

Interactive comment on “The effect of empirical-statistical correction of intensity-dependent model errors on the climate change signal” by A. Gobiet et al.

Anonymous Referee #1

Received and published: 15 July 2015

The manuscript analyses the role of bias correction in ENSEMBLES regional scenarios on the temperature response. Contrary to the so-called delta-method, quantile mapping modifies the mean model response. With an original linear approach, the authors show that the new response is more reliable than the un-corrected model response. As quantile mapping (or similar methods) is a "necessary evil" for driving impact models, this study is a major contribution to the climate impact community. The presentation is clear, with relevant citations. I recommend the manuscript for publication with minor corrections: 1. page 6 line 23 (and also title): it is clear that the approach can be extended to daily min and max temperature. But the application to precipitation is

C2589

not as straightforward as the authors claim. Indeed the model error is generally: too many drizzle days and underestimated heavy precipitation. The notion of "error slope" is not adapted. Perhaps precipitation can be replaced by its logarithm or another function, but I hardly see a linear approach as in the present study. In addition, some models at some locations produce less rain days than in the observation, making quantile mapping not applicable (but applicable with a probabilistic approach). Precipitation correction is very important for impact studies (even more than temperature correction in many applications). Indeed, the sign of the response may be reversed after correction, because both the sign of the error and the sign of the response may change from low to high precipitation. I suggest to specify in the title that this study is devoted to temperature, to state in the perspectives that this approach could be extended to other variables, and I encourage the authors to prepare a second paper on precipitation correction. 2. page 8 line 15: noisy tails (a funny typo) 3. page 17, line 9: you can mention that the new centennial reanalyses (NOAA and ECMWF) offer a good test bed for this time-invariance

Interactive comment on Hydrol. Earth Syst. Sci. Discuss., 12, 5671, 2015.

C2590