



## **Bias correction of regional climate models over Croatian region – influence on statistical measures of temperature and precipitation**

Renata Sokol Jurković and Ivan Güttler

Croatian Meteorological and Hydrological Service, Department for Climatology, Zagreb, Croatia (renata.sokol@cirus.dhz.hr)

The variables modeled in global and regional climate models deviate from observations to a certain extent, i.e. modeled variables contain systematic errors called bias. The use of climate projections in different impact models requires input with very low or without any bias. Therefore, before using outputs of the climate models in the applied research their results need to be statistically corrected. In this paper, one univariate and two bivariate methods of statistical bias correction were compared. The precipitation and temperature were modeled by regional climate models RegCM4, RCA4 and CLM forced by four CMIP5 global models at boundaries. Univariate methods are used to correct each variable separately, and bivariate corrects variables together in order to preserve the physical relationship between them. In the quantile mapping (univariate method) and in the first bivariate method, gamma (precipitation) and Gaussian (temperature) probability distribution are used while the other bivariate method is using empirical probability distributions for precipitation and temperature. Joint distribution in bivariate method was modeled using Gauss copula. The model correction was carried out according to the E-OBS19e data at a resolution of  $0.1^\circ \times 0.1^\circ$  on the monthly precipitation data and the mean air temperature for each season for the wider Croatian region. For calibration of the method the period 1971-1990 was used while the validation period was 1991-2004. Ensemble of regional climate models was used in analysis. The influence of the methods on trend and basic statistical measures of location, dispersion and symmetry and also their change in relation to the reference observations was studied.