RESPONSE TO EDITOR'S COMMENTS
Effect of the Revisit Interval on the Accuracy of Remote Sensing-based Estimates of Evapotranspiration at Field Scales (hess-2016-273)

Note: The responses follow the reviewers' comments and highlighted using red text. Excepted text from the revised manuscript is shown in blue with the changes underlined when appropriate.

Editor's Comments 1:

1) About the title: I think the new proposal for the title is too long and not covering the content. What about e.g. "Effect of revisit interval and temporal upscaling methods on the accuracy of remotely-sensed evaporation estimates"?

We agree that the proposed title change is both more accurate and better reflects the focus of the paper. The revised title now reads:

Effect of the Revisit Interval and Temporal Upscaling Methods on the Accuracy of Remotely-Sensed Evapotranspiration Estimates

(5) Used metrics: If D provides similar information as RMSE and MAE, but D is only scaled between 0 and 1. Then I suggest to chose one metric you prefer instead of showing 3 similar metrics.

The analyses using the index of agreement (D) have been removed from the paper. The manuscript now focuses on RMSE and MAE when describing error. The computational underpinnings and sensitivities of these two metrics are sufficiently distinct to provide unique insights into magnitude and variability of the error introduced into the ET estimates via temporal upscaling.

Page 8, Line 1 to 21:
Page 11, Line 7 to 13:
The discussion of D has been remove from sections 2.4 Statistical Metrics and
3.3 Accuracy of the Latent Heat Flux Estimates. Similarly, the figure showing how D varies with return interval has been removed.

Editor's Comments 2:

Comment on λ and $\lambda_{v:}$

There is no difference between λ and λ_v. Both are the latent heat of vaporization. I think the confusion is caused by the fact that the authors call the 'latent heat flux' λE instead of ρλE, with ρ the density of water.

Comment on equation 2:

I agree with the reviewer to change equation 2 to the way the Penman-Monteith equation is denoted in Allen et 1998 and add the density of water to the left hand site of the equation so $\lambda = \lambda_v$,

The discussion of the reference latent heat flux (λE_o) has been modified to improve its clarity while maintaining λE as symbolic abbreviation for the latent heat flux. While the authors recognize in the context of an equation that λE might be misinterpreted by some as the product of two terms, i.e. λ and E, the use of λE to represent the latent heat flux is well-established and commonplace in the literature. The authors are concerned that the usage of a nonstandard symbol would not only create an inconsistency with the symbols use for other related quantities, e.g. the equilibrium latent heat flux (λE_{eq}), it would also be a potential source of confusion to readers.

Although it nearly identical the equation given in the FAO56 documentation, the reference ET (ET_o) calculated for this study was determined following the updated version of the relationship given Walter et al. (2005). This is now clarified in the paper and that relationship is shown. The conversion from ETo to λE_o is then described. In this manner, the potentially confusing situation where both λ and λ_v appear in a single equation can be avoided.

Other errors identified in the description were also correct.

Page 6, Line 1 to 15:

The first of the χ derived from meteorological data, λE_0, is derived from ET_0 which is described by Allen et al. (1998) as the hypothetical ET (or λE) from a well-watered grass surface with an assumed height of 0.12 m and albedo of 0.23. It is calculated using a simplified form of the Penman-Monteith equation. For this study, the updated relationship given by Walter et al. (2005) was used:

$$ET_0 = \frac{0.408\Delta(\mathrm{R_n}-\mathrm{G})+\gamma\frac{C_n}{(T+273)}U(e_s-e_a)}{\Delta+\gamma(1+UC_d)} \tag{2}$$

where Δ is the slope of the saturation vapor pressure-temperature curve (kPa K^{-1}), R_n is the net radiation (W m^{-2}), G is the soil heat flux (W m^{-2}), γ is the psychrometric constant (kPa K^{-1}), C_n is a constant (37 °C s^2 m^{-2}), T is the air temperature (°C), U is the wind speed (m s^{-1}), e_s is the saturation water vapor pressure (kPa), e_a is the actual water vapor pressure (kPa), and C_d is a constant (0.24 s m^{-1}). This relationship is nearly identical to the one given in Allen et al. (1998); the two formulae differ only with regard to the assumed surface resistance. While the surface resistance is assumed to be 70 s m^{-1} by Allen et al. (1998), it is assumed to be 50 s m^{-1} in the later work. While modest, this modification yields improved results when the daytime moisture flux is calculated on an hourly basis (Walter et al. 2005). The result is converted to λE_0 by multiplying by the product of the density of water and the latent heat of vaporization. Similarly, λE_{eq}, which can be thought of as the energy-driven moisture flux that is independent of surface resistance, can be expressed according to:

$$\lambda E_{eq} = A\frac{\Delta}{\Delta+\gamma} \tag{3}$$

with the variables defined as above (McNaughton, 1976; Raupach, 2001).

Walter, I. A., Allen, R. G., Elliott, R. L., Itenfisu, D., Brown, P., Jensen, M. E., Mecham, B., Howell, T. A., Snyder, R., Echings, S., Spofford, T., Hattendorf, M., Martin, D. L., Cuenca, R. H., and Wright, J. L.: The ASCE Standardized Reference Evapotranspiration Equation. Technical Committee report to the Environmental and Water Resources Institute of the American Society of Civil Engineers from the Task Committee on Standardization of Reference Evapotranspiration, 173 pp., Reston, VA, 2005.