

Interactive comment on “The fate of land evaporation – A global dataset” by Andreas Link et al.

Anonymous Referee #1

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This manuscript presents a global dataset aiming to describe the moisture fate sourced from a particular area, ranging from a grid, a watershed to a country. Such dataset is not readily available and can be valuable for hydrometeorological studies trying to quantify the length scales and time scales of moisture transport starting from terrestrial evapotranspiration until it precipitates out and how these scales might change due to climate variability and land-cover land-use changes. The manuscript is well written and the authors did a great job in providing tools to analyze and visualize the data. However, because this dataset is the output from the WAM-2layers model to track moisture with a specific origin, I have two major concerns the authors should address before accepting for publication.

1. Because the WAM-2layer models divides the atmosphere into two layers, the paper

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didn't provide adequate information regarding how the two layers are divided. It might be provided by the references, but I think it is important to explain this aspect in the “material and methods” section. In addition, please explain how the vertical moisture flux is obtained. Is the vertical wind at the interface of the two layers used or is it derived from water conservation at each layer? Please clarify. Also, the sensitivity of how these two layers is divided to the results, and how the 2-layer models improves the 1-layer results and where such improvements are the most evident should be fully discussed.

2. The presented dataset is based on one of the several methods/models that can be used to track water from evapotranspiration until it contributes to precipitation. I believe it is necessary to fully discuss the assumptions and limitations of this model, and anticipate how the results from WAM-2layer can be different from other models. Indeed, the authors have made such effort by comparing with QIBT estimates. However, it is important to discuss the possible biases, especially with respect to more sophisticated methods like water vapor tracers embedded in climate models, which tend to fully resolve the physical processes that moisture can possibly be involved in the climate models. Such discussion can be critical for the future users by providing caveats and advantages of this dataset and also how they can anticipate the differences with other methods and to be aware of when and where such differences will mostly likely occur.

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