Supplementary information for the article "Distribution-based pooling for combination and multi-model bias correction of climate simulations"

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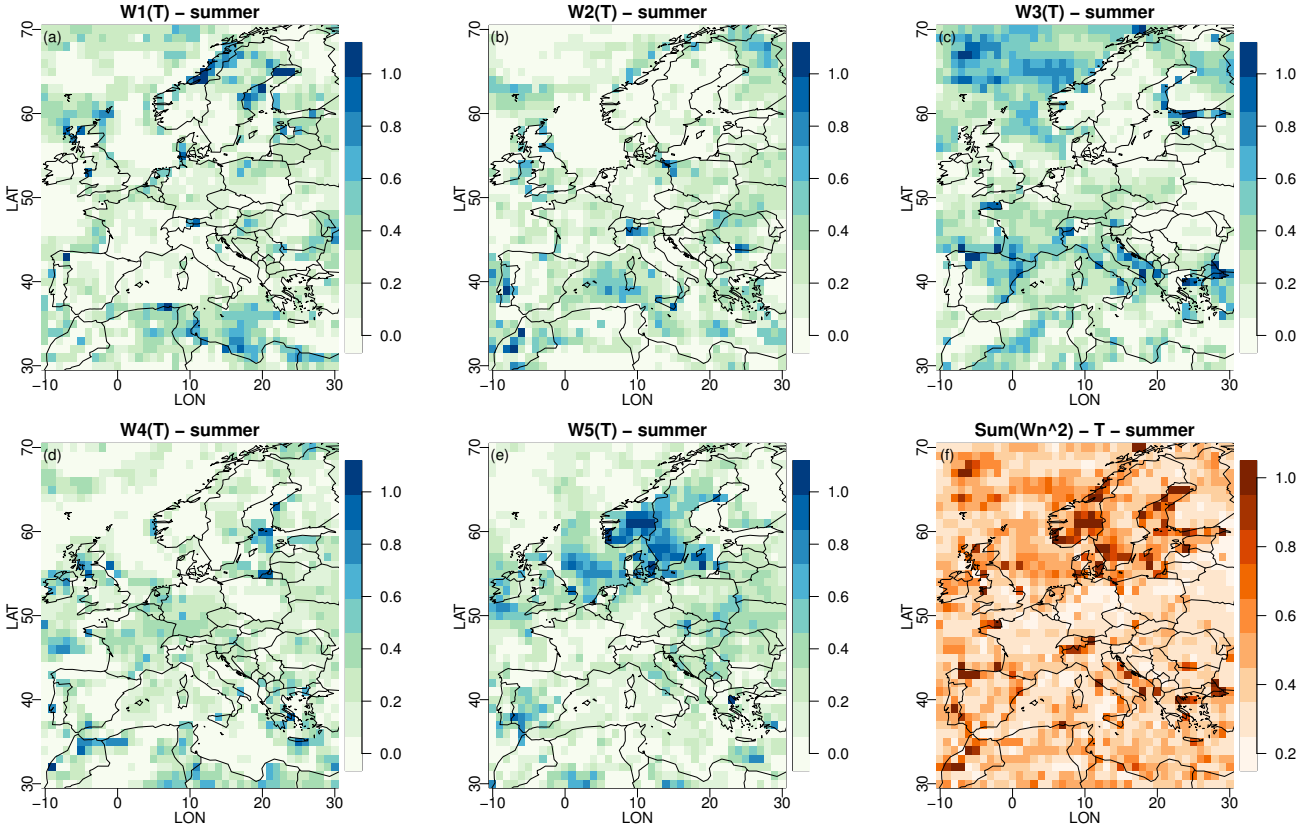

Figure S1. Maps of the weights parameters from α-pooling for summer obtained with the ERA5 experiment for temperature over summer. Panel (f) displays the sum of the squares of the 5 normalized weights.

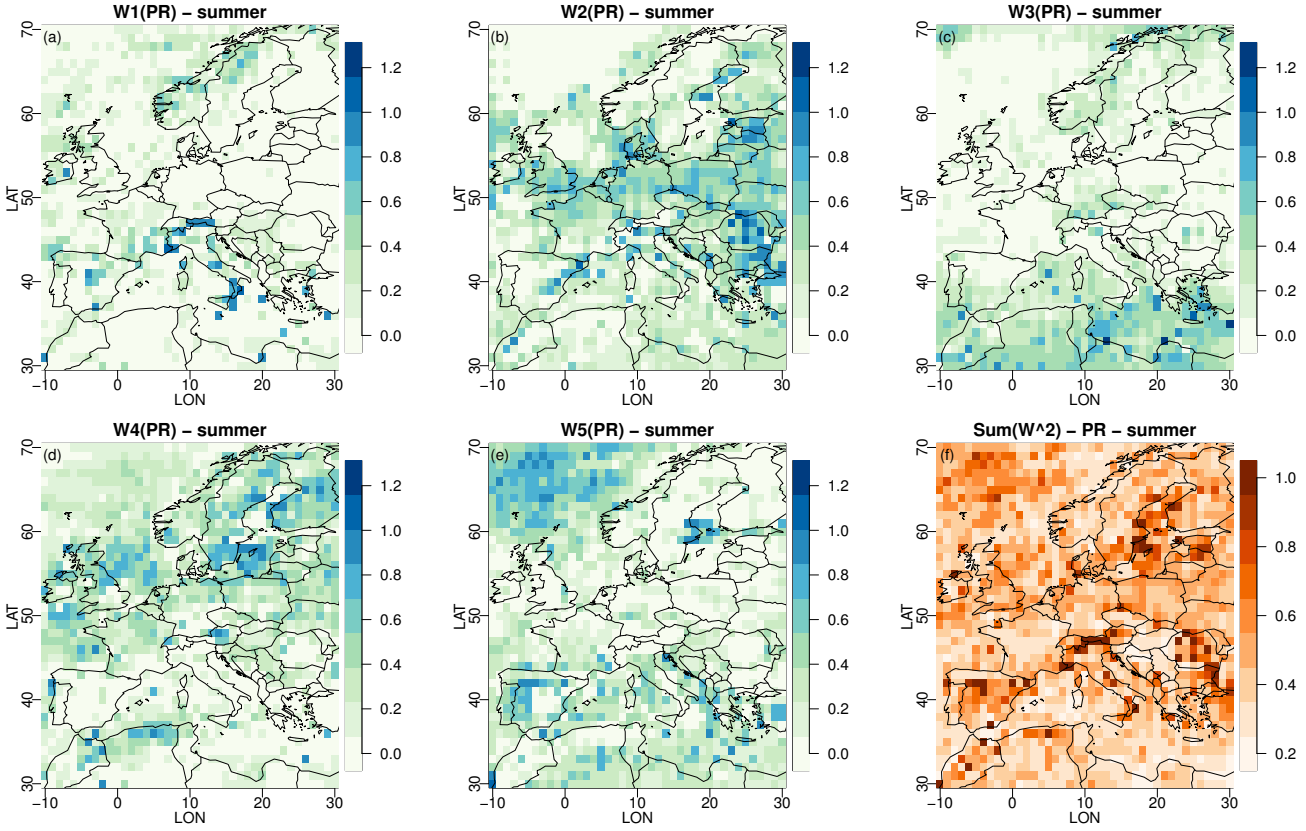

Figure S2. Same as Fig. S1 but for precipitation.

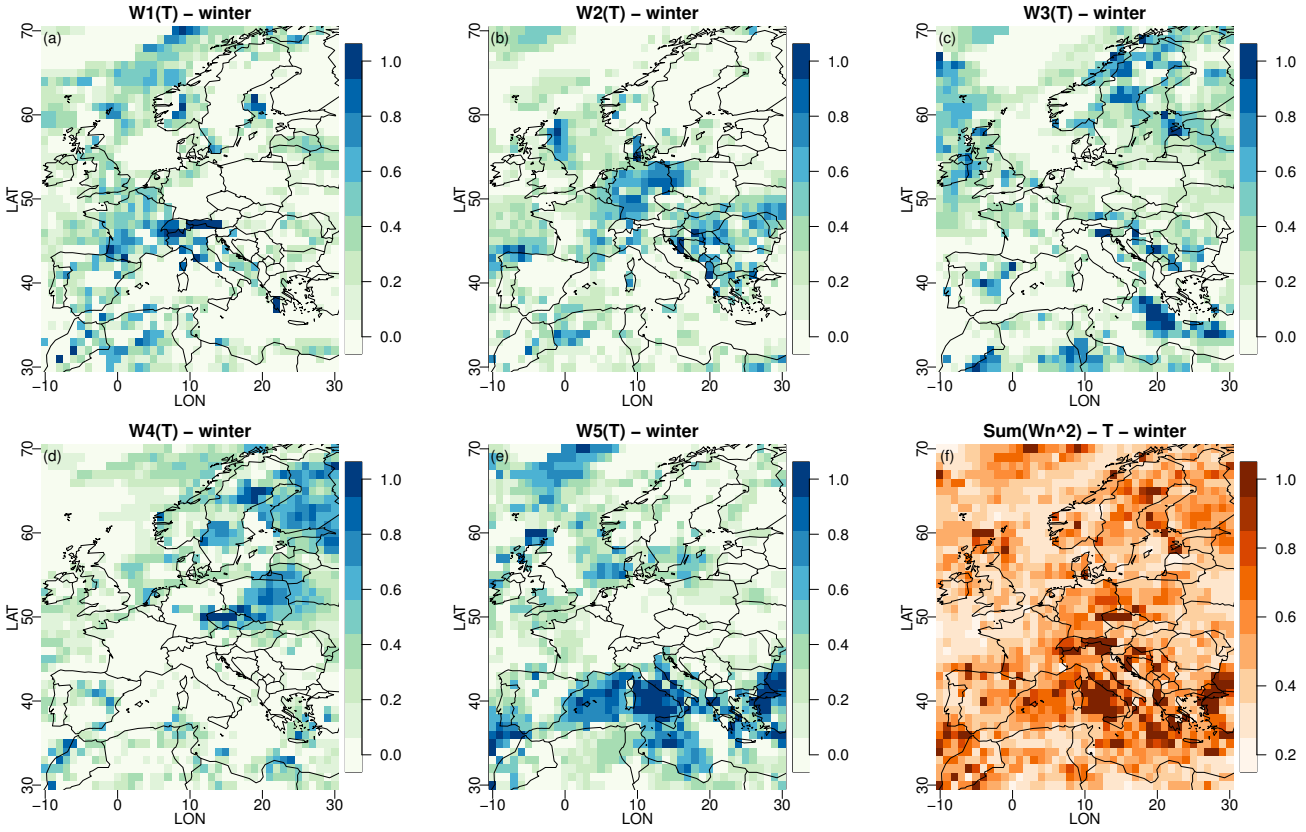

Figure S3. Maps of the weights parameters from linear pooling for winter obtained with the ERA5 experiment for temperature. Panel (f) displays the sum of the squares of the 5 weights.

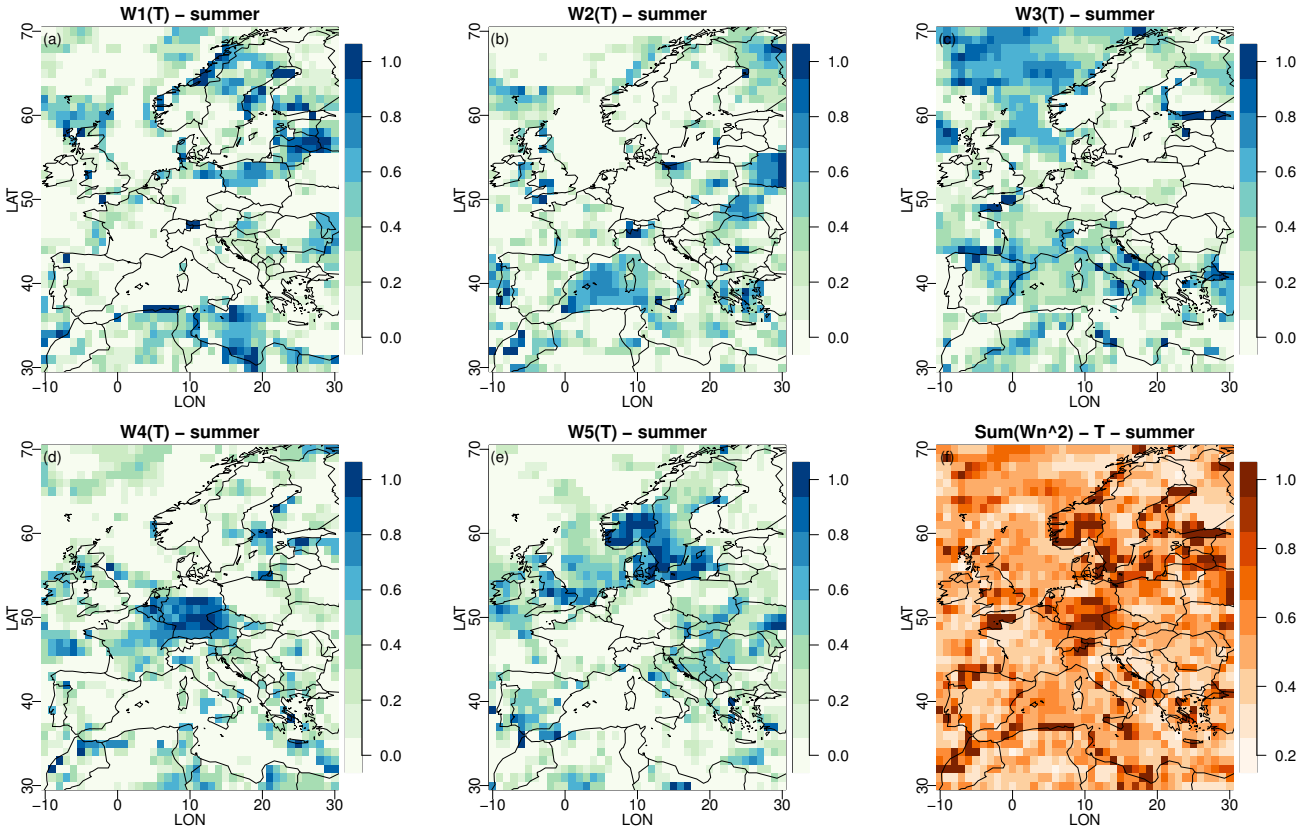

Figure S4. Same as figure S3 but for summer.

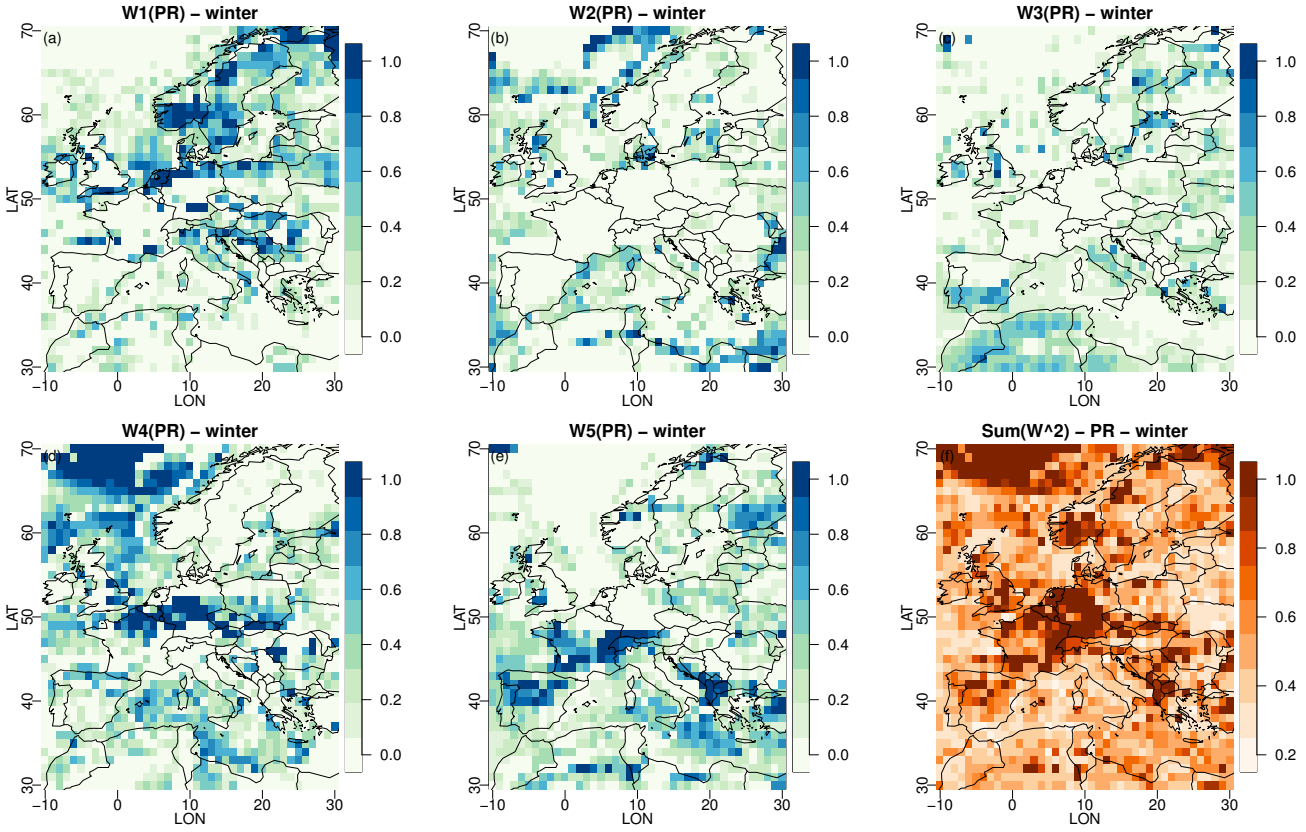

Figure S5. Maps of the weights parameters from linear pooling for winter obtained with the ERA5 experiment for precipitation. Panel (f) displays the sum of the squares of the 5 weights.

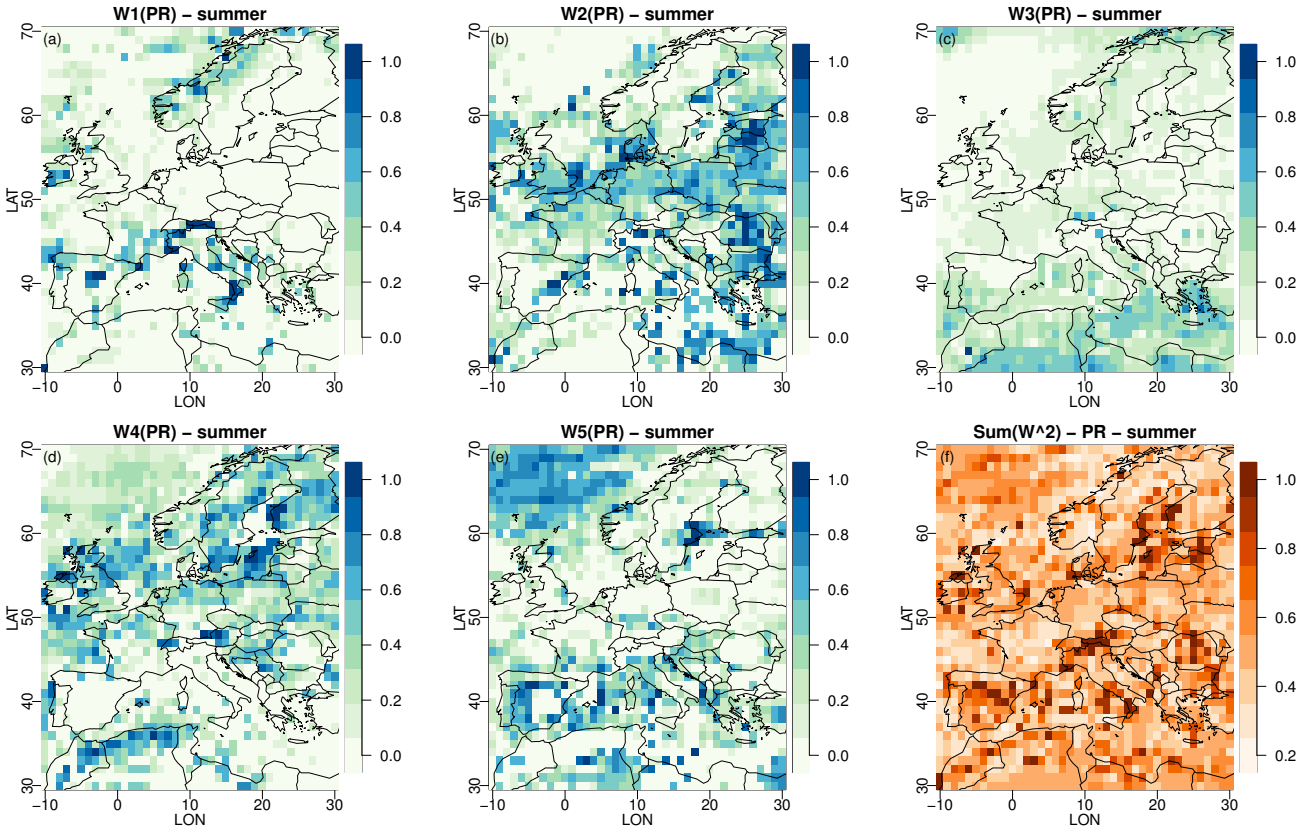

Figure S6. Same as figure S5 but for summer.

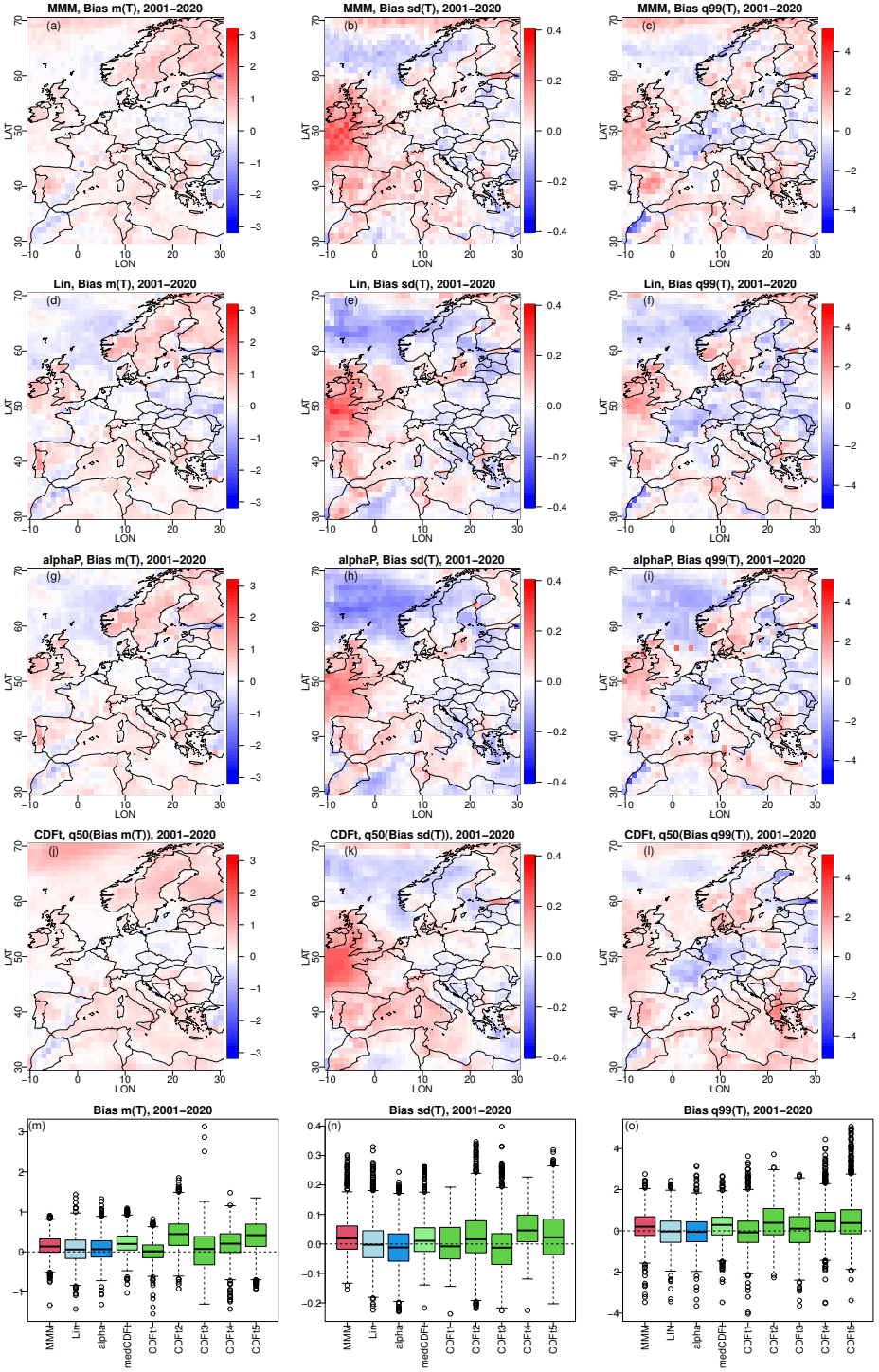

Figure S7. Biases in mean, standard deviation and 99% quantile for summer temperature from MMM, α-pooling , CDFt and linear-pooling under the 2001-2020 (projection) time period of the ERA5 experiment.

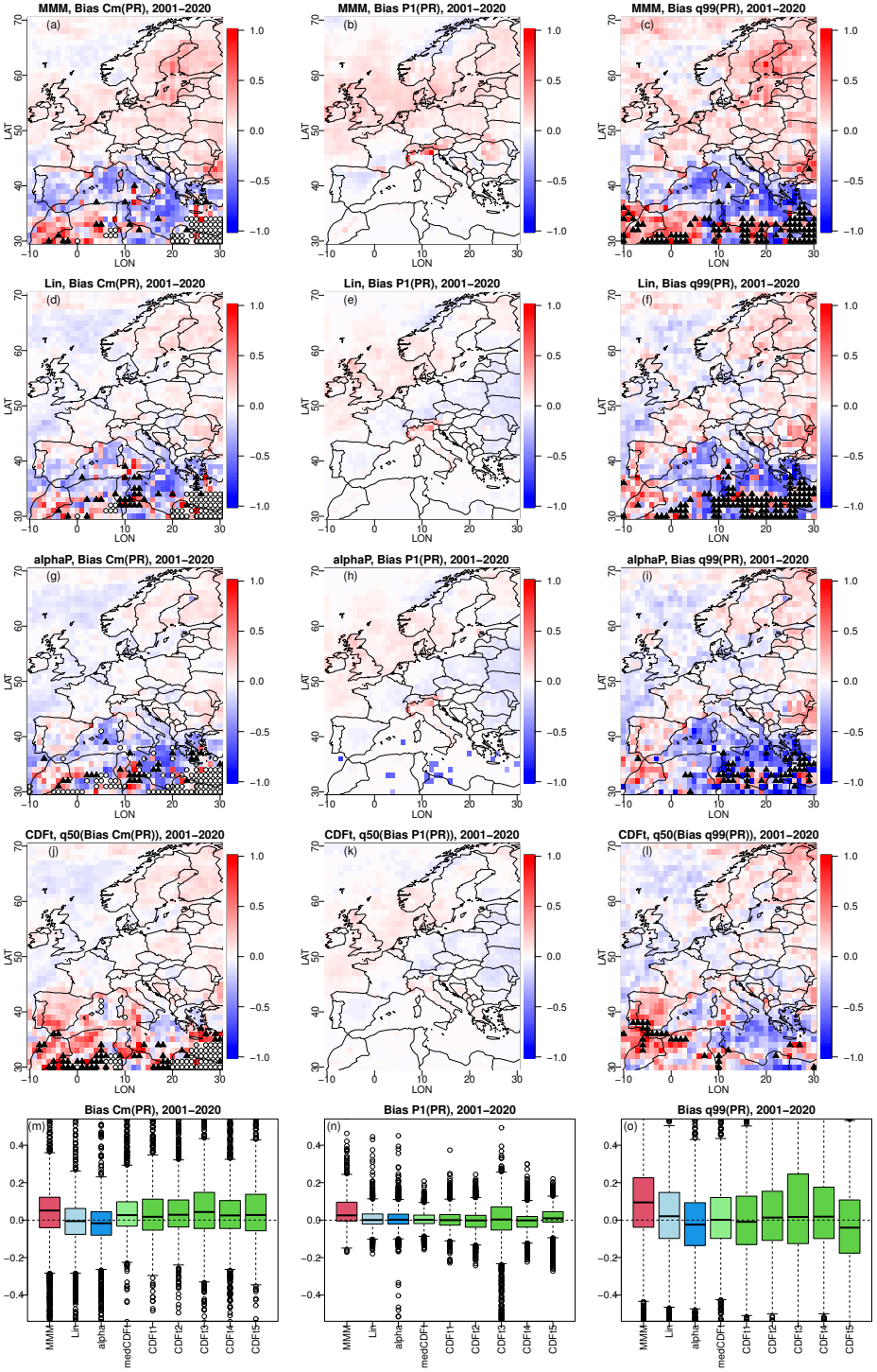

Figure S8. Same as Fig. S7 but for summer precipitation.

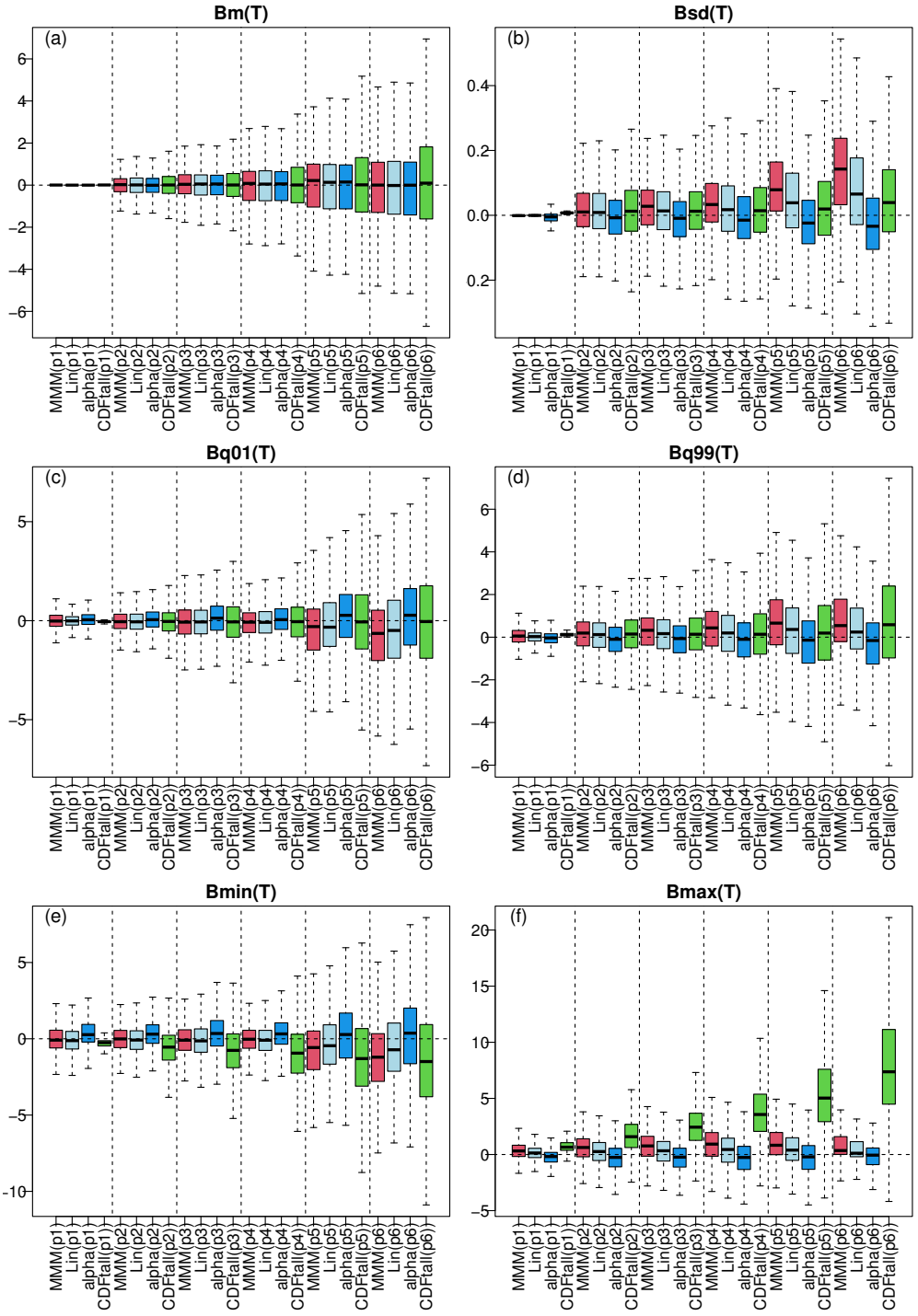

Figure S9. Boxplots of biases in summer temperature from the three methods (red=MMM, light blue=linear pooling, blue=α-pooling , green=CDFt) for the six 20-year time periods (from p1=1981-2000=calibration to p6=2081-2100). The different panels display biases in (a) mean temperature, (b) standard deviation, (c) 1% quantile, (d) 99% quantile, (e) minimum and (f) maximum temperature.

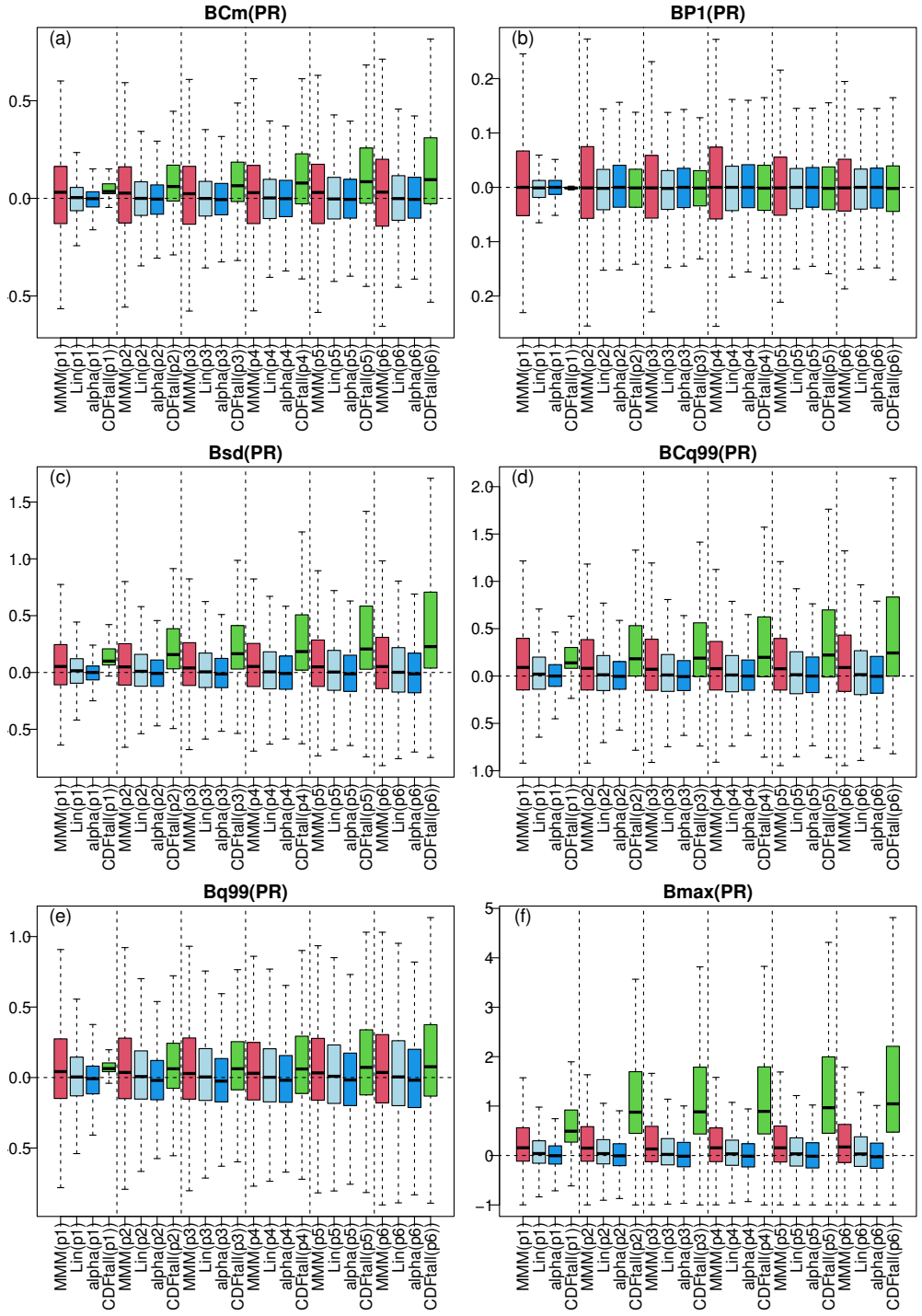

Figure S10. Same as Fig. S9 but for precipitation The different panels display biases in (a) conditional mean precipitation given wet, (b) probability of dry ($<$ 1mm) day, (c) standard deviation, (d) conditional 99% quantile given wet, (e) unconditional 99% quantile, and (f) maximum precipitation.

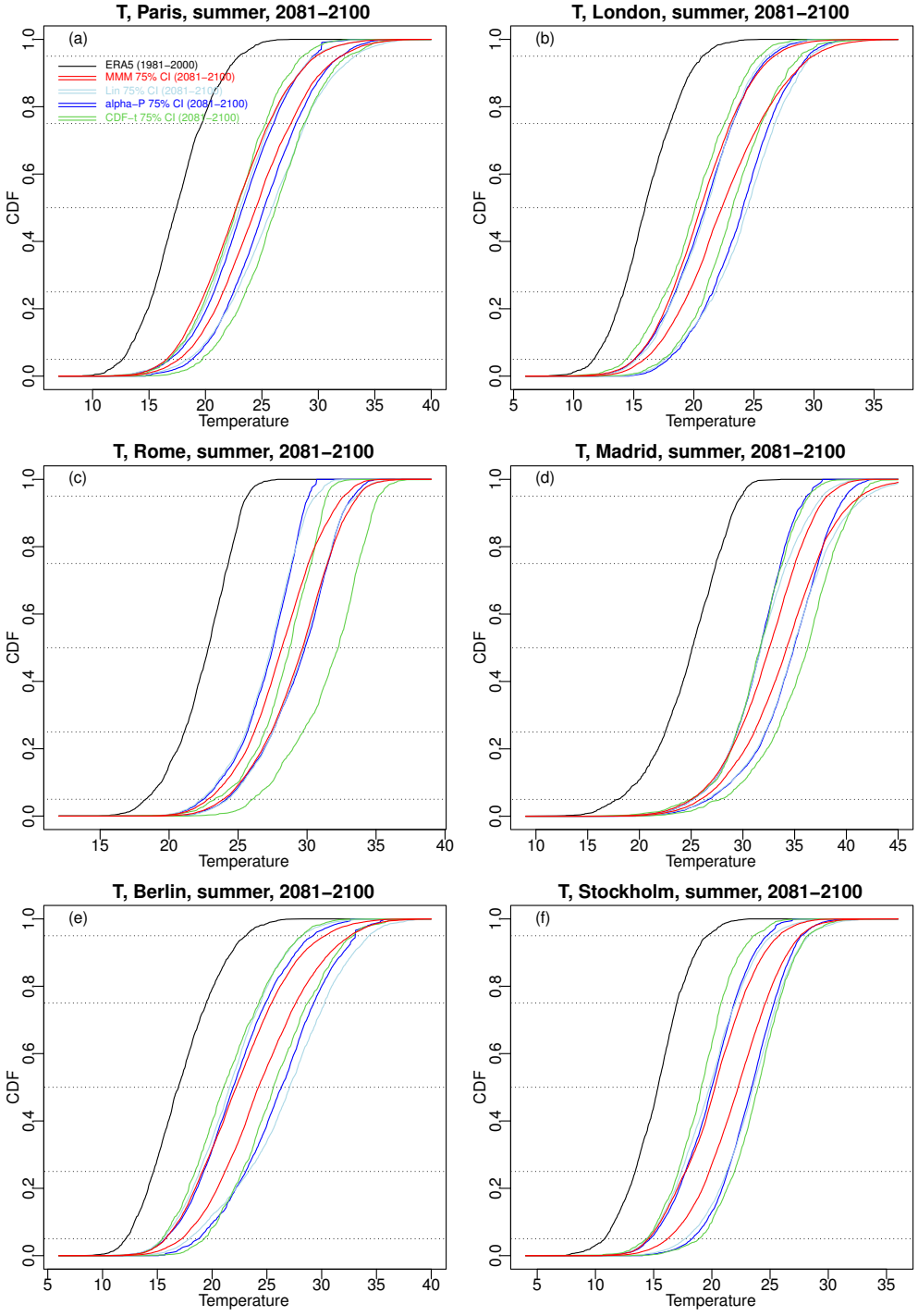

Figure S11. For summer temperature over 2081-2100 and 6 major cities in western Europe, 75% confidence intervals for MMM (red lines), linear pooling (light blue line), α-pooling (blue lines), and CDFt (green blue lines). The temperature ERA5 CDF (black line) over 1981-2000 is also displayed for visual evaluation of changes.

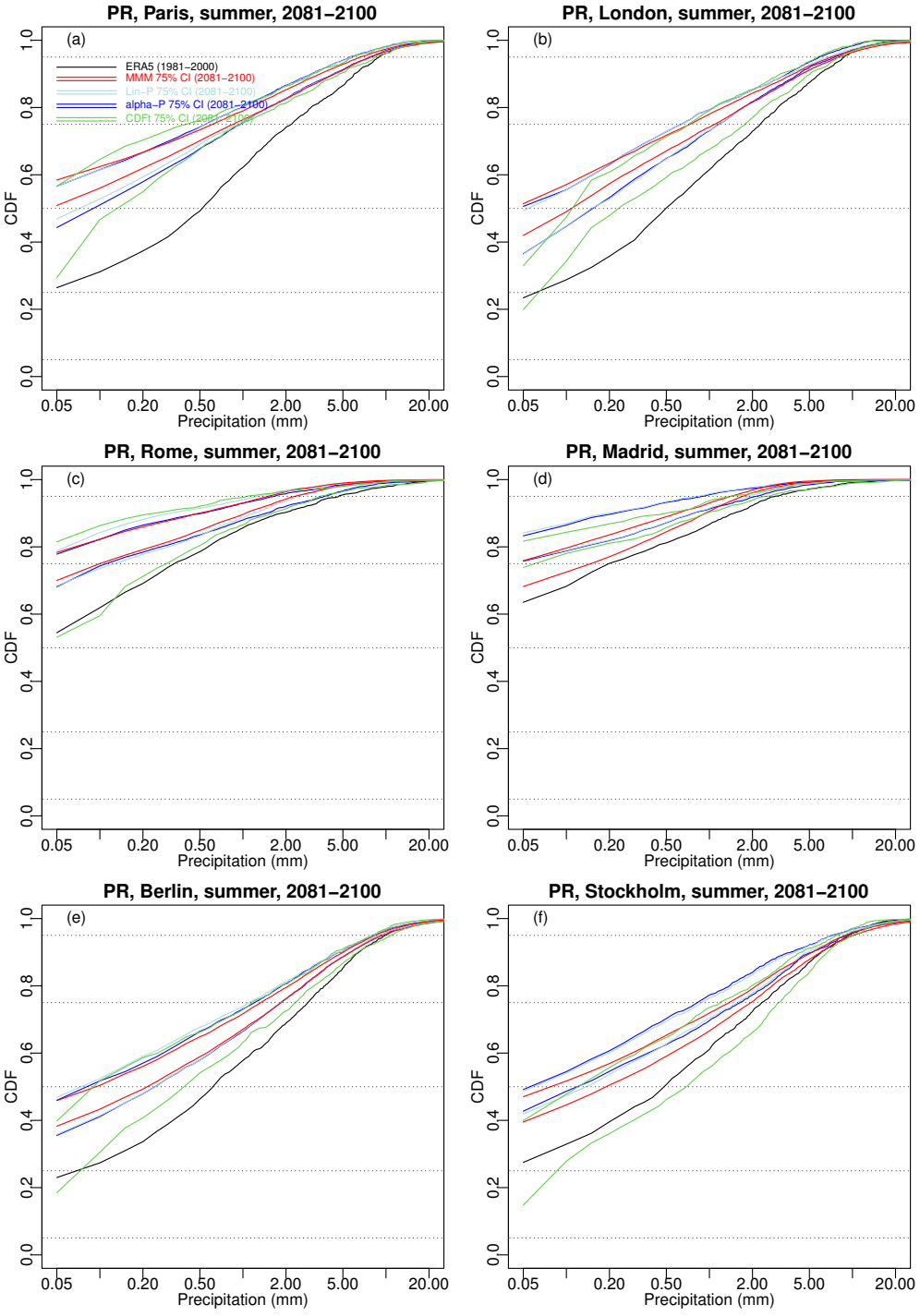

Figure S12. Same as Fig. S11 but for precipitation. Note that the x-axis is displayed in log-scale to ease evaluation.

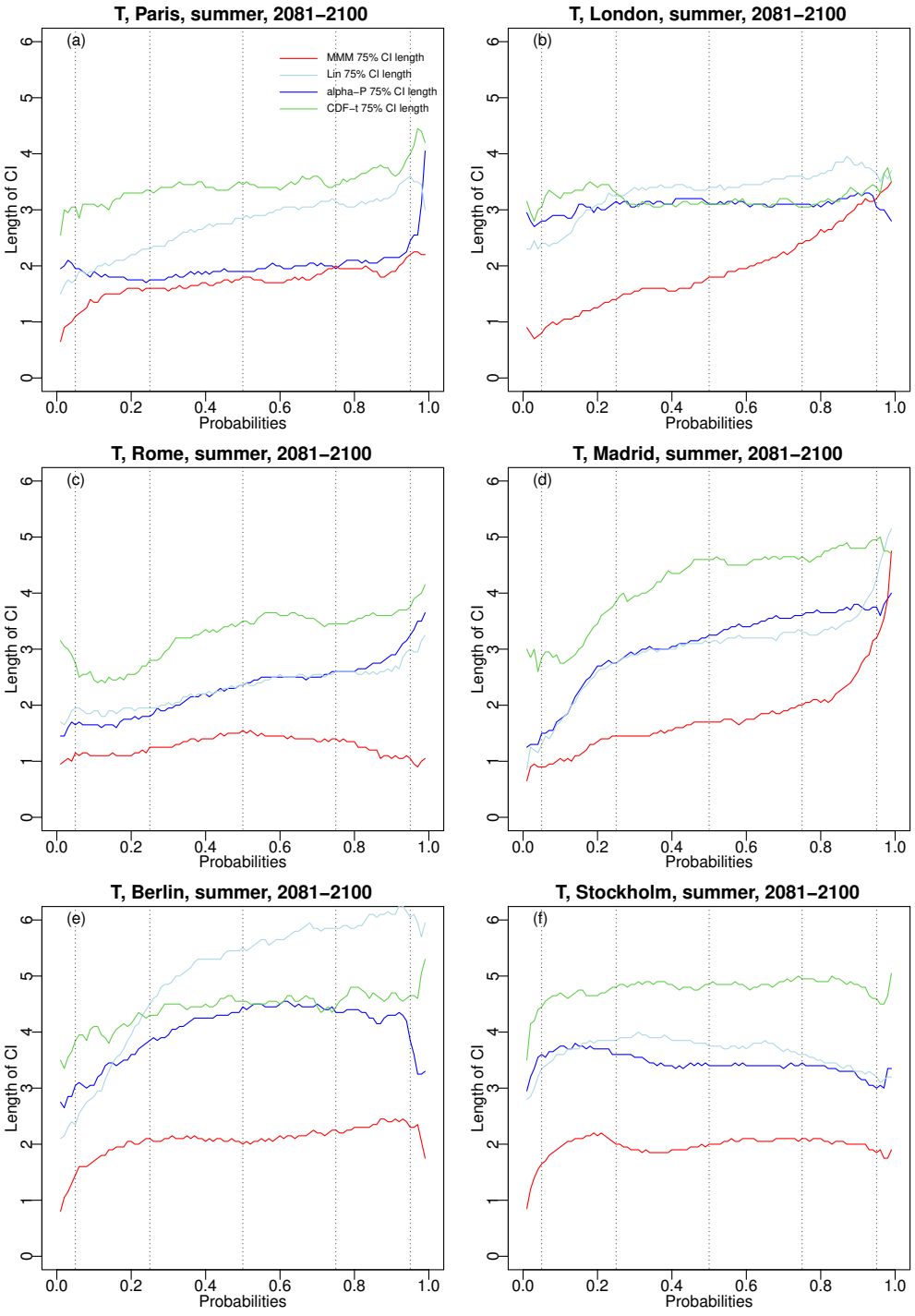

Figure S13. For summer temperature over 2081-2100 and 6 major cities in western Europe, length of the 75% CDF confidence intervals for MMM (red line), linear pooling (light blue line), α-pooling (red line), and CDFt (green line).

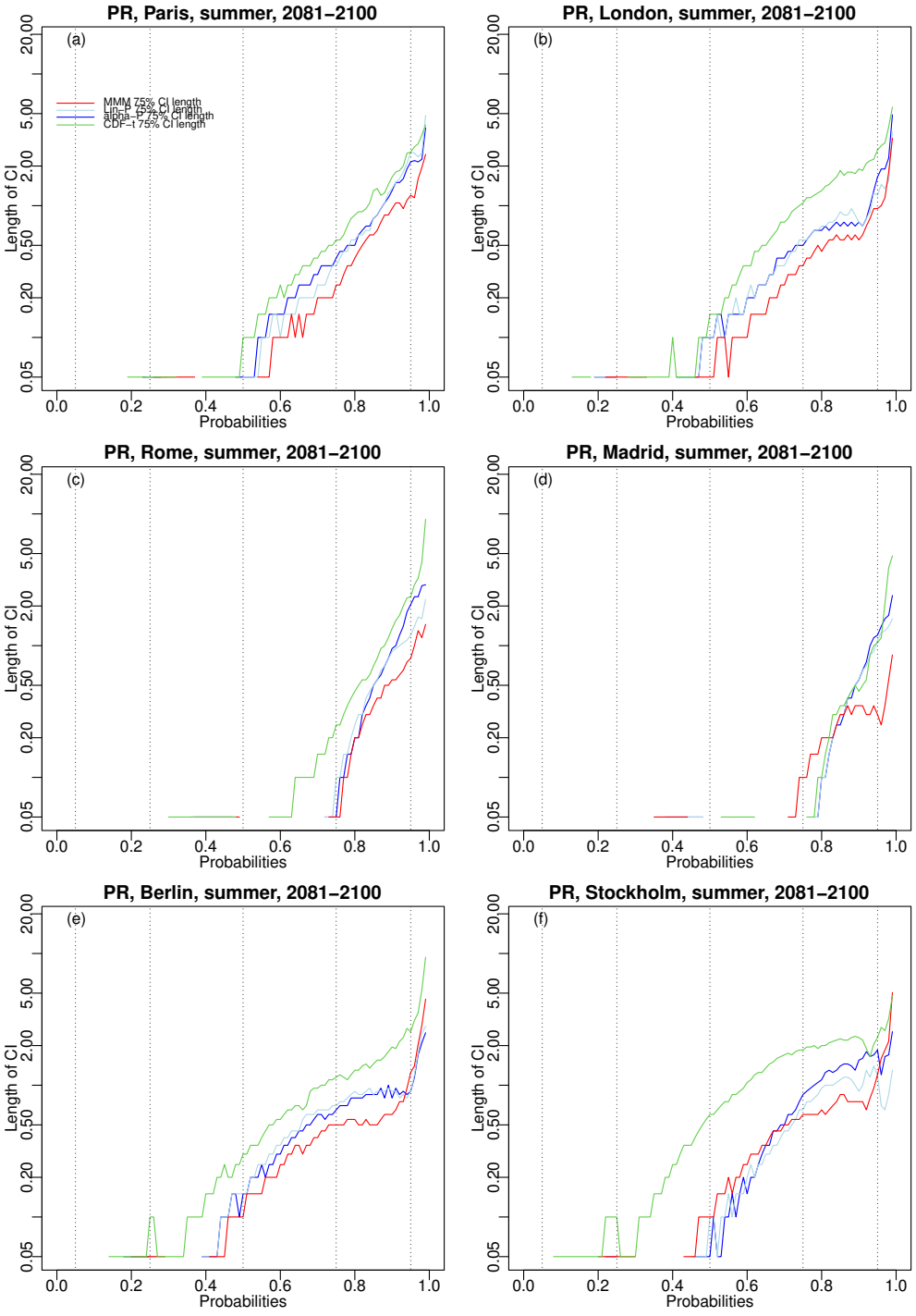

Figure S14. Same as Fig. S13 but for precipitation. Note that the y-axis is displayed in log-scale to ease evaluation.