Hydrology and Earth System Sciences Discussions

Interactive comment on "A framework for upscaling short-term process-level understanding to longer time scales" *by* W. H. Lim and M. L. Roderick

Anonymous Referee #1

Received and published: 11 July 2012

I am very please to read about the additional direction of the analysis, and taking the additional step to use the analysis conducted here as a method to improve estimation of evaporation.

However, I am a bit at loss as to what was done in this revision. I cannot understand the technical meaning of pulling all years to one super-year, nor can I see any merit in doing so. Unresolved from my previous comment, the explanation of the methods used is still confusing and lacking. What values exactly were used to calculate the daily covariance of a 1 day or 2 days or 16 days in the super-year? were these the

observations for each of the days pulled together to the super-year or the 30-minute data within each day? The new figure A is a bit redundant, it is rather obvious that there will be a daily cycle in each variable. I'd rather you plotted the time series per season of the covariance terms as calculated from each day rather than the observed variables, preferably (and perhaps in different colors or dashing), add the time series as calculated also from each 2 days, 16 days, month.... Figure B seems wrong - R^2 decreases and RMSE increase as more days are used, which seems opposite to what you would expect.

At the core of problem with the previous version, I expected that the method would be completed, i.e. taken to its conclusion by using the parametric methods developed here to predict E. For example, the empirical relationships presented in figures 5 and 7 could then be used to calculate E not based on the measured covarience by based on the observed variables, and the approximate covariences as calculated from U and H. The error analysis should not be based on the sensitivity of the observed covariences by on the sensitivity of the empirical relationships between the covariences and the environmental variables, i.e. if I wanted to calculate E and had no measurements of covarience, how accurate would it be if I use the estimates of the covarience using U and H and the empirical methods shown in fig 5 and 7. Naturally for fig 5 and 7 you must have some observed covariences, and here I ask again, how many? how sensitive it is to the timing of the measurement....

It is hard for me to estimate the improvement in the manuscript beyond that. A large part of my disagreement was due to the large mismatch between the introduction and the results, and I'll need to see a revised version to see how that has changed.