

Interactive comment on “Coupling statistically downscaled GCM outputs with a basin-lake hydrological model in subtropical South America: evaluation of the influence of large-scale precipitation changes on regional hydroclimate variability” by M. Troin et al.

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The paper presents a study addressing lake level fluctuations and their relation to observed or modelled precipitation and discharge volumes. Although the subject and approach are relevant for HESS, the paper is not ripe for publication yet.

First, there is a lack of motivation and explanation of the background of the study. It is
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not clear (a) why a reanalysis and a climate model integration are used, and (b) why LMDZ and not another climate model is used. What pieces of information are exactly expected from reanalysis data, and what is the information that can be added by a free running climate model integration that cannot be derived from the reanalysis? A clear hypothesis should be formulated in the introduction section, that is subsequently tested in the following analyses.

Second, the concept of statistical downscaling is not clearly explained and not well applied. The corrections applied should not be interpreted as a statistical downscaling exercise (where one would use large scale atmospheric features such as pressure patterns, high level (850 or 500 mb) wind/temperature/humidity fields or SSTs). Rather, the method applied is a plain bias-correction method, where in the case of precipitation a two-stage correction is applied (wet day frequency adjustment and a cum.freq.distr. adjustment). Reviewer #1 rightly points at other existing literature (such as Piani et al 2010) that should be referenced for this purpose.

Third, an overwhelming amount of data is presented to the readers but the information content in this data is not very clear. I think you should convey a clear message to the audience. I suggest (a) to remove either the CDF-t-season or CDF-t-year results at all (since they seem to make only little difference), (b) replace the long tables with one or two histogram figures that make your point clear, and (c) focus on the explained variance in the lake level calculations shown in figure 6, and discuss the various dataset/modelling options there.

You need to apply major revisions to your manuscript. It will be reviewed again after resubmission.

Interactive comment on Hydrol. Earth Syst. Sci. Discuss., 7, 9523, 2010.