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Hydrology and Earth System Sciences
Discussions

Interactive comment on "Alternative configurations of Quantile Regression for estimating predictive uncertainty in water level forecasts for the Upper Severn River: a comparison" *by* P. López López et al.

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This paper applies 4 different Quantile regression (QR) techniques to an operational flood forecasting model from the UK. It uses well regarded performance assessment criteria to try to quantify the performance of the models, particularly at high water levels. In attempting this latter aim the authors are to be commended, particularly for the honesty in their conclusions regarding the more complex QR representations.

This however raises a question. Given the visual differences between the quantile fits

seen in the figures why can they not be differentiated by the performance summaries (particularly at high water levels)? Is this down to interpretation or is it suggestive of something that is missing from the assessment of the forecast (both in this paper and elsewhere)?

As well as commenting on the above I suggest the authors comment more fully on the visual properties of the plots. For example The NQT QR plots in Fig 4 show an increases level of "wigglyness" and a marked difference to the other methods at the higher water with the quantiles becoming almost constant. Are these features a result of the difficulties in back transforming through the NQT (as mentioned in the paper, is a comparision of the different method possible?) or the QR methodology? Are they believable? In the case of the latter feature is the river has gone out of bank it may be a reason to prefer this methodology but if it hasn't. . .

Moreover some further comments as to the use of quantile regression in prediction when the magnitude of the observed or forecast value is out of the calibration sample range would be beneficial to the paper.

Beyond the above and the presentational comments below I should express slight disappointment that none of the other quantile regression techniques based on local smoothing (see Smith et al. HSJ 2014 and the references within, or the R package referenced in the paper) have been compared.

1 Presentational Comments

- Abstract is misleading in that it reads to suggest that the use of NQT is new, whereas the paper (correctly) indicates it was used in Weerts et al 2011.
- There is multiple repetition of information within the introduction. This render some of the later sections potentially redundant, for example the material in Sec-

tion 2.3.2 is a repetition of information in the proceeding text. I suggest the introduction is reviewed and some of the detail left to the later sections.

- In general I would prefer greater detail in the description of the methods. In particular define ρ in equation 4. Also expand the description of the piece wise methodology. It is apparent from the plots that there is enforce continuity in the quantiles across the breaks but this is not mentioned in the text.
- 3825 approx Line 20 Please explain why these are for plotting purposes only – do they differ markedly?
- Figure 6 is too small to be useful. I cannot sensibly comment on the forecasts.

Interactive comment on Hydrol. Earth Syst. Sci. Discuss., 11, 3811, 2014.