Supplementary Material for "Potential of global land water recycling to mitigate local temperature extremes"

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1 Supplementary Figures

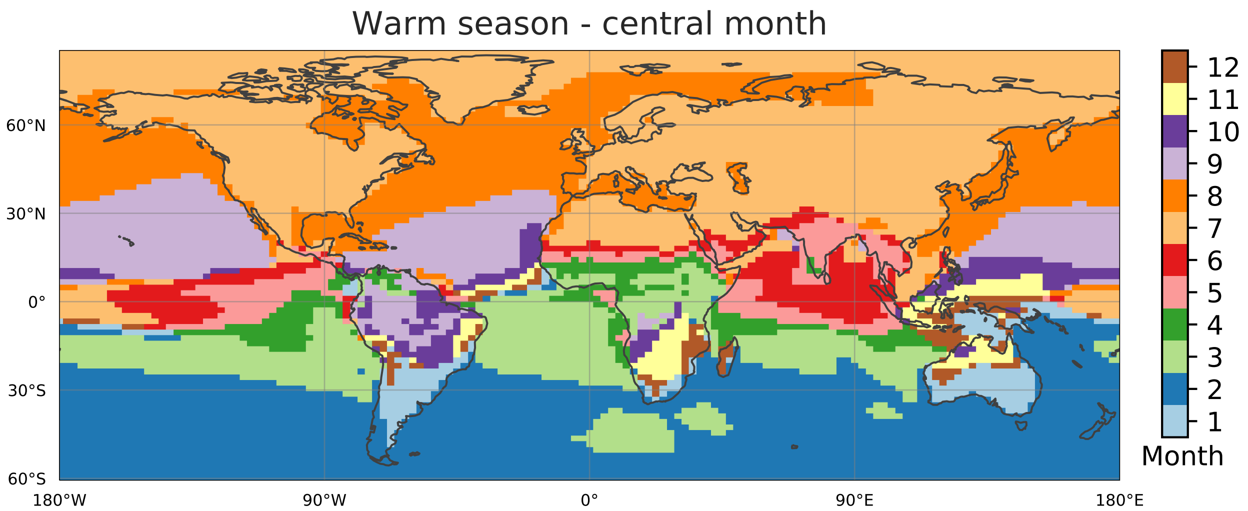

Figure S1: *Central month of the warm season (three hottest consecutive months) during 1971 to 2000 in REF. Derived from the ensemble mean. Used for Figures 2, 4, 5, 6, S3, S5, S6, and* **??**.

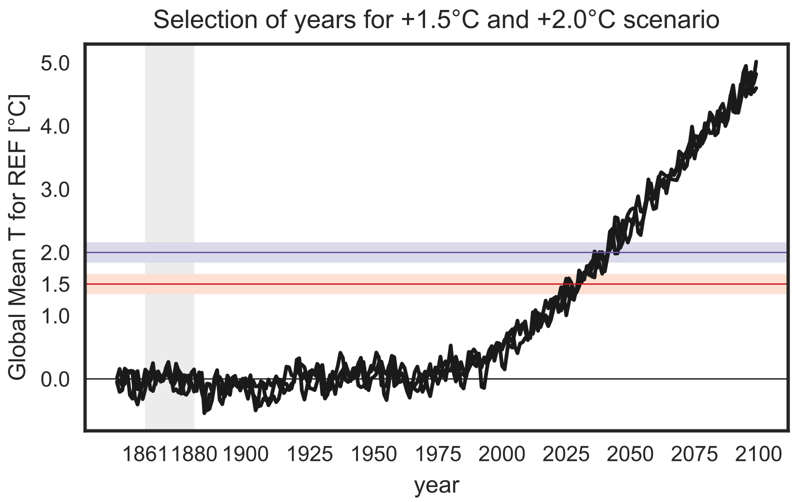

Figure S2: *Selection of years with global mean temperature anomalies of +1.5 °C (red) and +2.0 °C (mangenta). The temperature anomalies are calculated with respect to 1861 to 1880 (grey shading). All years that are within ±0.15 °C are selected (light red and magenta shading). From the three enseble members in REF this yields 19 model years for the +1.5 °C case and 18 model years for the +2.0 °C case.*

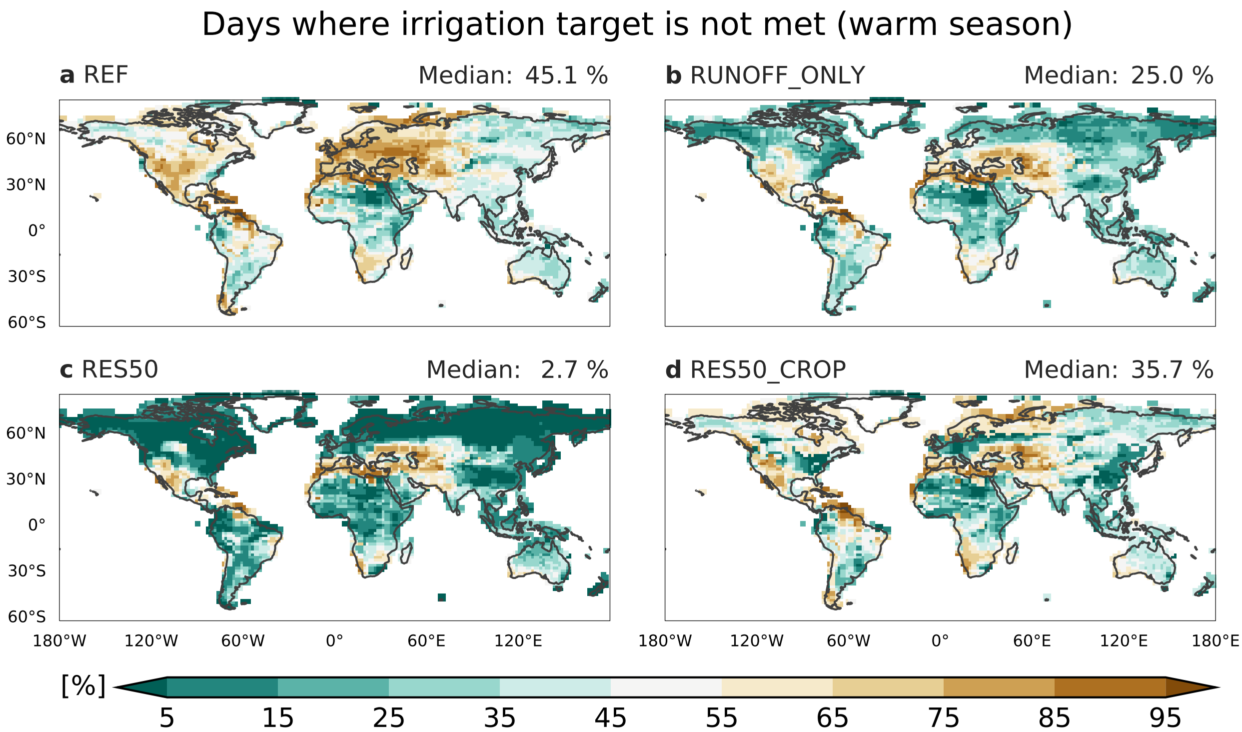

Figure S3: *Percentage of days when the SM conditions are below SMclim during the warm season. Depending on the grid point there are between 89 and 92 days in the warm season. The indicated value corresponds to the spatial median.*

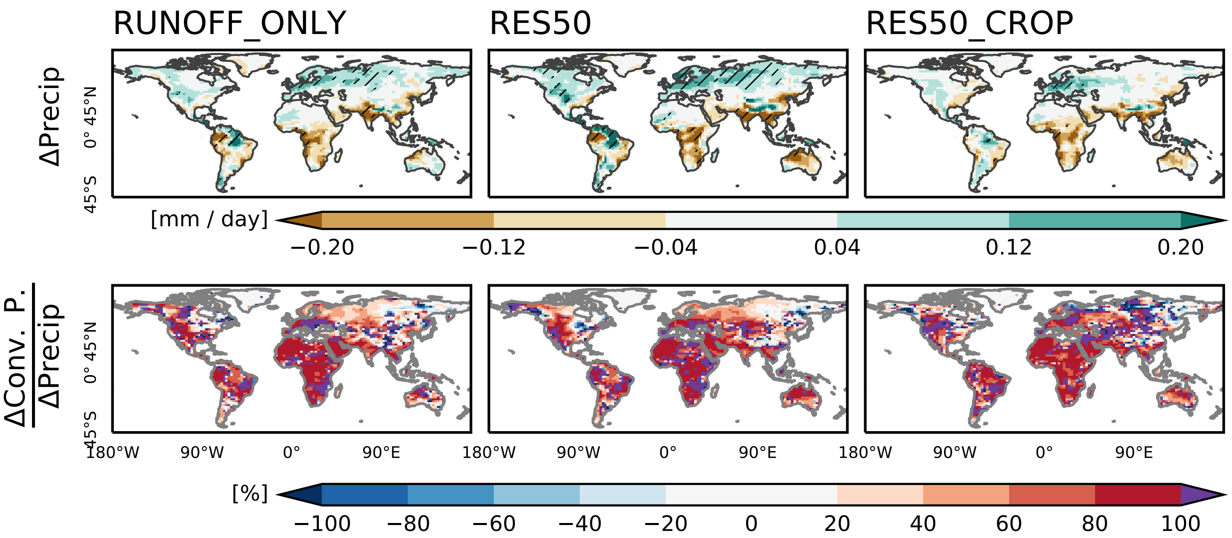

Figure S4: *LWR-induced changes in precipitation. (top row) The same as ΔPrecip in Figure 3. (bottom row) Percentage of ΔPrecip that is due to changes in convective precipitation (ΔConv. P.). Blue marks regions where ΔConv. P. is of opposite sign as ΔPrecip. Magenta indicates regions where the absolute values of ΔConv. P. is larger than the absolute values of ΔPrecip. Thus, magenta and blue colors indicates that the change in convective (ΔConv. P.) and large scale (ΔLS P.) precipitation are of opposite sign.*

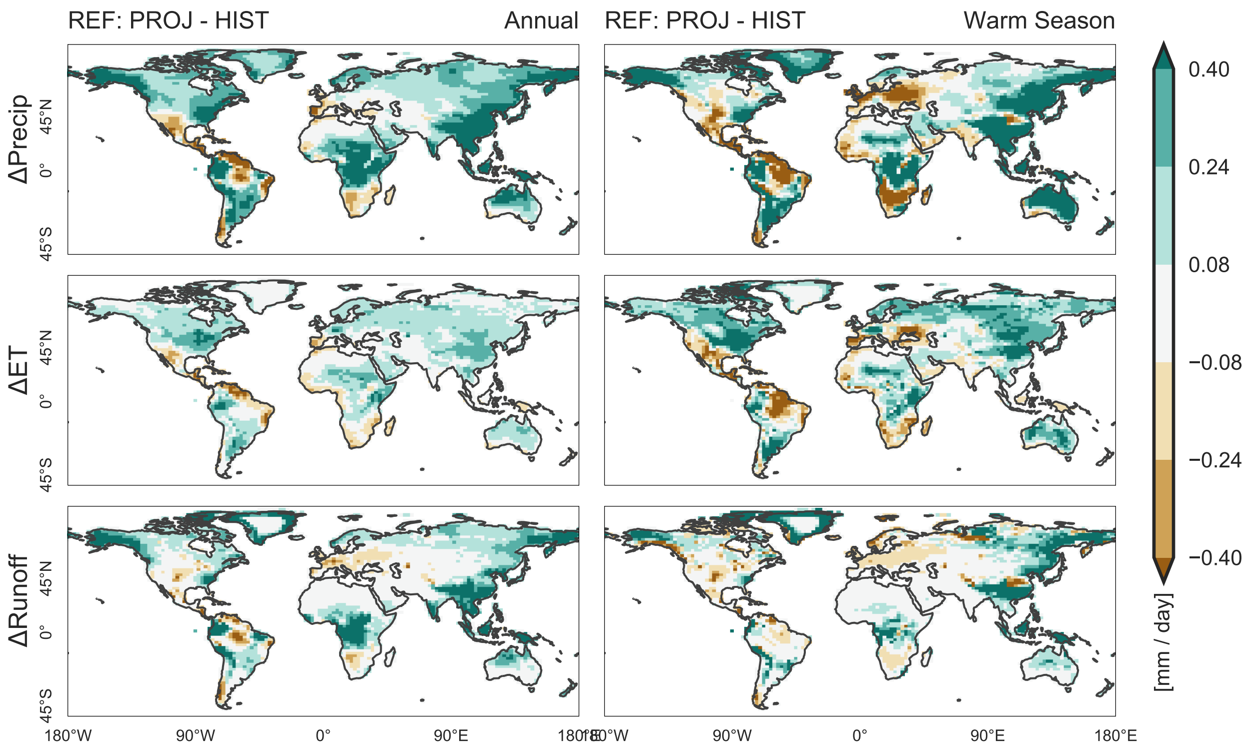

Figure S5: *Projected changes in hydrology for REF. Compares the future period (PROJ; 2070 to 2099) to the historical climatology (HIST; 1970 to 2000) for the whole year (left column) and the warm season (right column). Note that the colorbar spans twice the range as in Figure 3.*

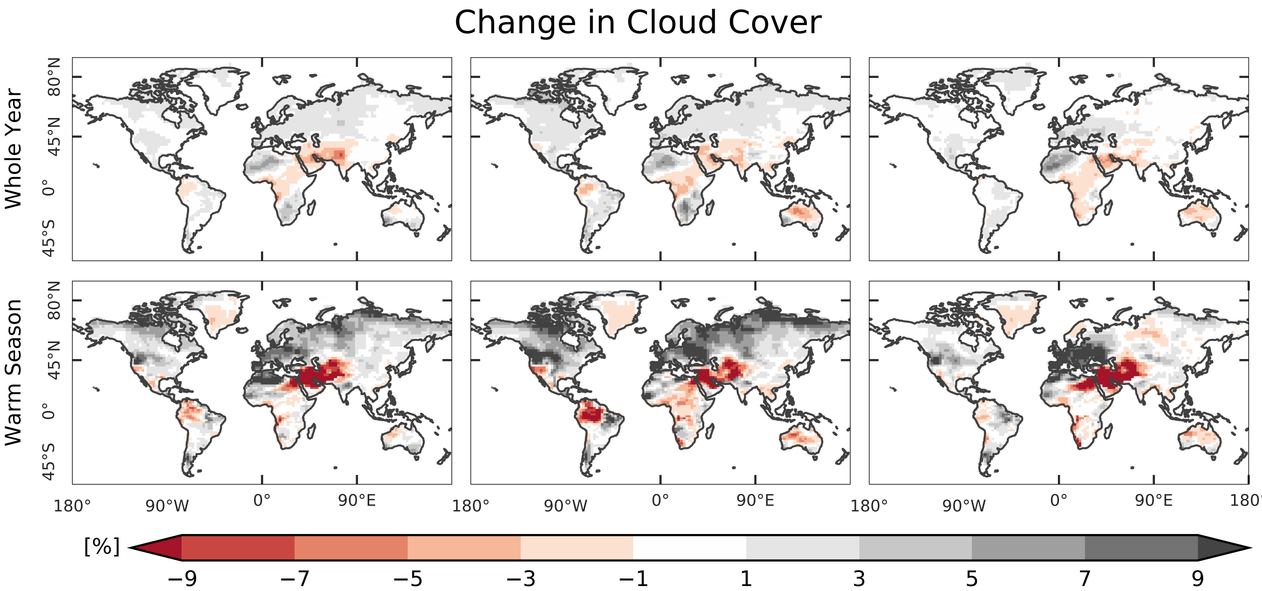

Figure S6: *Changes in cloud cover between REF and the experiments. Note that the months of the warm season do not coincide with the switch in SW_{net} (Figure 5).*

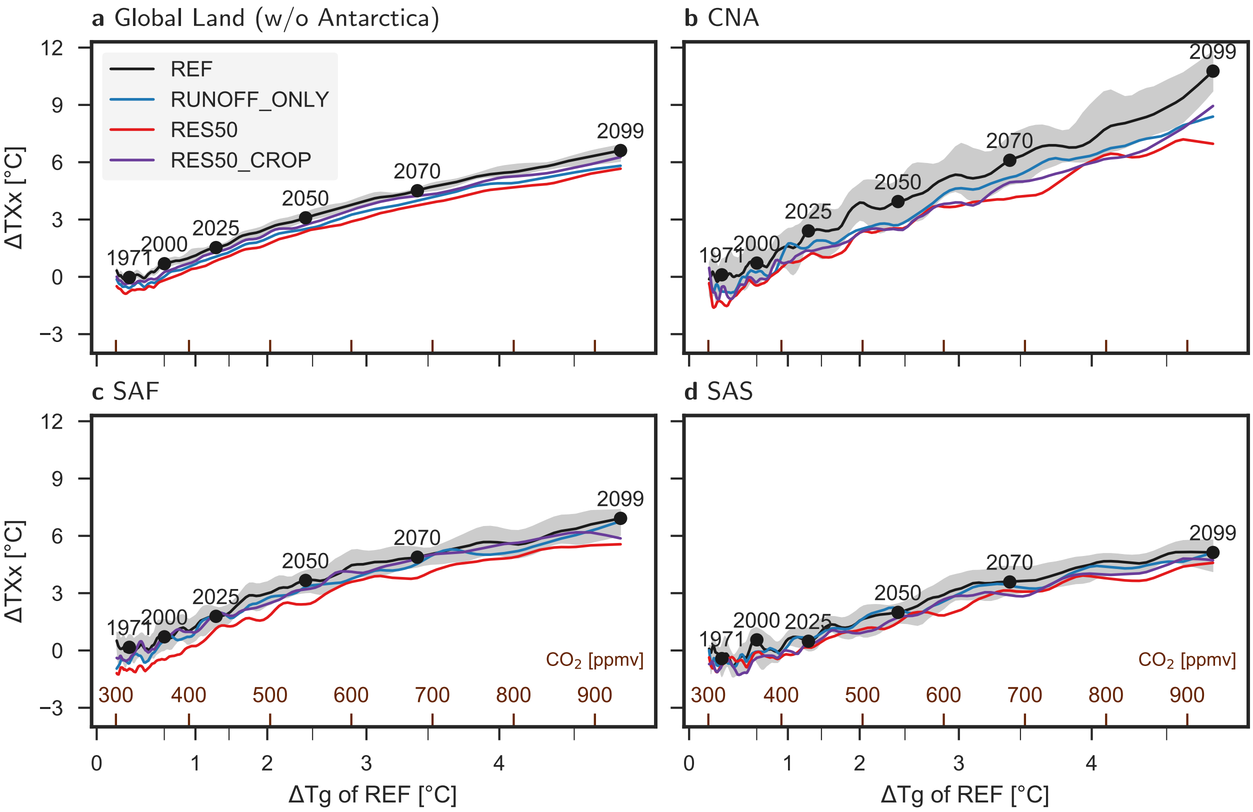

Figure S7: *Temperature scaling with CO_2 concentration/ global mean temperature (Tg). (a) For the global land area (excluding Antarctica), (b) Central North America (CNA), (c) South Africa (SAF), and (d) South Asia (SAS). All temperatures are relative to the 1861 to 1880 mean of REF. Lines correspond to the ensemble-mean annual maximum of the area-weighted average of daily maximum temperatures (TXx) as a function of the CO_2-concentration. Grey shading indicates the ensemble spread of REF. Lines are smoothed with a LOWESS filter (locally weighted scatterplot smoothing) filter (Cleveland, 1979); using 6 % of the data.*

References

Cleveland, W. (1979). "Robust Locally Weighted Regression And Smoothing Scatterplots". *Journal Of The American Statistical Association* 74.368, 829–836. DOI: 10.2307/2286407 (cit. on p. S5).