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Biogeosciences Discussions

Interactive comment on "Characterizing the multi-scale spatial structure of land-atmosphere interactions with information theory" *by* N. A. Brunsell and M. C. Anderson

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Response to Comments

We wish to thank the two reviewers for their thoughtful comments. We feel that by addressing these comments the manuscript is now better.

In line with both reviewers comments we have expanded the description of the model and have added a section of details concerning the site characteristics.

Reviewer 1 (P Falloon)

Response to specific comments

We have added a few paragraphs of site description giving details.

Done.

We have added a few sentences based on the selection of the dates.

Units have been added to the figures.

All of the minor textual changes have been made as suggested.

Reviewer 2

Response to general comments

In line with the comments of Reviewer 1, we have expanded the site description and model description sections of the manuscript. In addition, we have expanded the discussion section in a few places to tie the scaling results back to the surface conditions, in particular the soil moisture and vegetation.

The introduction has been expanded to comment on the results of the previous work by Brunsell and to clarify the additional contribution of this work.

We have chosen not to change the wavelet analysis, as we feel that it is useful to have this description in the text rather than an appendix.

The title has been changed.

Response to specific comments

All textual changes have been made as suggested.

P3446 L13: We perform subsampling of the MODIS and GOES data to 100 m so that all of the datasets are on the same resolution. We have clarified this in the text.

By 'overall field' we meant the original data series. This has been changed.

Yes, the Landsat and GOES entropies are on the same order, but the larger scale Landsat is greater than 6, while the GOES is approximately 5. Thus, while they are

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close, the information content of the Landsat is slightly higher than the GOES. This has been clarified in the text.

We have added an arrow to Figure 2 to illustrate the location of the 51 km scale.

We have added the figure references in support of the discussion statements as suggested.

We have added a comment on the relatively flat distribution of the MODIS pdf in the text.

We have changed the temporal variations to downplay the contribution of this manuscript, however since we are looking at three times with different stages of vegetation we have commented on seasonal variations.

The 'length scale of variability ... Landsat', it's not trivial due to the fact that the length scale determined by Landsat is on the order of several km, which should be detectable by the MODIS sensor. This has been clarified in the text.

Changes to the table have been made as suggested.

We have added a description of the bandpass filtered ET values to the caption of the figure to clarify the meaning.

We have added the McCabe and Wood (2006) reference, and thank the reviewer for bringing it to our attention.

Interactive comment on Biogeosciences Discuss., 8, 3435, 2011.