

Interactive  
Comment

## ***Interactive comment on “Arctic smoke – record high air pollution levels in the European Arctic due to agricultural fires in Eastern Europe” by A. Stohl et al.***

**A. Stohl et al.**

Received and published: 20 December 2006

Dear Kevin and Jean-Marie,

You are absolutely right that our estimates of the areas burned are highly uncertain. You may also be right that the areas burned per detected hot spot should be smaller for agricultural fires than for boreal fires. However, there are compounding factors like how the preferred times when farmers start the fires overlap with MODIS overpass times, or how quickly the fires burn a given area compared to boreal fires. These factors would affect the fraction of all fires that are detected - and we also want to account for undetected fires that are likely burning in the same region.

Unfortunately, we are not aware of a study that has established a statistical relationship

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between area burned and the number of detected hot spots for agricultural fires. Thus, we took the only value we found in the literature, which unfortunately is given only for boreal fires. The fact that the model results give reasonable results suggests that the relationship is not too far off. However, given uncertainties in the emission factors, the transport, etc., the area burned per hot spot could have easily been overestimated by us by a factor of 2, if not more.

In any case, the forthcoming products that you are mentioning will be very welcome for obtaining more accurate estimates of the areas burned. We would appreciate if you could inform us once these products are available - we would certainly use them in future studies.

For our present study, the area burned estimate is not a too critical factor, since we only released a passive CO tracer for the model simulation. The timing of the arrival of the tracer at Spitsbergen is the most critical information obtained from the model simulation and this should not be affected too much by the estimate of the areas burned (only by spatio-temporal variations of this factor which admittedly are also not known and could be important, too).

Regards,

Andreas (plus co-authors)

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Interactive comment on Atmos. Chem. Phys. Discuss., 6, 9655, 2006.

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