

The Empirical-Statistical Downscaling method EPISODES

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The Empirical-Statistical Downscaling method named EPISODES is presented. EPISODES combines the downscaling of GCM simulations by an analogue method with a follow-up production of synthetic local time series. EPISODES is a comparably simple, computationally rather inexpensive technique, providing multivariable 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). A selection of 35 GCM projections from CMIP5 has been downscaled by EPISODES. In this case EPISODES was based on a gridded observational data set covering the territory of Germany. The spatial resolution is 0.11 degree, as an equivalent to the European fine scale CORDEX grid, with a daily temporal resolution for the period 1951-2100. 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 °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. Here, the EPISODES methodology, as well as results from evaluation experiments and from the unique set of high resolution climate change projections for Germany mentioned above are presented. Kreienkamp, F., Paxian, A., Früh, B., Lorenz, P., Matulla, C. 2018: Evaluation of the Empirical-Statistical Downscaling method EPISODES, *Climate Dynamics*, <https://doi.org/10.1007/s00382-018-4276-2>