

## ***Interactive comment on “Synthesis of Global Actual Evapotranspiration from 1982 to 2019” by Abdelrazek Elnashar et al.***

**Anonymous Referee #1**

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This manuscript is very interesting and valuable in developing a global accurate ET dataset. Currently, there are many global or regional ET datasets, but their performances vary across different regions. This manuscript provides an insightful approach in processing these datasets ensemble. However, there are many procedures to be clarified to inform the readers. Major comments: 1)I don't understand the meanings of “best first and second levels” and “levels one and two validation metrics”. These two phrases have appeared many times and is vital important to understand the synthesis procedure. If I understand this correctly, the performance metrics in Tables 5-8 were used to select two or three best ET datasets and the new dataset is produced by averaging these two or three datasets. A figure of processing procedure may be helping. 2)The second major problem is the validation data. By reading this manuscript,

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it could be confirmed that the observed EC ET data serve as validation data in evaluating and ranking the 12 ET datasets and also the validation data in evaluating the proposed Global Actual Evapotranspiration dataset. There could be overfitting effect. It is like we using the same dataset as calibration data and validation data at the same time. Therefore, cross-checking method should be applied. For example, 2/3 of the EC sites be used to evaluate the ET datasets and 1/3 of EC sites to validate. 3)Another question that should be discussed is the scale problem. The EC sites normally work on a very limited area and can only present the ET condition of a small region. The related uncertainty should be discussed in the manuscript. Some minor comments. 1)Line 11: What do you mean by “they produce different levels of uncertainties” 2)In the abstract, the synthesization method should be indicated clearly. 3)Line 74: check the time period 4)Line 258: the title of subplot c 5)Line 371-392: Different datasets were selected due to data availability. That means for each period, for example before 2003 and 2003-2017, different datasets were used. My concern is that the ensemble means/variations may differ greatly. An adjustment in the period mean/variation should be considered. 6)Some table and figure captions are similar. For example, Table 5 and Table 12. The major differences between them are the time period, which should be clearly indicated.

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