Supplementary information to *Projected changes in the global precipitation area by CMIP6 models*

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1 Global precipitation area anomalies

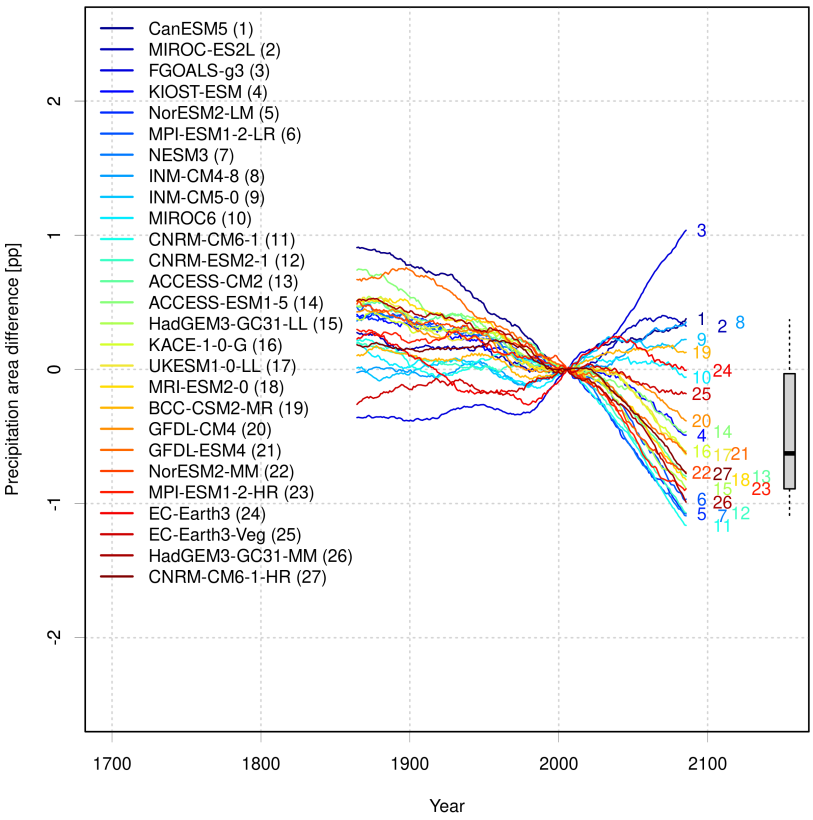

Fig. S1 Annual mean global precipitation area. The coloured lines show the mean global precipitation area anomalies from 27 CMIP6 models following SSP5-8.5 as 30-year running mean deviations from the reference period (1991–2020) for each model. The models have been sorted by increasing mean zonal resolution, where blue denotes the lowest and red the highest spatial resolution. The numbers to the right of the coloured lines refer to the single models where the ordinate indicates the precipitation area anomaly for the period 2071–2100. The box-plot on the right shows the inter-quartile (box) and 0.05–0.95 quantile range (dotted line) of the 2071-2100 anomlies.

2 All models

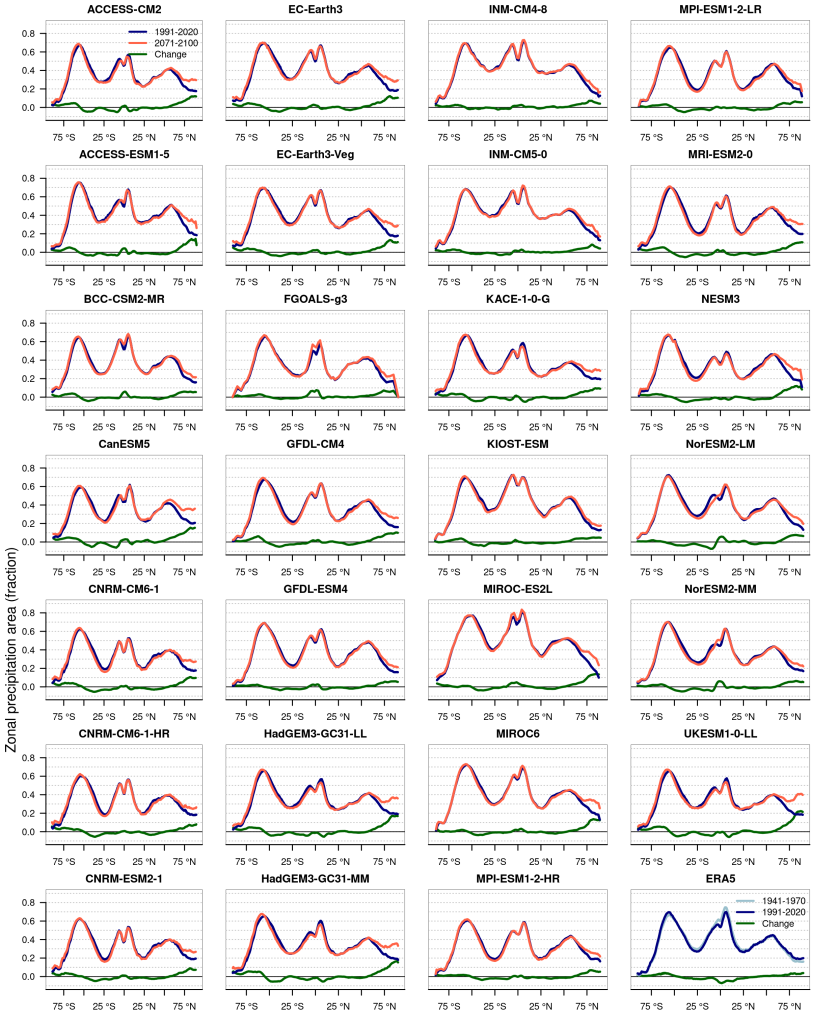

Fig. S2 Single model zonal precipitation fractions. Mean areal fraction of Earth's surface receiving more than 1 mm precipitation per day as a function of latitude for the single CMIP6 models and ERA5. Colours refer to different time periods (blue and red) and the changes from the earlier to the later period (green).

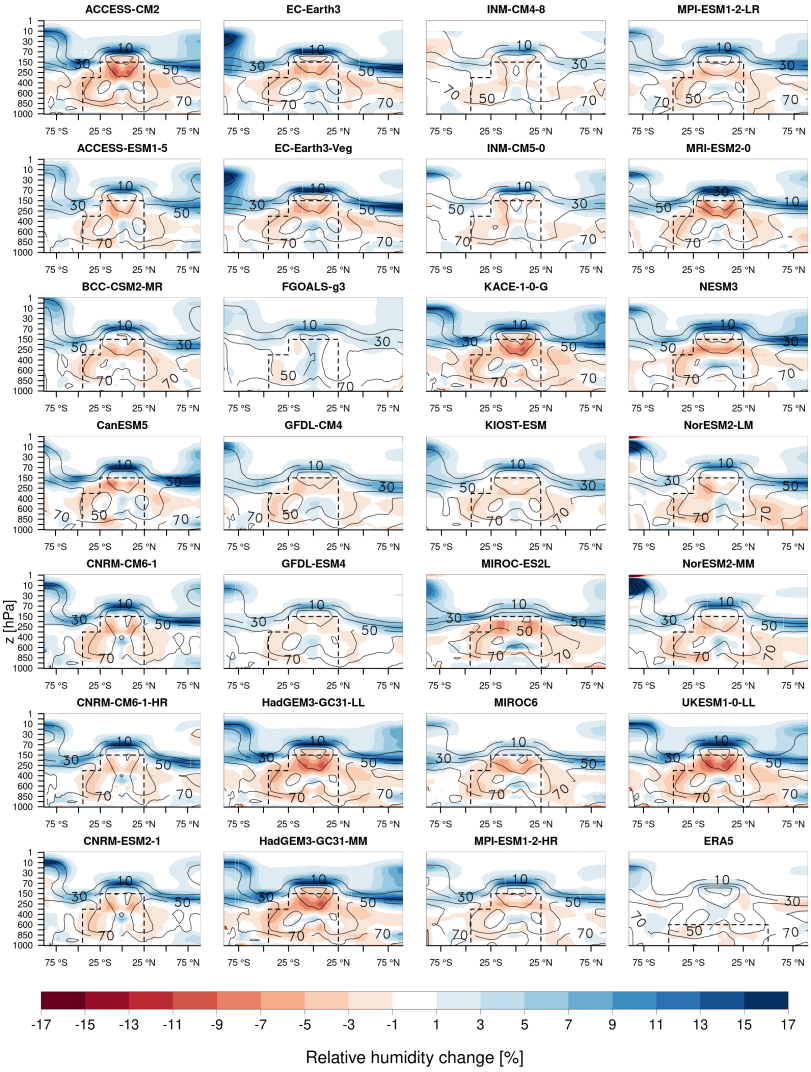

Fig. S3 Single model latitude-height profiles of relative humidity. Relative humidity for 1991–2020 (contours) and changes following the SSP5-8.5 scenario (colours) for the single CMIP6 models, and for 1941–1970 (contours) to 1991–2020 (colours) for ERA5. The dashed lines mark an area whose average is highly correlated to the MMM and ERA5 precipitation area, respectively.

3 Frequency, intensity and total precipitation maps

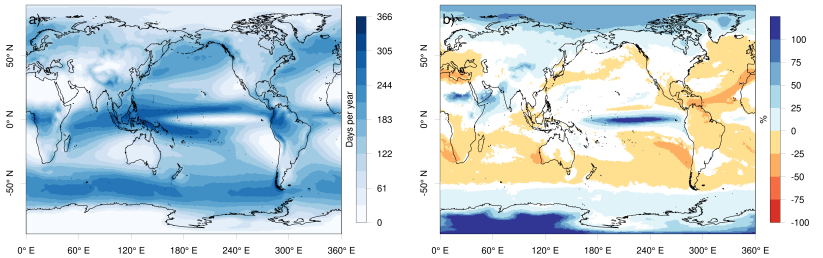

Fig. S4 Wet-day frequency. Annual number of wet-days in the reference period 1991-2020 (a) and relative changes for 2071-2100 following SSP5-8.5 (b). The changes are shown for the ensemble median and only where more than 75% of the models agree on the sign.

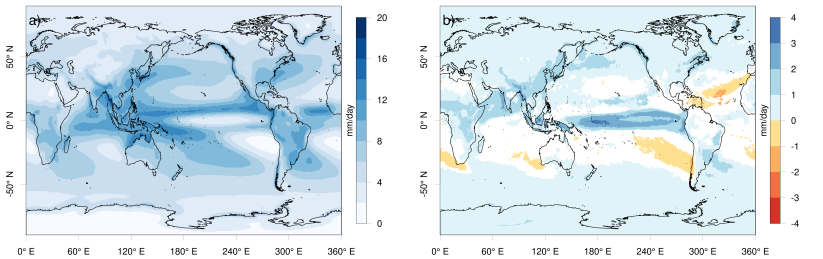

Fig. S5 Wet-day intensity. Daily precipitation intensities in the reference period 1991-2020 (a) and changes for 2071-2100 following SSP5-8.5 (b). The changes are shown for the ensemble median and only where more than 75% of the models agree on the sign.

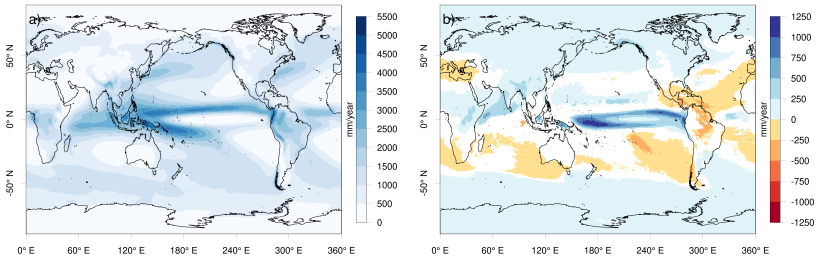

Fig. S6 Total precipitation sums. Annual precipitation sums in the reference period 1991-2020 (a) and changes for 2071-2100 following SSP5-8.5 (b). The changes are shown for the ensemble median and only where more than 75% of the models agree on the sign.

4 Precipitation area fraction: More models and scenarios

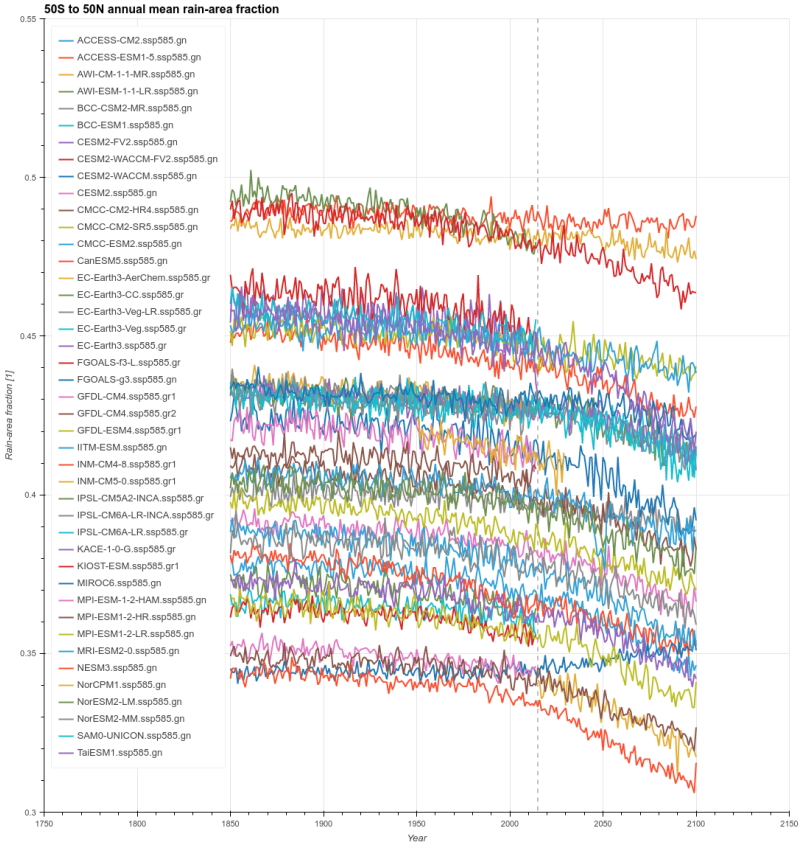

Fig. S7 Annual mean precipitation area between 50 °S **and** 50 °N **for SSP5-8.5.** The coloured lines show the annual mean precipitation area fraction between 50 °S and 50 °N calculated for an ensemble of SSP5-8.5 GCMs available on ESGF.

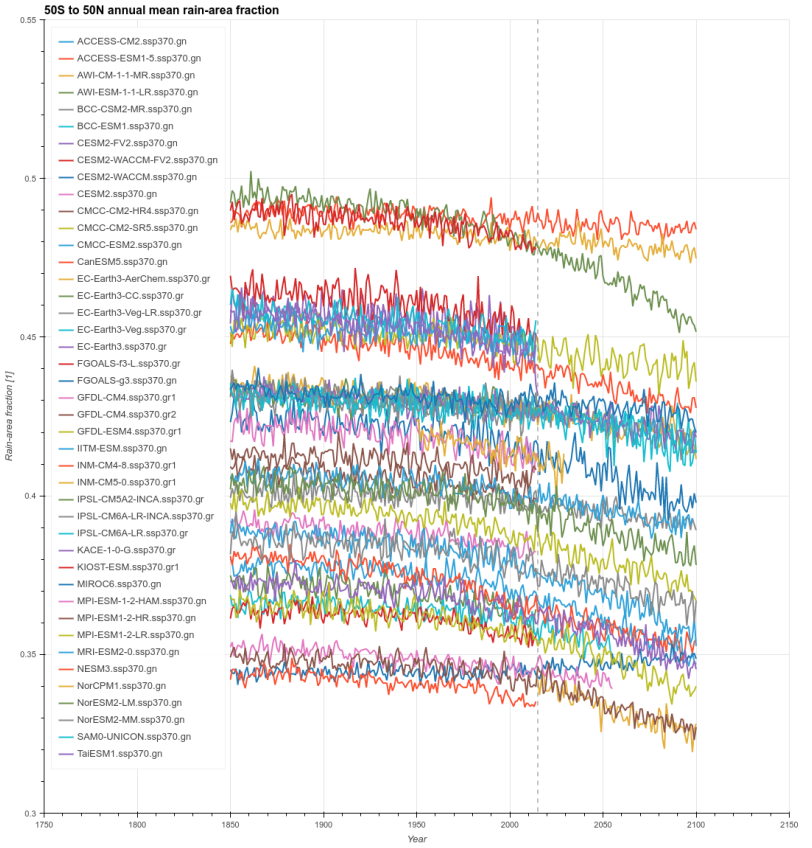

Fig. S8 Annual mean precipitation area between 50 °S **and** 50 °N **for SSP3-7.0.** The coloured lines show the annual mean precipitation area fraction between 50 °S and 50 °N calculated for an ensemble of SSP3-7.0 GCMs available on ESGF.

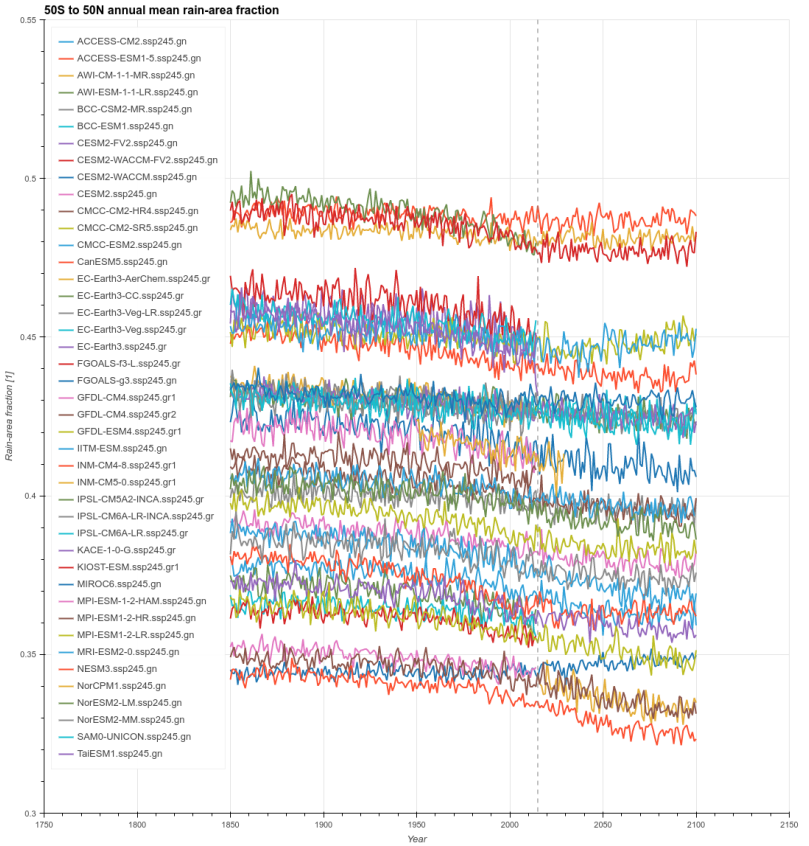

Fig. S9 Annual mean precipitation area between 50 °S **and** 50 °N **for SSP2-4.5.** The coloured lines show the annual mean precipitation area fraction between 50 °S and 50 °N calculated for an ensemble of SSP2-4.5 GCMs available on ESGF.

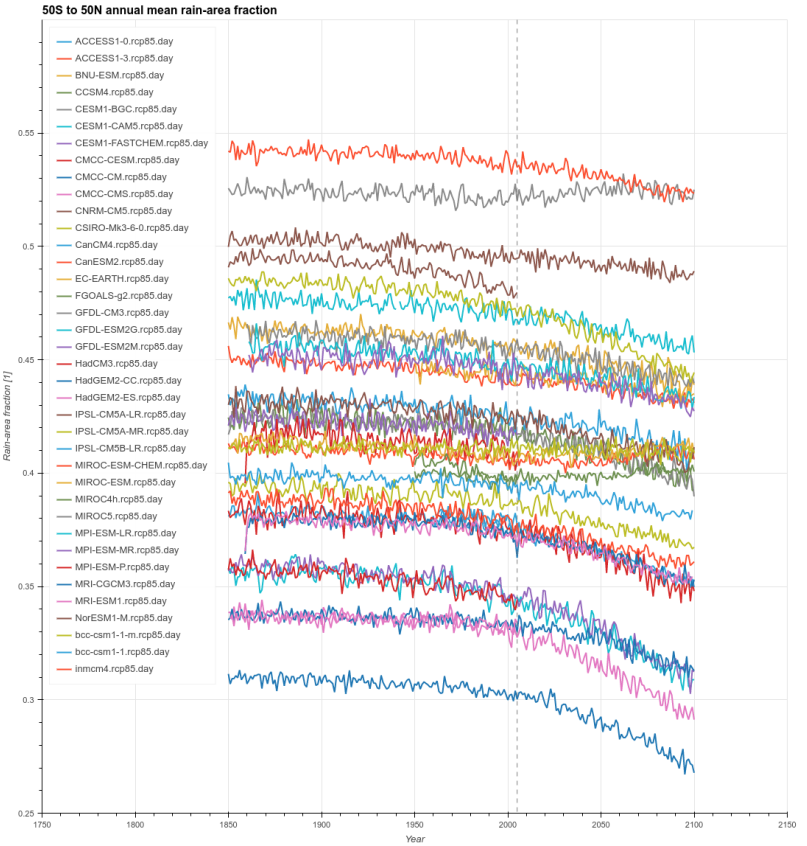

Fig. S10 Annual mean precipitation area between 50 °S **and** 50 °N **for RCP8.5.** The coloured lines show the annual mean precipitation area fraction between 50 °S and 50 °N calculated for an ensemble of RCP8.5 GCMs available on ESGF.

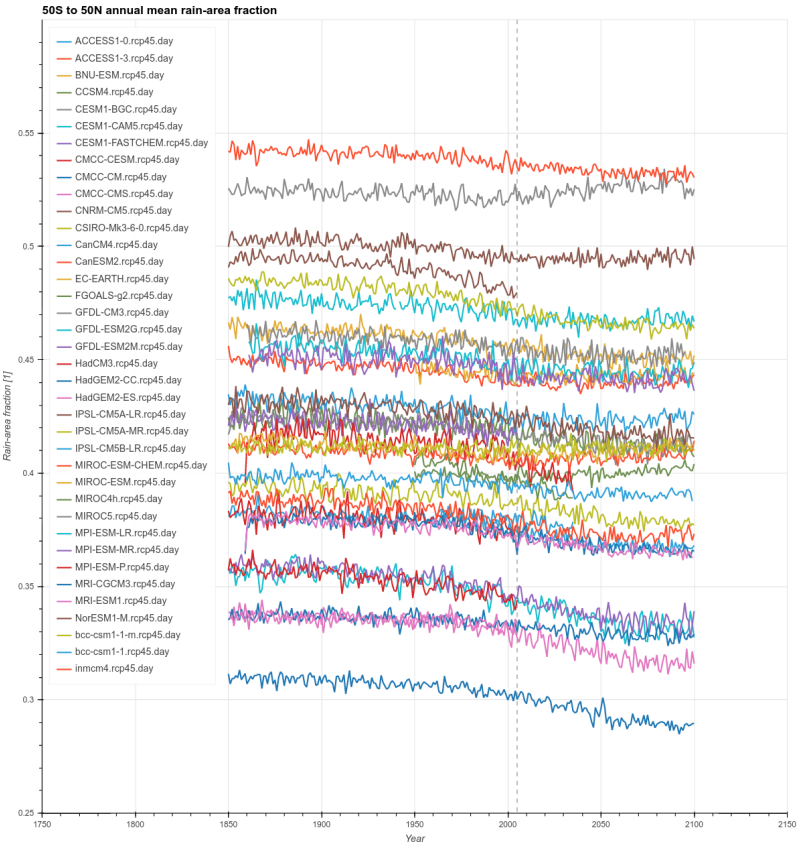

Fig. S11 Annual mean precipitation area between 50 °S **and** 50 °N **for RCP4.5.** The coloured lines show the annual mean precipitation area fraction between 50 °S and 50 °N calculated for an ensemble of RCP4.5 GCMs available on ESGF.