



A Gridded Weather Generator SPAGETTA: Towards the finer resolution

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SPAGETTA is a gridded (multisite) multivariate parametric stochastic weather generator: precipitation occurrence and amount are modelled by Markov chain and Gamma distribution, and the non-precipitation variables are modelled by a first-order autoregressive model conditioned on precipitation occurrence. The spatial coherence of all variables is modelled following Wilks' (2009) approach. Development of SPAGETTA started in 2016 and was motivated by the need to have a generator that will be able to produce realistic high-resolution gridded weather data (representing both present and future climates) for use in hydrological modelling in complex Alpine terrain (Ötztal Valley area, Austria). In the first stage of developing the generator we used gridded E-OBS daily data (Haylock et al, 2008) to calibrate the generator, and single RCM simulation (taken from the CORDEX database, EUR44 domain, RCP8.5 emissions) to develop the climate change scenarios for perturbing the WG parameters. The generator was validated in terms of selected validation characteristics (focusing on the generator's ability to reproduce spatial temperature patterns; large-area hot days and hot spells were included) and the effect of the climate change was assessed (an emphasis was put on the effect of changes in the spatial and temporal structure in weather series). Results of this pilot experiment made for 8 European regions (Southern Scandinavia, British Isles, Central Europe, France, and 4 Mediterranean sub-regions) have been presented in EGU-2017 conference. Now the experiment is extended by including more validation characteristics (focus on the spatial indices related to extreme temperature, precipitation and drought events) and more RCMs for developing the climate change scenarios (to account for the modelling uncertainty in the future climate projection). Results of this extended experiment will be presented in the first part of the contribution. In the second part, we will present interim results of the next stage of the SPAGETTA development, which will consist of making the generator operational at finer spatial and temporal resolution. In this stage, we will use high resolution (1 km in space and 1 hour in time) Austrian INCA data (Haiden et al, 2011) to calibrate the weather generator, and some modifications to the present modelling approaches are expected.