

## ***Interactive comment on “Spatial variability of mean daily estimates of actual evaporation from remotely sensed imagery and surface reference data” by Robert N. Armstrong et al.***

### **Anonymous Referee #2**

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This study illustrates methods to calculate normalized indices of surface characteristics to estimate evaporation and its spatial variation using the Granger and Gray model. Spatial variability of evaporation in this parkland area was low. Although aspects of this study were interesting, problems with clarity, organization and very limited discussion made it difficult to assess the contributions of this work and its conclusions.

Specific comments: The introduction/background did not clearly describe the study objectives and how it was new and would advance an understanding of the topic. More specific and well-defined research objectives including imagery resolution/scale detail and hypotheses would be helpful. Last sentence of section 1 detracts. Perhaps move

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into discussion.

Methods: Is it necessary to repeat the normalized index equation for each variable? It would be helpful to have all the reference values for the normalized variables in one place as well.

The eddy covariance measurements of evaporation and calculation methods are not well described. Are energy closure corrections or other corrections applied? There is a 2006 EC study mentioned in the results that is not described in the methods nor referenced. If that study is important, then results should be given to support the conclusions that are drawn (perhaps in an appendix). At the moment, it seems to raise more questions than it answers.

Figure 1 was not helpful for context. Perhaps a colour image of the region or instead, include the station and sampling points on Figure 2. If I understand correctly, the  $\sim 100$  m upwind fetch of the EC station is not shown on the map. Why not? Ponds are not labelled that I can see but are mentioned in the text, pg 11.

Results/discussion: There is a mix of methods and results in the results/discussion section. Clarity would be improved if these were better separated. For example, the corrections applied to the field measurements of broadband albedo to allow for comparison with narrow-band albedo could be included in the methods.

Was the study day cloud free? If so, then yes, daily and midday net radiation would scale very well. There is a large body of literature on net radiation models that could better constrain the uncertainty with which midday net radiation is useful for estimating daily values. Figure 7 relationships may not be useful in the long-term nor applicable elsewhere.

What is the basis for evaluating the evaporation measurements in Section 4.7? A difference of 0.5 mm/day is not insignificant.

The purpose of describing the distribution of the variables (Section 4.8 and Figures 10 -

14) and the covariance analysis (Section 4.10) could be made clearer. As noted above, specific objectives or hypotheses could be useful. The differences among roughness 'classes' in Section 4.8.1 is interesting but there is limited discussion.

Since the radiative/energy and aerodynamic terms are discussed earlier in the results (Fig 11), perhaps present equation 14 instead of equation 1 at the beginning of the paper.

There are a number of typographical errors throughout. Ensure all acronyms are defined on first use. The number of figures could be reduced and quality of most map Figures could be improved.

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Interactive comment on Hydrol. Earth Syst. Sci. Discuss., <https://doi.org/10.5194/hess-2018-600>, 2018.

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