

Downscaling climate timeseries in data sparse regions

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ADDRESS

Correspondence: NAME (EMAIL)

Abstract. TEXT

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1 Introduction

Climate timeseries are required at higher resolutions than currently available from GCM or even RCMs for meaningful impact studies. This is especially the case in heterogeneous terrain such as mountain regions where surface variability is high over short horizontal distances. Various methods of downscaling can be utilised to achieve this goal. Dynamical doewnscaleing requires no additional data beyond boundary forcing yet is costly and generally applied to limited domains. Statistical downscaling is cheap to run yet requires extensive and robust ground data.

Here we propose a hybrid method that use the quasi-physical topography based method TopoSCALE to generate point forcing timeseries for current period then employs quantile mapping to statistically downscale or debias a climate timeseries at this point. We demonstrate this approach by downscaling CORDEX RCM data at both point scale and additionally generalising this to a spatial product using the tool TopoSUB.

This method provides full forcing suite required to run a numerical model and we further demo this for the case of snowcover in switzerland

- plots
1. domain
 2. basic method poit
 3. method spatial
 4. plot snow

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3 Conclusions

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25 *Code availability.* TEXT

Data availability. TEXT

Code and data availability. TEXT

Sample availability. TEXT

Video supplement. TEXT

30 **Appendix A**

A1

Author contributions. TEXT

Competing interests. TEXT

Disclaimer. TEXT

References

REFERENCE 1
REFERENCE 2