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Hydrology and Earth System Sciences Discussions

Interactive comment on "Technical Note: The Normal Quantile Transformation and its application in a flood forecasting system" *by* K. Bogner et al.

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First of all we would like to thank Prof. Todini and Dr. Montanari (RC2) for reviewing and for giving valuable comments for improvements of the manuscript.

RC2: I would suggest to the authors to better stress the subjectivity of the conclusions, because the problem of the selection of the most appropriate extrapolation method is actually not resolved. The indication of combining the linear regression with the POT approach is an interesting conclusion which is nevertheless not final, because it could lead to underestimating uncertainty.

AC2: The subjectivity will be stressed according to this comment!

RC2: I think HESS readers would gain a clearer view by reading them, as I did ... On the other hand, including operational details in a scientific paper is not standard practice.

AC2: As a compromise (see also AC1) we would like to put the R commands in the appendix

RC2: The paper does not provide any discussion on the most important limitation of the NQT, namely, its limited ability to make the probability distribution of bivariate random variable multivariate Gaussian. In fact, practical application of the HUP often shows that the residuals of the regression of one normalized random variable against the other are non Gaussian and affected by heteroscedasticity (for details see Montanari and Brath, 2004; Montanari and Grossi, 2008). Did the authors experience this problem? I think a discussion of this issue would be appropriate in the paper, because this limitation heavily affects uncertainty estimation.

AC2: The problem of heteroscedasticity of the NQT has been outlined in our WRR paper (Bogner and Pappenberger, 2011), where we could demonstrate the importance of the VARX model for making the distribution of the bivariate random variable multivariate Gaussian and for reducing the heteroscedasticity. Also in this technical note the forecasts are pre-processed by using the VARX model and therefore this kind of problem has not been encountered. Nonetheless we will include the references and mention this problem. Thank you very much for your very positive comments!!!

Interactive comment on Hydrol. Earth Syst. Sci. Discuss., 8, 9275, 2011.