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The long-standing dilemma of European summer temperatures at the mid-Holocene and other considerations on learning from the past for the future using a regional climate model

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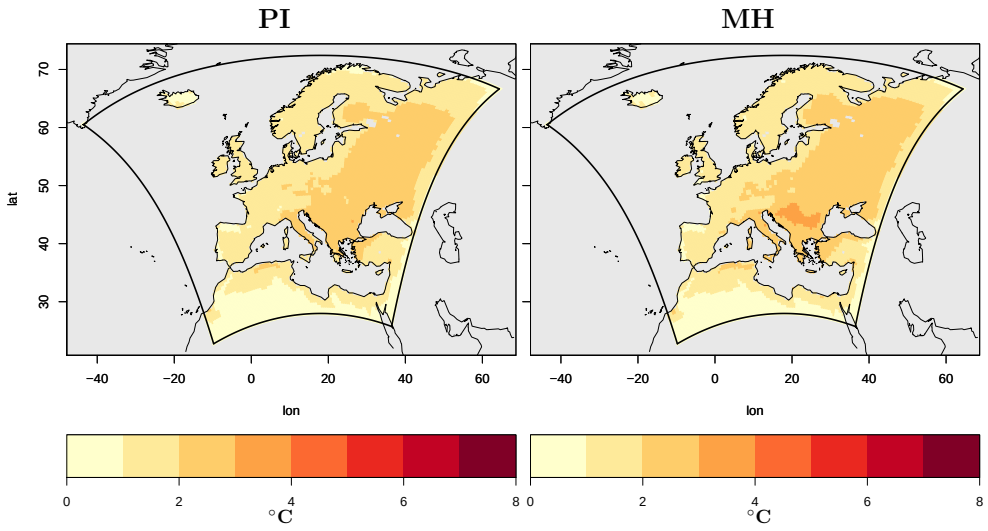

Figure S1. Maximum absolute differences in summer 2-meter temperatures calculated between the different PPE members, for the PI (left) and the MH (right) periods.

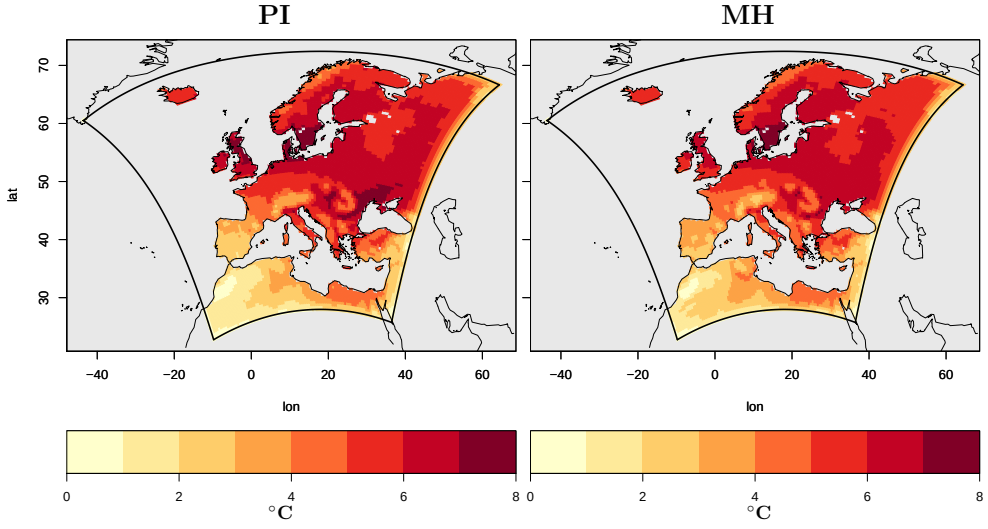

Figure S2. Maximum absolute differences in summer 2-meter temperatures calculated between the different PPE members, for the PI (left) and the MH (right) periods.

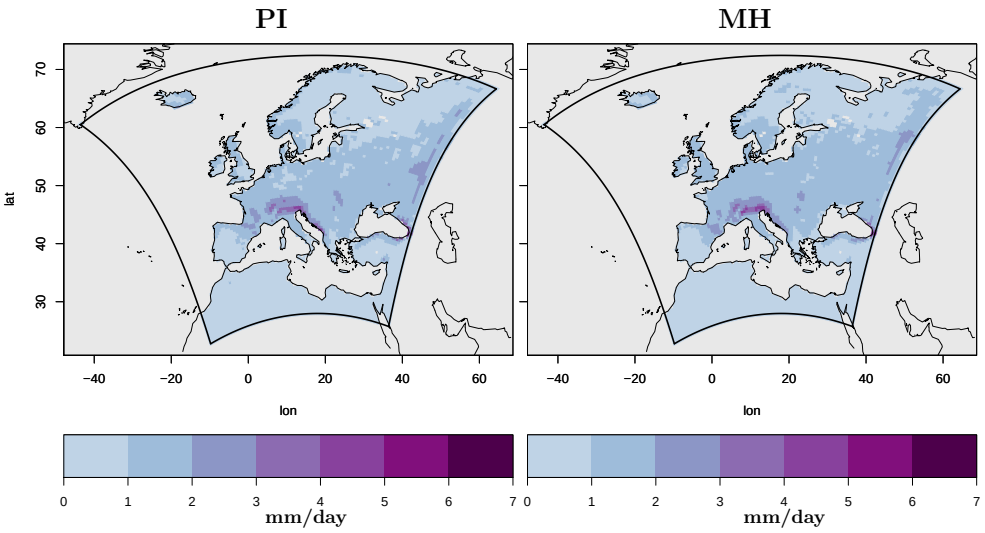

Figure S3. Maximum absolute differences in summer daily precipitation calculated between the different PPE members, for the PI (left) and the MH (right) periods.

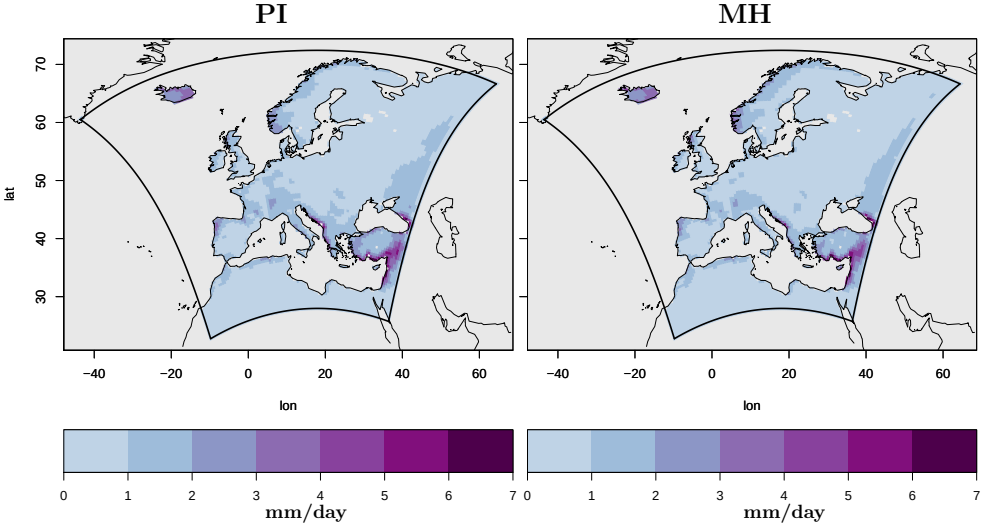

Figure S4. Maximum absolute differences in winter daily precipitation calculated between the different PPE members, for the PI (left) and the MH (right) periods.

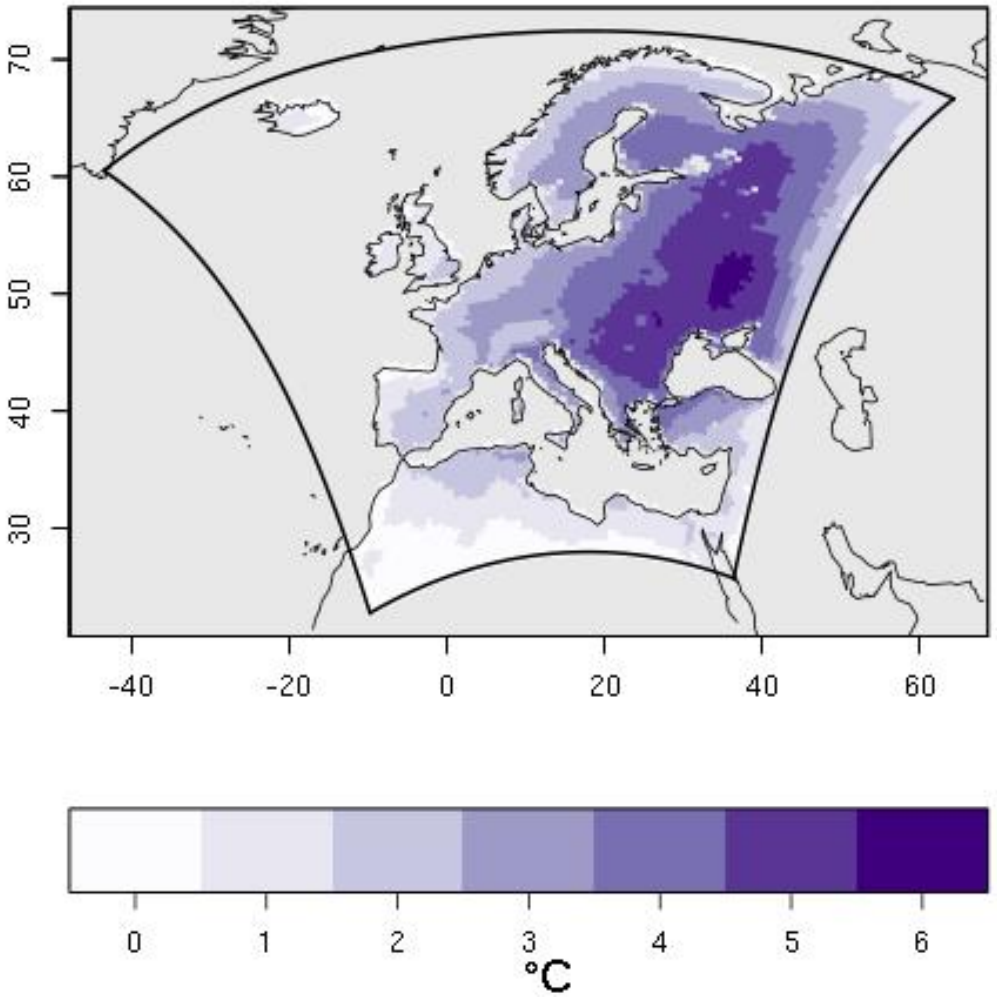

Figure S5. Mean value of the absolute differences in MH summer temperatures calculated between the simulation with a reduction of 75% in initial spring soil moisture, and the one with a correspondent increase of 75%, for 6 distinct years of the simulation period.

Table S1. Features of TERRA_LM soil types.

	Ice	Rock	Sand	Sandy loam	Loam	Loamy clay	Clay	Peat
Pore volume (-)	-	-	0.364	0.445	0.455	0.475	0.507	0.863
Field capacity (-)	-	-	0.196	0.26	0.34	0.37	0.463	0.763
Perm. wilting point (-)	-	-	0.042	0.1	0.11	0.185	0.257	0.265.
Air dryness point	-	-	0.012	0.03	0.035	0.06	0.065	0.098
Min. infiltration rate ($kg/(m^2s)$)	-	-	0.0035	0.0023	0.001	0.0006	0.0001	0.0002
Hydr. diffusivity D0 ($10^{-9}m^2s$)	-	-	18400	3460	3570	1180	442	106
Hydr. diffusivity D1 (-)	-	-	-8.45	-9.47	-7.44	-7.76	-6.74	-5.97
Hydr. conductivity K0 ($10^{-9}m/s$)	-	-	47900	9430	5310	764	17	58
Hydr. conductivity K1 (-)	-	-	-19.27	-20.86	-19.66	-18.52	-16.32	-16.48
Heat capacity ($10^6J/(m^3K)$)	1.92	2.1	1.28	1.35	1.42	1.5	1.63	0.58
Heat conductivity k0 (W/Km)	2.26	2.41	0.3	0.28	0.25	0.21	0.18	0.06.
Heat conductivity Dk (W/Km)	0	0	2.4	2.4	1.58	1.55	1.5	0.5
Exponent B (-)	1	1	3.5	4.8	6.1	8.6	10	9
Albedo (-)	0.7	0.3	0.3	0.25	0.25	0.25	0.25	0.2
Wet albedo (-)	-	-	0.44	0.27	0.24	0.23	0.22	0.1

Table S2. Ranking of different realizations in the two periods (PI left and MH right) for each of the considered variables, based on the MAE calculated over regional monthly means with respect to the reference simulation of Table 2 of the main manuscript. The simulations are ordered, from top (best) to bottom (worst), based on their MAE rankings (eq. 3 of the main manuscript)

T2M		RR		CLCT	
PI	**MH**	**PI**	**MH**	**PI**	**MH**
14	29	25	27	25	29
25	14	1	13	1	1
20	21	31	20	26	18
1	20	14	24	31	17
21	19	26	23	10	25
29	22	15	19	29	10
22	25	30	18	17	26
19	18	29	30	11	31
15	15	21	11	24	11
18	12	11	10	18	24
10	10	12	28	30	3
26	1	10	21	14	30
3	24	18	16	3	14
24	26	8	25	21	21
12	3	28	14	28	28
11	16	22	31	27	27
17	31	16	2	22	22
16	13	17	29	2	2
31	17	13	6	23	23
13	11	24	3	20	6
28	28	20	15	6	20
27	30	3	22	19	12
30	27	19	26	12	19
8	8	2	1	4	15
23	23	27	17	15	4
4	4	9	12	8	8
2	2	23	8	13	13
6	6	4	9	7	7
9	9	6	4	16	16
7	7	7	7	9	9
5	5	5	5	5	5