Supplementary information: Climate field reconstructions for the North Atlantic region of annual, seasonal and monthly resolution spanning CE 1241-1970 (egusphere-2025-2911)
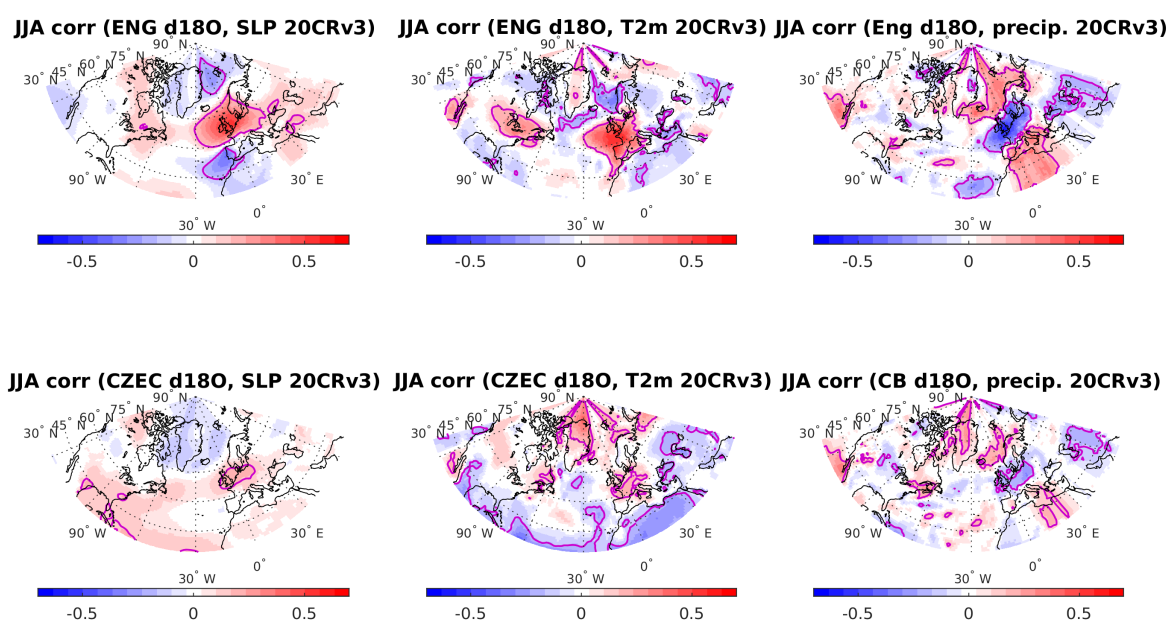
Figure S1: Upper panel: Correlation between d18Ocell ENG and JJA 20CRv3 SLP, T2m and precipitation amount. Lower panel: Correlation between d18Ocell CZEC and JJA 20CRv3 SLP, T2m and precipitation amount.
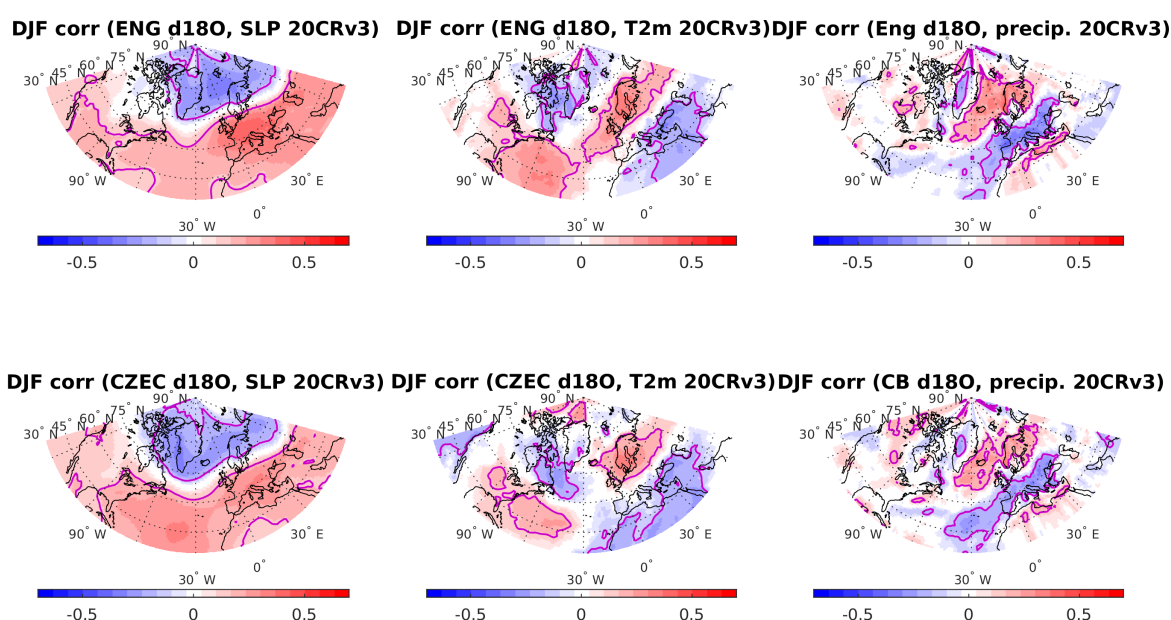
Figure S2: Same as Figure S1 but for DJF.
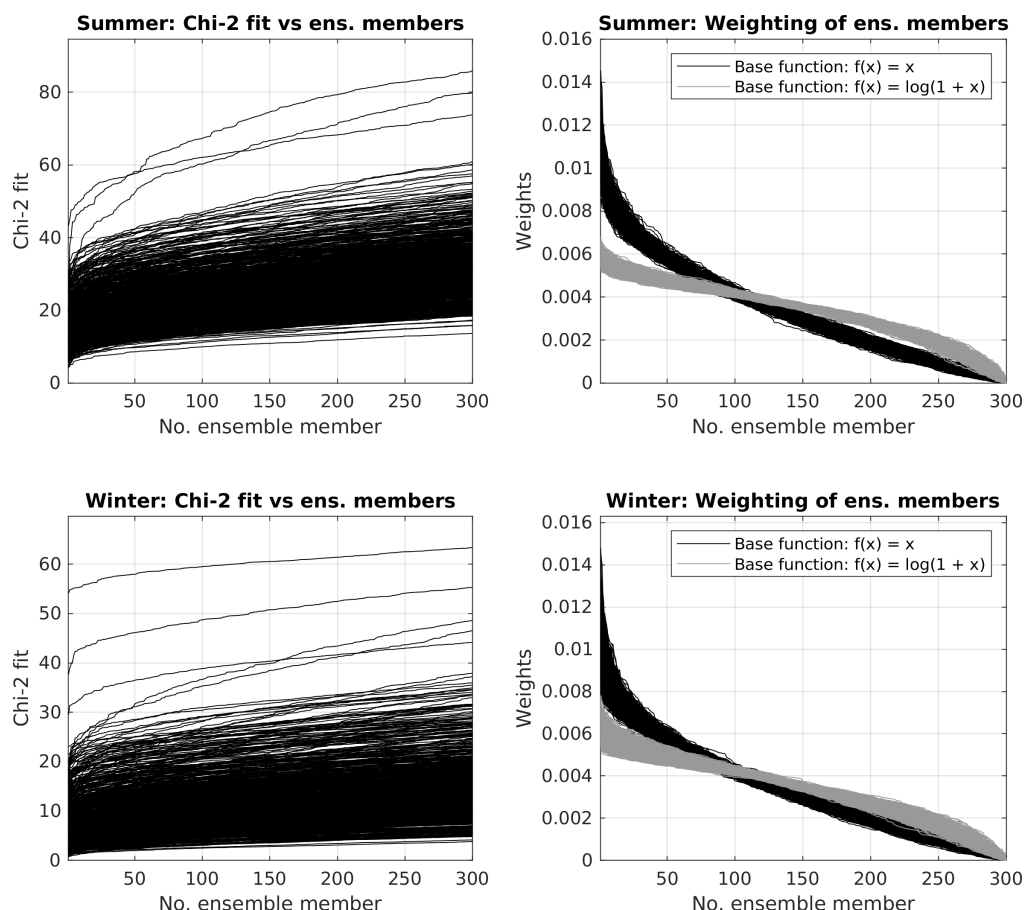
Figure S3: Upper panel. (left) Chi-2 distance for all years as function of ensemble member for summer. (right) Weighting function for summer ensemble mean based on Chi-2 distance (left), with the raw weights (black) and logarithmic transformed (grey).
Lower panel. (left) Chi-2 distance for all years as function of ensemble member for winter. (right) Weighting function for winter ensemble mean based on Chi-2 distance (left), with the raw weights (black) and logarithmic transformed (grey).
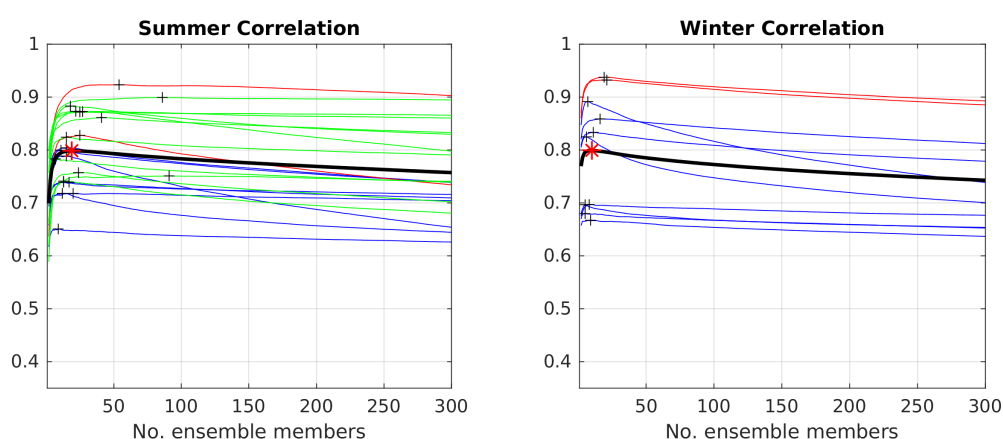
Figure S4: Upper panel: Correlation between reconstructed data at proxy sties and proxy data versus number of ensemble members for summer and winter. The curves indicate correlations for tree-ring data (green), ice core d18O (blue) and tree-ring d18Ocell (red). The bold black curve is the mean for all data. (+) or (*) marks maximum correlation.
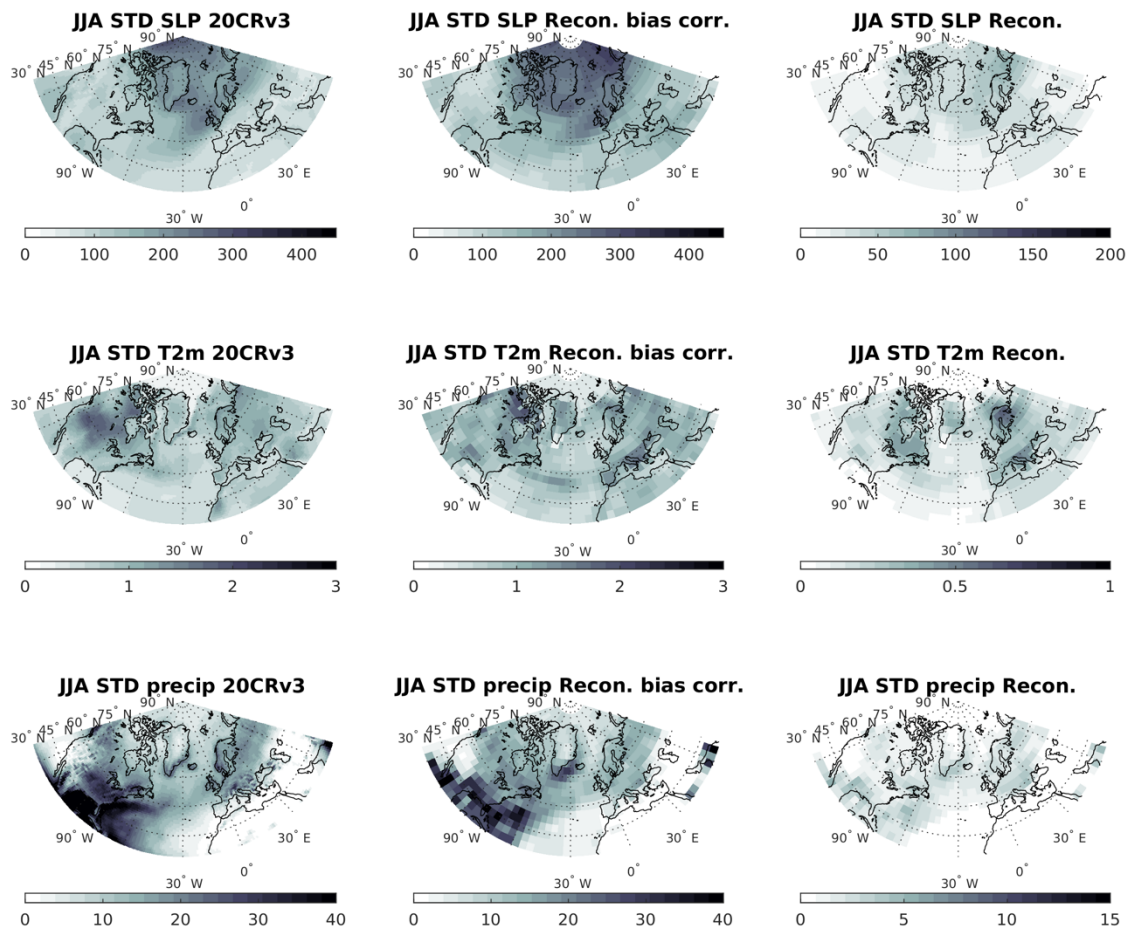
Figure S5: Upper panel: Standard deviation of JJA SLP from 20CRv3, SAT25 with variance correction and SAT25 without variance correction. Middle panel: Standard deviation of JJA T2m from 20CRv3, SAT25 with variance correction and SAT25 without variance correction. Lower panel: Standard deviation of JJA precipitation from 20CRv3, SAT25 with variance correction and SAT25 without variance correction. Note the different scale for plots of SAT25 without variance correction.
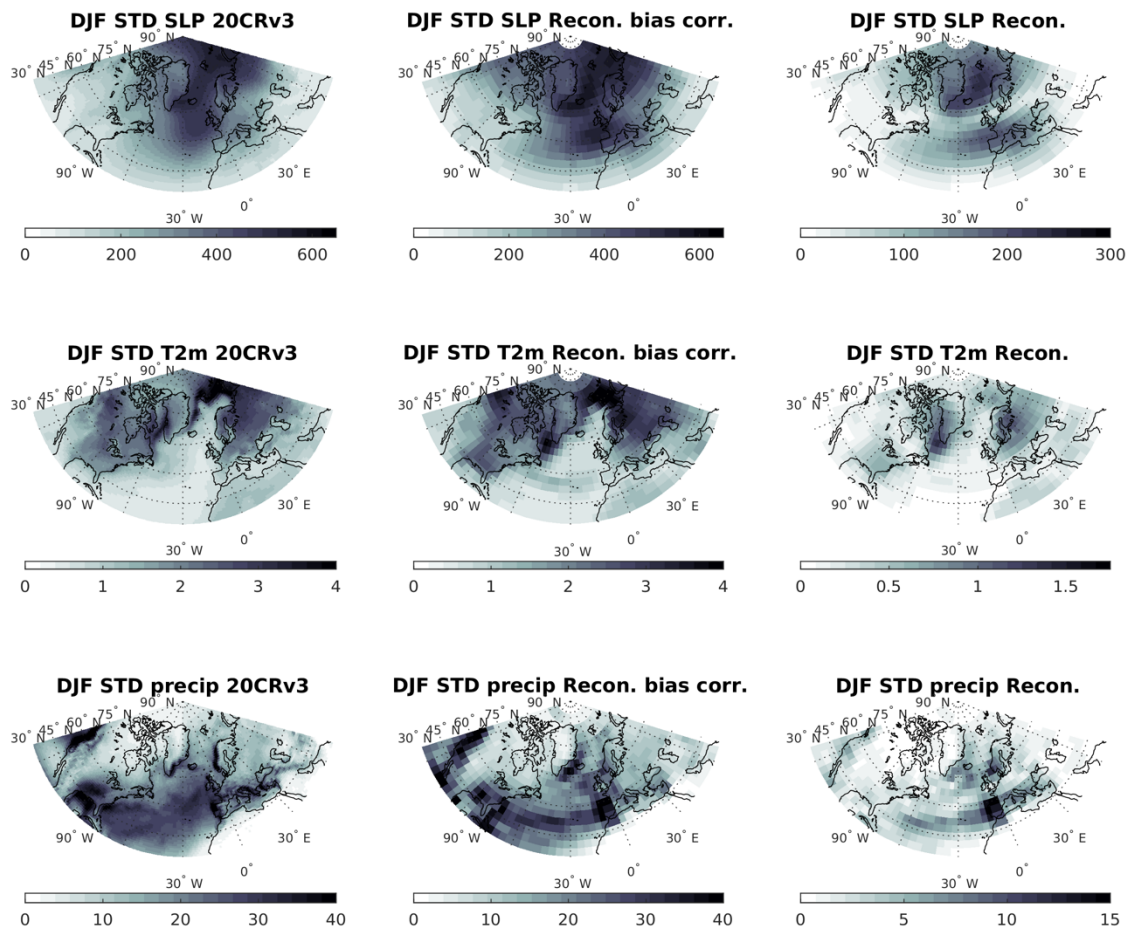
Figure S6: Same as S4, but for DJF.
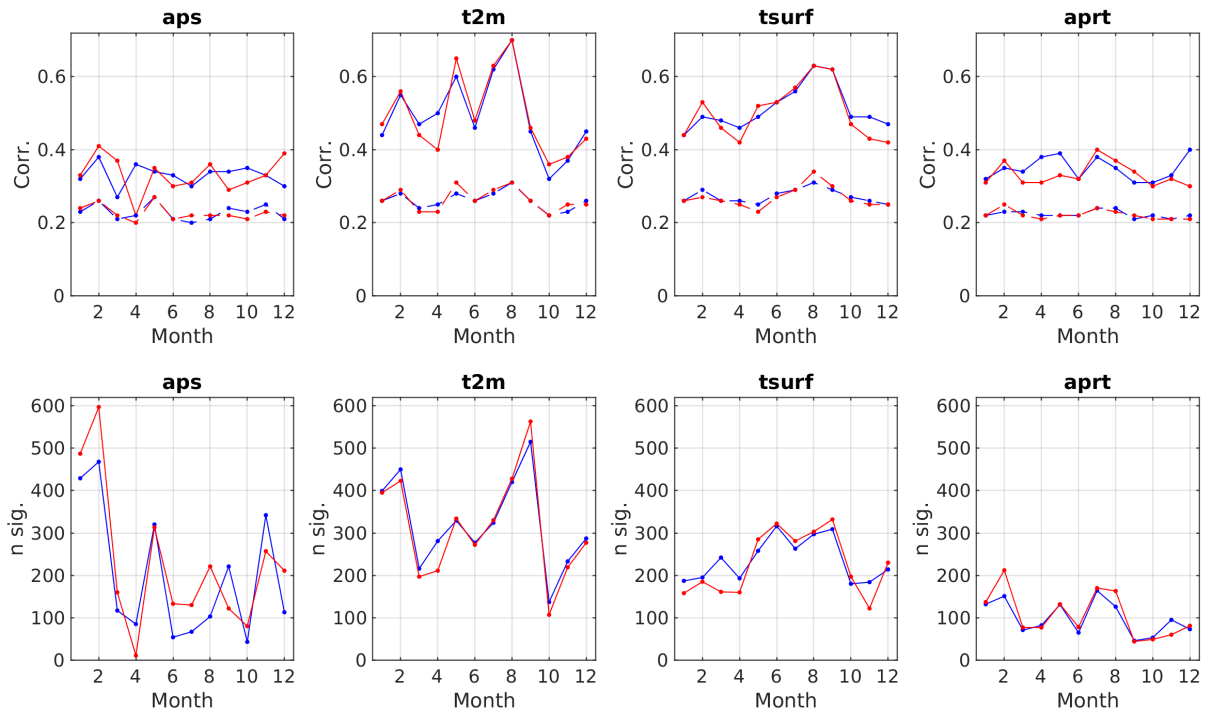
Figure S7: Comparison of performance of monthly reconstructions to the 20CRv3 (COBE2 SST for tsurf) for atmospheric surface pressure (aps), 2m temperature (t2m), surface temperature of ocean (tsurf) and total precipitation (aprt). Red shows the results if the months of the model output are extracted using separate evaluation of the summer and winter season, while blue shows the results if the months are extracted with simultaneously evaluating summer and winter, i.e., summer and winter months are from the same model year. Upper panel: full lines show maximum correlation and dashed lines mean significant correlation. Lower panel: number of grid points with significant correlation.
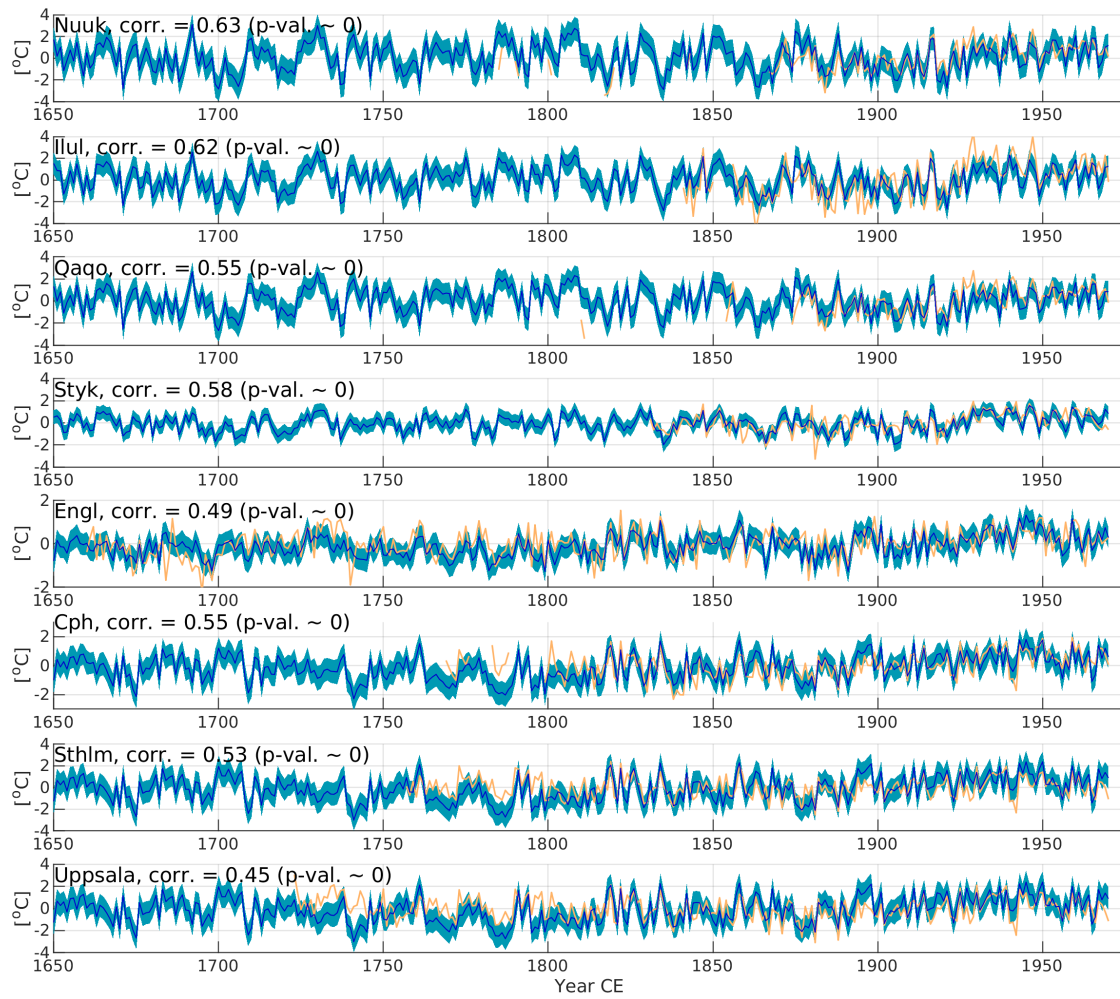
Figure S8: Time series of reconstructed (blue) and observed (yellow) annual temperature for Nuuk, Ilulissat, Qaqortoq, Stykkisholmur, Central England, Copenhagen, Stockholm, and Uppsala. The blue shading indicated +/- I std dev of the ensemble reconstructed temperature.
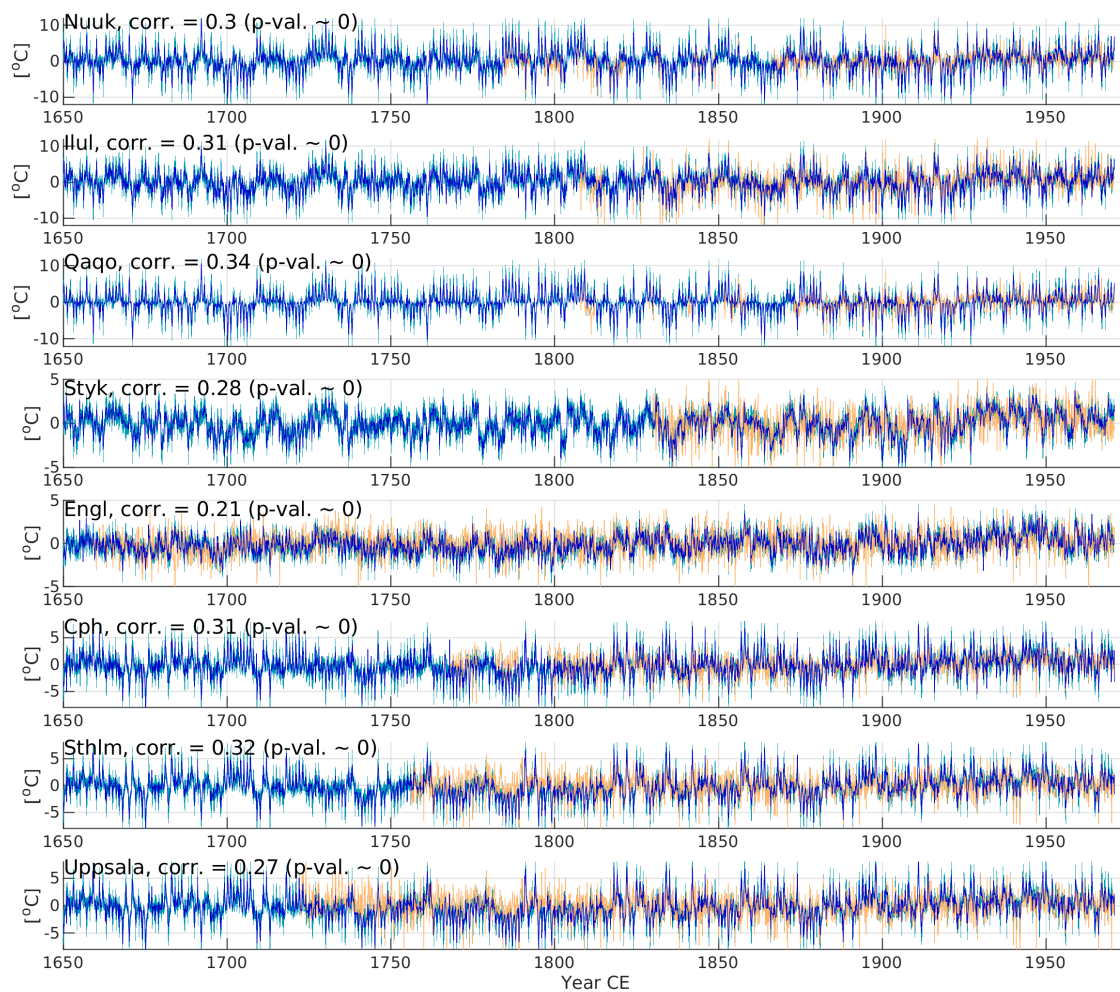
Figure S9: Time series of reconstructed (blue) and observed (yellow) monthly temperature for Nuuk, Ilulissat, Qaqortoq, Stykkisholmur, Central England, Copenhagen, Stockholm, and Uppsala. The blue shading indicated +/- I std dev of the ensemble reconstructed temperature.