Supplement of Geosci. Model Dev., 10, 1849–1872, 2017
http://www.geosci-model-dev.net/10/1849/2017/
doi:10.5194/gmd-10-1849-2017-supplement

Geoscientific Model Development
Open Access
EGU

Supplement of

weather@home 2: validation of an improved global–regional climate modelling system

Benoit P. Guillod et al.

Correspondence to: Benoit P. Guillod (benoit.guillod@ouce.ox.ac.uk)

Supplementary Figures

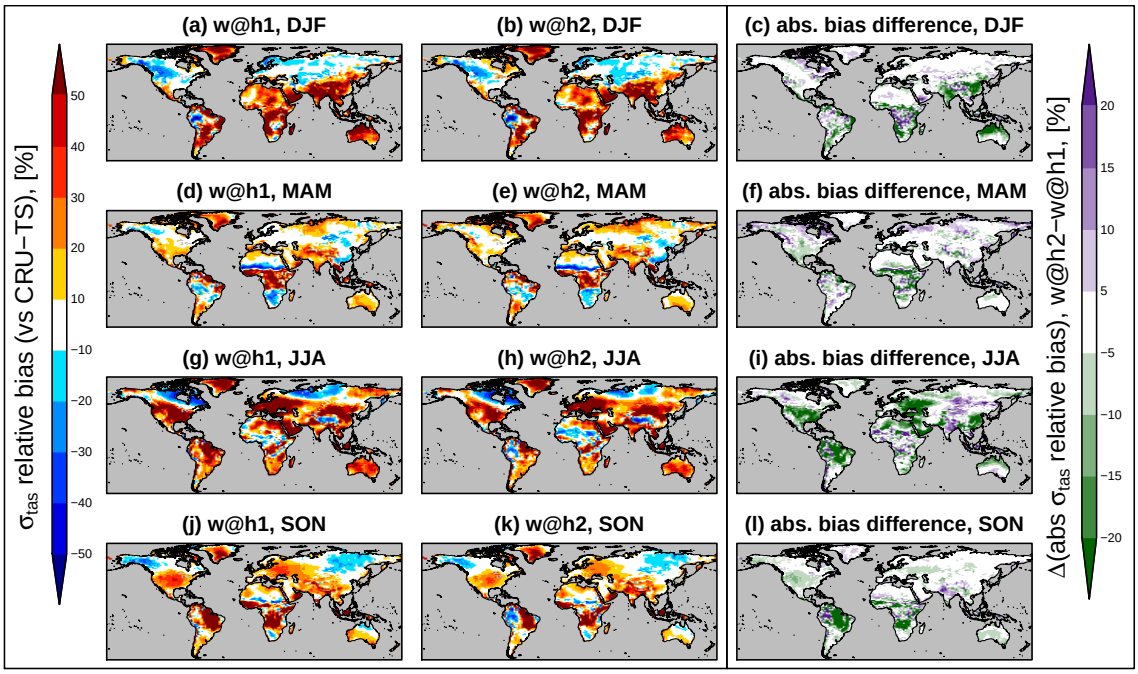

Figure S1: Biases in surface air temperature variability (standard deviation of monthly averages) for the GCM HadAM3P in w@h1 (left; a,d,g,j) and w@h2 (middle; b,e,h,k), and the difference in absolute biases (right; c,f,i,l, expressed as w@h2 minus w@h1, i.e., negative values indicate an improvement). Each row corresponds to a season (from top to bottom: DJF, MAM, JJA, SON). Biases are computed with respect to the CRU-TS dataset and are expressed in relative terms (%), and grey indicates regions without data (ocean grid cells).

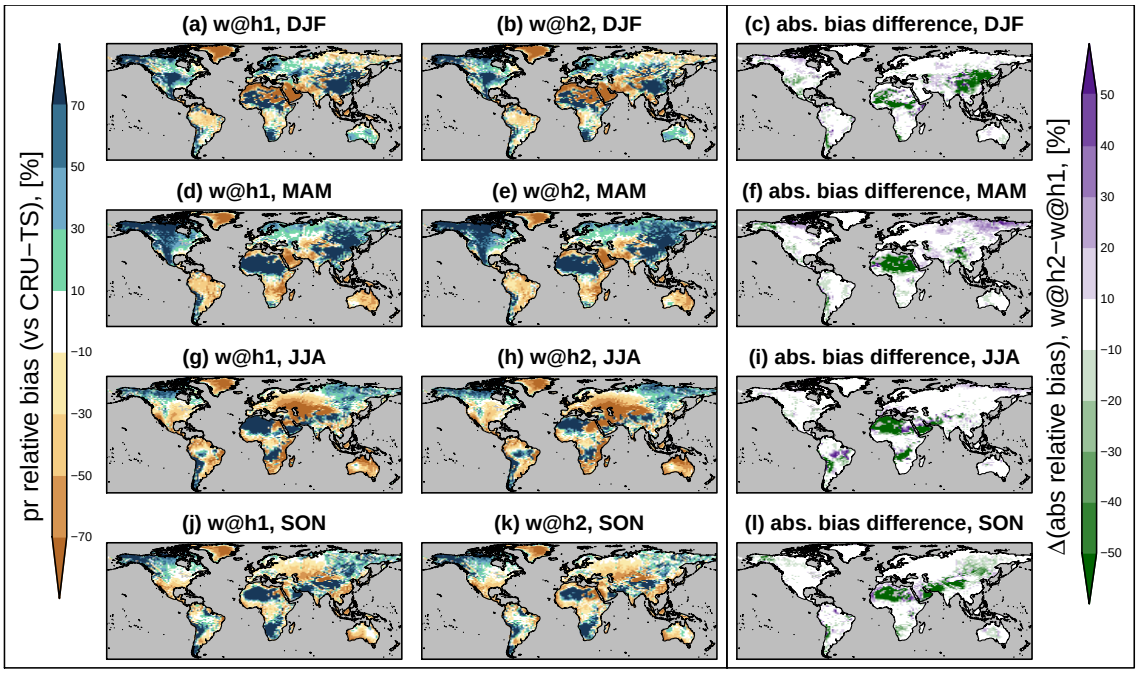

Figure S2: Same as Fig. 3 in the main text but for biases in precipitation expressed in %.

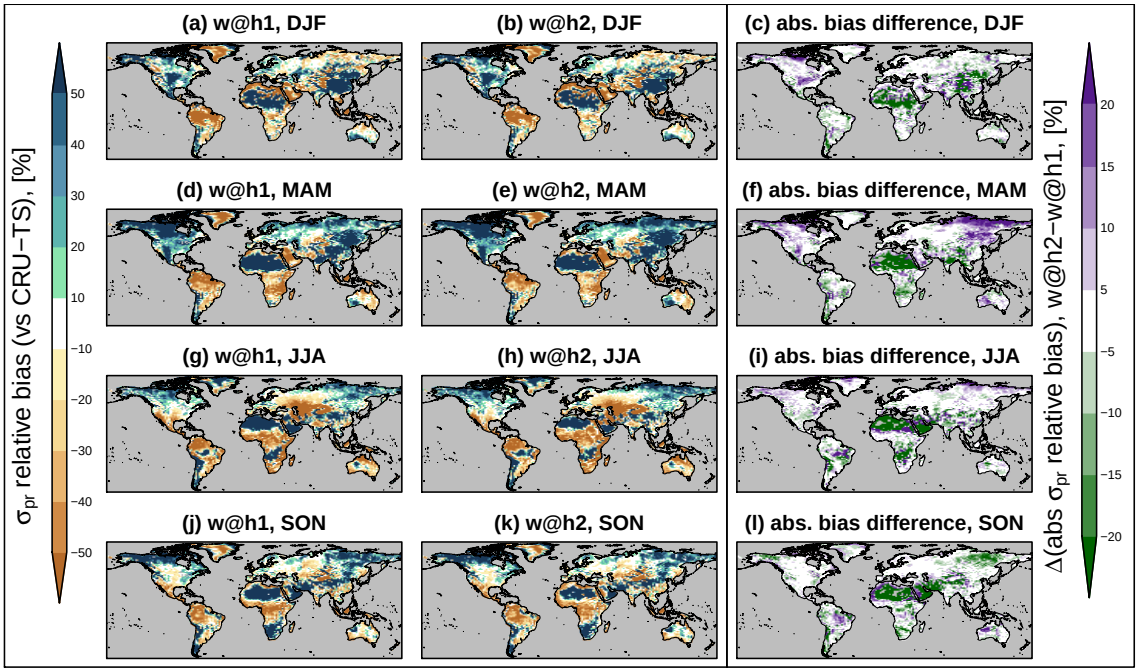

Figure S3: Same as Fig. S1 but for precipitation: biases in monthly precipitation variability (standard deviation), in %.

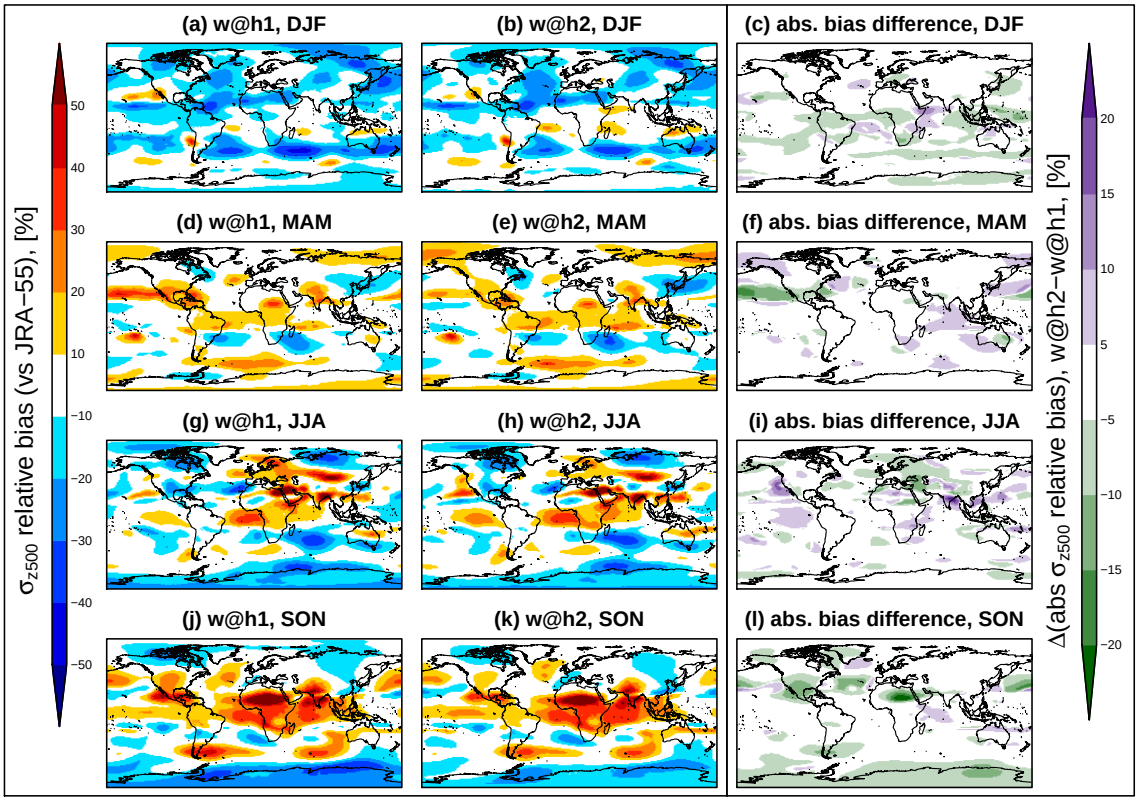

Figure S4: Same as Fig. S4 but for geopotential height at 500 hPa with respect to JRA-55: biases in monthly variability (standard deviation), in %.

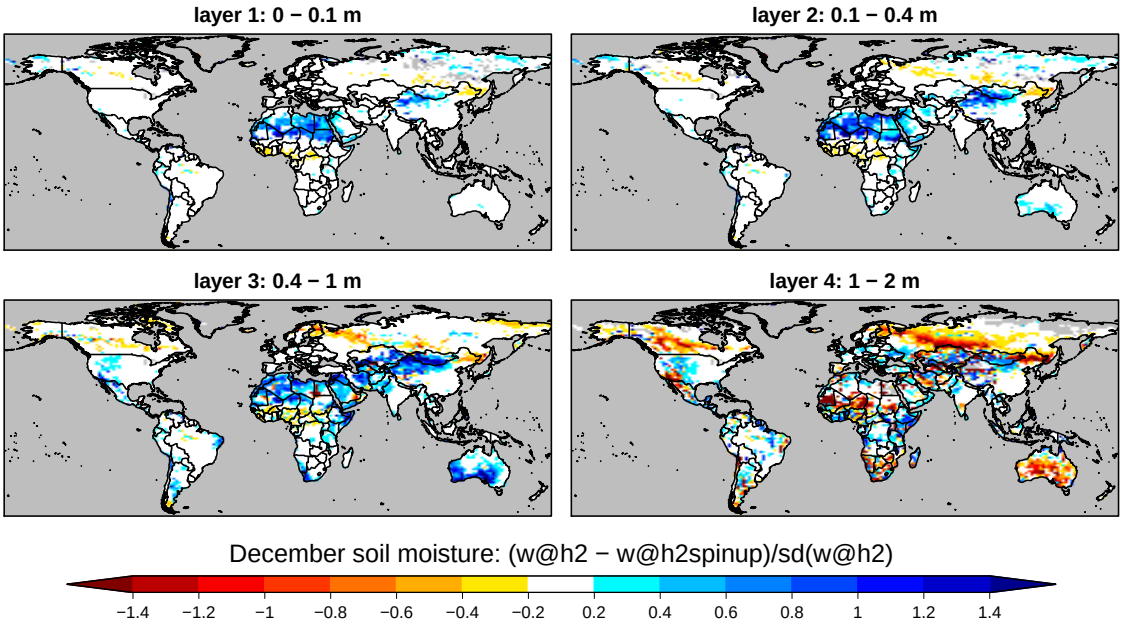

Figure S5: Soil moisture spin-up in HadAM3P. Difference between ensemble mean soil moisture in December between the end of the 1st year ("spin-up", 13th month from the generic restart) and the end of the 2nd year (25th months from the generic restart) in each simulation, normalized by the standard deviation (taken from the end of the 2nd year). Years 1961–1990 were used.

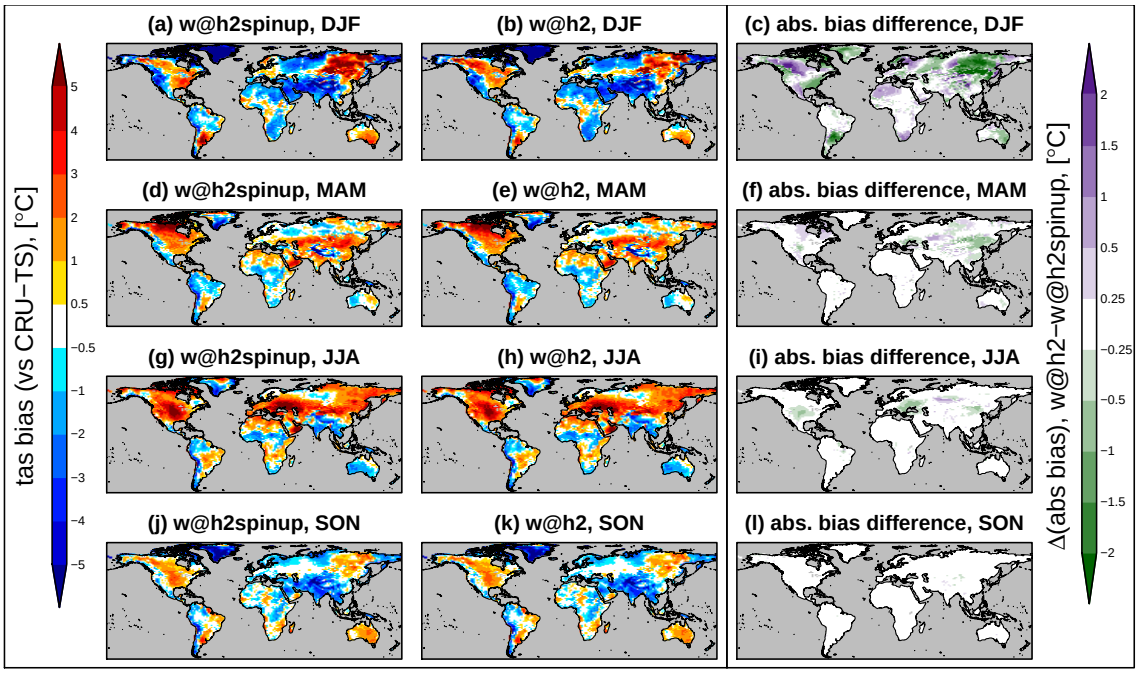

Figure S6: Spin-up effect on HadAM3P temperature biases: Biases in surface air temperature for HadAM3P in the spin-up run (w@h2spinup, left; a,d,g,j) and the 2nd year (w@h2, middle; b,e,h,k), and the difference in absolute biases (right; c,f,i,l, expressed as w@h2 minus w@h2spinup, i.e., negative values indicate an improvement with ongoing spin-up). Each row corresponds to a season (from top to bottom: DJF, MAM, JJA, SON).

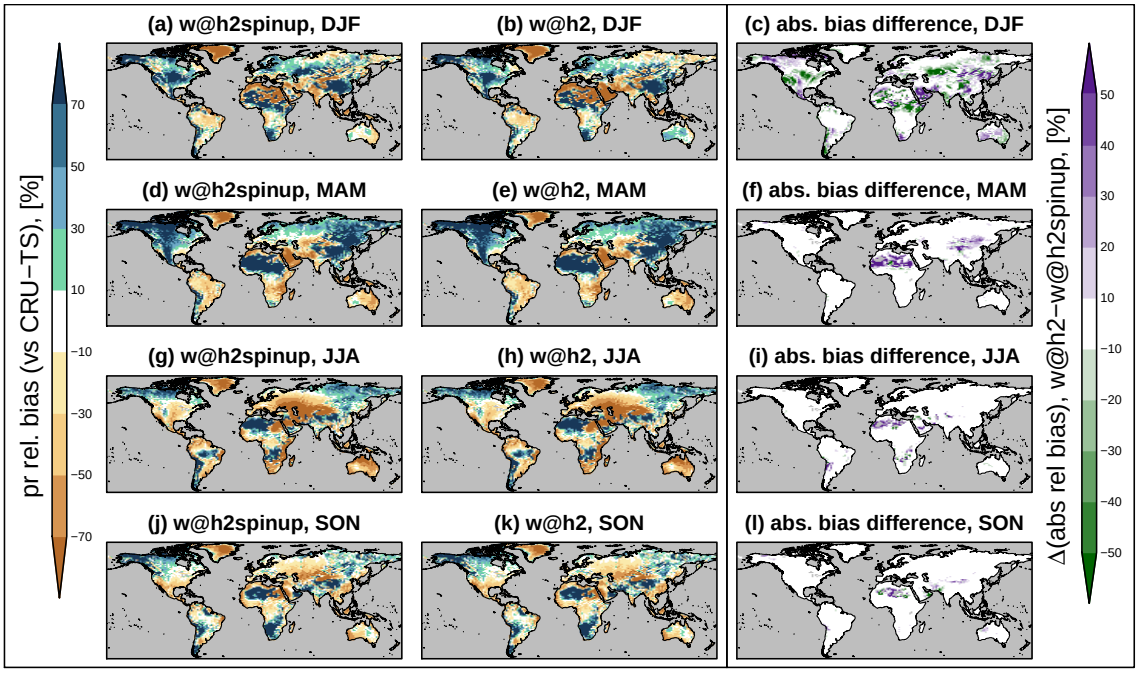

Figure S7: Same as Fig. S6 but for precipitation, in %.

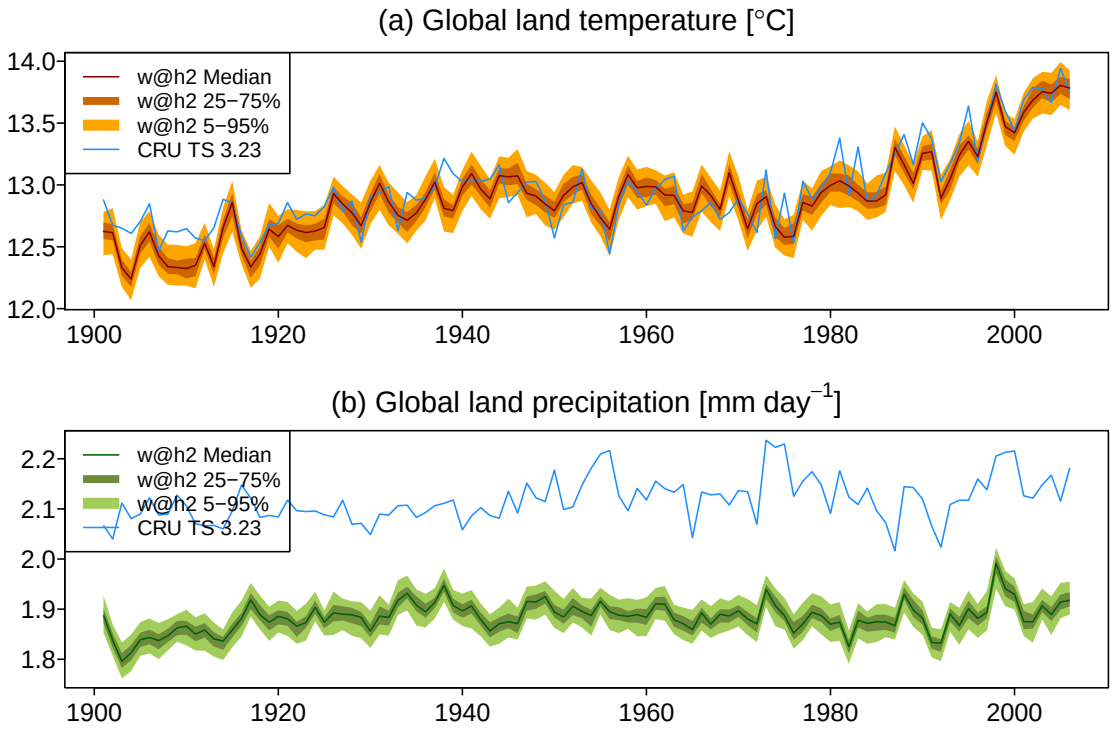

Figure S8: Global land annual mean time series of (a) temperature and (b) precipitation in the weather@home2 global HadAM3Pm2 model with respect to CRU-TS. The median, inter-quartile range (25–75%), and 5–95% range of the w@h2 ensemble members are shown for each year. Antarctica is not included, as in CRU-TS. Time series for anomalies are shown in Fig. 5 in the main text.

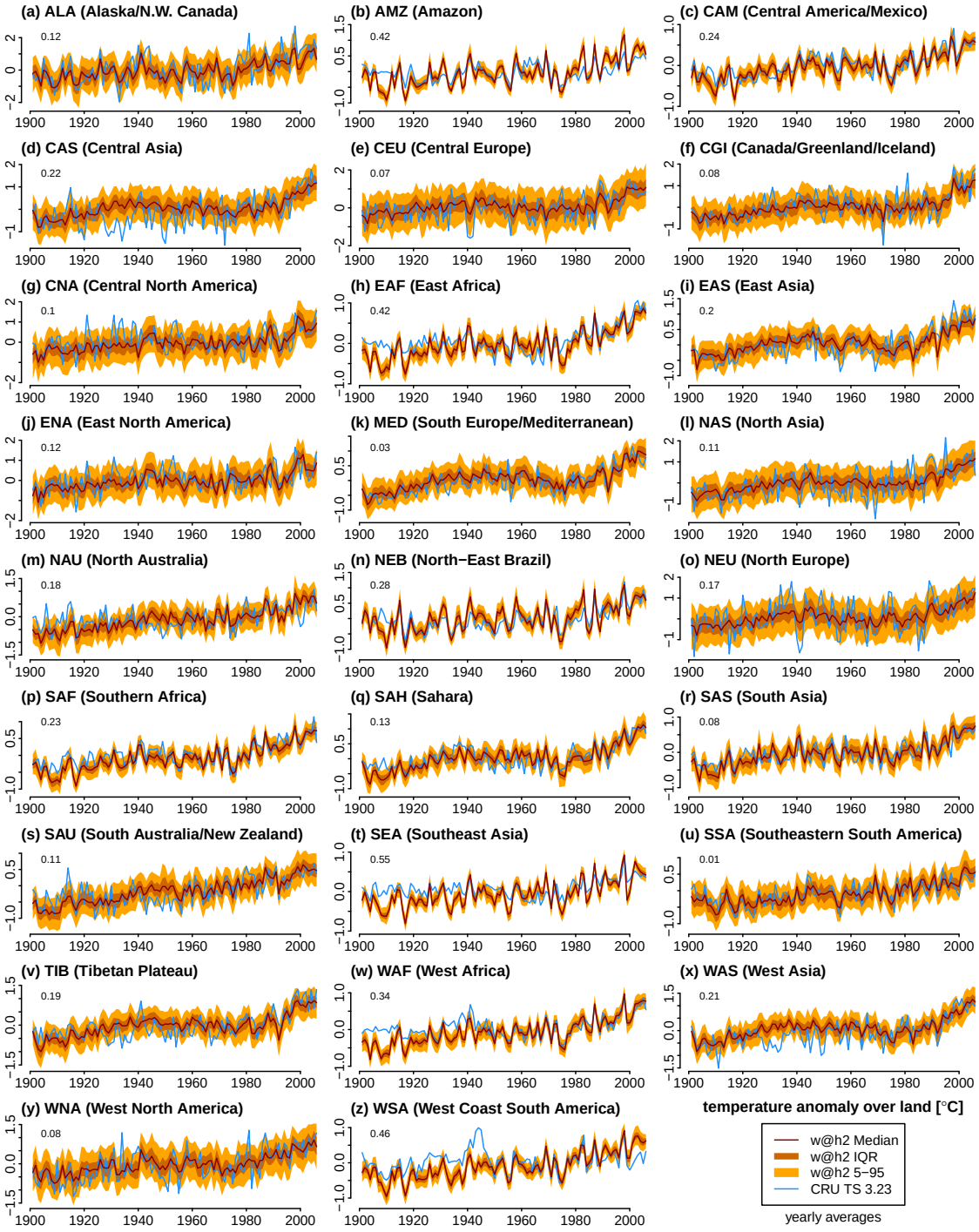

Figure S9: Same as Fig. 5(a) in the main text, but for temperature anomalies in the 26 SREX regions defined in Seneviratne et al. (2012). The fraction of years with observed value lying outside of the 5–95% range of the w@h2 ensemble members is shown in the upper left of each plot. Only land points within each region are included.

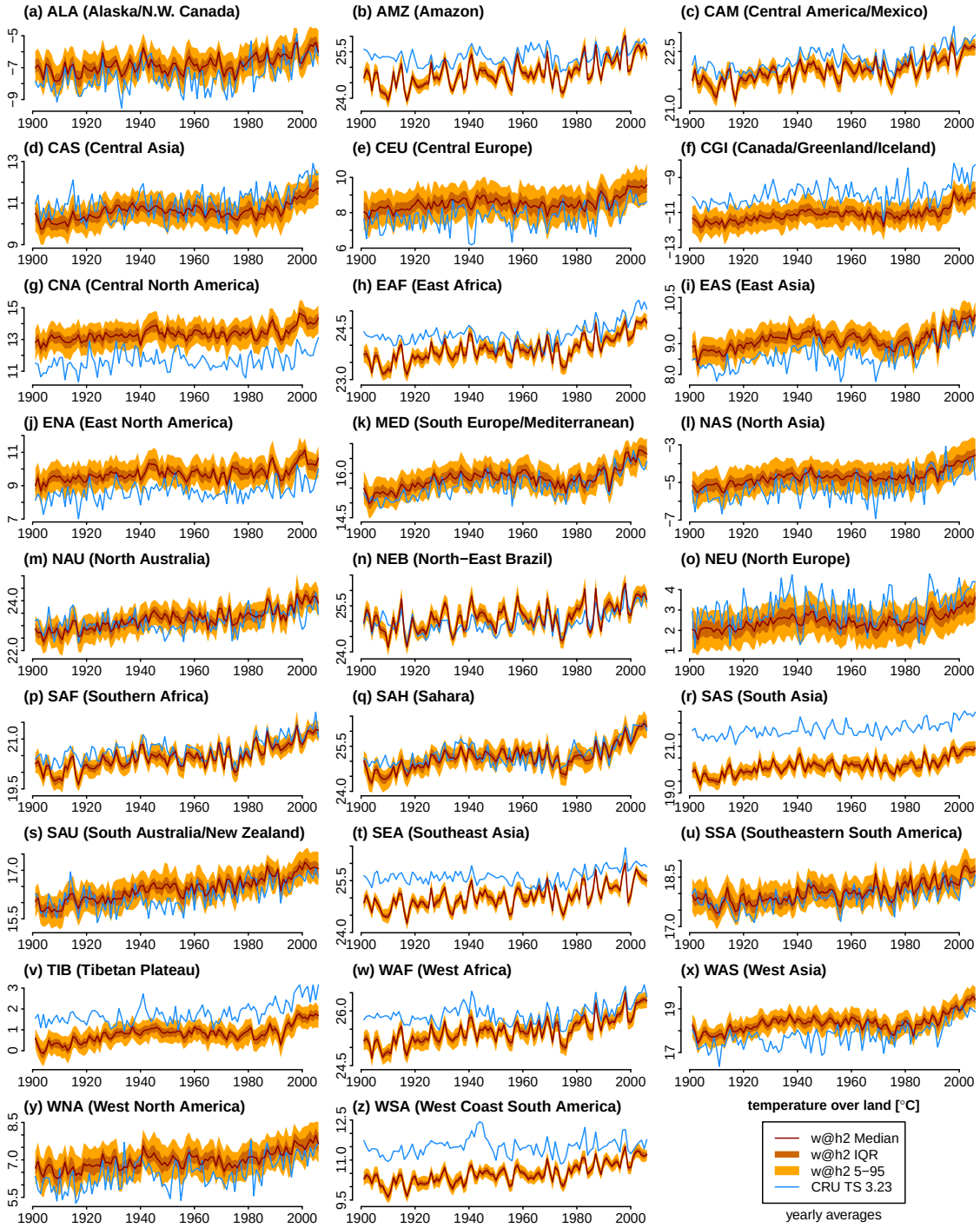

Figure S10: Same as Fig. S9 but without subtracting the 1961–1990 climatological values.

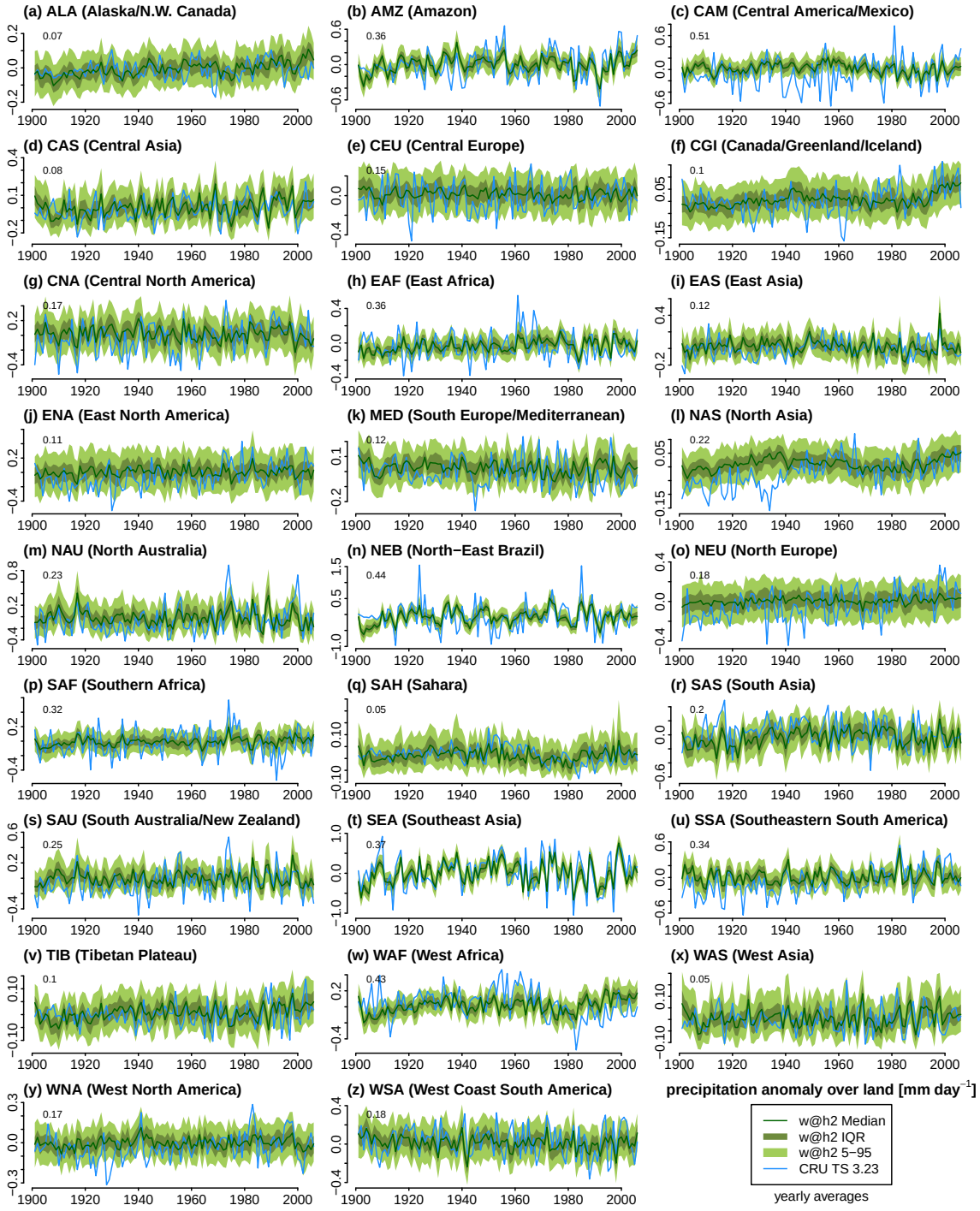

Figure S11: Same as Fig. 5(b) in the main text, but for precipitation anomalies in the 26 SREX regions. The fraction of years with observed value lying outside of the 5–95% range of the w@h2 ensemble members is shown in the upper left of each plot. Only land points within each region are included.

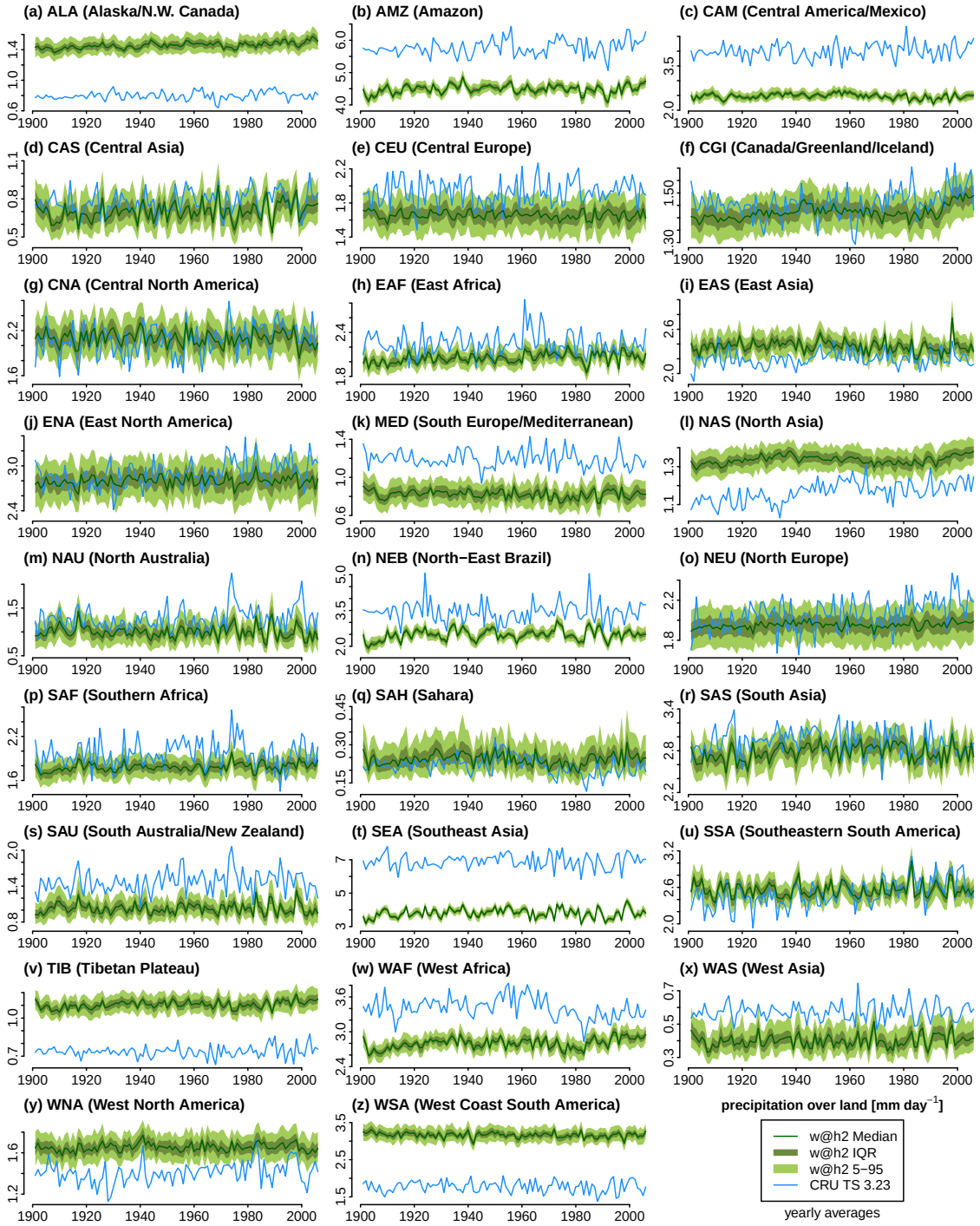

Figure S12: Same as Fig. S11 but without subtracting the 1961–1990 climatological values.

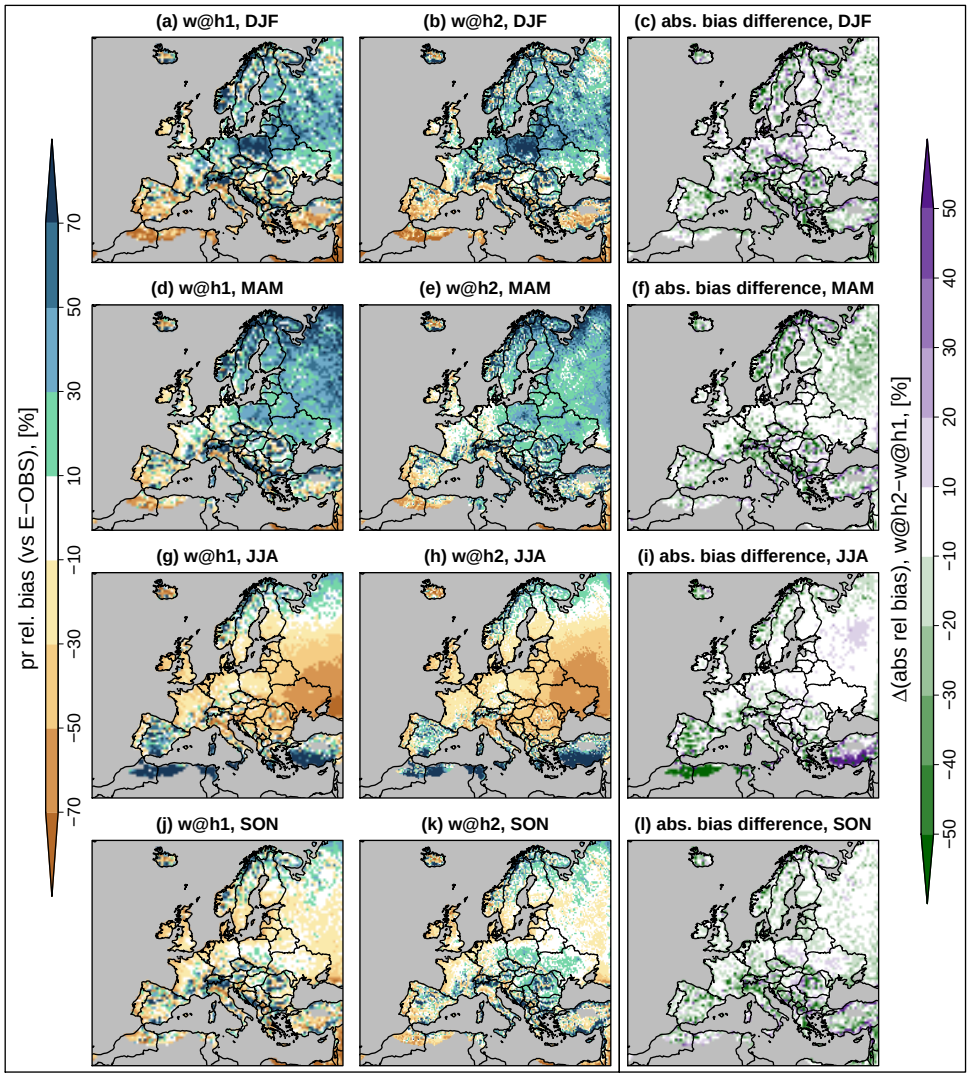

Figure S13: Same as Fig. 8 in the main text but for relative biases in precipitation expressed in %.

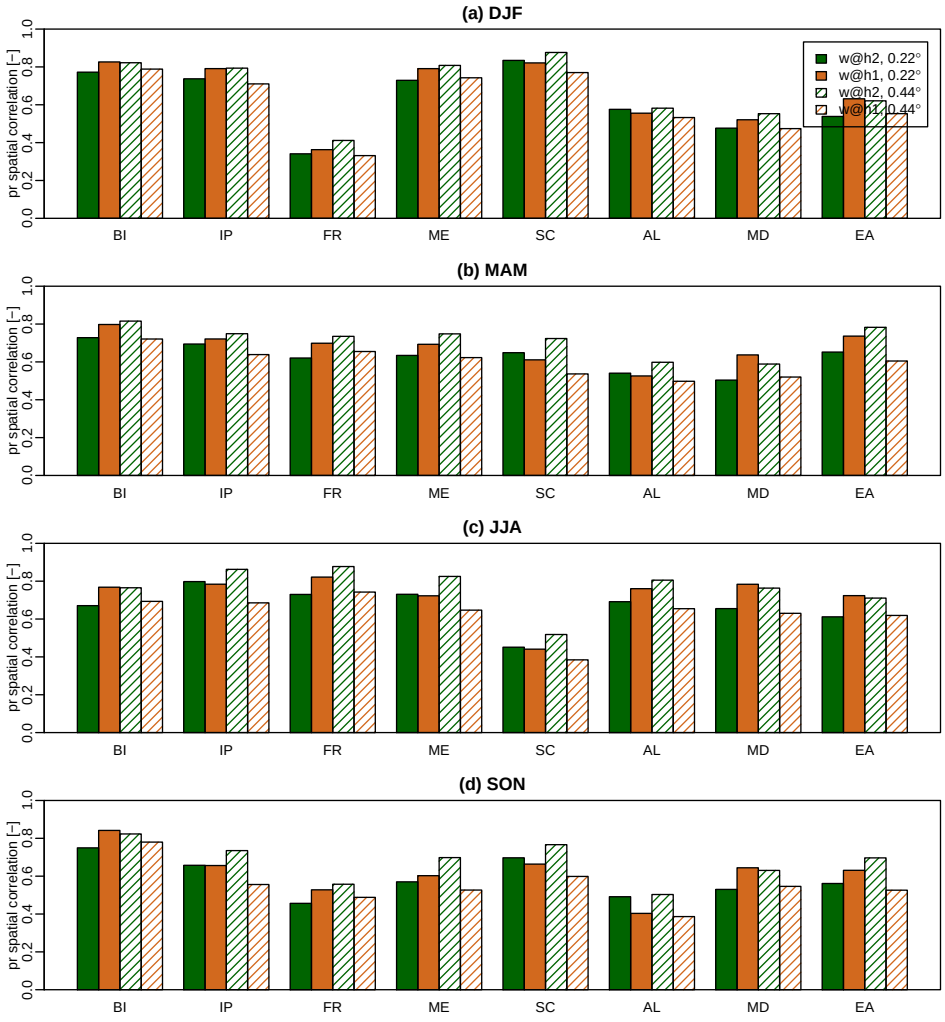

Figure S14: Spatial correlation of climatological values in w@h1 and w@h2 with E-OBS for precipitation, by region and season.

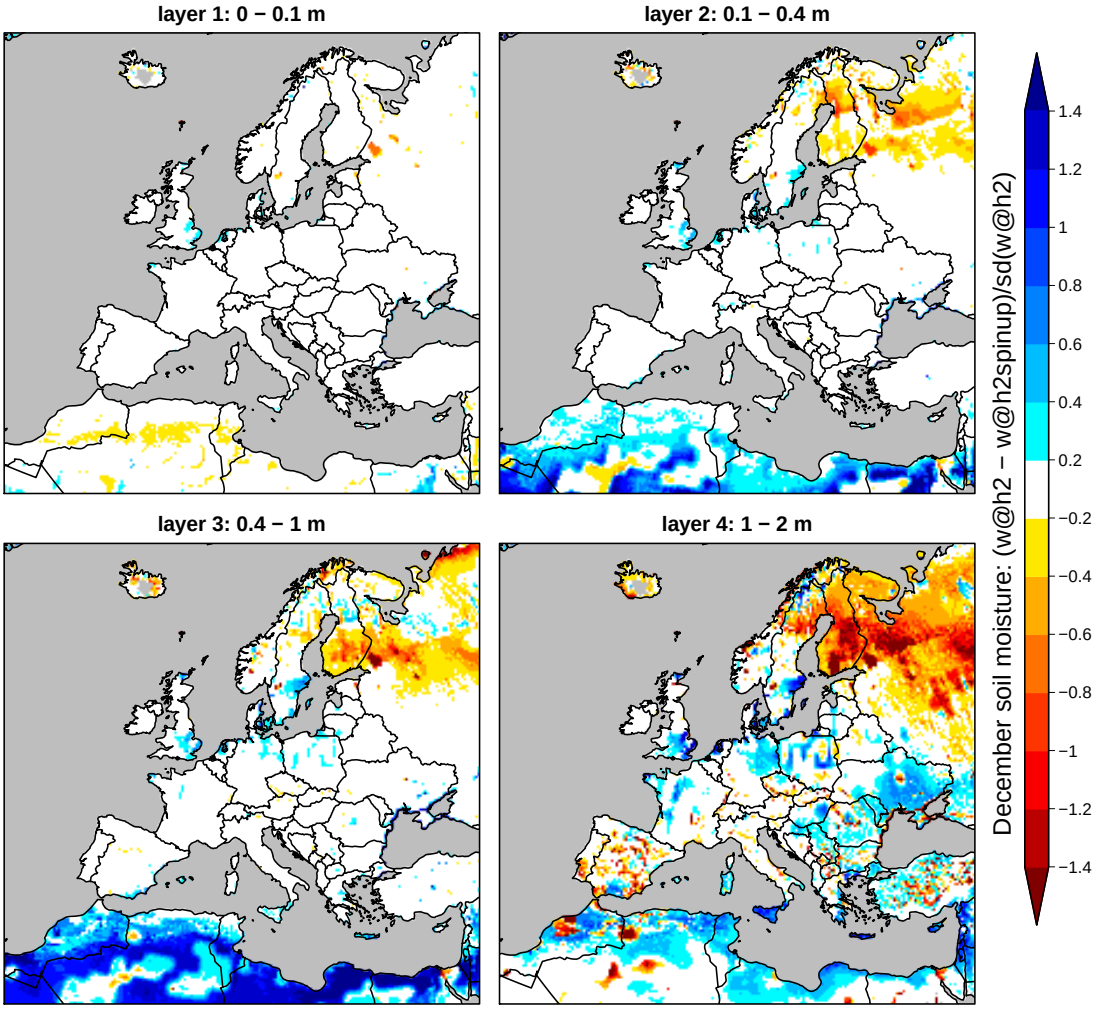

Figure S15: Soil moisture spin-up in HadRM3P: same as Fig. S5 but for HadRM3P.

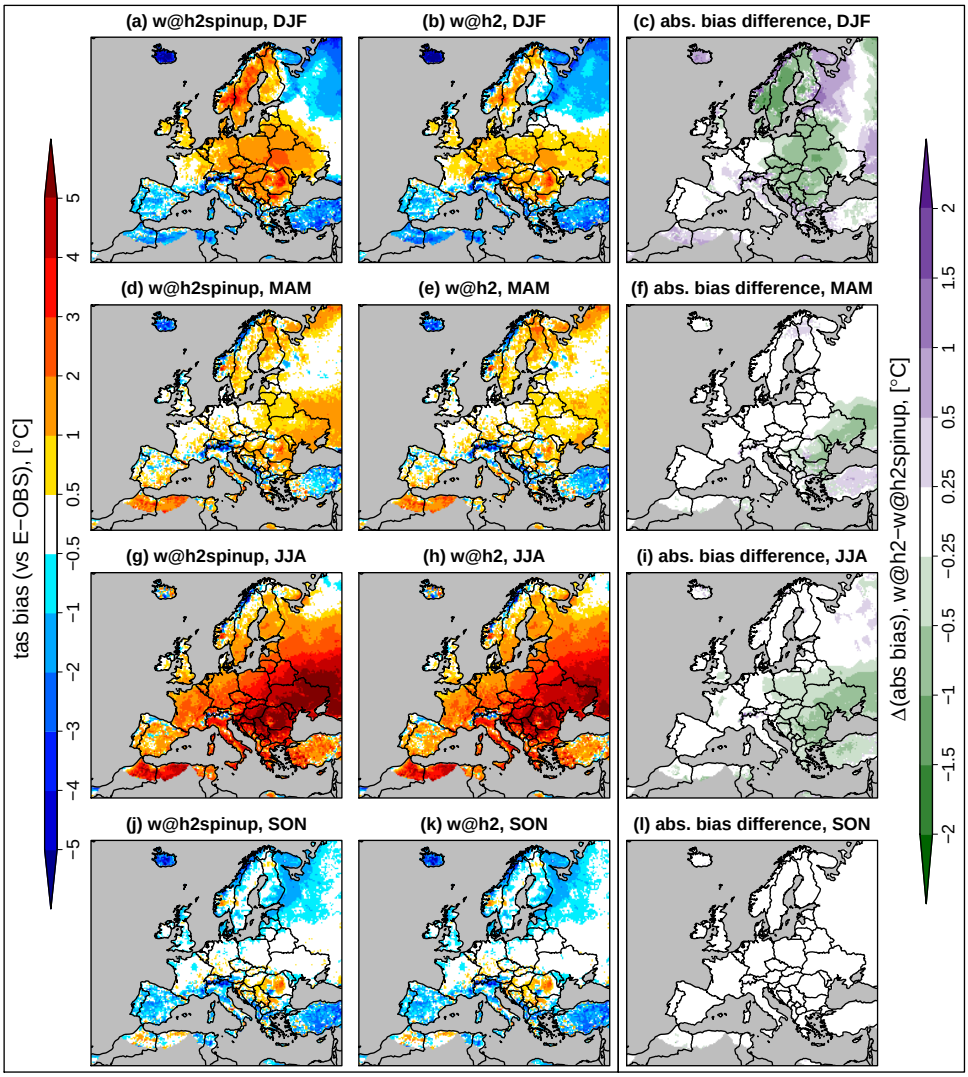

Figure S16: Spin-up effect on HadRM3P temperature biases: Same as Fig. S6 but for HadRM3P.

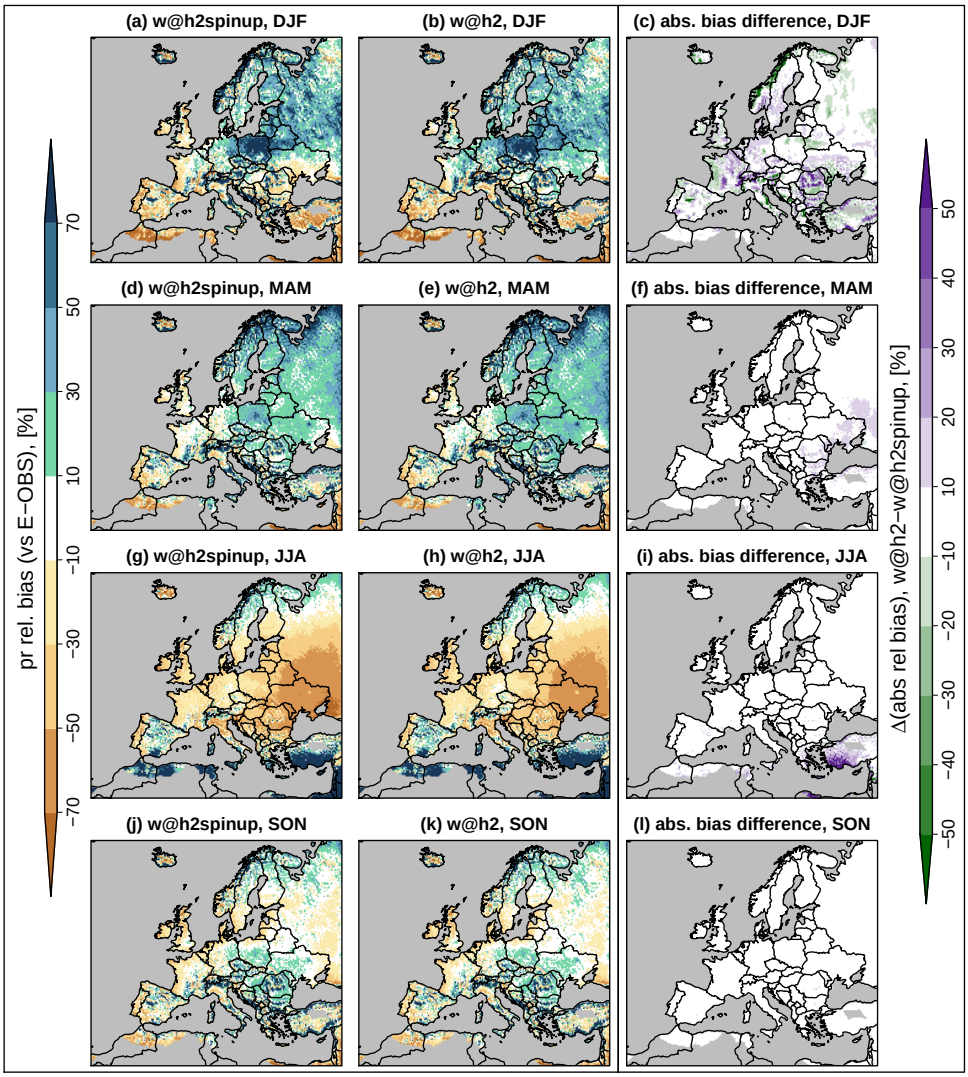

Figure S17: Same as Fig. S16 but for precipitation, in %.

References

Seneviratne, S. I., Nicholls, N., Easterling, D., Goodess, C. M., Kanae, S., Kossin, J., Luo, Y., Marengo, J., McInnes, K., Rahimi, M., Reichstein, M., Sorteberg, A., Vera, C., and Zhang, X.: Managing the Risks of Extreme Events and Disasters to Advance Climate Change Adaptation, pp. 109–230, Cambridge University Press, Cambridge, UK, and New York, NY, USA, URL `http://ipcc-wg2.gov/SREX/`, a Special Report of Working Groups I and II of the Intergovernmental Panel on Climate Change (IPPC), 2012.