SUPPLEMENTARY FIGURES

Gains and losses in surface solar radiation with dynamic aerosols in regional climate simulations for Europe

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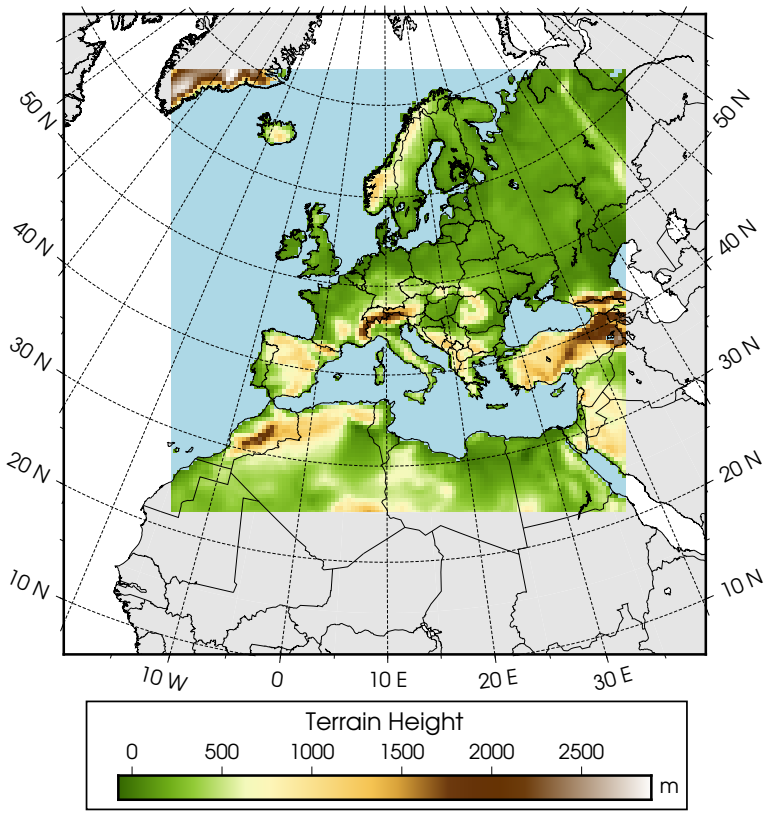
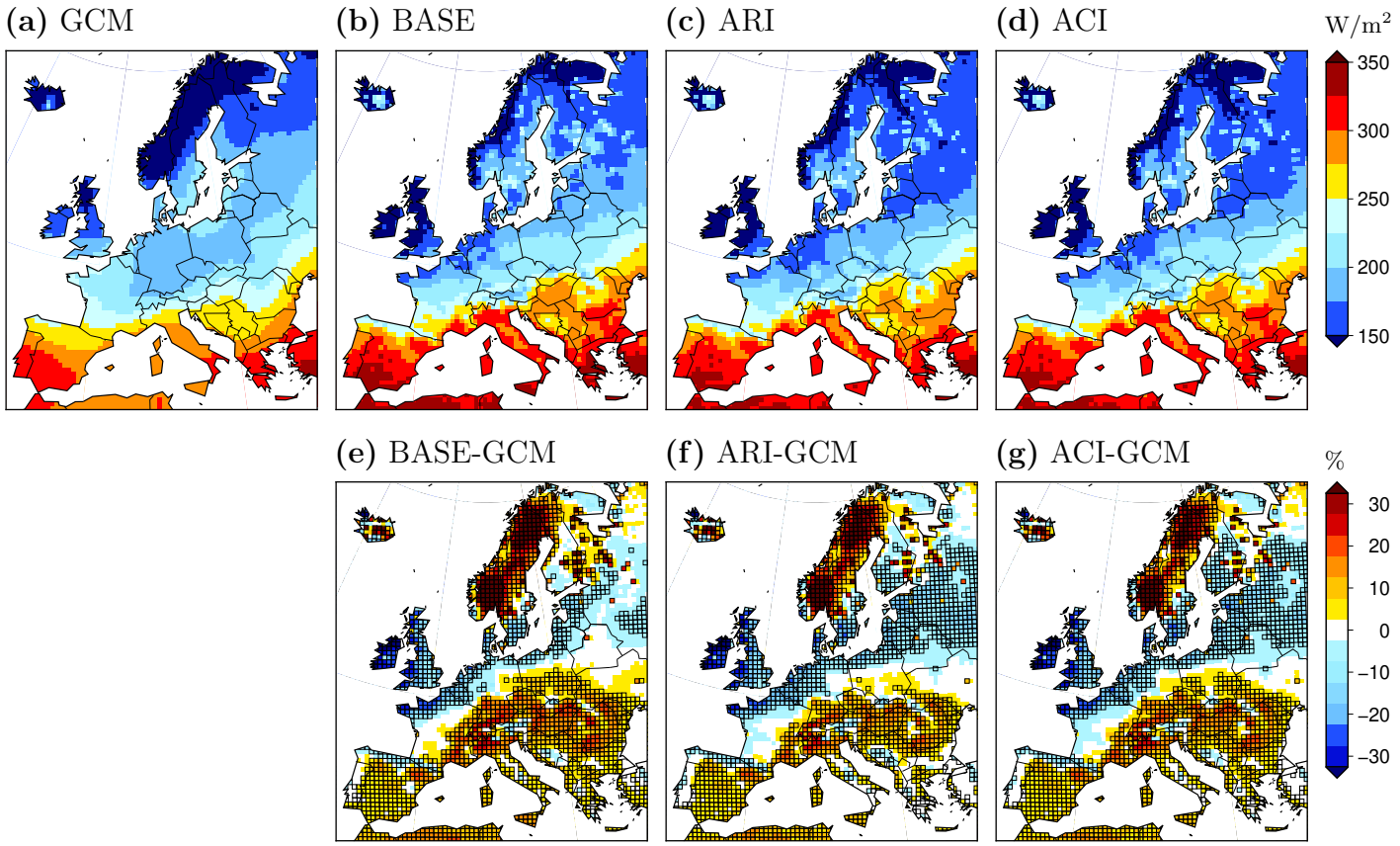
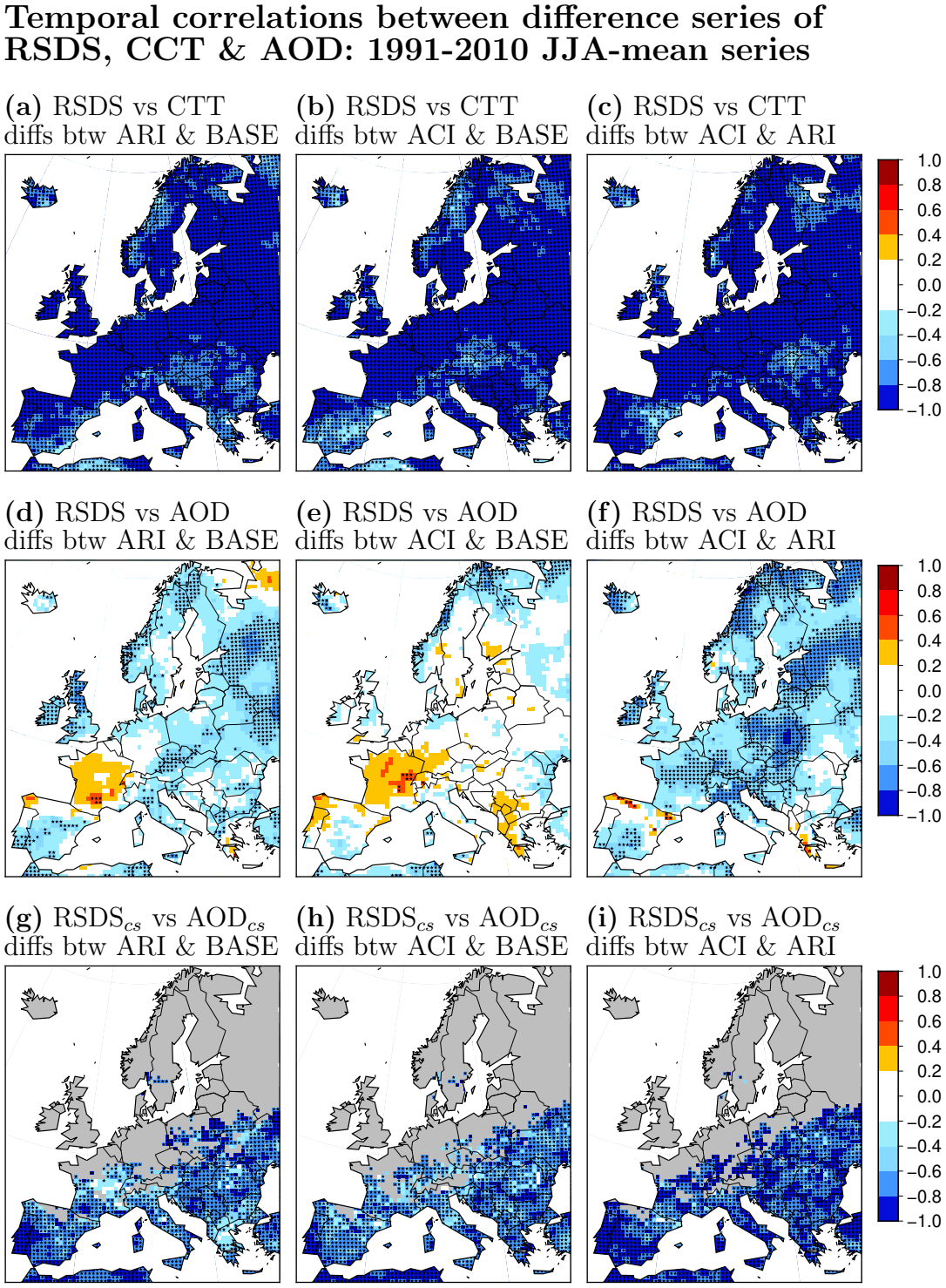


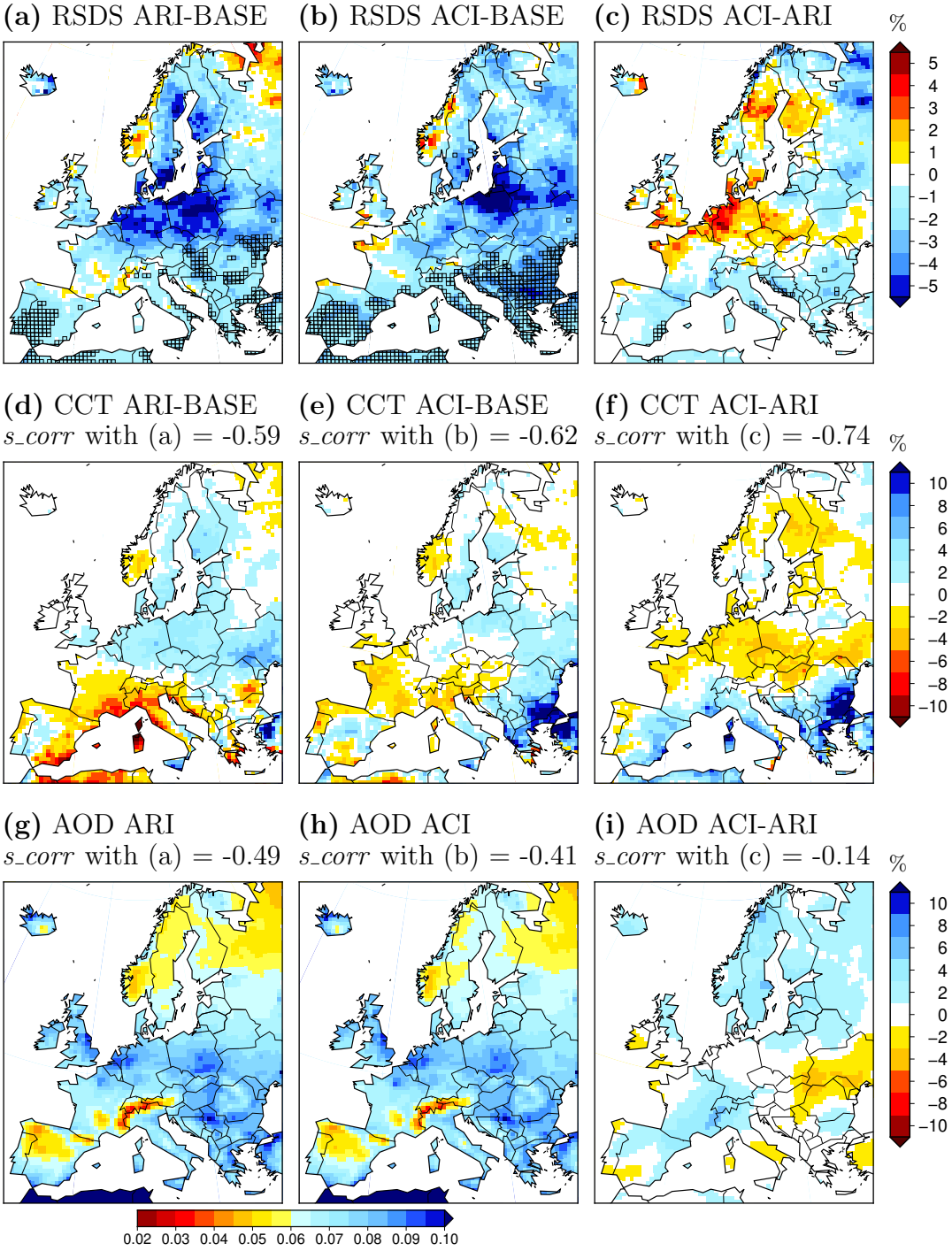
Supplementary Figure 1. Spatial domains used for the WRF simulations. The outer domain (gray shaded) has an horizontal resolution of 1.32^o in latitude and longitude; the inner target domain (colored) of 0.44^o (Euro-Cordex compliant). The nesting was one-way (outer-to-inner domain).



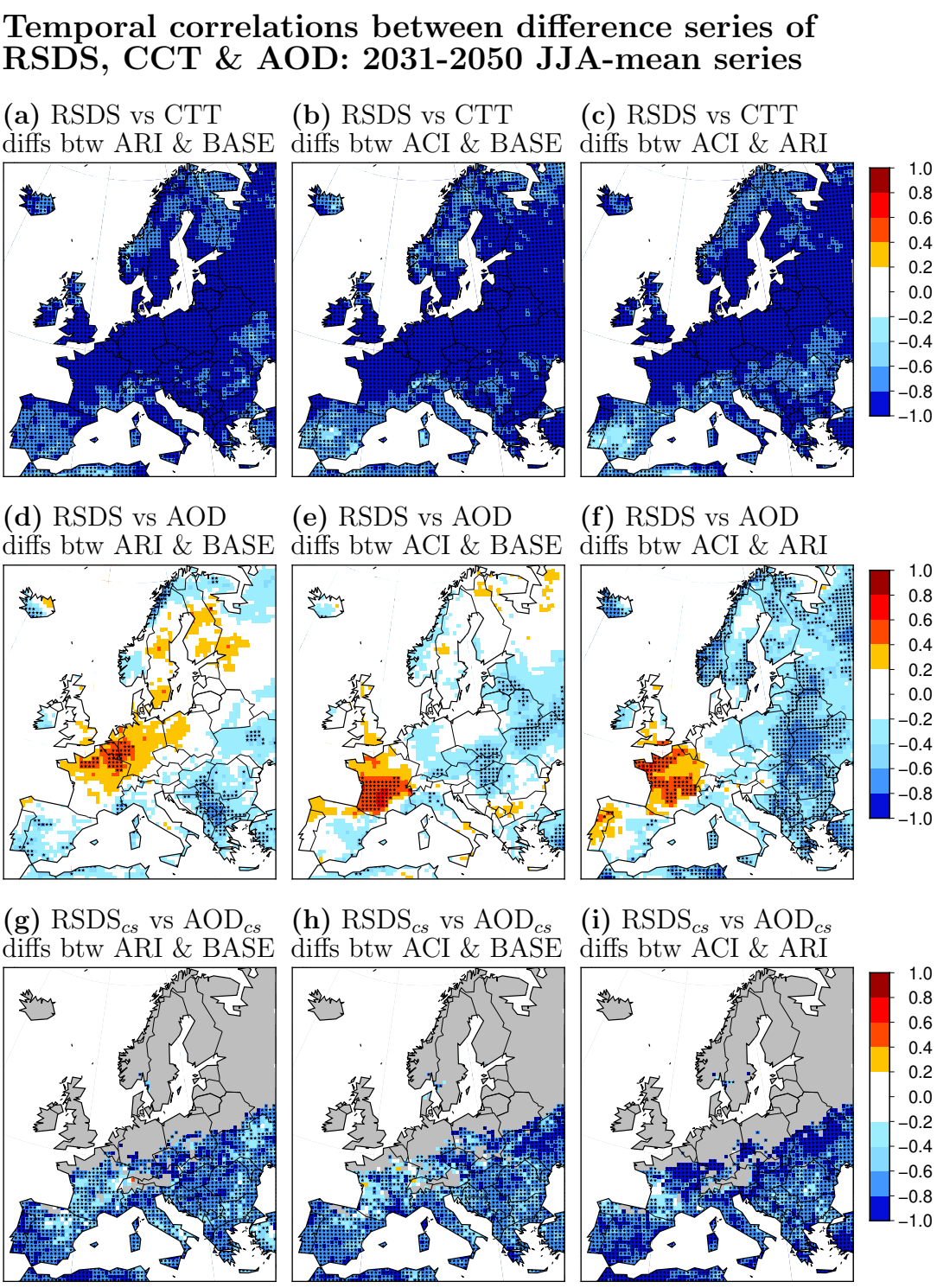
Supplementary Figure 2. RSDS summer climatologies in the present period from the GCM (a) and the WRF simulations (b to d); units: W/m2. Panels e to g depict relative differences between each WRF simulation and the GCM, squared if statistically significant ($p<0.05$); units: %.



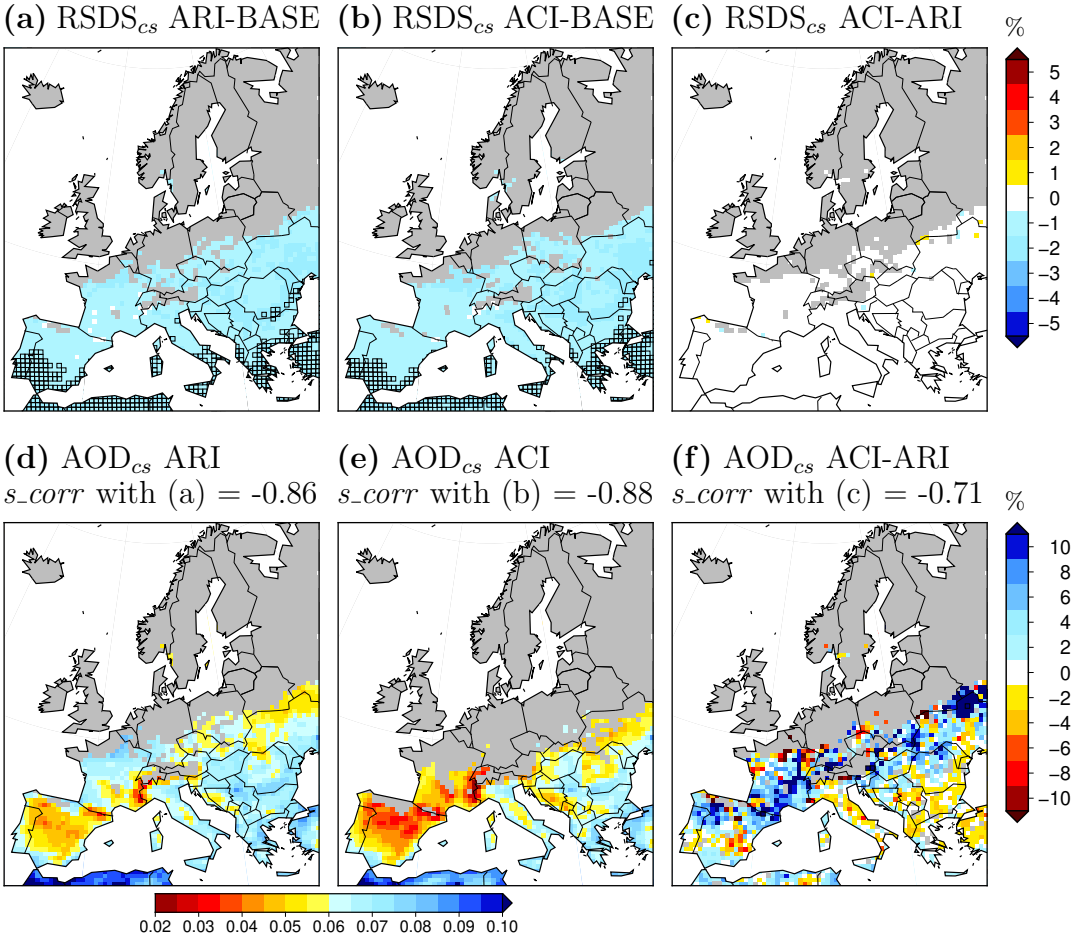
Supplementary Figure 3. Temporal correlations between JJA-mean temporal series of differences in RSDS and CTT (a to c), RSDS and AOD (d to f), and RSDS$_{cs}$ and AOD$_{cs}$ (g to i; gray-shaded areas where the number of time steps in the clear-sky series is below 75% of total time steps) between ARI and BASE (first column), ACI and BASE (second column), and ACI and ARI experiments (third column) in the present period (1991-2010). Little stars indicate statistical significance ($p<0.05$).



Supplementary Figure 4. Relative differences between the WRF simulations in the RSDS (a to c), CCT (d to f) and AOD at 550 nm (g to i) summer (JJA) climatologies in the future period (2031-2050), squared if statistically significant ($p<0.05$); units: %. Note that panels g and h are referred to the horizontal colorbar just below them and simply represent the AOD summer climatologies in ARI and ACI respectively. Spatial correlations (*s_corr*) between the patterns in the second and third rows and the respective patterns in the first row are indicated in the headers. This is as Figure 1 of the main manuscript but for the period 2031-2050.

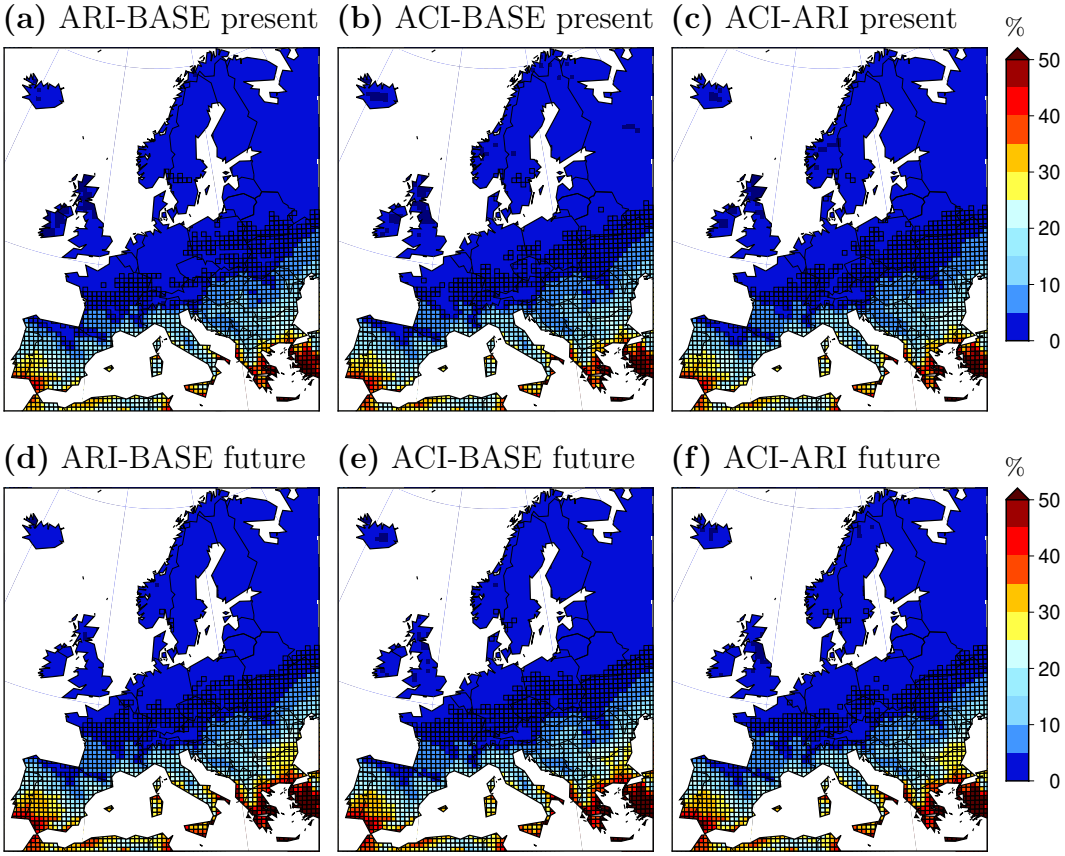


Supplementary Figure 5. As Supplementary Figure 3 but for the future period (2031-2050).



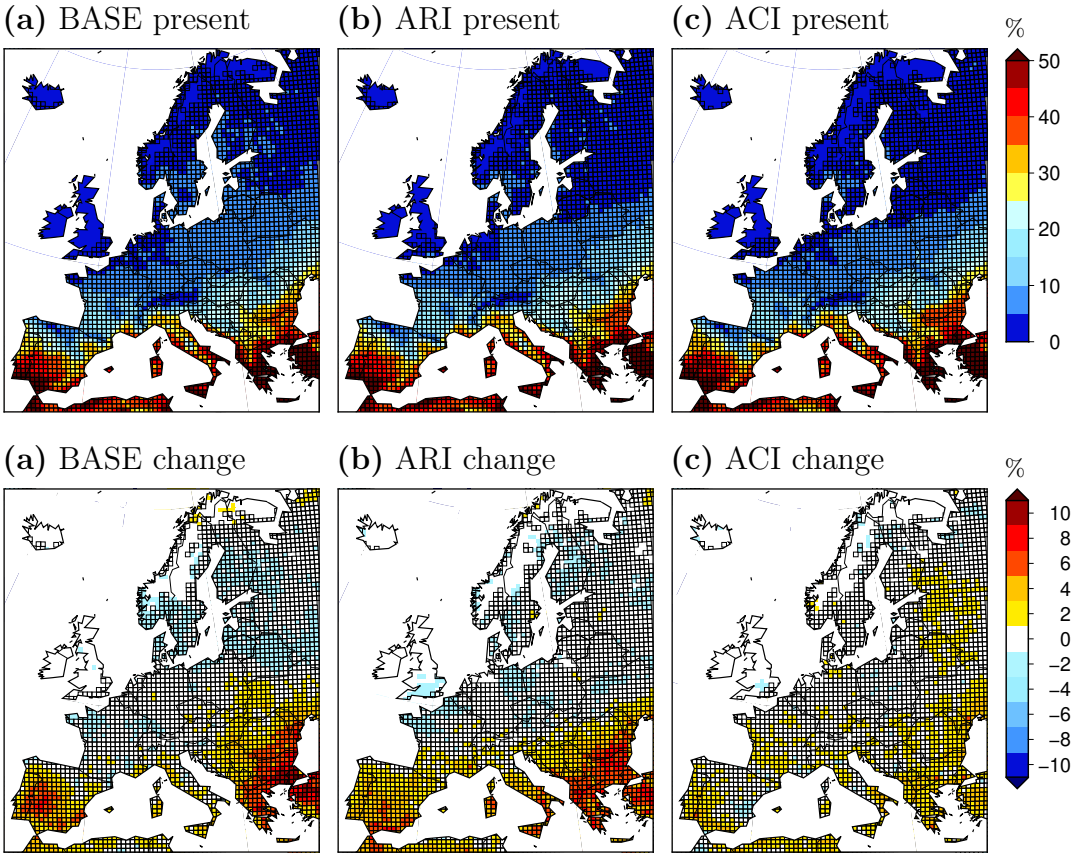
Supplementary Figure 6. Relative differences between the WRF simulations in the RSDS$_{cs}$ (a to c) and AOD$_{cs}$ at 550 nm (d to f) summer (JJA) climatologies, this is under clear-sky conditions, in the future period (2031-2050), squared if statistically significant (p¡0.05); units: %. Note that panels d and e are referred to the horizontal colorbar just below them and simply represent the AOD summer climatologies in ARI and ACI respectively. Gray shaded areas depict grid point where less than 75% of the summer mean values in the time series of RSDS$_{cs}$ and AOD$_{cs}$ were not missing values. Spatial correlations (*s_corr*) between the patterns in the second row and the respective patterns in the first row are indicated in the headers. This is as Figure 2 of the main manuscript but for the period 2031-2050.

Coincident clear-sky days between experiments

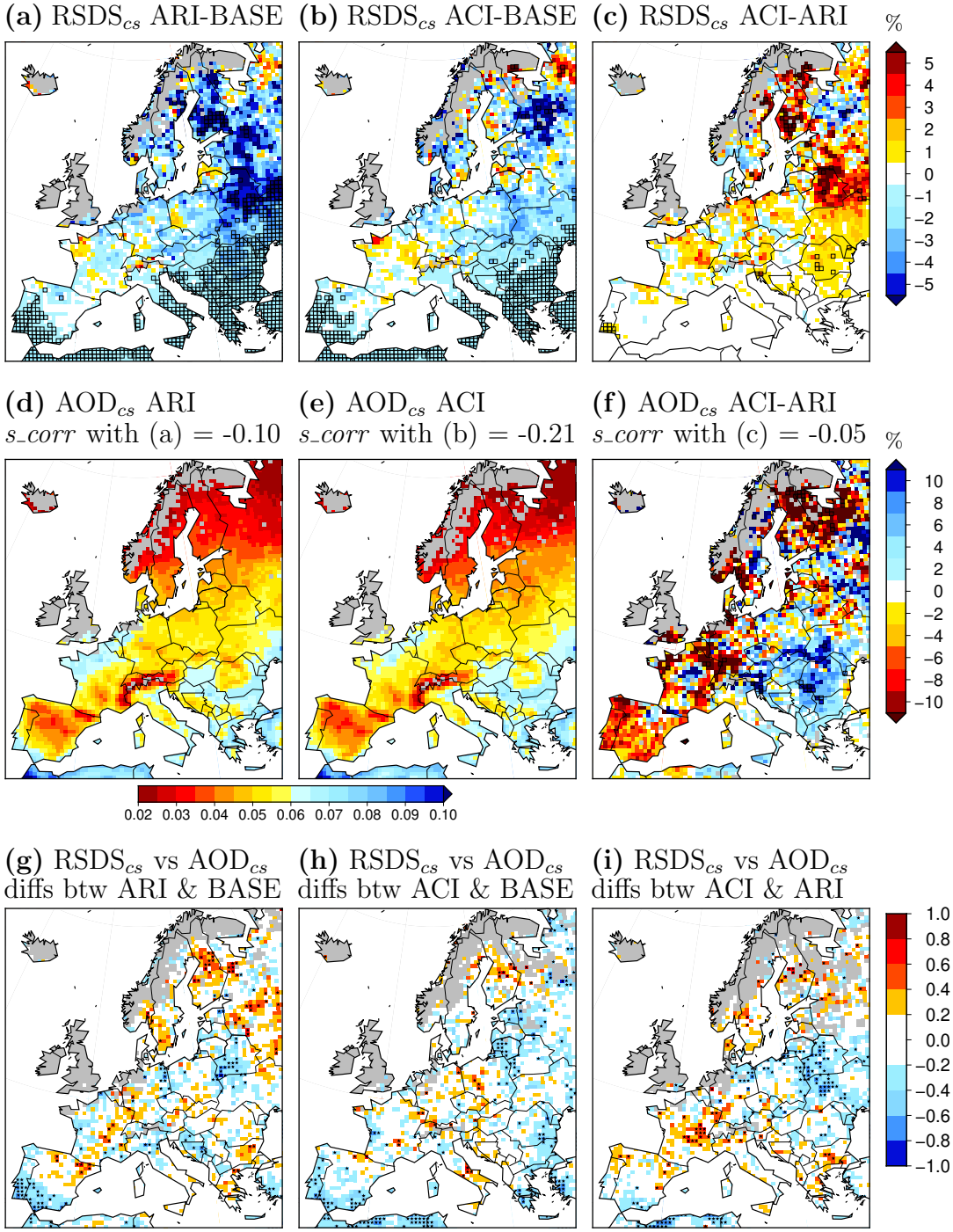


Supplementary Figure 7. Percentage of JJA clear-sky days date-coincident between ARI and BASE (a and d), ACI and BASE (b and e), and ACI and ARI experiments (c and f) in the periods 1991-2010 (top row) and 2031-2050 (bottom row), squared if the resultant JJA-mean series contains at least 75% of non-missing values (thus, squares represent the area selected for the analysis shown in Figure 2 of the main manuscript and Supplementary Figures 3 (panels g to i), 5 (panels g to i) and 6).

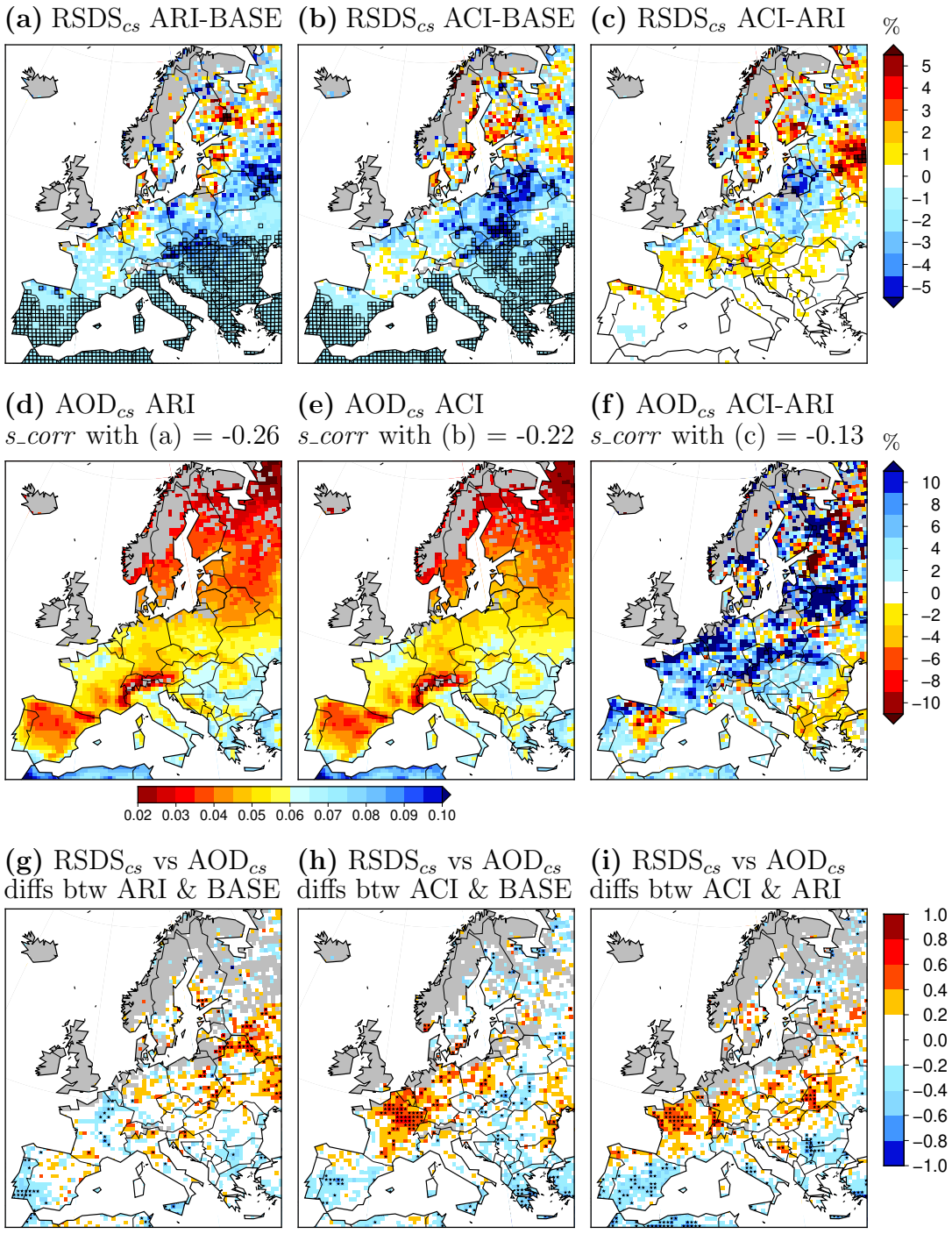
Clear-sky days in each experiment



Supplementary Figure 8. Percentage of JJA clear-sky days in the period 1991-2010 (top row), and its change in the period 2031-2050 (bottom row), in the BASE (first column), ARI (second column) and ACI experiments (third column), squared if the resultant JJA-mean series contains at least 75% of non-missing values in both present and future periods (thus, squares represent the area selected for the analysis shown in Figure 4 of the main manuscript and Supplementary Figures 9 and 10).



Supplementary Figure 9. Panels a to f: as Figure 2 of the main manuscript but without having selecting coincident clear-sky days between pairs of experiments. Panels g to i: as panels g to i in Supplementary Figure 3 but without having selecting coincident clear-sky days between pairs of experiments.



Supplementary Figure 10. As Supplementary Figure 6 but for the period 2031-2050.