RC4

Reviewers' comments:

In this paper, K-SOM and other methods are used to improve the estimation of lake evaporation, which is conducive to accurately estimate the total lake evaporation and improve the climate effect of the lake under the background of climate change. I recommend publication of the paper in HESS after revision.

Thank you!

Major comments

Has this article been studied by simulation at Keszthely, Hungary. However, how do you consider the effect of the evaporation of non-uniform underlying surfaces, such as mountains, and grass?

The use of class A pan to measure evaporation is controlled by WMO Guide including its placement, pan dimensions, time, and frequency of measurements etc. The aim of these strict restrictions is the comparability of evaporation measurements under different environmental conditions. The goal of the study was to detect the effect of littoral sediment and macrophyte on evaporation rate. The seeded and empty pans were set up on the same place on the Agromet. Research Station of Keszthely, allowing comparison of standard and seeded pan's evaporation rates. Finally, the impact of macrophytes and sediments on (lake) evaporation rates were discussed.

This paper improves the calculation method of lake evaporation, and further analysis of lake evaporation and its climate effects are needed on the Lake Balaton in the future.

Thank you!

Minor comments

Figure 1 should be topography.

Corrected

L.47 The unsupervised NNs, including Kohonen Self Organizing Maps (K-SOM), has several advantages (Kohonen, 1982). Full name should be given for the first occurrence'NN'.

Completed

L.16-20 Performances of the different models were compared using statistical indices, which included the root mean square error (RMSE), mean absolute error (MAE), scatter index (SI) and Nash-Sutcliffe efficiency (NSE). The results showed that the MLR method provided close compliance with the observed pan evaporation values, but the K-SOM method gave better estimates than the other methods. Overall, K-SOM has high accuracy and huge potential for Ep estimation for water bodies 20 where freshwater submerged macrophytes are present. This section need to be rewrite.

Performances of the different models were compared using statistical indices. The results showed that the MLR method provided close compliance (R^2=0.58-0.62) with the observed pan evaporation values, but the K-SOM method (R^2=0.97-0.98) gave better estimates than the other methods. Although, we plan to re-write the whole Abstract.

L.84 (latitude: 46°44′N, longitude: 17°14Ê¹E, elevation: 124 m above sea level) 'above sea level' Can be abbreviated as a.s.l.

Done

L.231 From the figure, it can be observed that most of the estimated daily Ep values are close to the observed daily Ep values for all three pan treatments.

Which figure?

In Fig. 6. We complete the text.

Many researchers have conducted research with neural networks aimed at the estimation of Ep as a function of meteorological variables (Keskin and Terzi, 2006). Several of these researchers found better results in Ep estimation with neural network than those obtained from the Priestley-Taylor and the Penman methods (Rahimikhoob, 2009; Malik et al., 2020). Consistent with other studies, this study demonstrated that modelling of Ep is possible through the use of K-SOM technique in addition to the 275 FAO56-PM and MLR methods. The comparison results indicated that, in general, the K-SOM model was superior to the FAO56-PM and MLR methods. Chang et al. (2010) used different methods to estimate pan evaporation, including also the KSOM and the FAO56-PM. According to the results of Chang et al. (2010), K-SOM was the best of the studied methods, and it was found that the Penman-Monteith method is also likely to underestimate evaporation. Malik et al. (2017) used four heuristic approaches and two climate-based models to approximate monthly pan evaporation, where the K-SOM model performed better than the climate-based models. The regression line in scatter plots has R2 as 0.937 for K-SOM model at Pantnagar and Ranichauri (India), respectively. In the study of Malik et al. (2017), RMSE values were 0.685 and 1.126 for K-SOM, when 50% of the total available data was used in the testing of models in two stations. This section should be put in the introduction.

We don't think so. This paragraph contains our results in the light of other author's ones dealing with the same topic as this study.

Line 280 The regression line in scatter plots has R2 as 0.937 for K-SOM model at Pantnagar and Ranichauri (India), respectively. 'Respectively' can be deleted.

Deleted

Can the confidence of the correlation coefficient pass the significance test?

Yes, all p levels are below 0.001. We indicate them on Fig. 6 as well.