



Evaluation of non-stationary models for precipitation extremes in RCM simulations

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Various approaches can be used to describe changes in precipitation extremes in regional climate model (RCM) simulations. These approaches vary from simple comparison of characteristics of extremes in two time slices (often assumed stationary), through parametric models considering covariates describing the temporal variation of rainfall extremal properties to non-parametric models assuming smooth variation in these properties. In addition these approaches can be applied at-site or regional models can be developed. In present paper we apply different statistical models to assess changes in seasonal sub-daily precipitation maxima and rainfall erosivity as simulated by RCMs from the ENSEMBLES and CORDEX projects for the period 1961-2100. The indices of extreme precipitation are described by Generalized Extreme Value (GEV) distribution with temporally varying parameters. Two non-stationary models are considered – 1) parametric non-stationary model relating the precipitation extremes to (regional average) temperature and 2) non-parametric model allowing smooth variation in GEV parameters with temperature. The possibilities of extension to regional extreme value models are discussed.