

Interactive comment on “Upscaling instantaneous to daily evapotranspiration using modelled daily shortwave radiation for remote sensing applications: an Artificial Neural Network approach” by L. Wandera et al.

Anonymous Referee #2

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This paper developed and evaluated a temporal upscaling method for estimating ETd from different time-of-daytime instantaneous ET (ETi) measurements with the assumption that the ratio between daytime to instantaneous RS (RSd/RSi) is the predominant factor governing ETd/ETi ratio. However, since RSd is not measurable from the polar orbiting satellites, they first developed a robust ANN based method to upscale RSi to RSd followed by using the ratio of RSd/RSi to further upscale ETi to ETd.

Given the significance of ETd in remote sensing based water resource management from polar orbiting satellites, the overarching goal of this study is to provide an oper-

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ational and robust ETi upscaling protocol for estimating ETd from any polar orbiting satellite.

I found the research idea and the methodology behind it to be very interesting. However, I have some minor comments and questions as detailed below:

1- How do you pick the training sites? Will the vegetation type and climate type (seasonal climate) have any effect on your trained ANN algorithm? Given that Fluxnet sites at least in N. America are mostly forest sites, will that have any potential impact on your trained ANN?

2- I think a paragraph on Rs and factors affecting Rs is missing from the paper. This is necessary to justify your choice of inputs for your ANN.

3- Please include discussion on why the method performs poorly over cropland (Figure 9).

4- As discussed in lines 25-27, Rsd and cloudiness are directly related. ANN has no input related to cloudiness. However, you argue that you assess the performance of ANN under cloudy sky condition based on simple cloudiness index. Please elaborate on this and include discussion in the paper. Can you use Precipitation or the index of cloudiness as an input to your ANN?

5- Since vegetation plays an important role in Evapotranspiration, it would be interesting to compare different scaling methods against the type of vegetation as well (in graphs or figures)

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