Supplement of Earth Syst. Dynam., 9, 459–478, 2018
https://doi.org/10.5194/esd-9-459-2018-supplement
© Author(s) 2018. This work is distributed under
the Creative Commons Attribution 4.0 License.

Earth System Dynamics
Open Access
EGU

Supplement of

European climate change at global mean temperature increases of 1.5 and 2 °C above pre-industrial conditions as simulated by the EURO-CORDEX regional climate models

Erik Kjellström et al.

Correspondence to: Erik Kjellström (erik.kjellstrom@smhi.se)

The copyright of individual parts of the supplement might differ from the CC BY 4.0 License.

Supplementary material

Here we describe which additional tables and figures that are given in the supplementary material. We also discuss a late-discovered inconsistency with the boundary conditions used in some of the assessed RCM simulations.

In addition to the material presented in the article we present one table and two figures here. Table S1 complements Table 4 in the paper by showing the corresponding numbers but for SWL2 instead of SWL1.5. Figures S1 and S2 complements Figures 4 and 5 by showing results based on the global climate models that have been downscaled by the EURO-CORDEX RCMs shown in those figures. The ensemble statistics are calculated in the same way as in the article but here replacing each individual RCM by its driving GCM. For some GCMs, that was downscaled more than once, this means that they are included more than one time in the calculations. For instance, the IPSL GCM is used two times and the CNRM GCM three times.

During the review process we have learned from MétéoFrance that there has been a mistake when uploading CNRM-CM5 output to be used for dynamical downscaling onto the Earth System Grid Federation (ESGF) from which all RCM groups have downloaded boundary conditions. This implies that the CNRM-CM5 data for the historical period consists of data from different ensemble members, where the 2D surface fields come from to one member, but the 3D atmospheric fields from a different member. The different ensemble members have the same long-term mean climate, but show different variability. For the current study we have decided to keep it in the analysis but with the caveat that the results may change when/if the historical time periods are rerun with internally consistent data.

Table S1. Summary statistics showing temperature and precipitation changes at SWL2 for the eight regions in Fig. 1. For each region there are three sets of data for each season and variable representing: the full CMIP5 ensemble (top), the nine-member GCM-ensemble downscaled by the RCMs (middle) and the eighteen-member RCM ensemble (lower). The numbers represents minimum (left), maximum (right) and mean plus/minus one standard deviation (middle).

Area	Near surface temperature (°C)						Precipitation (%)					
	DJF			JJA			DJF			JJA		
	min	mean±sd	max	min	mean±sd	Max	min	mean±sd	max	min	mean±sd	max
IP	0.70	1.36±0.35	1.95	1.12	2.16±0.65	3.61	-21	-3.3±10.3	23	-46	-13±10	5.0
	0.77	1.22±0.40	1.95	1.25	1.81±0.53	2.73	-13	2.6±7.5	11	-23	-13±6.7	-1.0
	0.63	1.11±0.40	1.82	1.04	1.48±0.36	2.33	-11	0.3±6.0	11	-21	-11±6.3	2.0
MD	0.59	1.51±0.45	2.40	1.12	2.24±0.67	3.55	-18	-4.2±7.7	13	-43	-12±10	9.1
	0.59	1.30±0.44	1.97	1.39	1.96±0.55	2.90	-5.4	0.7±5.9	11	-31	-13±8.8	-2.7
	0.49	1.29±0.42	2.00	1.21	1.69±0.38	2.52	-8.8	1.3±6.8	14	-17	-1.5±11	20
FR	0.65	1.42±0.48	2.35	0.63	2.01±0.76	3.56	-9.9	5.1±5.3	15	-47	-10±14	15
	0.65	1.18±0.43	1.80	0.97	1.69±0.71	3.01	-9.9	4.8±6.3	11	-19	-12±8.4	8.6
	0.53	1.17±0.39	1.69	0.75	1.34±0.47	2.63	-6.2	6.4±5.5	14	-16	-4.9±8.7	13
AL	0.69	1.83±0.65	3.38	1.08	2.46±0.94	5.14	-7.2	5.8±6.7	20	-51	5.2±13	21
	0.69	1.51±0.65	2.76	1.44	2.18±0.77	3.73	-1.3	-6.8±5.0	12	-9.0	-3.5±5.6	9.5
	0.66	1.53±0.52	2.31	1.08	1.65±0.43	2.85	-2.7	8.1±6.1	18	-13	0.4±7.8	16
EA	0.26	2.15±0.86	4.30	0.91	2.50±0.99	5.29	-8.3	7.4±6.2	25	-37	-2.4±12	14
	0.26	1.73±0.79	2.64	1.38	2.23±0.90	4.22	-8.3	7.0±6.9	14	-22	-1.8±11	14
	0.24	1.71±0.73	2.68	0.99	1.54±0.45	2.32	-4.1	10±6.6	21	-4.6	4.6±6.5	15
BI	-0.05	1.17±0.46	2.50	-0.00	1.44±0.64	2.60	-3.6	6.9±5.4	18	-21	-3.6±9.2	20
	0.45	1.03±0.34	1.37	0.61	1.21±0.54	2.31	-3.6	4.8±5.1	13	-14	-4.6±7.1	6.9
	0.41	1.04±0.30	1.40	0.56	1.10±0.44	2.03	-2.9	5.4±5.7	14	-8.1	-0.6±5.1	8.8
ME	0.51	1.75±0.64	3.10	0.47	2.04±0.82	4.17	-9.4	8.8±6.7	21	-36	-1.9±14	25
	0.51	1.40±0.56	2.11	1.04	1.73±0.78	3.52	-9.4	5.6±8.1	15	-13	-0.7±9.6	18
	0.54	1.40±0.50	2.06	0.84	1.37±0.46	2.65	-5.8	8.8±8.0	19	-6.0	2.9±8.0	22
SC	-0.35	2.50±0.96	4.74	-0.02	2.04±0.77	3.50	-1.5	7.8±5.7	2	-8.4	4.6±7.3	18
	1.28	2.14±0.44	2.70	0.91	1.78±0.67	3.14	-1.5	3.8±2.7	8.5	-3.8	6.1±7.6	16
	1.15	2.22±0.44	3.00	1.02	1.74±0.50	2.73	-0.5	5.7±3.6	12	0.4	8.0±4.0	14

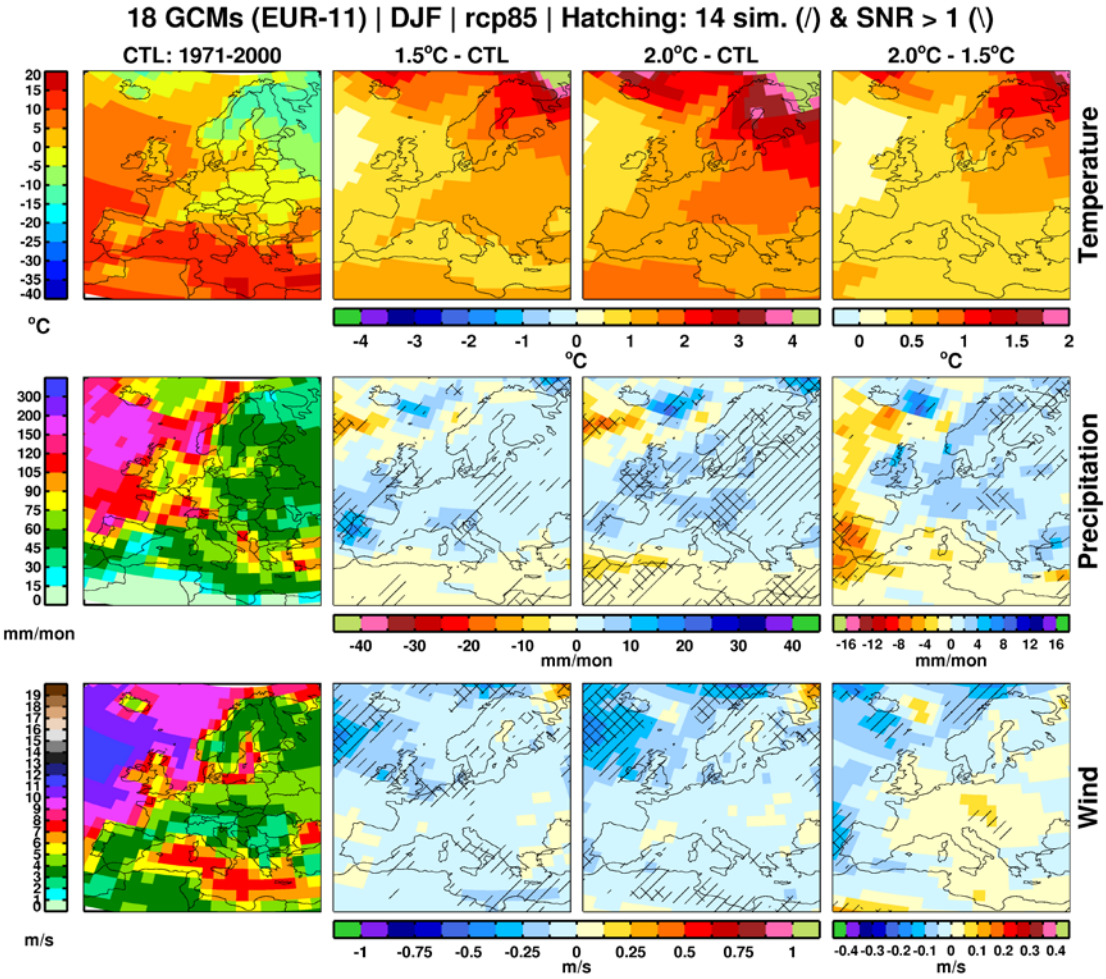

Figure S1. Winter (DJF) 2m-temperature (top), precipitation (middle) and 10m-wind speed (lower) in the control period (left), its change at SWL1.5 (second column) and SWL2 (third column), and the difference between the change at SWL2 and SWL1.5 (rightmost column). Hatching in the climate change signal for precipitation and wind speed represents areas where at least 14 of the 18 ensemble members agree on the sign of change (for temperature this is always the case). Cross-hatching indicate that there is agreement on sign of change and that the signal-to-noise ratio is larger than 1. Hatching in the rightmost plots indicates that changes at SWL2 are larger than those at SWL1.5 in at least 14 of the 18 model simulations. The figure is comparable to Figure 4 but the data are from the GCMs that have been downscaled by the RCMs in the paper.

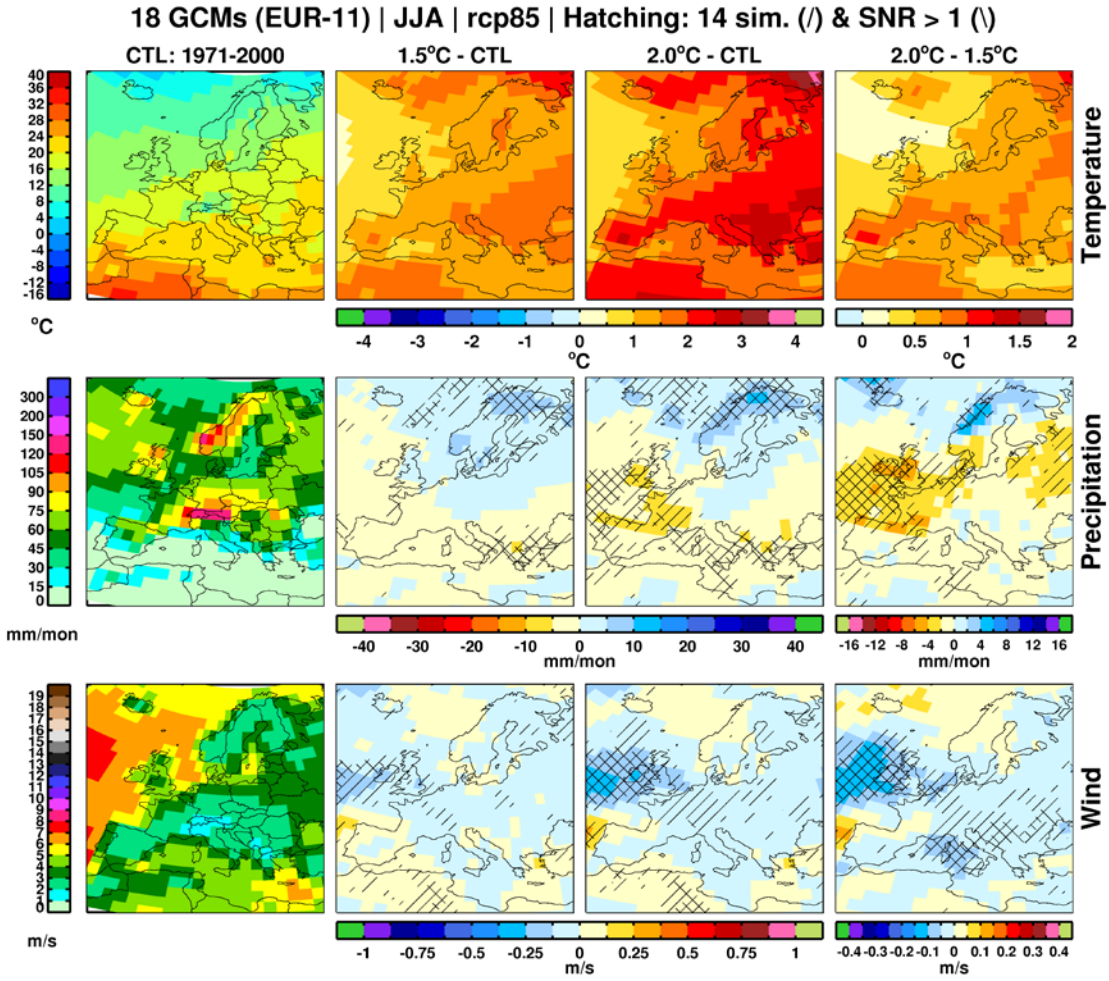

Figure S2. Summer (JJA) 2m-temperature (top), precipitation (middle) and 10m-wind speed (lower) in the control period (left), its change at SWL1.5 (second column) and SWL2 (third column), and the difference between the change at SWL2 and SWL1.5 (rightmost column). Hatching in the climate change signal for precipitation and wind speed represents areas where at least 14 of the 18 ensemble members agree on the sign of change (for temperature this is always the case). Cross-hatching indicate that there is agreement on sign of change and that the signal-to-noise ratio is larger than 1. Hatching in the rightmost plots indicates that changes at SWL2 are larger than those at SWL1.5 in at least 14 of the 18 model simulations. The figure is comparable to Figure 5 but the data are from the GCMs that have been downscaled by the RCMs in the paper.