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New regional short-duration rainfall statistics for Sweden

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Short-duration rainfall statistics for Sweden have been based on a relatively limited amount of observations. For example, one of the main data bases used comprises 10-15 years of data from 15 municipal stations with most of them located in the southern part of the country. This has limited the possibility to discern regional differences and also to estimate intensities associated with return periods > ∼10 years. In this work, we used ∼20 years of 15-min observations from ∼130 stations in the national meteorological network to produce new national statistics. Initially, we made a cluster analysis to identify homogeneous regions in Sweden, with respect to the extreme short-duration rainfall statistics. This analysis lead to a division into four regions: south-western, south-eastern, central and northern Sweden. In each region, observations were then merged into long regional time series, following the classical station-year method. Supporting analyses were performed to make sure that extremes from different stations within each region could be considered independent realizations of the same rainfall climate. The final statistics comprise regional values valid up to at least 100 years' return period and with quantified uncertainty. In southern Sweden, the new statistics agree overall well with previous national statistics, but in central and northern Sweden the new statistics have lower intensities for the corresponding combination of duration and return period. The new regional statistics agree overall well with statistics in our neighbouring countries.