



## **A Cooperation between the National Weather Services of Germany and Austria based on the Empirical-Statistical Downscaling method EPISODES and its Goals**

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This contribution presents a new cooperation between the National Weather Services of Germany (DWD) and Austria (ZAMG), which is based on the Empirical-Statistical Downscaling method EPISODES that was developed at the DWD. Apart from the objectives that this cooperation aims to achieve a comprehensive performance assessment of the empirical-statistical downscaling (ESD) technique named EPISODES is shown. Pertaining evaluation analyses consist of multivarious validation experiments as well as various comparisons of EPISODES' projections with those of three RCMs and two ESD methods based on the same GCM scenarios driven by two distinct Representative Concentration Pathways (RCPs).

EPISODES combines the downscaling of GCM simulations with a follow-up production of synthetic local time series. EPISODES is a comparably simple, computationally rather inexpensive technique, providing multi-variable and multi-site data that are suitable for being merged in an ensemble of RCM projections. This allows (e.g. for different RCPs) the compilation of large multi member ensembles derived from various GCM simulations via both main downscaling strategies (ESD and RCMs).

Evaluation experiments reveal satisfying degrees of compliance between various results generated by EPISODES and observations. The grid cell bias for yearly values, for instance, is mostly less than  $0.1^{\circ}$  C for temperature and 10% for precipitation totals. Recorded temperature values and precipitation totals corresponding to their 1st and the 99th percentiles are well represented by EPISODES too. Comparisons of various climate change signals derived by EPISODES and other downscaling approaches, present high levels of agreement as well. Many more findings referring to evaluation experiments and climate change projections are to be found in the paper as well as throughout the supplement.

Amongst the goals which the DWD-ZAMG cooperation sets out to attain are: the adaption of EPISODES to the alpine terrain, conducting simulations for the DACH region and in turn comparisons with observed climate variations, the generation of Ensembles of climate change projections and making projections applicable to time horizons of less than three decades.

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