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Geoscientific Model Development Discussions

Interactive comment on "The method ADAMONT v1.0 for statistical adjustment of climate projections applicable to energy balance land surface models" *by* Deborah Verfaillie et al.

Anonymous Referee #2

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Review report for manuscript "The method ADAMONT v1.0 for statistical adjustment of climate projections applicable to energy balance land surface models" by Verfaillie et al. (2017) This study introduces the method ADAMONT v1.0 to adjust and disaggregate daily climate projections from a regional climate model against an observational dataset at hourly time resolution. The method makes use of a refined quantile mapping approach for statistical adjustment and an analogous method for sub-daily disaggregation. The method is capable of producing adjusted hourly time series of temperature, precipitation, wind speed, humidity, and short- and longwave radiation, which can in turn be used to drive any energy balance land surface model (e.g. a fully distributed energy and water balance hydrologic model). The observational dataset used here is

the SAFRAN meteorological reanalysis, which covers the entire French Alps split into 23 massifs, within which meteorological conditions are provided for several 300 m elevation bands. In order to evaluate the skills of the method itself, it is applied to the ALADIN-Climate v5 RCM using the ERA-Interim reanalysis as boundary conditions, for the time period from 1980 to 2010. The authors find the disaggregation method to preserve inter-variable dependency structures although it performed well for temperature compared to precipitation. The manuscript is well organized and the analyses methods are well thought out, except a few points. Please find below a few comments which could help you to improve your manuscript on the way to publication.

Major comment: Line 1 – 64: The authors introduce the need for bias-correction of RCM outputs but completely fail to address the many flaws of bias-adjustment which have been well detailed in Ehret at al 2012: "Should we apply bias correction to global and regional climate model data?" Most impact studies are now utilizing convection permitting models at <4km resolution to overcome some of these limitations. Also, the authors have to specifically state that the results of the quantile mapping are sensitive to data sets used and adjustment method as well. Thus, there is a wide array of uncertainties associated with these kinds of studies.

Minor Comments:

Abstract: I could not tell for which RCP(s) the adjustment was made just by reading the abstract. Please make the abstract a standalone section.

What is "ADAMONT"?

Line 145 – 160: what do you mean by integration? Just use something like "aggregation" for easy understanding. Tmax/Tmin is taken from 6am to 6am? This is not clear at all. When did you take the max and min specifically?

Line 335: The authors should clearly state that the RMSE and mean bias were used to evaluate model performance in terms of reproducing amounts while FAR, POD etc.

for occurrence.

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