

6 Supplementary Material

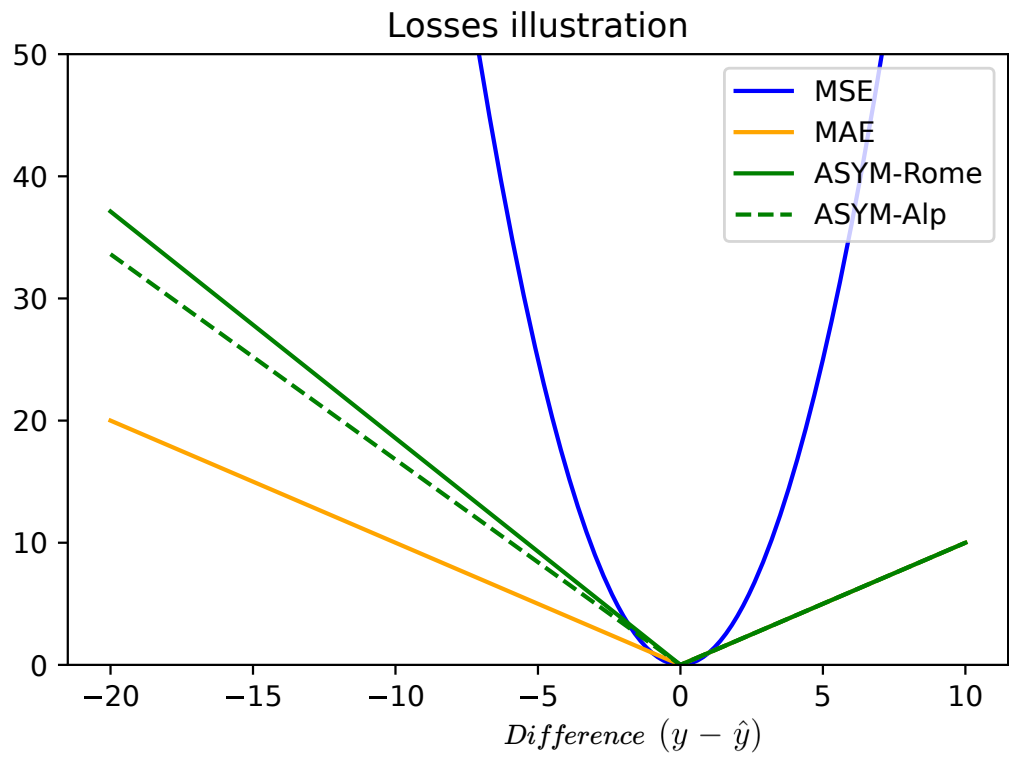


Fig. SM.F1. Illustration of the three loss functions according to the error $(y - \hat{y})$. For the ASYM loss, as it depends on the true prediction and the location, we illustrate it with $y = 20mm/day$ and 2 locations: Roma and the Alps point already mentioned (Fig 2).

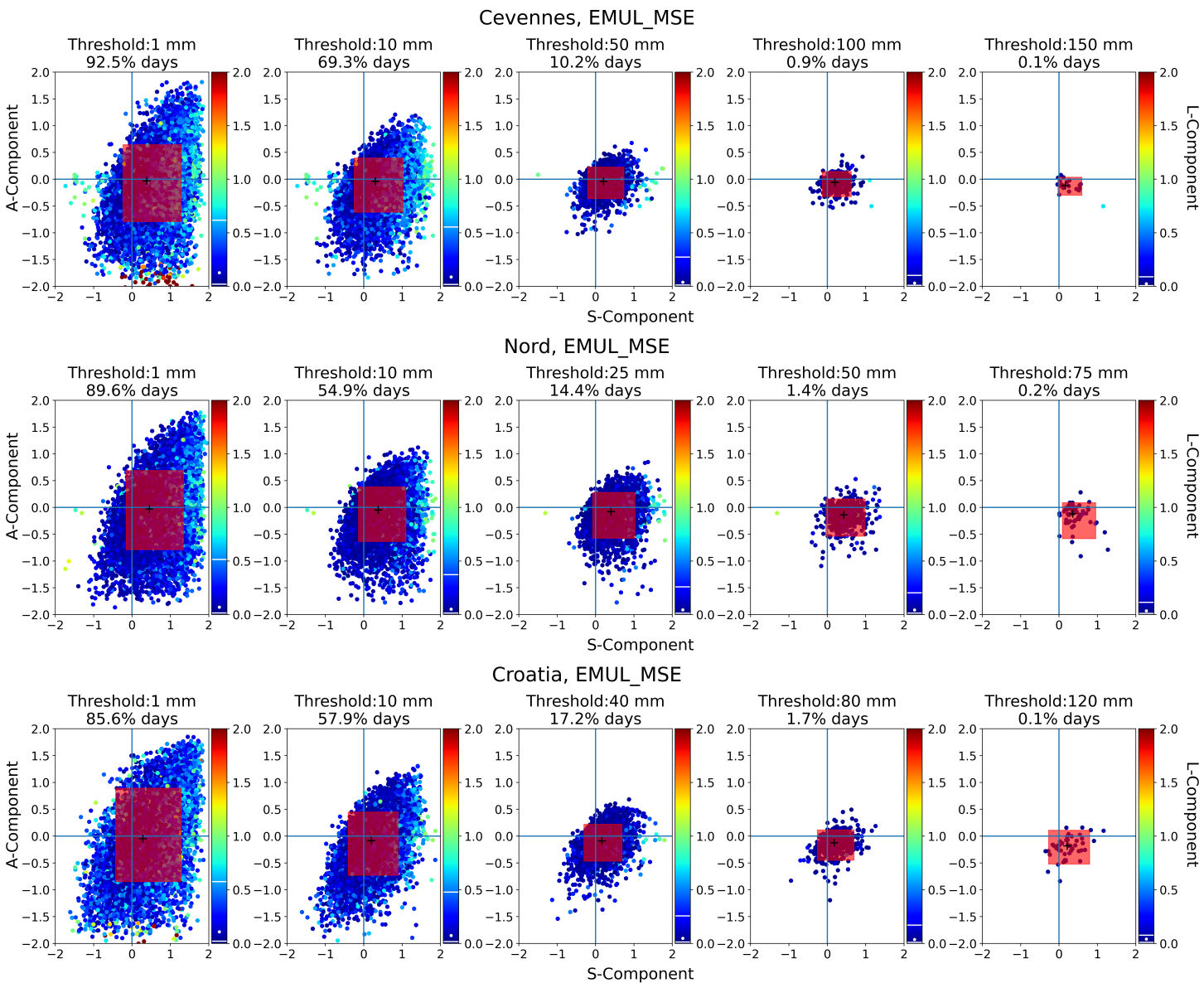


Fig. SM.F2. SAL diagram for MSE emulator for the three regions: Cevennes (up), North of the domain centred around Belgium (middle), and a region over Croatia and the North of the Adriatic sea. From left to right, the panel show the SAL results for days with maximum events intensities above an increasing threshold. Each point on the diagram represents a day with the Amplitude threshold. The red box includes 90% of the points, and the black cross indicates the A and S median. The 5th, 50th and 95th quantiles are given in white on the colormap for the Location component.

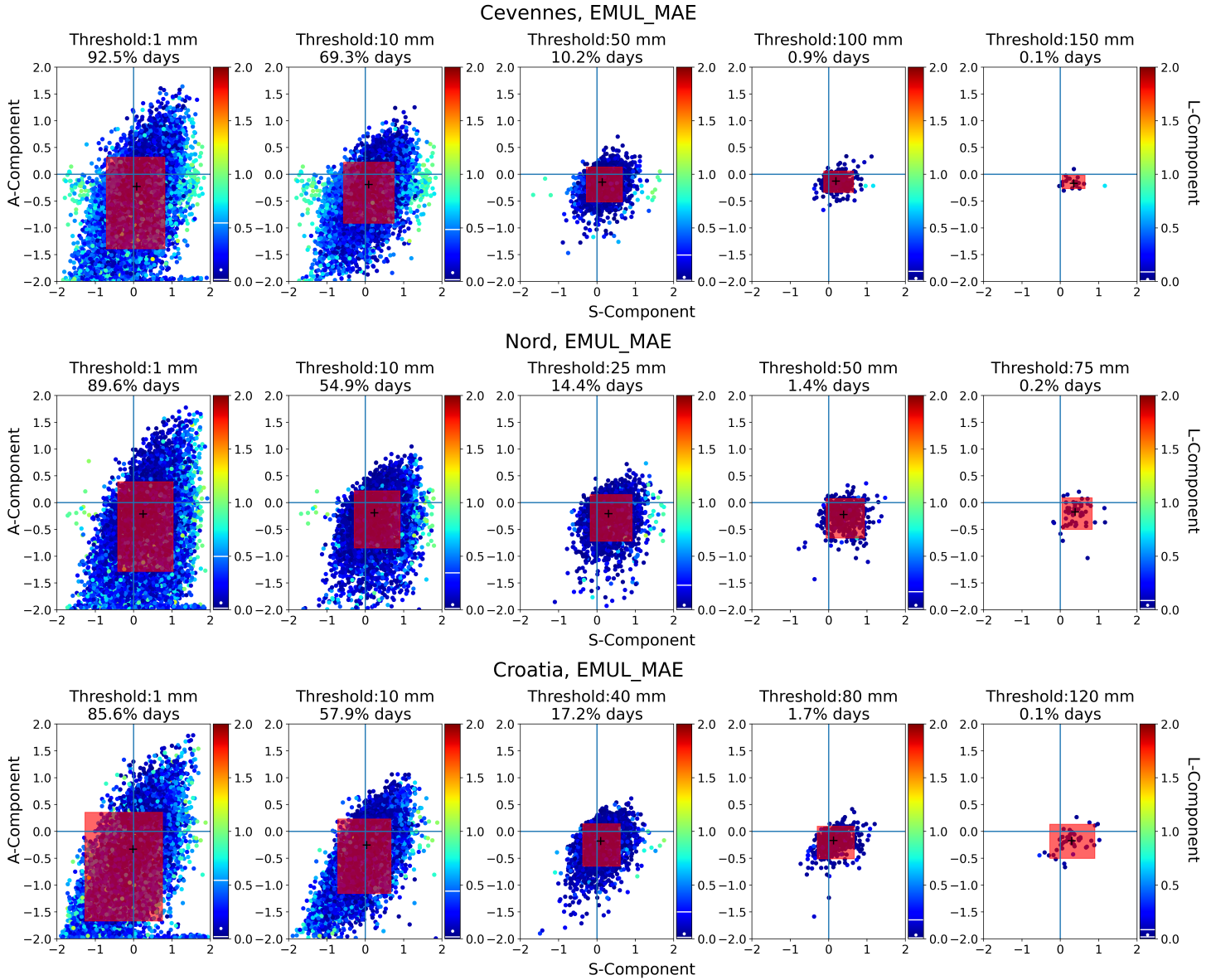


Fig. SM.F3. SAL diagram for MAE emulator for the three regions: Cevennes (up), North of the domain centred around Belgium (middle), and a region over Croatia and the North of the Adriatic sea. From left to right, the panel show the SAL results for days with maximum events intensities above an increasing threshold. Each point on the diagram represents a day with the Amplitude component on the y-axis, the Structure on the x-axis and the color give the Location score. The red box includes 90% of the points, and the black cross indicates the A and S median. The 5th, 50th and 95th quantiles are given in white on the colormap for the Location component.

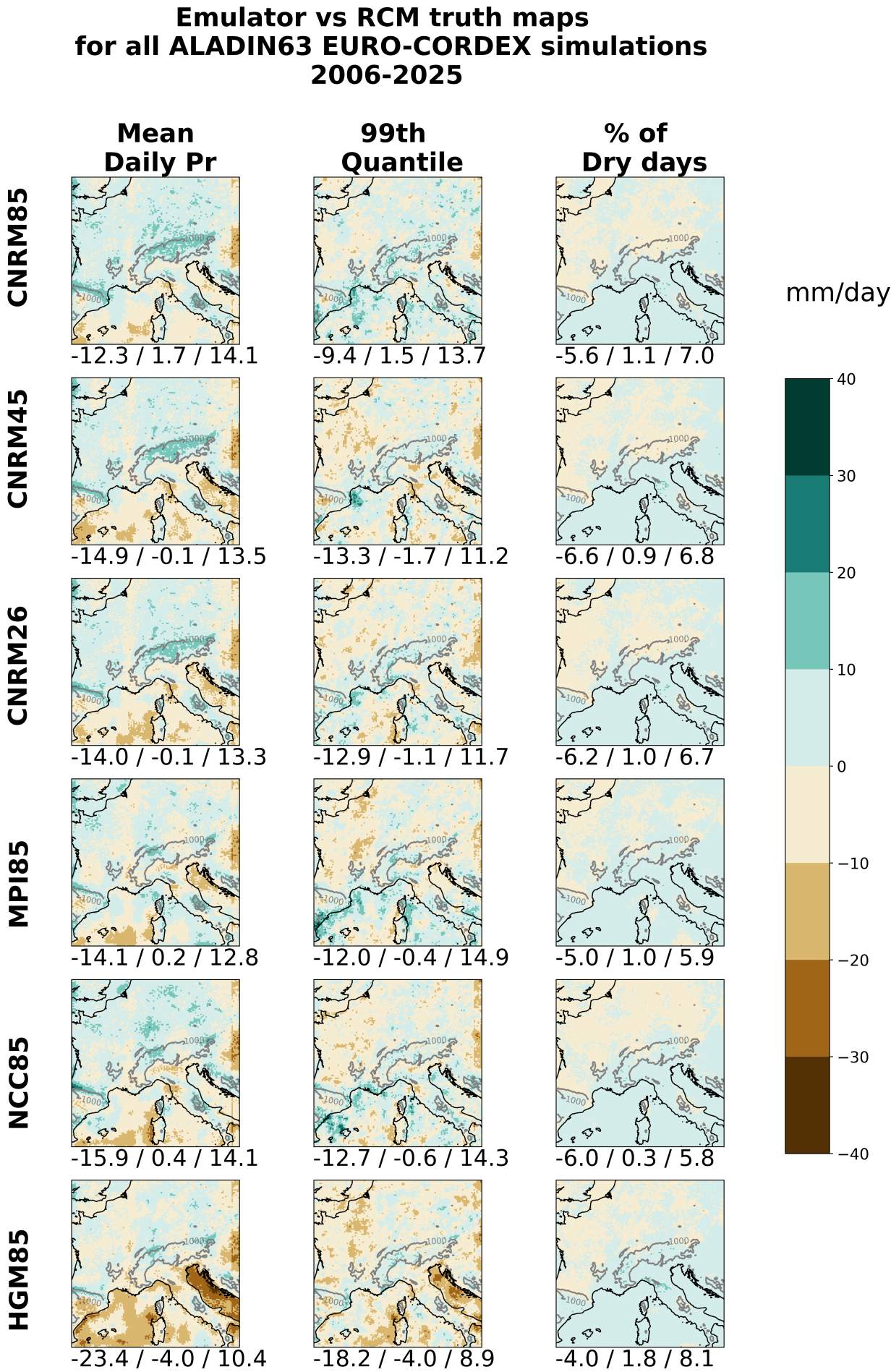
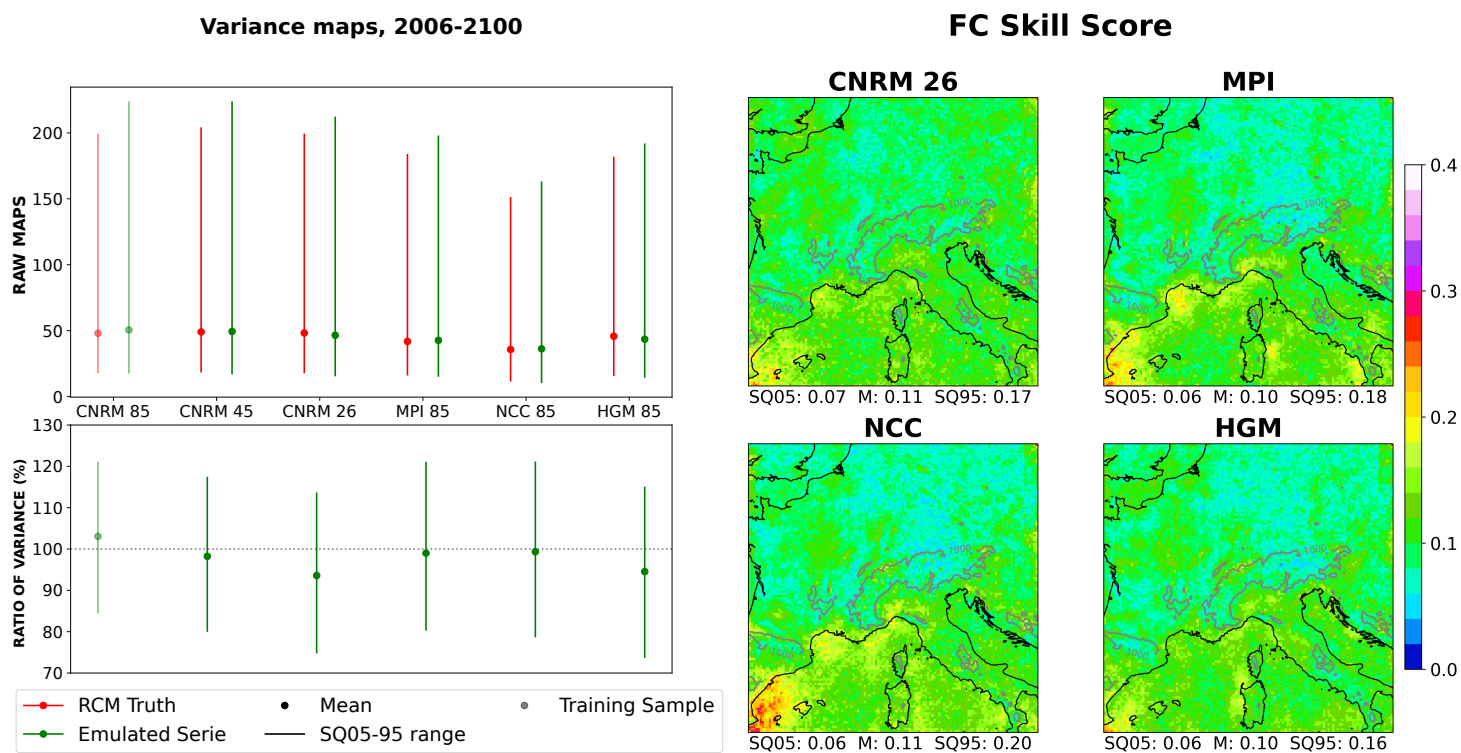


Fig. SM.F4. Biases in perfect model evaluation over the 6 ALADIN63 EURO-CORDEX simulations for the daily mean, the 99th quantile and the percentage of dry days.



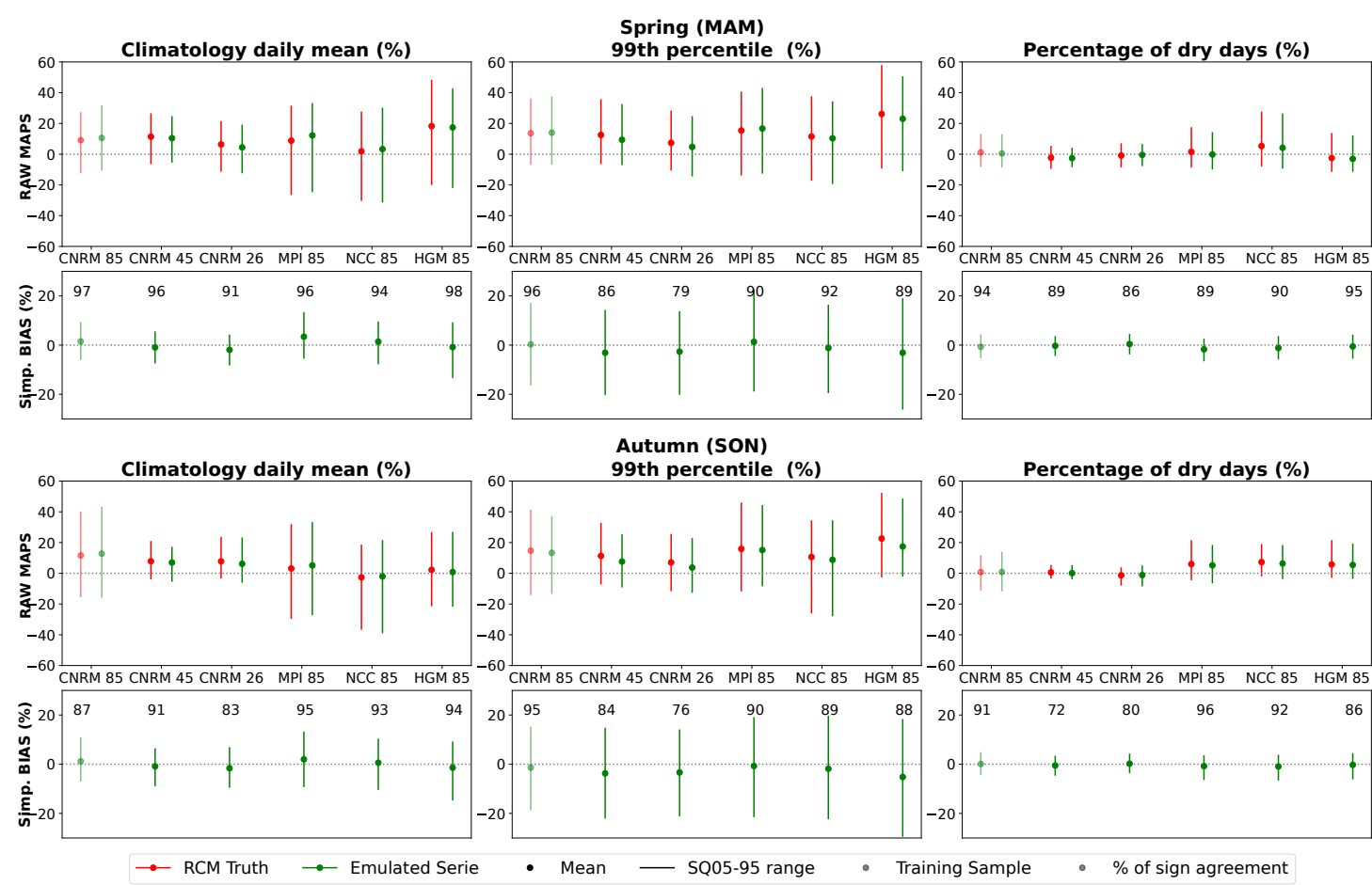


Fig. SM.F6. Same as Fig 12 for the winter and summer climate change (2070-2100 vs 1950-80) summary plots for the three statistics of interest: the daily precipitation mean, the 99th quantile and the percentage of dry days. The changes are the relative difference between the future period and the past one. The biases are simple bias between the emulator and RCM relative change maps. On each bias summary plot the number indicates the % of points where RCM and emulator agree on the sign.