

Interactive comment on “Mapping daily evapotranspiration at field to global scales using geostationary and polar orbiting satellite imagery” by M. C. Anderson et al.

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We would like to thank Referee #2 for the helpful comments on the submitted manuscript.

1)"Judged as an overview paper, the level of detail could be considered as adequate. Nevertheless, as not much has yet been published for the newer applications, a bit more of detail about the model implementation and/or a possible early validation of the estimates could have made the paper more interesting. Some readers may also be left wondering whether this could have been a good opportunity to elaborate more on the

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challenges of applying the same modeling framework to such different spatial scales (specially concerning the foreseen global application). For instance, the temperature lapse rate used for the ABL model over CONUS is derived from the synoptic radiosonde data, while over other areas meteorological analysis may be the only source of data, which could have implications when applying the model. Or a discussion about possible changes on land cover, soil properties, and/or canopy characteristics to run the model at the global scale. These should be discussed in detail in forthcoming publications, but if the progress of the ongoing work allows, it can be a nice addition for a final revised paper in HESS."

We have added information regarding our plan for global application, and added a new Table 2 summarizing data sources used in the CONUS, Europe/Africa, and global ALEXI domains. With the recent release of the global Geoland2 geostationary datasets, our timeframe for implementing a global ALEXI domain has been moved up and we expect first results within a few months. At that point, we will submit a manuscript including a complete description of the final implementation strategy.

2)"Title. The title may make think the reader that a global application is presented, which is not the case. Perhaps replacing “global” with “continental” in the title may reflect better the paper contents."

The title was changed from "...Field to Global Scales..." to "...Field to Continental Scales..." in response to comments from Referees #1 and 2. The paper suggests a plan toward global applications, but no global application is actually presented here.

3) "P5963.L21. As no scale of applications for TSEB has been mentioned at this point, it may help the reader to point out the limitations of a stand alone TSEB for a regional application here (instead of at the end of the paragraph)."

This paragraph has been modified to immediately raise the issue of obtaining accurate air temperature boundary conditions for stand-alone TSEB application over large areas.

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4)"P5964.L6. One of the limitations of thermal infrared remote sensing for land surface monitoring is that no observations are available for cloudy conditions. The gap-filling technique based on running water pools used on ALEXI may be mentioned here to complete the model description, instead of just the brief reference given in one of the applications (P5967.L17)."

A more detailed explanation of the gap-filling algorithm has been moved to the model description section, as suggested.

5)"P5964.L12. The reader may wonder why the application of ALEXI over the continental US seems to cover only the 2000-present period and not before, whether this is due to sensor capability, or availability of consistent (in time) ancillary data, and so on. A longer CONUS data record would be very much welcome by a long list of potential users."

Currently we are limited by the MODIS LAI archive, but there are other long-term multi-sensor LAI datasets available. Sentences describing current limiting factors and potential for expansion have been added to the text

6) "P5965.L15. The LST-VI relations have been already exploited for quite some time, some reference to earlier work will help the reader."

Citations have been added, as suggested.

7)"P5967.L15. CONUS already defined in P5964."

Fixed.

8)"P5967.L20. 8 days?"

Yes – 8 days was intended. "Days" was changed to "d" by HESS in the formatting stage.

9)"P5969.L15. A discussion about why the year 2004 is not captured by the ALEXI-derived drought metric (in contrasts to e.g. 2007) will be of interest, even if the reasons

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are not fully understood."

This feature is not captured by any of the shorter term (less than one year) drought indices because it reflects a hydrologic drought event – a long-term, multi-year deficit. We would anticipate ALEXI could capture this signal if we computed say a 36-month composite. This is more clearly described in the text now.

10)"P5971.L10. Could the source of the irrigation figures be mentioned? P5973.L15. GDAS means the NCEP GDAS? It may help to make it clearer, and/or perhaps add references, as done in P5970 with LDAS."

Report giving irrigation figures is now cited. A citation for GDAS is also now provided.

11)"P5974.L18. A possible reference to the LandFlux initiative is Jimenez et al (2010) Global inter-comparison of 12 land surface heat flux estimates", JGR, in press."

This citation is now included.

12)"Figures. Some of the figures seem reprinted from previous papers, a reference in the caption may be useful."

Citations to prior papers have been added to captions.

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