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RoCliB - Bias corrected CORDEX RCM dataset over Romania

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Four climate parameters (i.e., maximum, mean and minimum air temperature and precipitation amount) from 10 regional climate models, provided by the EURO-CORDEX initiative, are adjusted using as reference the ROCADA gridded dataset. The adjustment was performed on a daily temporal resolution for the historical period (1971-2005), as well as for climate change scenarios based on two Representative Concentration Pathways (RCP45 and RCP85).

The best method for bias-correction was selected following a 2-fold cross-validation approach, which was performed on historical data using two methods: Quantile Mapping (QMAP) and Multivariate Bias Correction with N-dimensional probability (MBCn). The performances of the two methods are very similar when analysing the frequency distribution of each selected variable, whereas the comparison between the inter-variables correlation of the adjusted datasets and the reference dataset revealed much smaller differences for the dataset adjusted with the multivariate method, hence this was used for producing the BC climate scenario dataset.

Based on the MBCn adjusted dataset, a climate change analysis over Romania was performed at the seasonal and annual scales. Overall, for the multimodel ensemble mean, at the country level, a substantial temperature increase is reported for both scenarios and no significant trend is revealed for precipitation amount.

The adjusted RCMs are provided without any restrictions via an open-access repository in netCDF CF-1.4-compliant file format (<https://doi.org/10.5281/zenodo.4642463>). The BC climate models are archived at the 0.1° spatial resolution, in the WGS-84 coordinate system, at a daily temporal resolution. Based on bias-corrected dataset, relevant information about climate change over Romania's territory is provided by using an interactive dashboard, implemented in an open-source web application (RoCliB data explorer - <http://suscap.meteoromania.ro/roclib>).