

***Interactive comment on “Downscaling of surface moisture flux and precipitation in the Ebro Valley (Spain) using analogues and analogues followed by random forests and multiple linear regression” by G. Ibarra-Berastegi et al.***

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Dear editor:

After the comments of March 8th by Dr. Rasmus Benestad to our paper there are three points that if they are to be properly addressed, intensive further calculations are needed (\*\*):

1. Sensitivity of our results to the size of the dominion.
2. The relevance of using the EOF shown on the paper versus mixed EOF.
3. Normality vs non-normality and

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subsequent choice of a GLM or a classical regression model (MLR).

After adapting our scripts, we have launched them for:

1. The original(done) and a second (bigger) dominion 2. In both dominions the downscaling is calculated using original EOFs (done for the original dominion) and mixed EOF That makes a total amount of four alternatives (two domains x two modes(original/mixedEOF)) out of which one was already presented in the paper (original dominion, classical EOF). For this reason three new overall recalculations are currently being computed.

3. In all these alternatives, for each of the cases belonging to the test data set, normality tests (KS) are being carried out on residuals to properly address the GLM/MLR issue.

Repeating all the process shown on the paper three more times requires about 4 weeks of computing time. For this reason, we would like to ask you to extend our current deadline by one month beyond April 18th .

I hope you can positively consider our request.

Thank you very much.

Best regards (\*\*)  
We have some preliminary results with only a few cases and variables, suggesting that i) a bigger dominion needs a higher number of analogs (cases) for regression purposes. In that case, a higher amount of dissimilar cases are included and as result performance deteriorates. ii) mixedEOF do not represent a net improvement iii) residuals are gaussian in a high percentage of cases for q10 but not for precipitation. However, to the best of our knowledge, literature on linear methods for precipitation downscaling indicate that classical multiple linear regression methods are usually employed. The performance in the literature for downscaling at a daily time scale are similar to ours ( $R \sim 0.5$ )

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