We thank the anonymous referee for the thorough review, positive comments, and constructive remarks on this manuscript. We believe that, by addressing the concerns in this review, the manuscript will improve. Our reply to the numbered General and Specific Comments are given below:

General comments:

With delight I read through this paper. The authors made great efforts to summarize the current situation of Reliability and errors of remote sensing data in ET, rainfall and land use. This study will benefit the science community and will be appreciated by the peers. The subject is within the scope of HESS, the paper is clearly structured and the story line is straight forward, and the tables are well designed and informative. At the same time, to make this paper more ambitious and more profitable for the community, further concerns need to be addressed before consideration of publication at HESS. I recommend acceptance after moderate revision.

We are we very glad that the referee finds our paper to be of benefit for the science community and peers. We also appreciate the reviewer's positive feedback on the manuscripts structure and design.

Specific comments:

1. There is a lack of section presenting the directions or recommendations of future work in this field. This section is a necessary part of a review paper, to guide the peers or young generation to better advance science.

   Response: Great point. We agree that the paper will improve by providing some directions/recommendations for future research in this field. We will revise the paper to include such recommendations.

2. To further enrich the merits of this study, a summary of recommended remote sensing data and methods on ET, rainfall and land use for different regions (e.g. continental scale or small region) and different research tasks (e.g. focus on hydrological processes or on human-land-atmosphere interactions) is desirable. Although it is apparent that there is huge heterogeneity across the globe, it is still possible to give some recommendations or directions. Sometimes the researchers are overwhelmed by a long list of data and methods, and might struggle for choosing the appropriate one, and there is a big space for the authors to fill. I leave this to the authors on how to benefit a broader range of readers.

   Response: We very much appreciate and understand the value of providing such recommendations that may help users to choose appropriate methods and data products for their work. However, as it's been rightly pointed out by the reviewer, there is a great deal of heterogeneity regarding with the accuracy and reliability of remotely sensing data and methods. Oftentimes reliability of RS methods outputs, especially in case of public available processed data products is rather case and location specific. Therefore providing such recommendations and endorsing or dismissing a RS based product requires further research that is

linked to an specific application which falls beyond scope of this paper. We will revise the paper to be more explicit on this issue.

3. Interpretation of PDF is problematic. The distribution of figure 1 and figure 2 tends to be an exponential distribution rather than a skewed normal distribution, but the authors imposed a skewed normal distribution to fit the histogram. Do you have sufficient evidences to support this imposition? You should be very cautious to make that kind of imposition, as it would be very easily complained by statisticians. Consequently, the interpretation of the PDF should also be careful.

   Response: As stated in the paper many authors of the reviewed papers are both the developer and the tester of the algorithms, thus we believe there is a natural bias towards reporting low errors in literature. This is evident from the number of reported error that are exceptionally low. To correct this the data points were fitted by means of a skewed normal distribution so that less weight is given to the class with very low errors.

4. The measure variables of errors or accuracy should be widely accepted, or specifically defined, and consistent throughout the paper. The term “error”, “absolute error”, “deviation” show up multiple times in the paper, it is not very clear for their statistical meaning as they are kind of vague, please define these terms clearly in the paper or use widely accepted statistical terms such as mean percentage error (MPE), mean absolute percentage error (MAPE), standard error (SE), and keep these terms consistent throughout the paper.

   Response: Good point. The paper will be revised to use mean absolute percentage error (MAPE) throughout the paper to make sure the use of consistent terminology.

5. There are a bunch of studies using triangle method for estimating ET (e.g. review paper by Toby Carlson (2007, Sensors)), the authors might want to lump it with trapezoid method.

   Response: Paper will be revised to reflect on triangle method.

6. The uncertainties of measurements should be taken into consideration when you summarize the accuracy of different methods and RS products. For example, the uncertainties of ET measurements at eddy covariance flux tower are up to 30%, and the wind induced precipitation under catch for precipitation measurements in the Northern High Latitudes is prevalent.

   Response: As stated in the paper we agree that conventional methods of measuring hydrological processes (e.g. rainfall and discharge) are not flawless and their accuracy needs to be verified. The paper will be revised to elaborate more on this issue.

7. Page 1085, line 2, what does “seasonal ET” exactly mean here? For each record of Table A1, do you calculate mean percentage error (MPE) for monthly ET or ET during growing season or annual ET? What does “Deviation (%)” in Table A1 exactly

stand for (link to afore mentioned comment 4)? In statistics, “deviation” stands for the difference between the value of an observation and the mean of the population, it is a measure variable having unit rather than a percentage in a normal case. It is not clear for the calculation process, please specify explicitly. Besides, adding information of time step of measured ET for each record in Table A1 might be helpful.

Response: Seasonal ET refers to ET during growing season which on average is about 5-6 months. Numbers in Table A1 represent mean absolute percentage error (MAPE) either growing season or annual ET. The term “Deviation” will be replaced with MPAE. Information on time step of measured ET will be added to the table.

Technical corrections:

1. Page 1074, line 21, Vörösmarty et al (2010, Nature) is a good paper to cite.

   Response: the paper will be revised to include the suggested citation.

2. Clear definition of the term “water accounting” for a broad range of readers is necessary.

   Response: Water accounting is the process of communicating water related information about a geographical domain, such as a river basin or a country, to users such as policy makers, water authorities, basin managers, and public users. The paper will be revised to include the clear definition of water accounting.

3. Page 1075, line 21, “land use” is not a commonly accepted hydrological variable, although it is an input variable for WA+, please be careful when you phrase it.

   Response: Noted. Will reflect on it.

4. Page 1086, line 5, it is not clear what does the “spatial layers of ET maps” exactly refer to, please specify or rephrase it.

   Response: it should read “spatial layers of ET”. Will be revised.