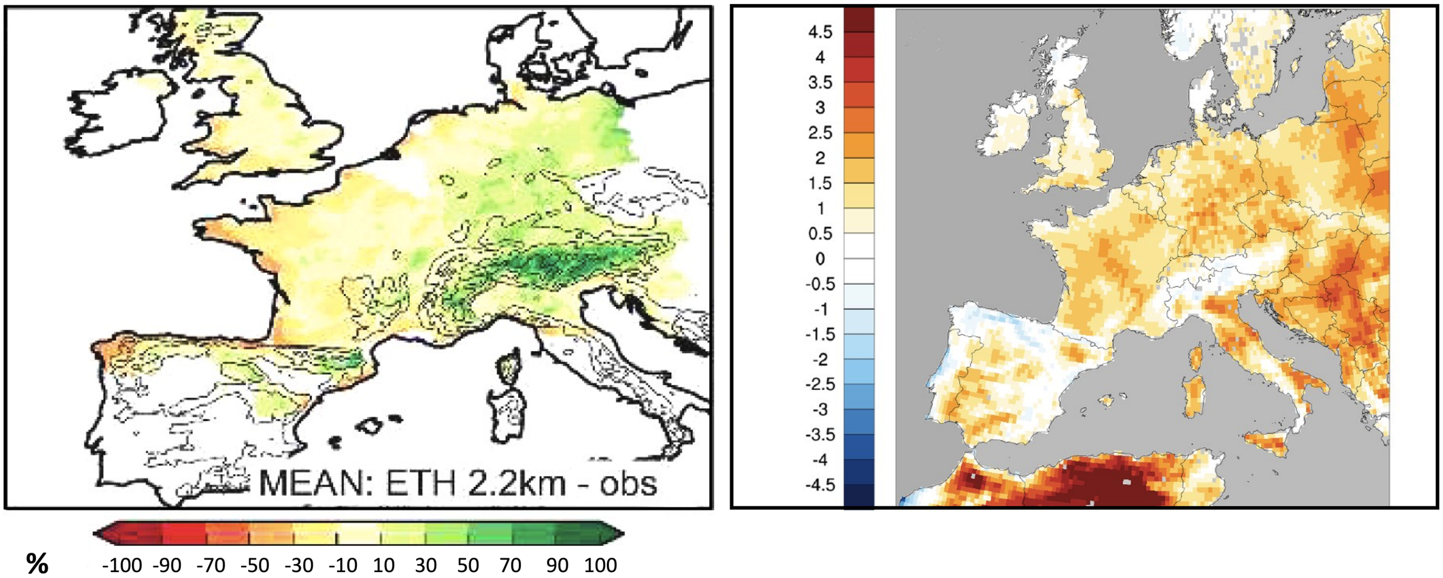

Fig. 4. (left) Percentage difference in (mean) daily precipitation totals for a 9-yr regional climate simulation for western Europe at 2.2-km horizontal grid spacing with the COSMO-CLM ("ETH 2.2 km" stands for the simulation of the Swiss Federal Institute of Technology with 2.2-km horizontal grid spacing). Thin black lines are orographic height contours and color coding corresponds to the bias (from Berthou et al. 2020). (right) Seasonal mean summer (JJA 2006) temperature bias (K), color code, with an early convection-permitting regional climate model, COSMO-CLM (Leutwyler et al. 2016).

climate models can safely be used as input for Earth system modeling applications—even over mountainous terrain.

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Data availability statement. Access restrictions apply to some of the data used in this study. Original data elaborations were needed only for Fig. 3. Measurements at SYNOP stations in the Alpine area were downloaded from the freely available Global Hourly-Integrated Surface Database of NOAA. The URL and literature reference are included in the figure caption. Model output from deterministic IFS forecast runs was downloaded from the Meteorological Archival and Retrieval System (MARS) at ECMWF and is available to licensed users based at institutions in ECMWF member states.

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