

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

**Anonymous Referee #2**

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General comments

The paper presents an overview of a method to estimate evapotranspiration (ET) over land surfaces driven by thermal infrared remote sensing. The modeling framework is presented without much detail, but numerous references are provided to guide the interested reader. This is followed by a list of applications at regional and continental scales. Some of these applications seems quite mature (e.g., the derivation of a drought metric from the ALEXI ET estimates), while some of the others seems to be in a very early stage (e.g., the hydrologic decision support over the Nile river basin).

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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 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.

In general, the paper is very well written. A few specific suggestions and comments are given below.

Specific comments

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.

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

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

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applications (P5967.L17).

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.

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

P5967.L15. CONUS already defined in P5964.

P5967.L20. 8 days?

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 are not fully understood.

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.

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.

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

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Interactive comment on Hydrol. Earth Syst. Sci. Discuss., 7, 5957, 2010.