HESSD

Interactive
comment

Interactive comment on "Comparison of probabilistic post-processing approaches for improving NWP-based daily and weekly reference evapotranspiration forecasts" *by* Hanoi Medina and Di Tian

Anonymous Referee #1

Received and published: 24 September 2019

Dear authors,

Thank you for the interesting paper on post-processing ensemble forecasts of reference evapotranspiration with lead times up to a week, on which I believe you are right to point out that not much research has been published yet.

I do not have any major concerns with this paper.

I do have the following suggestions for additions and improving clarity of the paper:

Introduction:

Please reformulate or leave out 'emerging', 'novel', and 'new' throughout the manuscript when referring to the probabilistic post-processing methods applied in this study, because the methods referred to here, date from over 10 years back. I would suggest to extend the literature review on post-processing methods for meteorological ensemble forecasts with, for example, quantile mapping and extended logistic regression (e.g. Whan and Schmeits 2018; Messner et al. 2014; Verkade et al. 2013). And then provide the reasoning for selecting NGR, BMA, and AKD for this research. (Page 2, line 61).

Methodology:

Please provide the equations and detailed definition of variables and parameters therein of each of the performance metrics used (Section 2.4). Please add analyses of CRPS(S) results for comparison with other recent hydrometeorological ensemble forecast studies (e.g. van Osnabrugge et al. 2019).

Please keep consistently clear throughout the paper when you are referring to ensemble and probabilistic forecasts. (Because of the presented deterministic performance metrics, at some points in the manuscript impression may arise that deterministic forecasts are concerned). Please see annotated pdf for some examples.

Results:

I think that there are too many results presented in the main text. Consider that graphs and tables partly present the same information. Remove redundancies and consider moving part of the results to an Annex.

For clarity, I would recommend that every time when reporting or discussing forecast BSS the reference forecasts used to calculate BSS should be mentioned.

In general, when discussing forecast performance, please clearly state which forecasts you are referring to as a benchmark (e.g. climatology, persistence, raw ECMWF, or BC ECMWF) Figure 4 - Consider simply presenting BSS with BC-ECMWF as reference

forecast.

Discussion:

It would be interesting if you could discuss some of the earlier published results of post-processing ensemble forecasts of temperature, wind speed, and radiation, and how using these post-processed products, instead of the raw forecasts, to construct ETo forecasts would compare to the post-processed ensemble forecasts of ETo of this research.

Conclusion (and Abstract):

The relevance of differences in computational efficiency (Page 13, line 404) depends on what the computational time is, what the intended application is, and what will be the hardware on which these expected applications will run. None of these considerations are currently written here, which is too limited for a discussion on computational time (also not discussed earlier as criterion earlier in the paper, just mentioned). Please expand or consider leaving out the issue of computational efficiency.

Please find detailed comments and editorials in the annotated pdf.

References:

Whan, K. and M. Schmeits, 2018: Comparing Area Probability Forecasts of (Extreme) Local Precipitation Using Parametric and Machine Learning Statistical Postprocessing Methods. Mon. Wea. Rev., 146, 3651–3673, https://doi.org/10.1175/MWR-D-17-0290.1

Messner, J.W., G.J. Mayr, A. Zeileis, and D.S. Wilks, 2014: Heteroscedastic Extended Logistic Regression for Postprocessing of Ensemble Guidance. Mon. Wea. Rev., 142, 448–456, https://doi.org/10.1175/MWR-D-13-00271.1

J.S. Verkade, J.D. Brown, P. Reggiani, A.H. Weerts, 2013: Post-processing ECMWF precipitation and temperature ensemble reforecasts for operational hydrologic fore-

casting at various spatial scales, Journal of Hydrology, Volume 501,2013, Pages 73-91,http://dx.doi.org/10.1016/j.jhydrol.2013.07.039

van Osnabrugge, B., Uijlenhoet, R., and Weerts, A., 2019: Contribution of potential evaporation forecasts to 10-day streamflow forecast skill for the Rhine River, Hydrol. Earth Syst. Sci., 23, 1453–1467, https://doi.org/10.5194/hess-23-1453-2019.

Please also note the supplement to this comment:
https://www.hydrol-earth-syst-sci-discuss.net/hess-2019-369/hess-2019-369-RC1-supplement.pdf

Interactive comment on Hydrol. Earth Syst. Sci. Discuss., https://doi.org/10.5194/hess-2019-369, 2019.