

## ***Interactive comment on “Fire dynamics during the 20th century simulated by the Community Land Model” by S. Kloster et al.***

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We thank the reviewers for their constructive comments and suggestions. We hope to have addressed all raised issues in our comments on the individual reviews.

Anonymous Referee 1:

Specific comments:

1.: Page 576: Observed area burned datasets for western United States (Westerling et al., 2003) and boreal North America (Stocks et al., 2003) might be useful to further evaluate simulated area burned.

Thanks for pointing this out. Both datasets are very valuable for an evaluation of our

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model. We added a comparison between simulated burned area and reported burned area by Stocks et al. (2003) to the evaluation section (4.1 Annual area burned and carbon emissions) of the manuscript.

We added to Page 576/Line 18: “For Canada the model mean estimates ranged between 1 and 4 Mha for the 1959 to 1997 period. This was generally consistent with the mean burned area of 1.8 Mha reported in the large fire database (LFDB, Stocks et al. 2004).”

The results reported by Westerling et al. (2003) do not allow a direct comparison of the area burned. However, the data collected for the western United States on fire activity nicely reflect the seasonality of wildfires within that region. We included these results in our evaluation of the seasonal performance of the fire algorithm in section 4.2: Interannual and seasonal variability

We added to Page 580/Line 11: “For the western US the model using the Arora and Boer (2005) algorithm had highest emissions in July/August. This was consistent with results based on a comprehensive data compilation of observed burned area (Westerling et al., 2003). In contrast, peak emissions were simulated too late in the year (September/October) when the model was applied with the Thonicke et al. (2004) fire algorithm.”

2.: P581. Is moisture probability the same as  $P_m$  in Appendix A2.1? If so, please clarify.

Yes, the moisture probability refers to  $P_m$  defined in Appendix A2. To clarify this we changed:

Page 581/Line 18: “... as well as with the biomass probability and moisture probability as used in the Arora and Boer (2005) fire algorithm (see Appendix A2).”

To: “... as well as with the biomass and moisture probability as used in the Arora and Boer (2005) fire algorithm ( $P_b$  and  $P_m$ , see equation A6 and A7, respectively).”

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