



Supplement of

Revisiting the historical wintertime drying of the Mediterranean in the LESFMIP simulations

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Abstract. The supplemental material assesses sensitivity to the epochs averaged over (Figure S2 to S6, S8-S9). It also displays the large intermodel spread in the historical climate responses (Figure S7). Finally, it shows spatial DJF PSL bias maps calculated for each model ensemble mean for the hist-GHG and hist-aer experiments, during three separate historical periods (Figure S10).

Multi-Model Mean of PSL response, 1990-2014 vs. 1851-1920

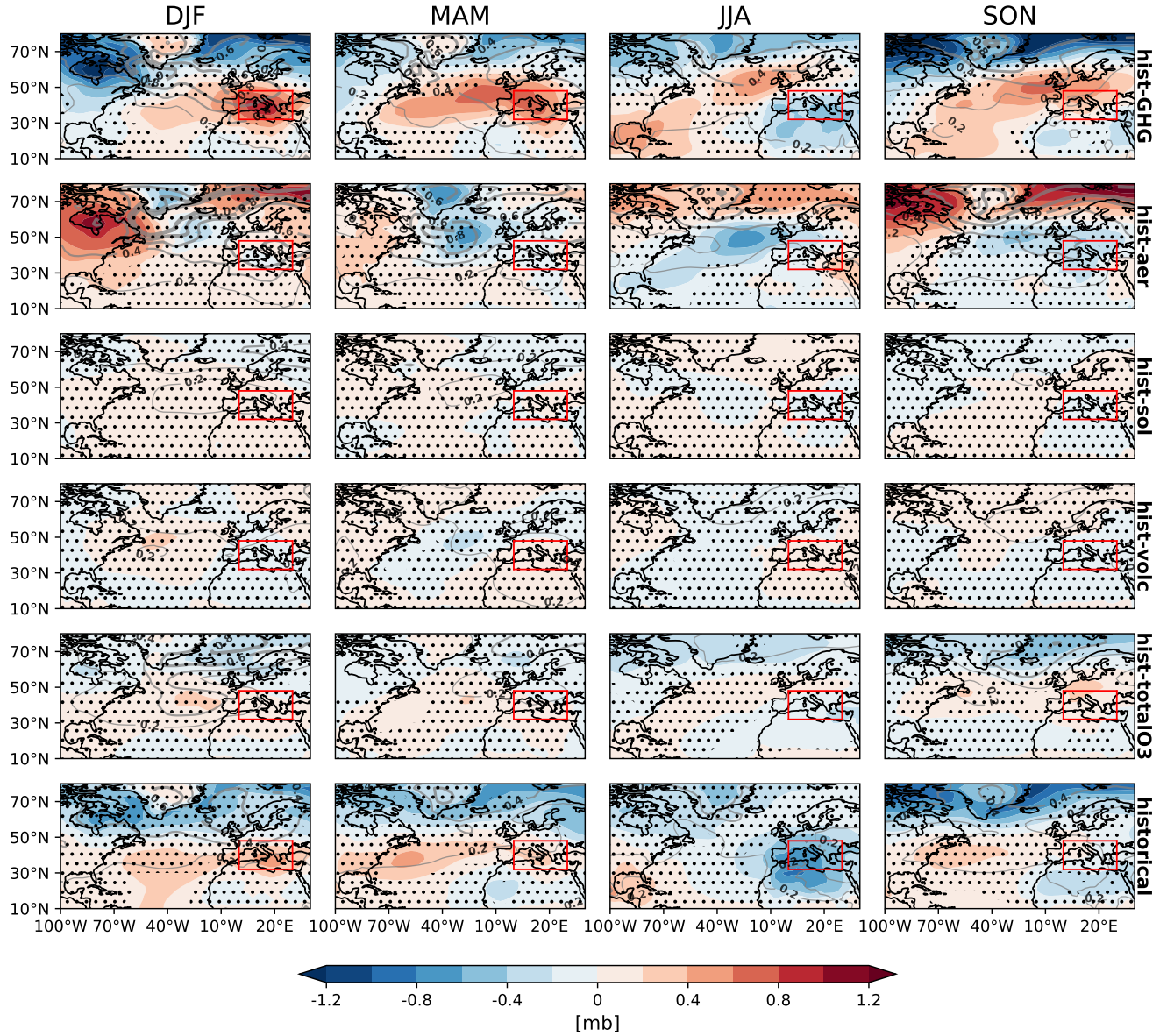


Figure S1. Multi-model means of the seasonal (column-wise) PSL responses (1990-2014 vs. 1851-1920) in the single-forcing and all-forcings experiments (row-wise).

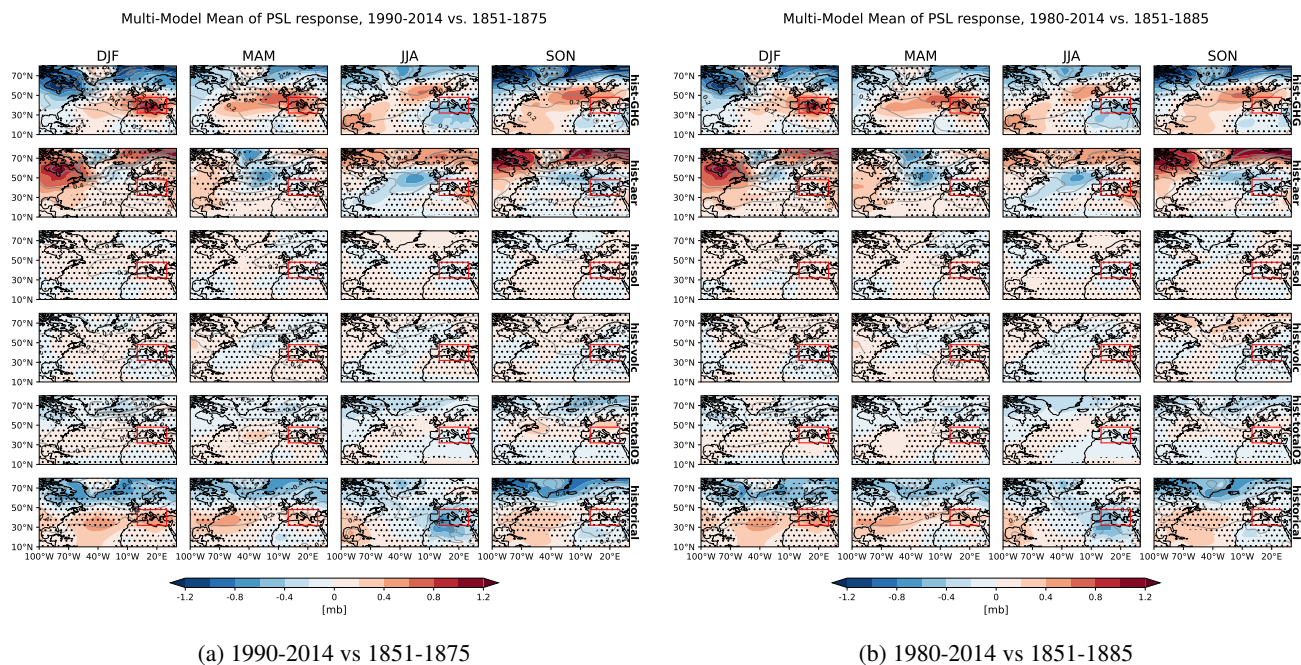


Figure S2. Sea-level pressure multi-model means single-forcings and historical responses for different epochs.

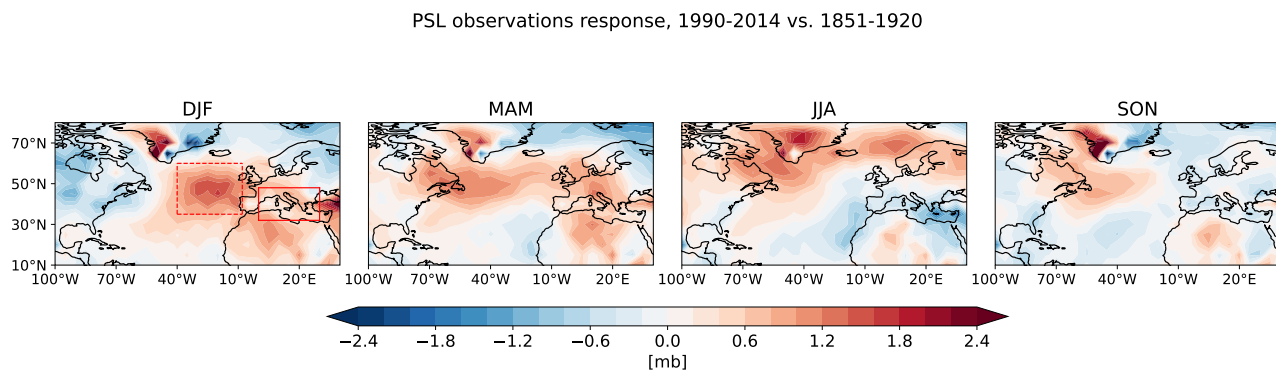


Figure S3. Seasonal (column-wise) PSL responses (1990-2014 vs. 1851-1920) in the HadSLPv2 observations.

Multi-Model Mean of Precip. response, 1990-2014 vs. 1851-1920

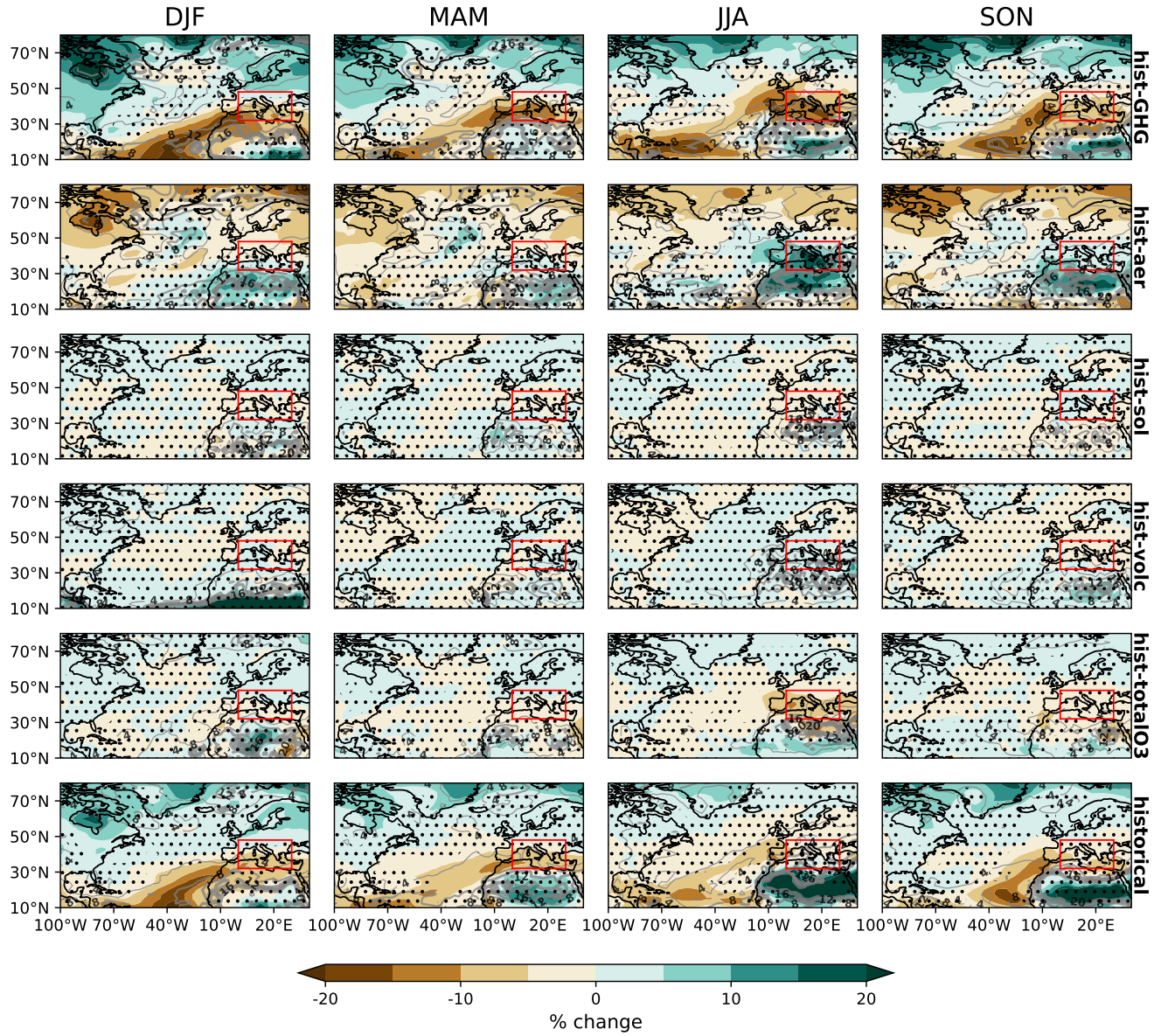


Figure S4. Multi-model means of the seasonal (column-wise) precipitation responses (1990-2014 vs. 1851-1920) in the single-forcing experiments (row-wise).

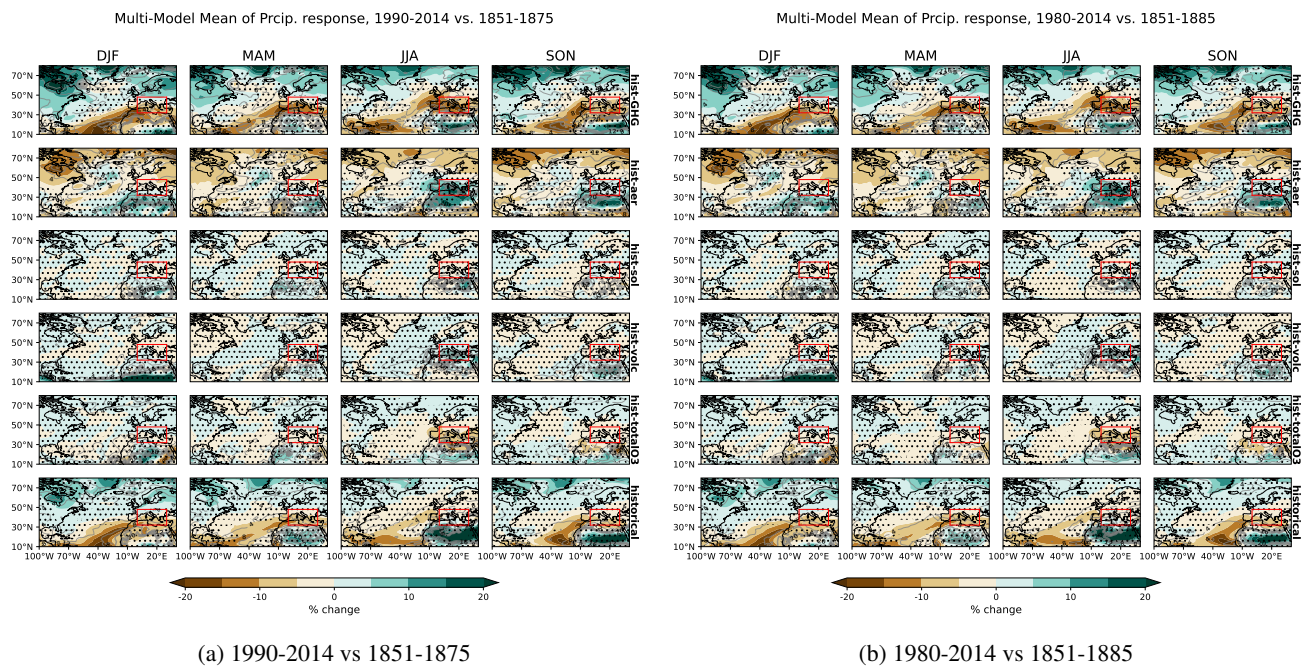


Figure S5. Precipitation multi-model means single-forcings and historical responses for different epochs.

historical, DJF, Models Prcip. trends

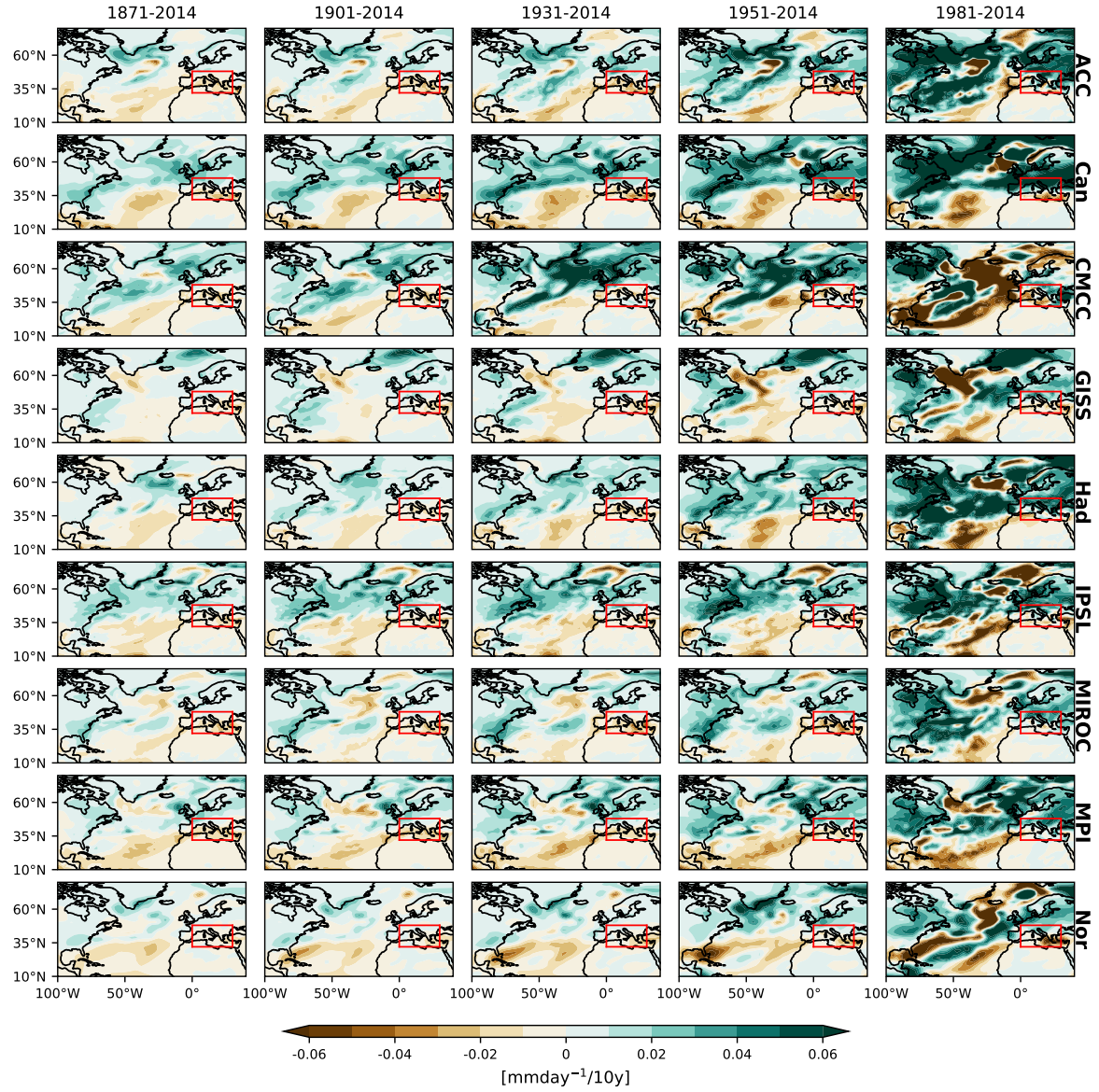


Figure S6. Ensemble means of the DJF precipitation trends [mm/day/10y] for the different models (row-wise) during different time periods (column-wise) based on the historical LESFMIP experiment.

historical , DJF, $\Delta_t=1990-2014$ vs. 1851-1920

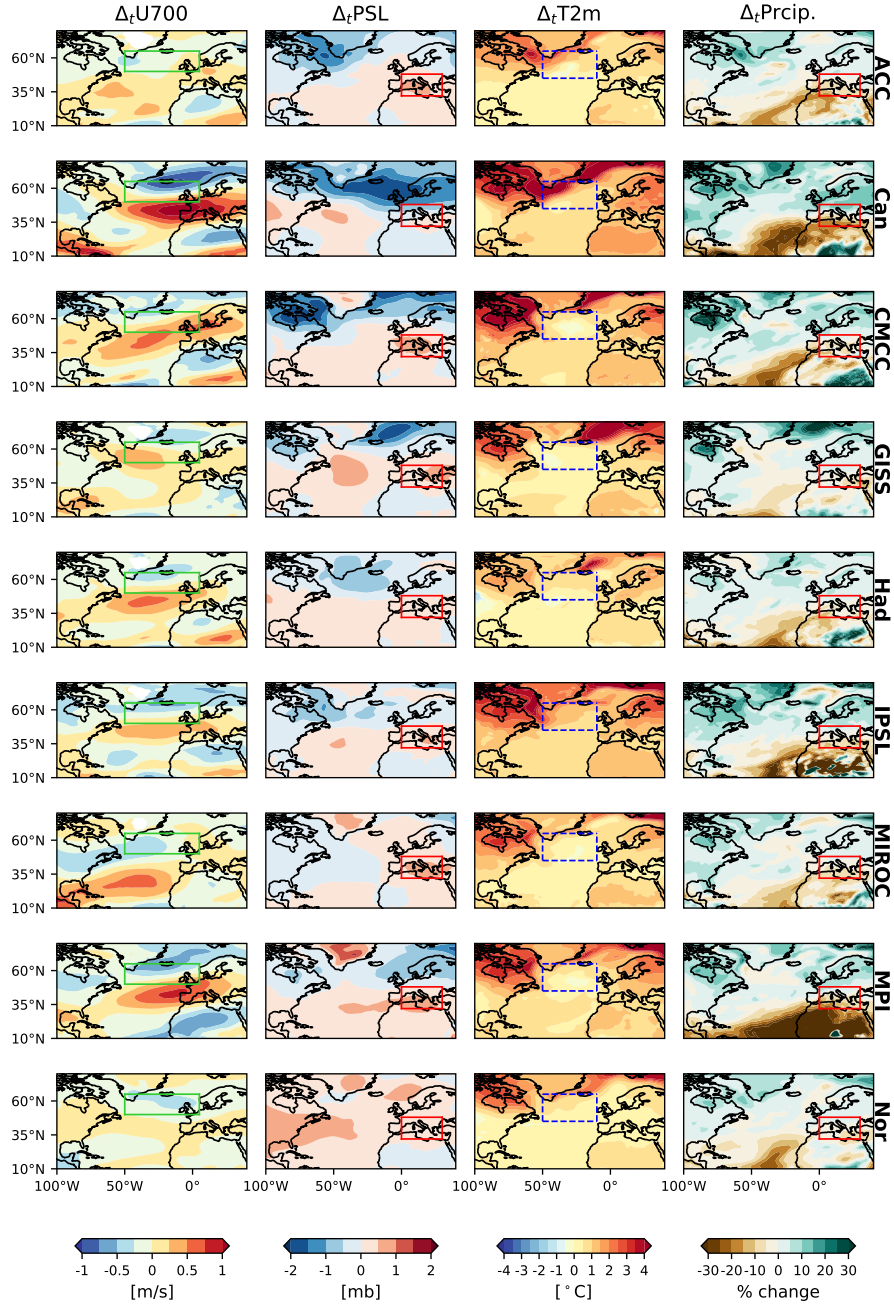


Figure S7. Ensemble means of the DJF historical responses for the U700, PSL, T2m, and Prcip. (column-wise) fields, obtained for each model (row-wise) in the historical experiment. The green, red, and blue rectangles mark region of high variability of U700, the Mediterranean region, and region of the NA warming-hole, respectively.

hist-GHG , DJF, $\Delta_t=1980-2014$ vs. 1851-1885

hist-GHG , DJF, $\Delta_t=1990-2014$ vs. 1851-1875

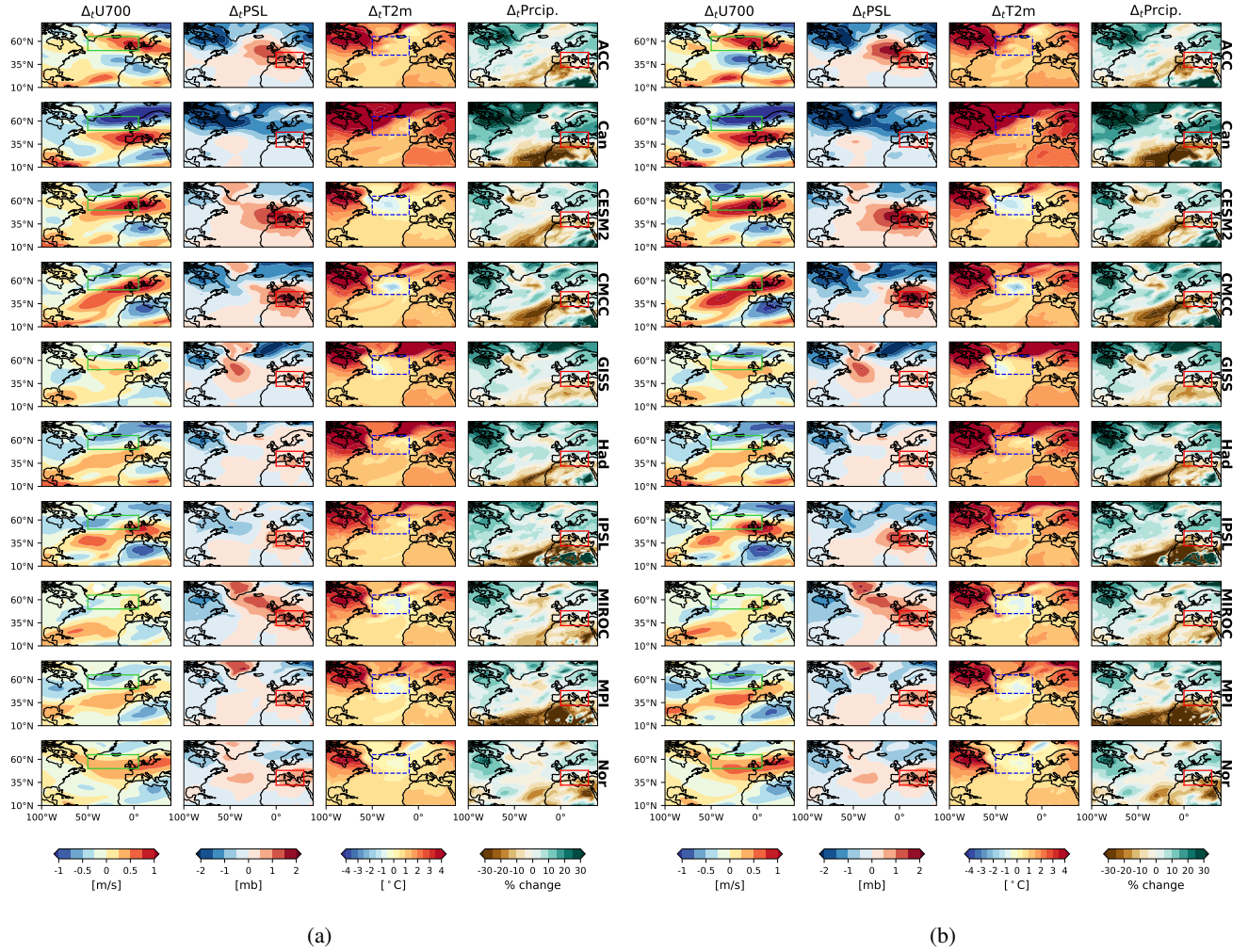


Figure S8. Ensemble means of the DJF responses for the U700, PSL, T2m, and Prcip. (column-wise) fields, obtained for each model (row-wise) in the hist-GHG experiment, for different averaging ranges than in the main text.

hist-aer , DJF, $\Delta_t=1980-2014$ vs. 1851-1885

hist-aer , DJF, $\Delta_t=1990-2014$ vs. 1851-1875

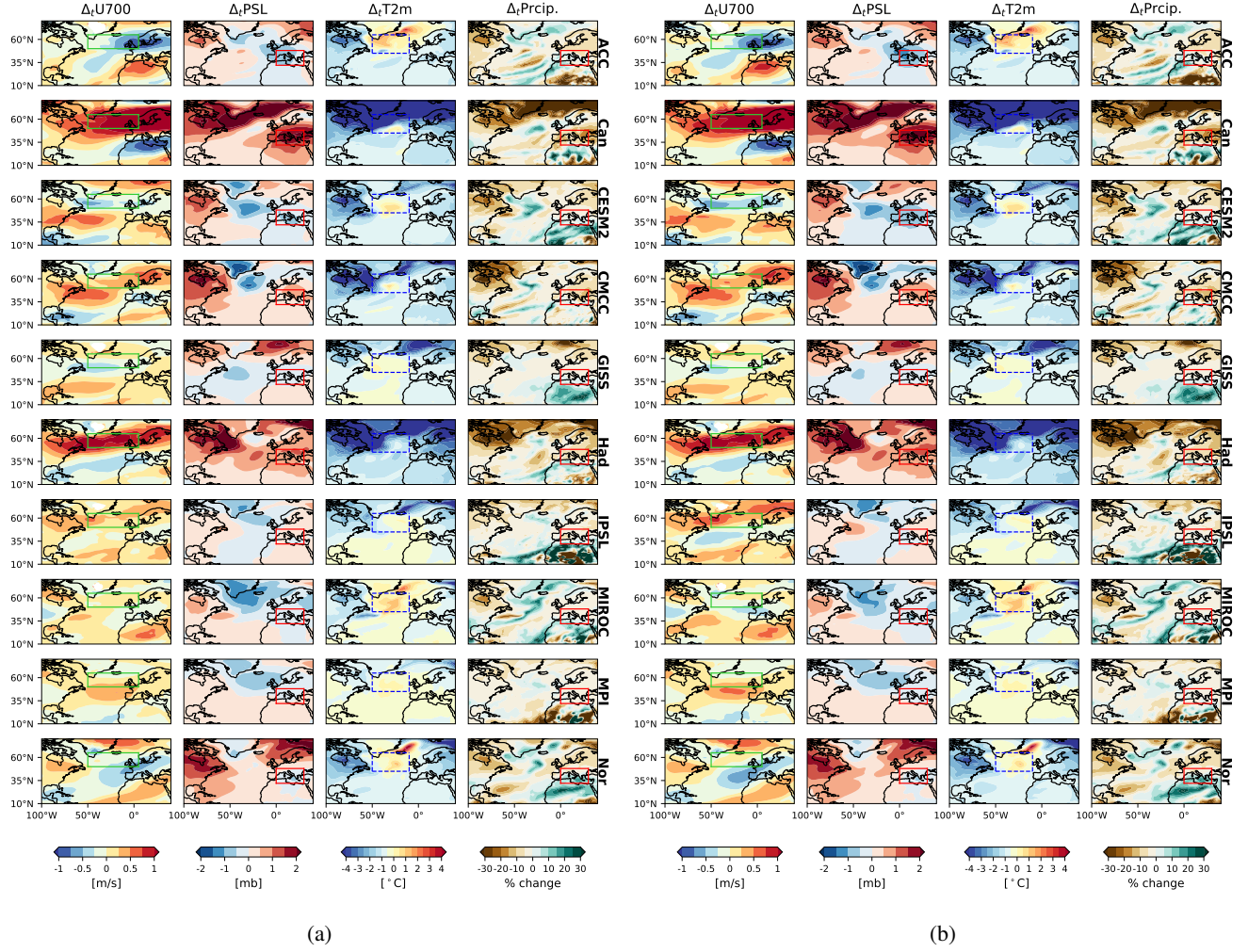


Figure S9. Ensemble means of the DJF responses for the U700, PSL, T2m, and Prcip. (column-wise) fields, obtained for each model (row-wise) in the hist-aer experiment, for different averaging ranges than in the main text.

historical, DJF, Model bias PSL

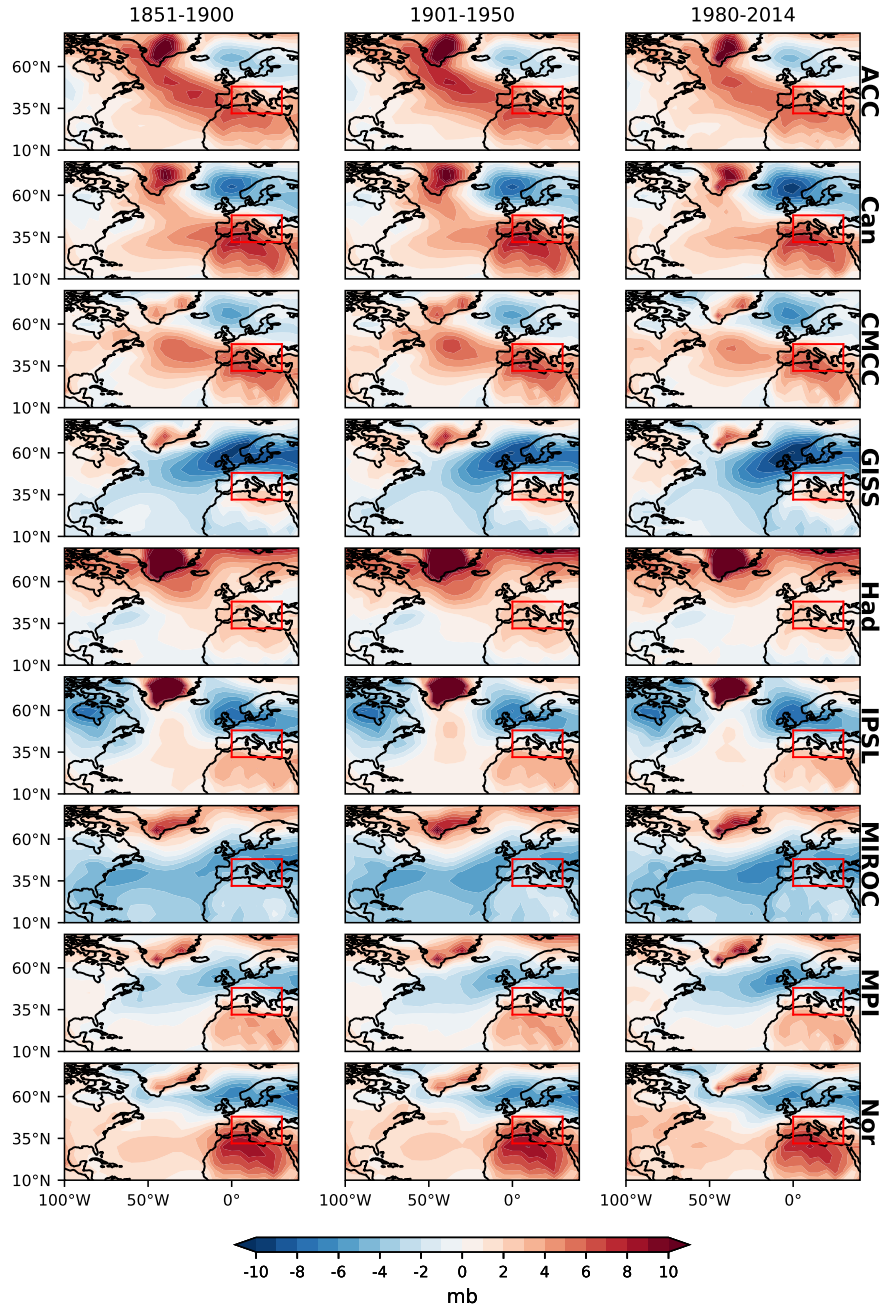


Figure S10. Mean DJF PSL biases for the model ensemble means (rows) for the historical experiment during three separate historical period (left to right panels). The bias is calculated after interpolating each model to HadSLP's 5 degrees resolution.