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The emergence of projected scaled patterns of extreme weather events over Europe

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This work investigates the scalability of wet and dry persisting condition patterns over the European domain with global warming levels. For this aim, we have used the EURO-CORDEX ensemble of regional climate projections at 0.11° grid-mesh for daily minimum and maximum temperature and precipitation to analyze future changes in extreme weather events addressing climate warming levels of 1°C, 2°C, and 3°C, respectively. A simple scaling with the annual mean global mean temperature change modeled by the driving GCM is applied. The annual minimum of daily minimum temperature (TNN) is found to increase more compared to the annual maximum of daily maximum temperature (TXX) at the end of the century. We also identify the emergence of the scaled patterns of minimum and maximum temperatures and wet and dry persisting conditions about certain extreme weather indices. The emergence of the scaled patterns of TNN occurs from around 2040, whereas TXX pattern is emerging around 2050. Individual GCM-RCM pairs tend to have stable spatial patterns since then for both indices. The ensemble mean patterns are emerging earlier than the individual models.

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