Biogeosciences Discuss., 9, C4101–C4103, 2012
www.biogeosciences-discuss.net/9/C4101/2012/

Biogeosciences Discussions

Interactive comment on "Satellite-based assessment of climate controls on US burned area" *by* D. C. Morton et al.

Anonymous Referee #2

Received and published: 20 September 2012

General Comments:

This paper presents findings from the first national assessment of climate controls on US fire activity using 2 satellite based estimates of monthly burned area from the Global Fire Emissions Dataset (GFED) and the Monitoring Trends in Burn Severity (MTBS) project. This study is well-written, and relatively easily accessible to a wide range of audiences, including technical research scientists, as well as regional and national managers. This topic is very timely, and uses cutting-edge spatial fire and climate data to produce novel, useful results that will lead to future research. The Introduction does a nice job of explaining how this study fits into the web of literature focused on wildfire extent and climate drivers. The Discussion is clear, easy to follow and provides valuable synthesis of this novel study. Perhaps the most valuable insights this analysis

provides are regional relationships, and differences, between climate drivers and fire. Overall, the variable interactions presented by these authors across space and time provide the research and management communities with tangible platforms for better understanding climate effects on the interannual variability of burned areas.

Specific Comments:

While this paper is valuable and well written, it has triggered some questions and suggestions for the authors:

1) Are there substantial differences between fires that burn in woodlands, grasslands and savanna, or agricultural fires? I understand the need to simplify the analyses, and to lump fires into similar bins. In my limited experience, there are stark differences (including wind and other climatic variables) between woodland fires, grass fires and agricultural fires. Could the analysis be further refined in the future by examining differences between these unique vegetation types and the climatic drivers that impact these types of fires?

2) Do either of these data sets (GFED or MTBS) include prescribed fires or fire for resource benefit (ie. Fire Use Fire)? If so, what percent of the fires are "controlled" or prescribed? Would an analysis investigating the relationship of climate on BA be affected to a large extent by fires that are intentionally set in a window of climatic opportunity? Perhaps this could be a future investigation for the authors.

3) One of the climate variables that are included in the analysis was albedo. I am personally interested in your findings regarding how albedo affects fire systems. I did not see any further mention of albedo in the paper. How was this variable investigated, and were there any interesting interactions discovered?

4) Did the authors consider including a measure of atmospheric stability, similar to the Haines Index, as one of the climate variables in this study? This variable is often linked to the spatial extent of fires; fires growing quickly in a short period of time.

5) It would be extremely interesting to analyze these data in the future to identify any temporal shifts in fire season occurrence across the regions examined in this paper. These data sets could provide rudimentary understanding of temporal shifts in peak fire season under current climate change conditions. This information could be of considerable value to mangers regarding planning for a longer, earlier, or later peak fire season.

6) I would have been interested in a more refined analysis of the 4 burning regions with similar regional distribution of FDED and MEGS BA estimates (AK, NP, NW and SW). Perhaps providing a finer scale resolution analysis could tease apart some of the broader relationships, and provide insight into other regions and/or climatic/fire interactions.

7) It would be very interesting to incorporate specific vegetation models, or coarse fuel distribution mapping into this study. Adding a fuels component would make this study extremely comprehensive, and could probably provide further explanation for some of the results of this study.

Technical Corrections:

Pg 7882; Figure 2: Explain the legend with text. It was not clear or intuitive if the colors 2-12 are representative of months.

Pg 7862; Figure 5: The trends/correlations are not clear to me. Perhaps better explanation in the text will clarify this figure.

Pg 7871; Line 10: “Non-climate drivers of regional BA were also important. . ..” I am not certain which drivers you are referring to, or how it relates to the findings in this paper.

Interactive comment on Biogeosciences Discuss., 9, 7853, 2012.