



Parametric vs. non-parametric daily weather generator: validation and comparison

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As the climate models (GCMs and RCMs) fail to satisfactorily reproduce the real-world surface weather regime, various statistical methods are applied to downscale GCM/RCM outputs into site-specific weather series. The stochastic weather generators are among the most favourite downscaling methods capable to produce realistic (observed like) meteorological inputs for agrological, hydrological and other impact models used in assessing sensitivity of various ecosystems to climate change/variability. To name their advantages, the generators may (i) produce arbitrarily long multi-variate synthetic weather series representing both present and changed climates (in the latter case, the generators are commonly modified by GCM/RCM-based climate change scenarios), (ii) be run in various time steps and for multiple weather variables (the generators reproduce the correlations among variables), (iii) be interpolated (and run also for sites where no weather data are available to calibrate the generator).

This contribution will compare two stochastic daily weather generators in terms of their ability to reproduce various features of the daily weather series. M&Rfi is a parametric generator: Markov chain model is used to model precipitation occurrence, precipitation amount is modelled by the Gamma distribution, and the 1st order autoregressive model is used to generate non-precipitation surface weather variables. The non-parametric GoMeZ generator is based on the nearest neighbours resampling technique making no assumption on the distribution of the variables being generated. Various settings of both weather generators will be assumed in the present validation tests. The generators will be validated in terms of (a) extreme temperature and precipitation characteristics (annual and 30 years extremes and maxima of duration of hot/cold/dry/wet spells); (b) selected validation statistics developed within the frame of VALUE project. The tests will be based on observational weather series from several European stations available from the ECA&D database.