

Interactive comment on “Land surface temperature representativeness in an heterogeneous area through a distributed energy-water balance model and remote sensing data” by C. Corbari et al.

Anonymous Referee #2

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This paper describes investigation of the relationships between land surface temperature predicted from a distributed hydrological/water balance model and remotely sensed surface temperature imagery at different pixel resolutions over a heterogeneous (agricultural) site containing a patchwork of irrigated and non-irrigated fields.

In general the paper is clearly written, although in places the phrasing is somewhat awkward or the grammar is poor. It would be advisable for the paper to be reviewed by a grammarian well versed in the English language. A few of the common phrasing that

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should be revised is the following:

"alternation of irrigated and non-irrigated vegetated field" is not what the landscape is actually (Fig 1)...this phrase would describe more of a "checkerboard" type surface where you would have alternating wet and dry fields somewhat similar in size...instead what they have is more like a "patchwork" or mixture of irrigated and non-irrigated fields differing in shape and size..

Also the phrase "catch" used throughout the paper is not a good word to use in this context..."capture" is more appropriate..

The phrase "peculiar circular shapes" are in factv not all peculiar for irrigated agricultural lands, particularly in the U.S. These are center pivot irrigation systems and are used all over the world.

Technical Issues:

Under section 4 water balance validation, please specify if the comparisons were made using measured H and LE fluxes closed so that there was energy conservation (residual flux partitioned between H and LE) or not. Also at what model resolution what the output compared to the fluxes and was a flux-footprint run to assign the contributing area to the flux measurements.

Figure 2 provides no information concerning the scatter in the model-measurement comparison as a function of magnitude. The fluxes should be plotted as X-Y plots with a 1:1 line. Also the difference statistics should be given for nighttime and daytime data separately.

Figure 3: The scale (10 degrees) helps to reduce the scatter between remotely sensed and modeled LST. I would separate daytime versus nighttime temperatures. In fact since the variation in nighttime temperatures is minor, the authors should really focus on the differences/scatter between modeled and measured LST during daytime conditions.

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During the study period analyzed, was there irrigation occurring? If so, how did the hydrological/water balance handle this and how were the fields identified?

Under the section 6.1 LST scale of fluctuation, I wonder if the length scale of the field boundaries (i.e., average diameter/radius of the center pivot irrigation fields) is what defines the resolution of scale above which much of the variability is lost. If so, this would be a much simpler metric to use than what is presented by the authors.

Finally, a more interesting analysis would have been to have run the hydrological/water balance model at coarser resolutions (say MODIS 1 km) and see what errors would have been incurred (compared to the model run at high ~10m resolution) as a result of having a mixture of surfaces in each modeling grid-box.

Interactive comment on Hydrol. Earth Syst. Sci. Discuss., 7, 5335, 2010.