**Opportunities and challenges for paleoaltimetry in "small" orogens:
Insights from the European Alp**

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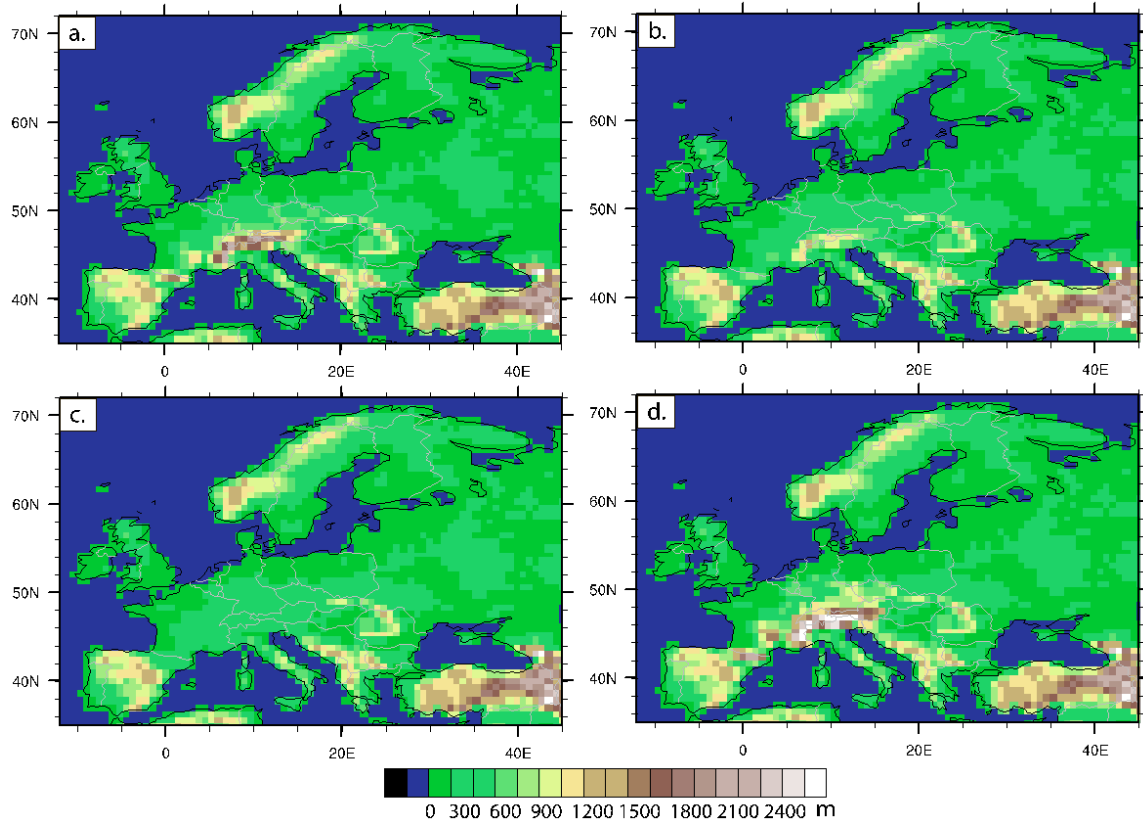
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Figure S1. Topographies as used in the experiment design: (a) 100 % of modern elevation (Alps100); (b) Alps reduced to 50 % of modern elevation (Alps50); (c) Alps reduced to 250 m (Alps0) ; (d) Alps increased to 150 % of modern elevation (Alps150). The experiments topographies are derived from the gtopo30 dataset of the United States Geological Survey (USGS) and interpolated to the model resolution.
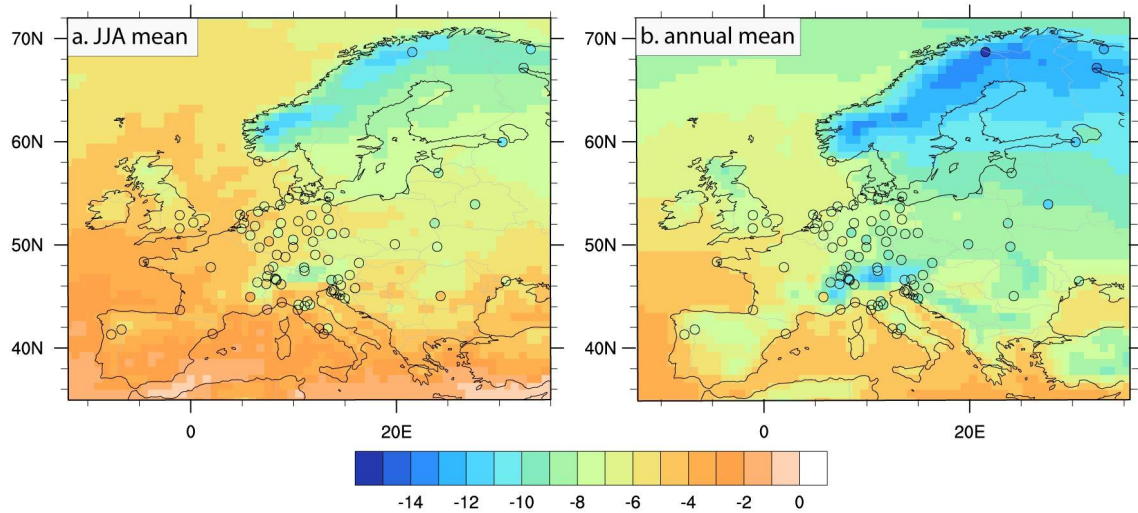
Figure S2. ECHAM-wiso simulated (a) mean summer (JJA) and (b) annual mean $\delta^{18}O_p$ (background pattern) and (a) summer (JJA) and (b) annual mean $\delta^{18}O_p$ from the International Atomic Energy Agency (IAEA) Global Network of Isotopes in Precipitation (GNIP) observations (colored circles) for the present-day control simulation (PD). The PD is an Atmospheric Model Intercomparison Project (AMIP)-style simulation with present-day boundary conditions, including the AMIP2 sea surface temperatures and sea ice data from 1957 to 2000, and observed greenhouse gas concentrations for the same period. The simulation was conducted for >40 model years. A climatological reference period of 30 years (1970–1999) used for the calculations of means. Simulated $\delta^{18}O_p$ values for the PD are in good agreement (within 1-2 ‰ for most locations) with observations across Europe.
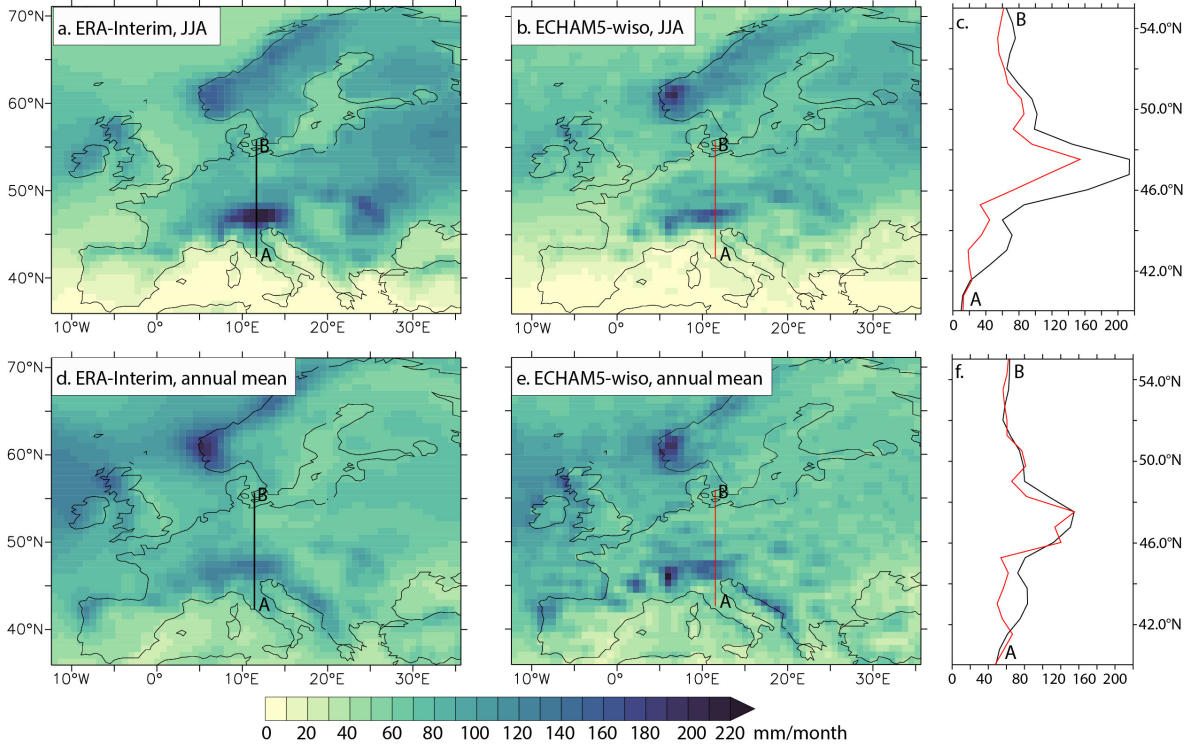
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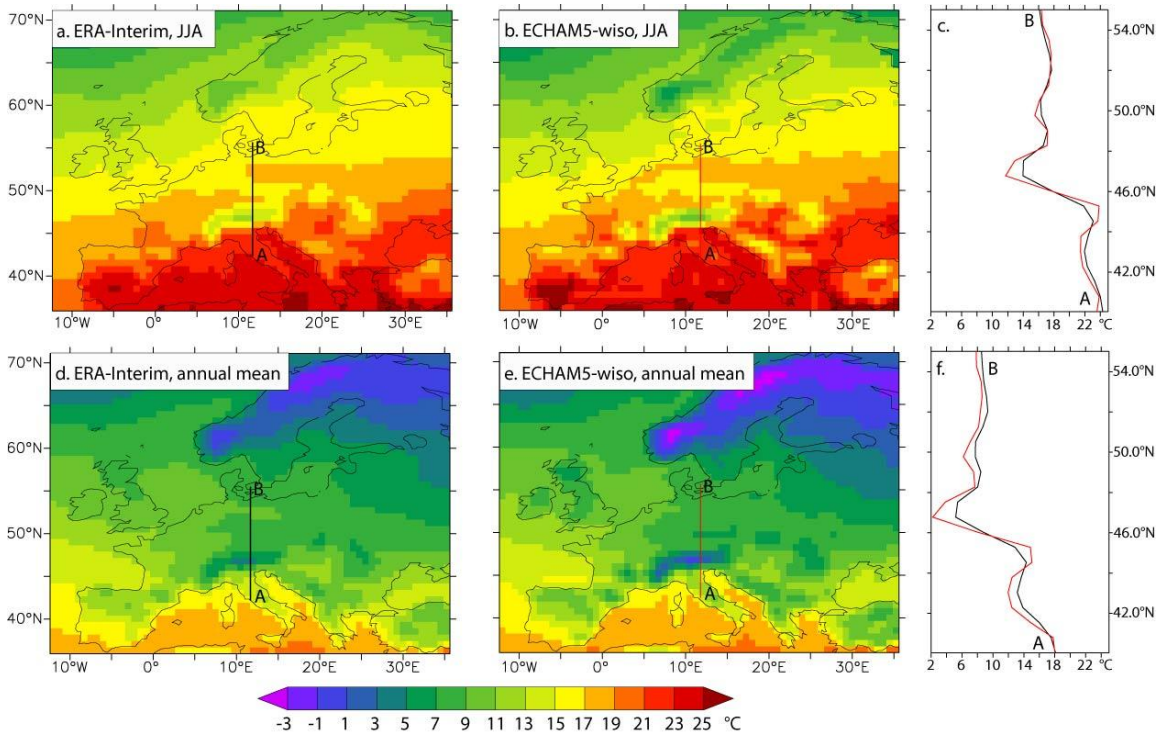
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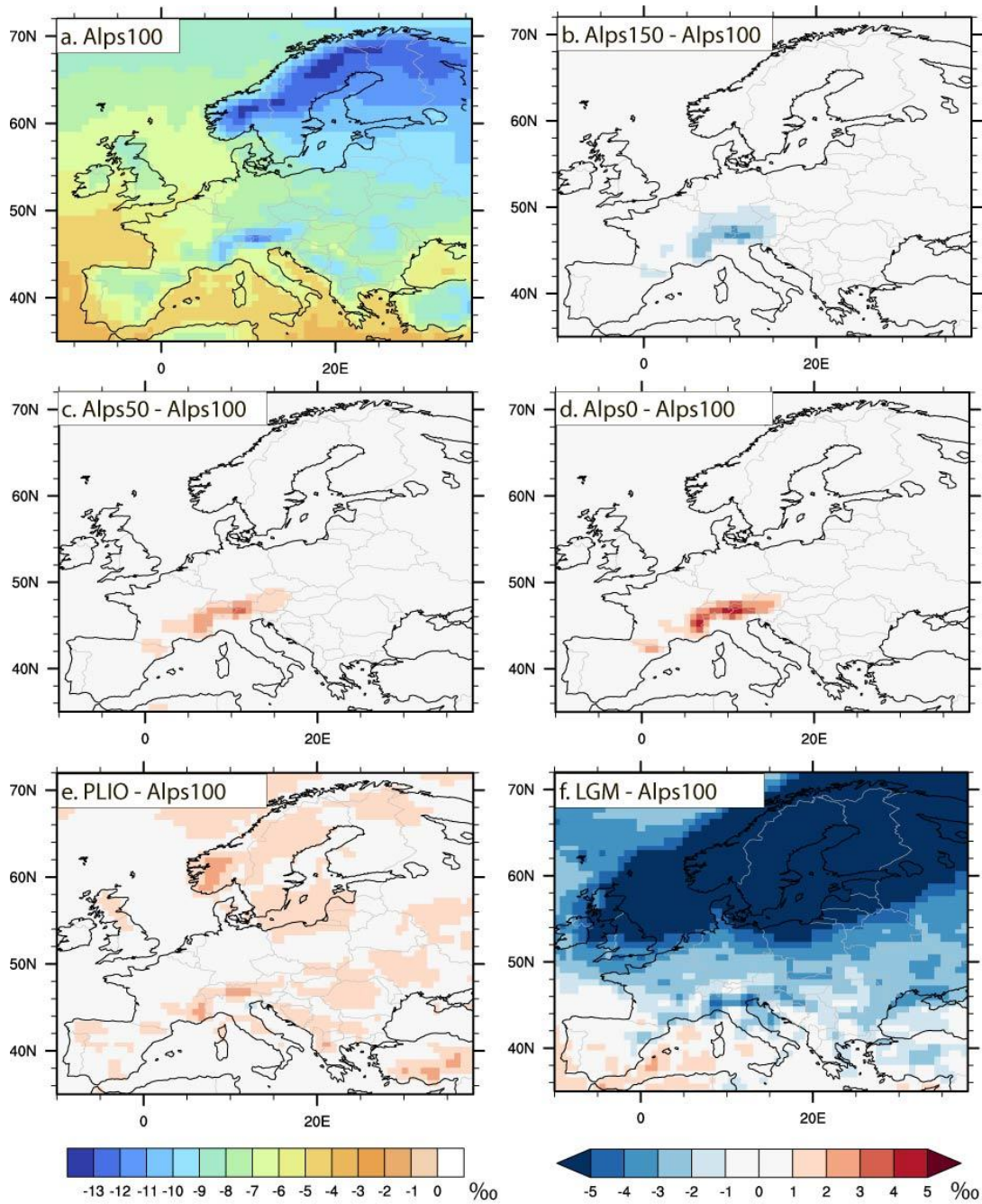
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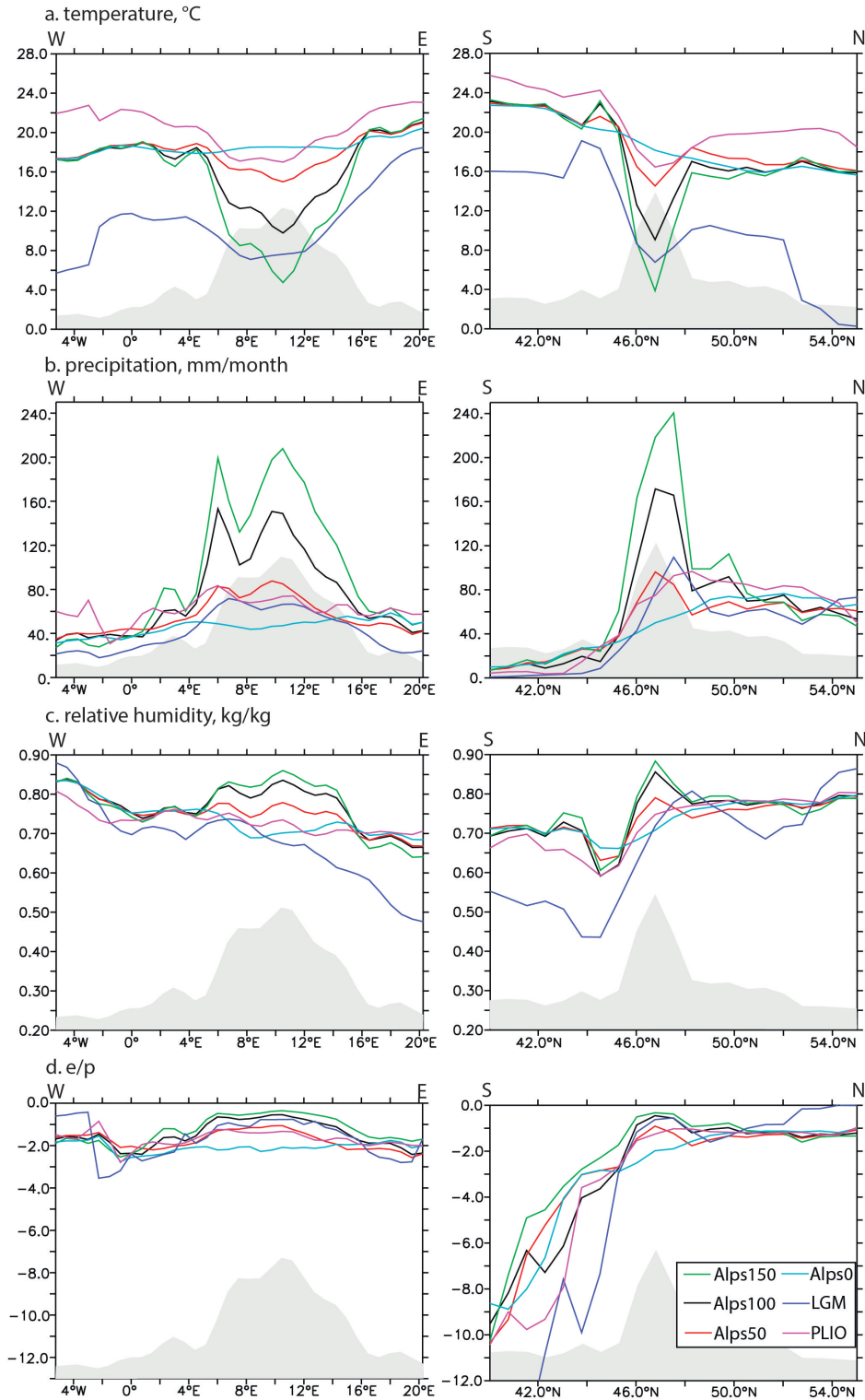
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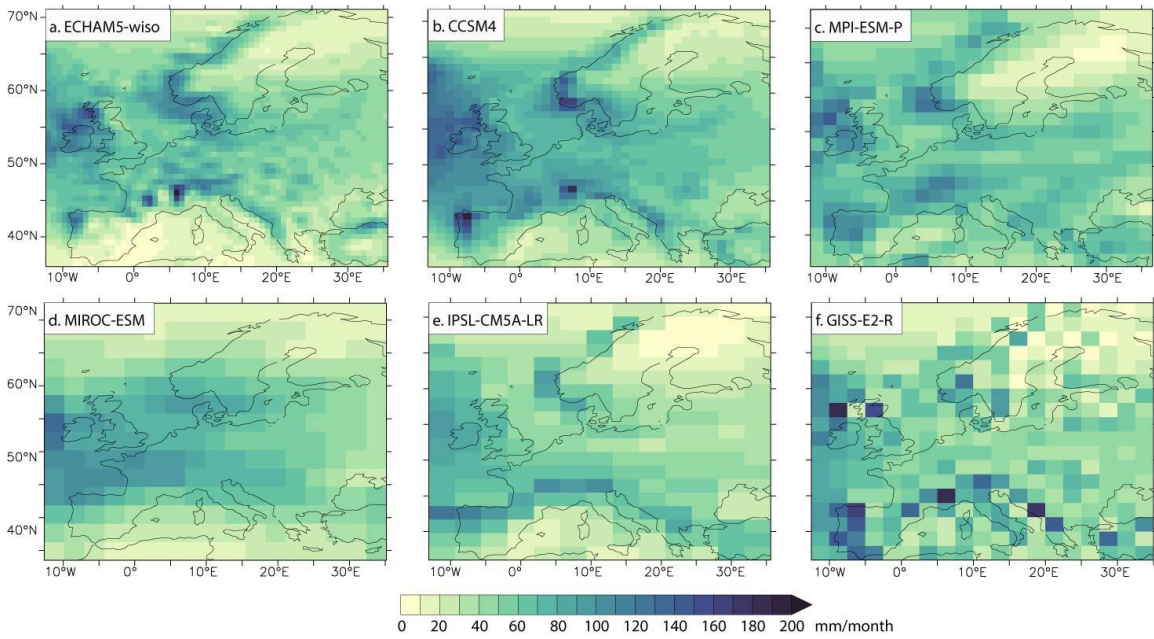
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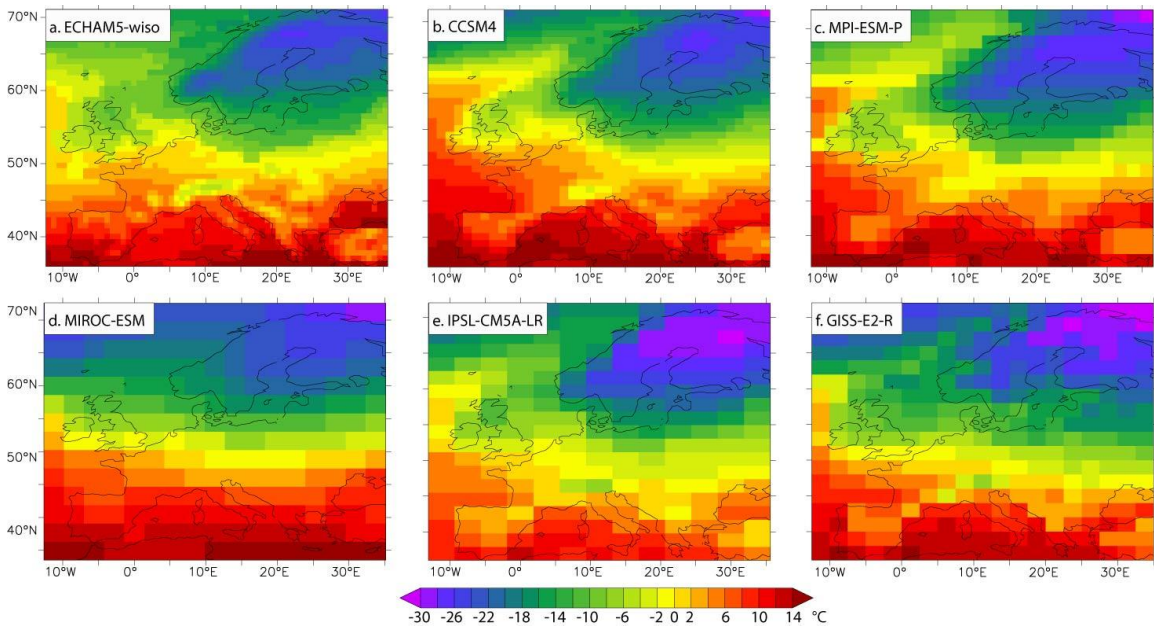

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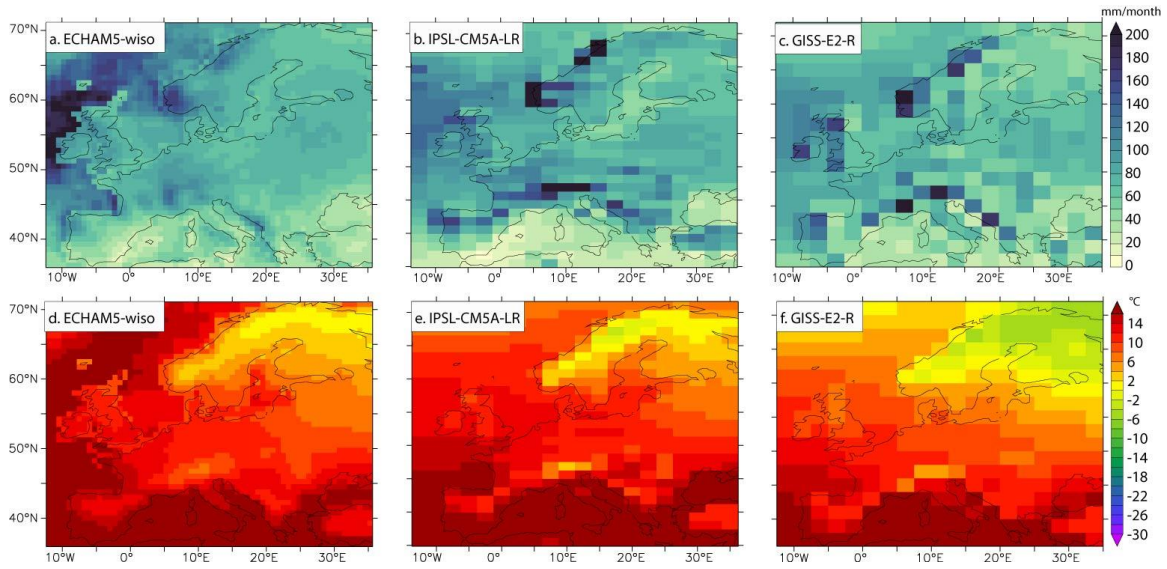
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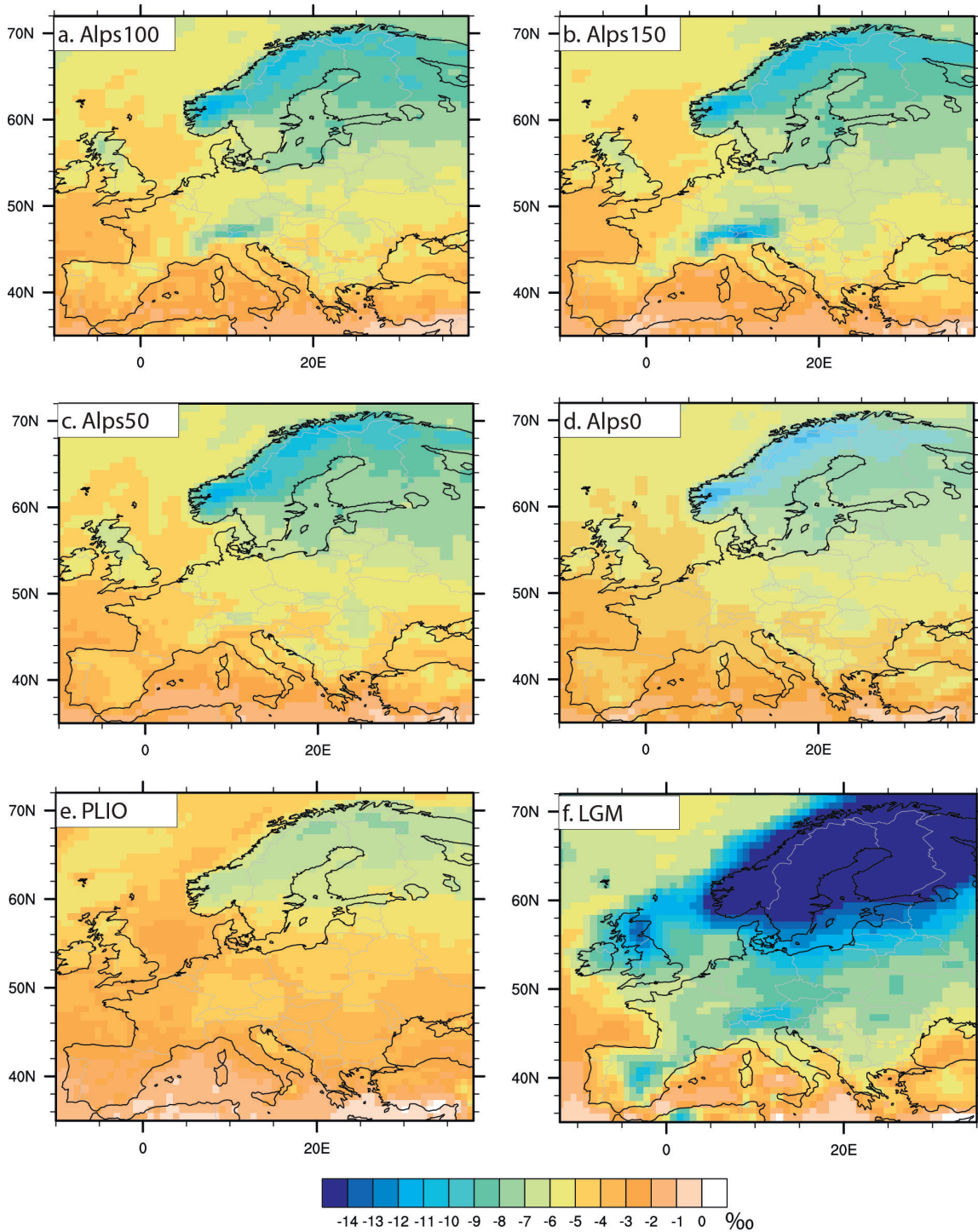
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