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Regional climate model data used within the SWURVE project – 1: projected changes in seasonal patterns and estimation of PET

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Abstract. Climate data for studies within the SWURVE (Sustainable Water: Uncertainty, Risk and Vulnerability in Europe) project, assessing the risk posed by future climatic change to various hydrological and hydraulic systems were obtained from the regional climate model HadRM3H, developed at the Hadley Centre of the UK Met Office. This paper gives some background to HadRM3H; it also presents anomaly maps of the projected future changes in European temperature, rainfall and potential evapotranspiration (PET, estimated using a variant of the Penman formula). The future simulations of temperature and rainfall, following the SRES A2 emissions scenario, suggest that most of Europe will experience warming in all seasons, with heavier precipitation in winter in much of western Europe (except for central and northern parts of the Scandinavian mountains) and drier summers in most parts of western and central Europe (except for the north-west and the eastern part of the Baltic Sea). Particularly large temperature anomalies ($>6^{\circ}\text{C}$) are projected for north-east Europe in winter and for southern Europe, Asia Minor and parts of Russia in summer. The projected PET displayed very large increases in summer for a region extending from southern France to Russia. The unrealistically large values could be the result of an enhanced hydrological cycle in HadRM3H, affecting several of the input parameters to the PET calculation. To avoid problems with hydrological modelling schemes, PET was re-calculated, using empirical relationships derived from observational values of temperature and PET.

[Final Revised Paper](#) (PDF, 938 KB)

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