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Sensitivity of land–atmosphere coupling strength to changing atmospheric temperature and moisture over Europe

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Supplementary Material

1 Non-atmospherically controlled days after a-posteriori model output modification of ±5K

We applied the same methodology as in the core modifications set with higher modification factors corresponding to ±5K and with 8.81%/K change in the specific humidity.

Figure S 1 shows the changes in average fraction of nAC-days in the summer months introduced by the corresponding modification factors. The signal of the change signal, as well as the patterns remained similar to that with ±2K modifications in all cases apart from the cases with moisture decrease and either temperatures unchanged (d) or increasing temperatures (g). In the latter case, the relative humidity and thus the humidity deficit were severely decreased by more than 40% over the high-latitudes which reduced the frequency of nAC-days by more than 20% of the summer days and thus reduced the size of the hotspot tremendously. Furthermore, all nAC-days were pushed in the transition zone category shown in Figure S 2g. However, an average relative humidity in summer of 60% rather occurs in the Mediterranean region, which is why such an extreme change in the classification over the historical period 1986-2015 is considered unrealistic.

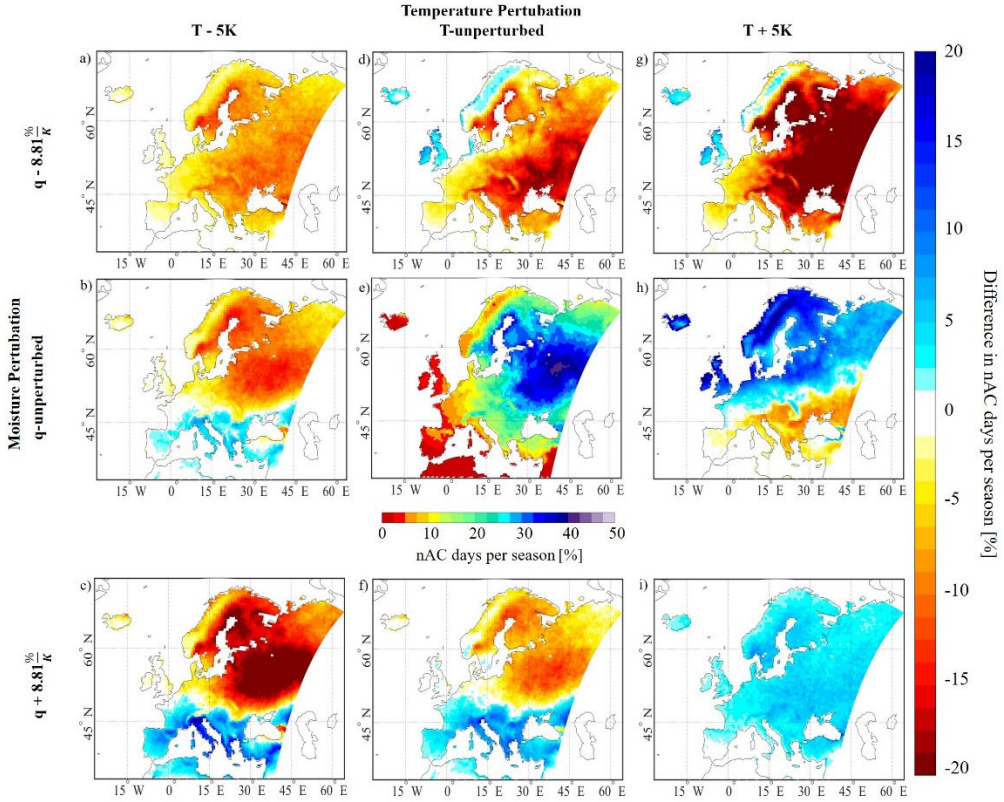

Figure S 1: Cases of ±5K of posterior modification and corresponding modifications of the specific humidity.

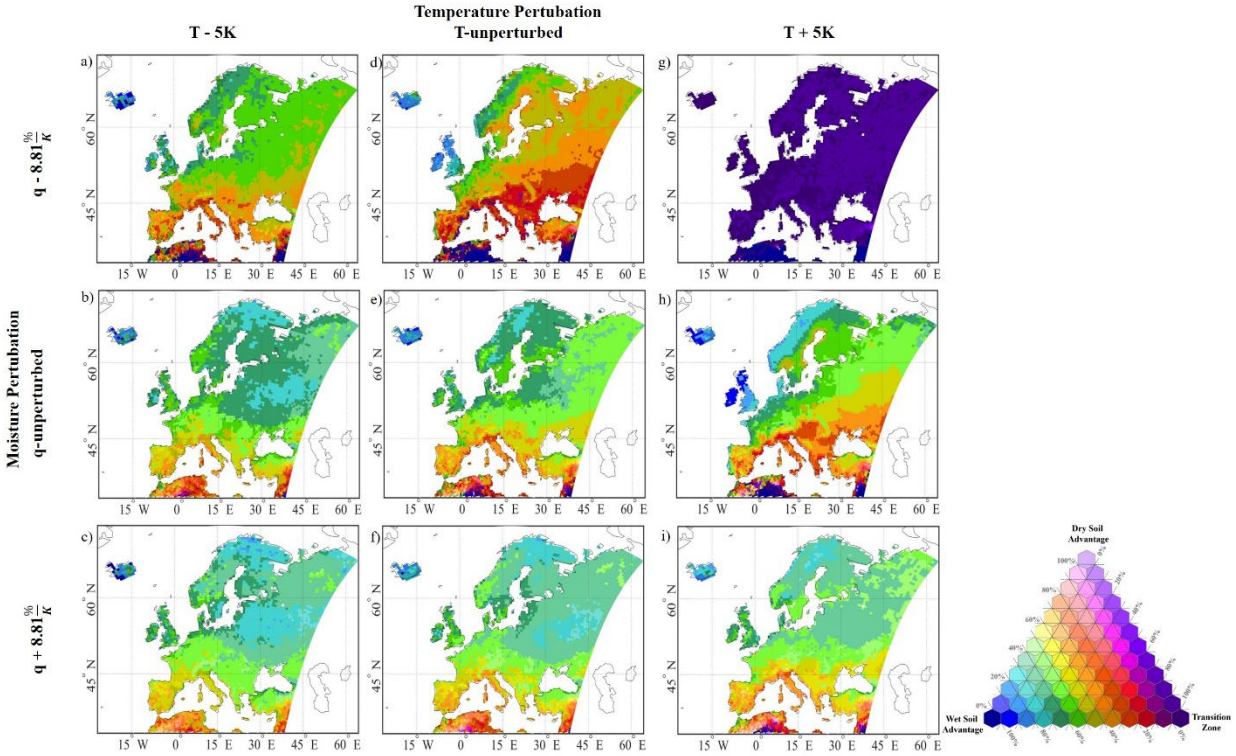

Figure S 2: nAC-day partitioning of the ±5K posterior output modification cases.