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The Elbe Catchment: Extreme Events in Observations and Simulations

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A data set of high quality for the Elbe catchment, consisting of daily meteorological observations from 1951-2003, serves as a base for simulations of the near climatological future of the region. To this end, a combinatorial scheme is used which generates simulated climate series forced by a given temperature development. It has been proven to simulate series with realistic persistence and extreme events.
The focus of this analysis is on meteorological events relevant for hydrology such as droughts, heat waves and heavy precipitation in observations and simulations. Additionally, statistics of complex variables taking into account the interaction between several variables like temperature and precipitation are considered.
The overall finding is that the region is going to experience a drier climate in the next decades. This goes along with longer heat waves and droughts. At the same time, heavy precipitation, which in recent past caused disastrous floods, becomes more frequent in future. As the region is economically sensitive to changes in atmospheric water supply, methods and findings like the ones presented in this paper can support future water management strategies considerably.