

Dear Editor

Thanks for handling our opinion paper. We are submitting the response for the reviewers' comments.

Sankar Arumugam

Review of HESS Manuscript #2019-418

Title: HESS Opinions: Beyond the Long-term Water Balance: Evolving Budyko's Legacy for the Anthropocene towards a Global Synthesis of Land-surface Fluxes under Natural and Human-altered Watersheds

Author: Sankarasubramanian et al.

Review

This proposed HESS opinion manuscript describes how the Budyko-supply-demand type analysis can be extended to cover several other important problems in Hydrology.

The manuscript is well written and plays a useful opinion/review type role in the literature.

I had few comments.

The main substantive scientific comment relates to Figure 6 and the associated text. In short, I did not understand the point. The basic ideas for partitioning R_n between LE and H over different surface types have been covered in 1000s of papers. The urban example used (in Fig. 6) is also covered extensively in the classic text on urban climatology by Prof. Oke. In short, Fig. 6 and the associated text really does not belong in this manuscript.

Response to Reviewer-1's comments

Response: Thanks for the review of our article. We agree with your comment on the established literature on the partitioning of latent heat and sensible heat. Our primary contribution here on Figure 6 is in presenting the partitioning of surface energy balance in the Budyko's supply and demand framework and also in demonstrating the observed fluxes from urban and nearby rural settings fall within the bounds as suggested by the Budyko's framework. Hence, we would like to keep the figure in the overall scope for extension of the framework. However, we have revised Figure 6. We have also clearly defined the "actual" (in Figure 6, it is sensible heat), supply ("net radiation") and demand ("latent heat"). So, figure 6 presents the budyko framework for urban climatology to understand urban heat island issues.

Comments

1. Lines 118-120. Please explain how your PET has been calculated.
2. Line 168. "simplistic" is the wrong word I think. simple might be a better choice.
3. Line 191. TYPO. curtail~~ing~~
4. Line 193. delete simple (not needed).

Line 118-120: ET and PET estimates were obtained from the NOAA Land Surface Model, which uses Penman-Monteith method for calculating the land-surface fluxes (Rui, 2011).

Lines 168, 181 and 193: All corrected.