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In recent years, urban flooding has occurred in Denmark due to very local extreme precipitation events with very short lifetime. Several of these floods have been among the most severe ever experienced. The current study demonstrates the applicability of the Spatio-Temporal Neyman-Scott Rectangular Pulses weather generator at urban scale and how it can be used for downscaling by perturbation with a changed climate. The weather generator is calibrated against a dense network of high resolution tipping bucket rain gauges in and around Copenhagen. The model is validated by its ability to reproduce realistic extreme statistics. The model satisfactorily reproduces extreme statistics down to the one-hour scale and further produces realistic spatial correlation patterns at the rain event level. This is also the case for the extreme events. Furthermore, the weather generator is able to reproduce the observed spatio-temporal differences at very fine scale for all measured parameters. For downscaling, perturbation with a climate change signal, precipitation from four different regional climate model simulations has been analysed. The analysed models are two runs from the ENSEMBLES (RACMO/ECHAM and HIRHAM/ECHAM, A1B scenario and 25 km spatial scale) and two models run just for southern Scandinavia (both HIRHAM/EC-EARTH, rcp 4.5 and rcp 8.5 scenarios and 8 km spatial scale). All datasets are at one-hour time resolution. All models result in marked different perturbation schemes for the weather generator. The downscaled time series are analysed similarly to the validation procedure and change factors for the extremes are derived as a function of return period. Despite different perturbation schemes both A1B scenario models and the rcp 4.5 scenario model result in very similar downscaled precipitation time series and extreme statistics. Hence, the weather generator seems to be very robust to how a climate change signal is transferred to a perturbation scheme.