

Climate Scenarios of Precipitation Extremes in Europe: Similarities and Differences between Regional Climate Models

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Changes in the occurrence of heavy precipitation may constitute one of the most significant impacts of climate change to society. We present a detailed analysis of changes in precipitation extremes as simulated by seven regional climate models (RCMs) for European regions. Using the same GCM-forcing with all RCMs (IPCC A2 emission scenario), the comparison provides insight into the role of RCM-formulation for scenario uncertainties. In winter there is high agreement between RCMs in that precipitation extremes tend to increase north of about 45N. In northern Europe the 20-year return value of future climate (2070-2100) corresponds to the 40- to 100-year return value of present climate (1960-1990). In contrast, there are large model differences in summer when RCM formulation contributes significantly to scenario uncertainty. Nevertheless, there is a common signal in all RCMs, indicating that summertime extreme events increase more or decrease less than average events.