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Hydrology and Earth System Sciences
Discussions

Interactive comment on "Rainfall and temperature estimation for a data sparse region" *by* R. L. Wilby and D. Yu

R. Wilby

r.l.wilby@lboro.ac.uk

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Amo-Boateng (2013) gently encourages us to suggest ways in which predictive uncertainties might be handled in future developments of our methodology. We were reminded of several sources in the hydrological literature dealing with flood frequency estimation for ungauged catchments. This raises a couple of possibilities.

First, we should explicitly state that the variables listed in Tables 1 and 2 are all uncertain to vary degrees at the site scale. This uncertainty could be explored through jackknife estimation of the sampling variance of parameter estimates based on available observations. Through Monte Carlo techniques it would then be possible to run the weather generator with multiple sets of parameters and thereby produce uncertainty

bounds for simulated temperature and precipitation series at individual sites (such as Taiz in Figs. 17 to 19).

Second, there is "generalisation" uncertainty in each of the regression equations reported in Table 3. Overall, this is reflected by the standard error of the model estimates. However, as suggested in the Discussion, this aspect of uncertainty could be explored further by pooling calibration data using site- or climate-similarity indices. Results shown in Table 4 suggest that regionalization may reduce errors for some (but not all) model diagnostics. Another benefit is that regionalization inherently retains observed covariance amongst sets of parameters at different sites.

We thank Amo-Boateng (2013) for reminding us of the importance of characterizing model uncertainties arising from our procedures. We will ensure that these points are duly reflected in the revised manuscript.

Amo-Boateng, M. 2013. Interactive comment on "Rainfall and temperature estimation for a data sparse region" by R.L. Wilby and D.Yu. Hydrol. Earth Syst. Sci. Discuss., 10, C2743-C2745.

Interactive comment on Hydrol. Earth Syst. Sci. Discuss., 10, 7575, 2013.