fires and false alarms exhibits a seasonal and inter-annual dynamics similar to that of the original (not screened) dataset and of the screened data set. Does that mean that the drivers of the temporal dynamics are the same for the vegetation fires and for the false alarms ?? This could be true for the land cover conditions (hot surfaces), but is difficult to understand for the non-vegetation fires. The authors should comment on that.

- Section 3.1 Temporal analysis. The results (peaking of false alarms in August-September) seem to indicate that most of the errors, if using the original WFA product without any screening, would affect fire inventories in the tropical part of the southern hemisphere (where the fire season run approximately from May to September), in the temperate/mediterranean regions of the northern hemisphere and in the boreal regions. The tropical regions north of the equator would be much less affected (usual fire season from October to April). A comment from the authors on this interpretation would be wellcome.

- Section 3.2 Geographical and quantitative analysis. The results show that a large proportion of the errors found in the WFA product are due to rather stable characteristics of the land cover (bare areas, permanent water bodies, artificial areas etc) and to gas flares (stable). Does that mean that additional timeseries provided by the

[Full Screen / Esc](#)[Print Version](#)[Interactive Discussion](#)[Discussion Paper](#)

WFA could be corrected by applying a simple spatial mask, without going through the time consuming procedure used in this study ? Comments from the authors would be wellcome.

Technical corrections:

- Introduction: reference Tansey et al., 2003 is from 2004
- Section 2.1 The World Fire Atlas: reflection of clouds (and not off clouds)
- Section 2.3 Screening based on land cover: the URL to access the GLC2000 product was changed recently: www-gvm.jrc.it/glc2000/defaultGLC2000.htm
- Section 2.3 Screening based on land cover, last paragraph: including all all areas.
- Table 1: column Vegetation Fires: 130 343 instead of 130,343
- Figure 1: a connecting line seems to be missing under the box FIRES
- References: as already said above, the list of references could be reduced by focusing mainly on continental and global scale studies.

Interactive comment on Atmos. Chem. Phys. Discuss., 5, 4641, 2005.

Full Screen / Esc

Print Version

Interactive Discussion

Discussion Paper