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Nonlinear Processes in Geophysics
Discussions

Interactive comment on "From research to applications – Examples of operational ensemble post-processing in France using machine learning" *by* Maxime Taillardat and Olivier Mestre

Anonymous Referee #2

Received and published: 14 February 2020

The authors have written an interesting paper about the operational implementation of state-of-the-art high-resolution post-processed forecast systems of temperature and precipitation at Meteo France. However, the manuscript can be improved, as outlined in the major and minor remarks below. It also suffers from quite a few grammatical errors and typos. Some are mentioned below, but the authors are advised to carefully reread the manuscript and correct the errors or ask a native speaker to do that before submitting a revised version.

Major remarks:

1. For post-processing temperature and precipitation data are used from 2-year pe-

riods. However, the paper does not mention which part of the data set is used for training and which part for verification and whether cross-validation has been used or a completely independent verification period is considered as in the verification of daily precipitation amounts (Fig. 16)? Besides, it would also be good to add the verification period in the captions of Figs. 5, 6 and 12-14.

2. The hyperparameters of QRF (like the number of trees and the terminal node size) should be added and whether these are optimized for the training period.

3. I think it is good to add flow diagrams in which all steps involved in the post-processing of temperature and precipitation are displayed.

4. The conclusion section is rather short and there is no discussion paragraph. The current conclusion section mainly focuses on computational aspects, which could be moved to a separate earlier section. Instead it would be good to have a real conclusions and discussion section in which the main conclusions are given and the results are placed in context (in relation to other papers if possible) and in which future work is mentioned.

5. Some of the figures are really small and will become much more clear if they are enlarged, notably Figs. 7-9, 11, 13 and 15. Alternatively the legend in some of the figures can be enlarged to be readable.

Minor remarks:

1. Lines 2 and 18: "misdispersed" and "misdispersion" do not seem to be correct English words. Please replace.

2. Line 5: Please add something like "and subsequent interpolation to a grid" after "temperature".

3. Line 40: Please introduce the abbreviation EGP.

4. Lines 44 and 46: Please add references for the two EPS systems.

5. Line 47: Please place “(calibrated with rain gauges)” after “data”.

6. Line 53: Please replace “adjustments” by “adjusted”.

7. Line 83: Why is it needed to apply the spatialization algorithm twice? Does ECC not account for that?

8. Line 89: Please replace “subgrid” by “grid”.

9. Line 91: I would say spatial penalties issues are reduced rather than solved.

10. Lines 94-95: Please replace “calibrated (with rain gauges) radar data ANTILOPE” by “radar data set ANTILOPE (calibrated with rain gauges)” and add the resolution of that data set.

11. Line 100: Please insert “potential” before “predictors”.

12. Line 138: Please provide a reference for the method of moment.

13. Line 141: Please insert “forecasting a” before “temperature”.

14. Line 159: I would use another title for this section.

15. Line 167: Please replace “data” by “observations”.

16. Line 171: The use of “natural” is a bit strange here.

17. Line 181: Please replace “close” by “close by” and add “fields” after “cover”.

18. Line 224: Is one year of data enough?

19. Lines 237-240: Please correct the equation: “+” instead of “=” and use the “for all” symbol (?) instead of the infinity symbol.

20. Line 247: Please delete β_{1D} the 2nd time is it mentioned and replace the multiple α_{1D}’s by α_{1D}, α_{2D}, α_{3D}, α_{4D}.

21. Line 248: Please introduce the abbreviation AIC.

22. Line 292-293: Please add a reference for the COSYPROD interpolation scheme.

23. Line 307: It is not necessary to start a new paragraph here.

24. Line 329: Please replace “according to” by “for”.

25. Line 331 and caption of Fig. 14: I would not say that the improvement is constant.

26. Axis labels of Fig. 13: Please move 1 of the 2 labels to the other side of the figure (top panel) and add “= 1-FAR” after “Success Ratio” (bottom panel).

27. Caption of Fig. 13: Please add that the red curves are for the post-processed forecasts and add the meaning of the different background curves and dotted lines in the bottom panel (respectively CSI and bias).

28. Line 334: Please replace “propose” by “show”.

29. Line 336: Please insert “24-h” after “Observed” and delete “in the day”.

30. Line 340: I would say “slightly improves” instead of “does not deteriorate”.

31. Line 341: I would replace “Figure 12 for raw CRPS. Indeed,” by “same results as in Figure 12 for the raw CRPS, because”.

32. Line 342: The bc-ECC method itself does not reduce time penalties because it does not involve temporal aggregation, but I wonder why time aggregation does not have more or less the same effect on the raw and post-processed precipitation forecasts in terms of CRPS?

33. Line 353: Please choose either allow or enable.

34. Line 357: Please add “for bc-ECC” after “3 minutes”.

35. Line 362: Please replace “substantial save space” by “to save space substantially”.

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