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Spatial and temporal characteristics of heat waves and cold spells over Central Europe in RCM simulations

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The study evaluates ability of current regional climate models (RCMs) to simulate basic spatial and temporal characteristics of heat waves and cold spells over Central Europe. The focus is on regional heat waves/cold spells that affect a larger area of Central Europe (approximately 47–53 N and 7–22 E). We examine how RCM simulations driven by reanalysis reproduce such characteristics as frequency, temperature amplitude, length, cumulative temperature excess, and spatial extent of heat waves/cold spells. We also analyze how recent major heat waves (1994, 2006, 2015) and cold spells (1996/97, 2011/12) in Central Europe are reproduced in the RCMs, and search for links of models' performance and biases to simulated atmospheric circulation, soil moisture/precipitation (for summer heat waves), and snow cover (for winter cold spells).