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Supplement of

European daily precipitation according to EURO-CORDEX regional climate models (RCMs) and high-resolution global climate models (GCMs) from the High-Resolution Model Intercomparison Project (HighResMIP)

Marie-Estelle Demory et al.

Correspondence to: Marie-Estelle Demory (marie-estelle.demory@env.ethz.ch)

Additional material

CMIP5 GCM	run	EURO-CORDEX RCM	version	Resolution	reduced
CNRM-CERFACS-CNRM-CM5	r1	CLMcom-CCLM4-8-17	v1	0.11	1
ICHEC-EC-EARTH	r12	CLMcom-CCLM4-8-17	v1	0.11	1
MOHC-HadGEM2-ES	r1	CLMcom-CCLM4-8-17	v1	0.11	1
MPI-M-MPI-ESM-LR	r1	CLMcom-CCLM4-8-17	v1	0.11	1
MPI-M-MPI-ESM-LR	r1	CLMcom-CCLM4-8-17	v1	0.44	1
CNRM-CERFACS-CNRM-CM5	r1	CLMcom-CCLM5-0-6	v1	0.44	1
ICHEC-EC-EARTH	r12	CLMcom-CCLM5-0-6	v1	0.44	1
MIROC-MIROC5	r1	CLMcom-CCLM5-0-6	v1	0.44	
MOHC-HadGEM2-ES	r1	CLMcom-CCLM5-0-6	v1	0.44	1
MPI-M-MPI-ESM-LR	r1	CLMcom-CCLM5-0-6	v1	0.44	1
ICHEC-EC-EARTH	r12	CLMcom-ETH-COSMO-crCLIM-v1-1	v1	0.11	1
MPI-M-MPI-ESM-LR	r1	CLMcom-ETH-COSMO-crCLIM-v1-1	v1	0.11	1
NCC-NorESM1-M	r1	CLMcom-ETH-COSMO-crCLIM-v1-1	v1	0.11	
CNRM-CERFACS-CNRM-CM5	r1	CNRM-ALADIN53	v1	0.11	1
CNRM-CERFACS-CNRM-CM5	r1	CNRM-ALADIN53	v1	0.44	1
CNRM-CERFACS-CNRM-CM5	r1	CNRM-ALADIN63	v2	0.11	1
MOHC-HadGEM2-ES	r1	CNRM-ALADIN63	v1	0.11	1
MPI-M-MPI-ESM-LR	r1	CNRM-ALADIN63	v1	0.11	1
CNRM-CERFACS-CNRM-CM5	r1	DMI-HIRHAM5	v1	0.11	1
CNRM-CERFACS-CNRM-CM5	r1	DMI-HIRHAM5	v2	0.11	1
ICHEC-EC-EARTH	r1	DMI-HIRHAM5	v1	0.11	1
ICHEC-EC-EARTH	r3	DMI-HIRHAM5	v2	0.11	1
ICHEC-EC-EARTH	r3	DMI-HIRHAM5	v1	0.44	1
MOHC-HadGEM2-ES	r1	DMI-HIRHAM5	v1	0.11	1
MOHC-HadGEM2-ES	r1	DMI-HIRHAM5	v2	0.11	1
MPI-M-MPI-ESM-LR	r1	DMI-HIRHAM5	v1	0.11	1
NCC-NorESM1-M	r1	DMI-HIRHAM5	v2	0.11	
NCC-NorESM1-M	r1	DMI-HIRHAM5	v3	0.11	
IPSL-IPSL-CM5A-LR	r1	GERICS-REMO2015	v1	0.11	
MPI-M-MPI-ESM-LR	r3	GERICS-REMO2015	v1	0.11	1

NCC-NorESM1-M	r1	GERICS-REMO2015	v1	0.11	
NOAA-GFDL-GFDL-ESM2G	r1	GERICS-REMO2015	v1	0.11	
MOHC-HadGEM2-ES	r1	ICTP-RegCM4-3	v1	0.44	1
MOHC-HadGEM2-ES	r1	ICTP-RegCM4-6	v1	0.11	1
MPI-M-MPI-ESM-LR	r1	ICTP-RegCM4-6	v1	0.11	1
IPSL-IPSL-CM5A-MR	r1	IPSL-INERIS-WRF331F	v1	0.44	
CNRM-CERFACS-CNRM-CM5	r1	IPSL-WRF381P	v2	0.11	1
IPSL-IPSL-CM5A-MR	r1	IPSL-WRF381P	v1	0.11	
MOHC-HadGEM2-ES	r1	IPSL-WRF381P	v1	0.11	1
NCC-NorESM1-M	r1	IPSL-WRF381P	v1	0.11	
CNRM-CERFACS-CNRM-CM5	r1	KNMI-RACMO22E	v2	0.11	1
ICHEC-EC-EARTH	r1	KNMI-RACMO22E	v1	0.44	1
ICHEC-EC-EARTH	r1	KNMI-RACMO22E	v1	0.11	1
IPSL-IPSL-CM5A-MR	r1	KNMI-RACMO22E	v1	0.11	
MOHC-HadGEM2-ES	r1	KNMI-RACMO22E	v2	0.11	1
MOHC-HadGEM2-ES	r1	KNMI-RACMO22E	v2	0.44	1
MPI-M-MPI-ESM-LR	r1	KNMI-RACMO22E	v1	0.11	1
NCC-NorESM1-M	r1	KNMI-RACMO22E	v1	0.11	
ICHEC-EC-EARTH	r12	MOHC-HadREM3-GA7-05	v1	0.11	1
MOHC-HadGEM2-ES	r1	MOHC-HadREM3-GA7-05	v1	0.11	1
MPI-M-MPI-ESM-LR	r1	MPI-CSC-REMO2009	v1	0.11	1
MPI-M-MPI-ESM-LR	r1	MPI-CSC-REMO2009	v1	0.44	1
ICHEC-EC-EARTH	r1	NUIM-WRF341E	v1	0.44	1
CNRM-CERFACS-CNRM-CM5	r1	RMIB-UGent-ALARO-0	v1	0.11	1
CNRM-CERFACS-CNRM-CM5	r1	RMIB-UGent-ALARO-0	v1	0.44	1
CCCma-CanESM2	r1	SMHI-RCA4	v1	0.44	
CNRM-CERFACS-CNRM-CM5	r1	SMHI-RCA4	v1	0.11	1
CNRM-CERFACS-CNRM-CM5	r1	SMHI-RCA4	v1	0.44	1
CSIRO-QCCCE-CSIRO-Mk3-6-0	r1	SMHI-RCA4	v1	0.44	
ICHEC-EC-EARTH	r12	SMHI-RCA4	v1	0.44	1
ICHEC-EC-EARTH	r3	SMHI-RCA4	v1	0.11	1
IPSL-IPSL-CM5A-MR	r1	SMHI-RCA4	v1	0.11	
IPSL-IPSL-CM5A-MR	r1	SMHI-RCA4	v1	0.44	

MIROC-MIROC5	r1	SMHI-RCA4	v1	0.44	
MOHC-HadGEM2-ES	r1	SMHI-RCA4	v1	0.11	1
MOHC-HadGEM2-ES	r1	SMHI-RCA4	v1	0.44	1
MPI-M-MPI-ESM-LR	r1	SMHI-RCA4	v1	0.44	1
MPI-M-MPI-ESM-LR	r1	SMHI-RCA4	v1a	0.11	1
NCC-NorESM1-M	r1	SMHI-RCA4	v1	0.11	
NCC-NorESM1-M	r1	SMHI-RCA4	v1	0.44	
NOAA-GFDL-GFDL-ESM2M	r1	SMHI-RCA4	v1	0.44	
CCCma-CanESM2	r1	UCAN-WRF341I	v2	0.44	

Table S1: Full list of EURO-CORDEX simulation data used, including institutions and detailed RCM model version. The last column indicates (1) those simulations used in the reduced ensemble analysis.

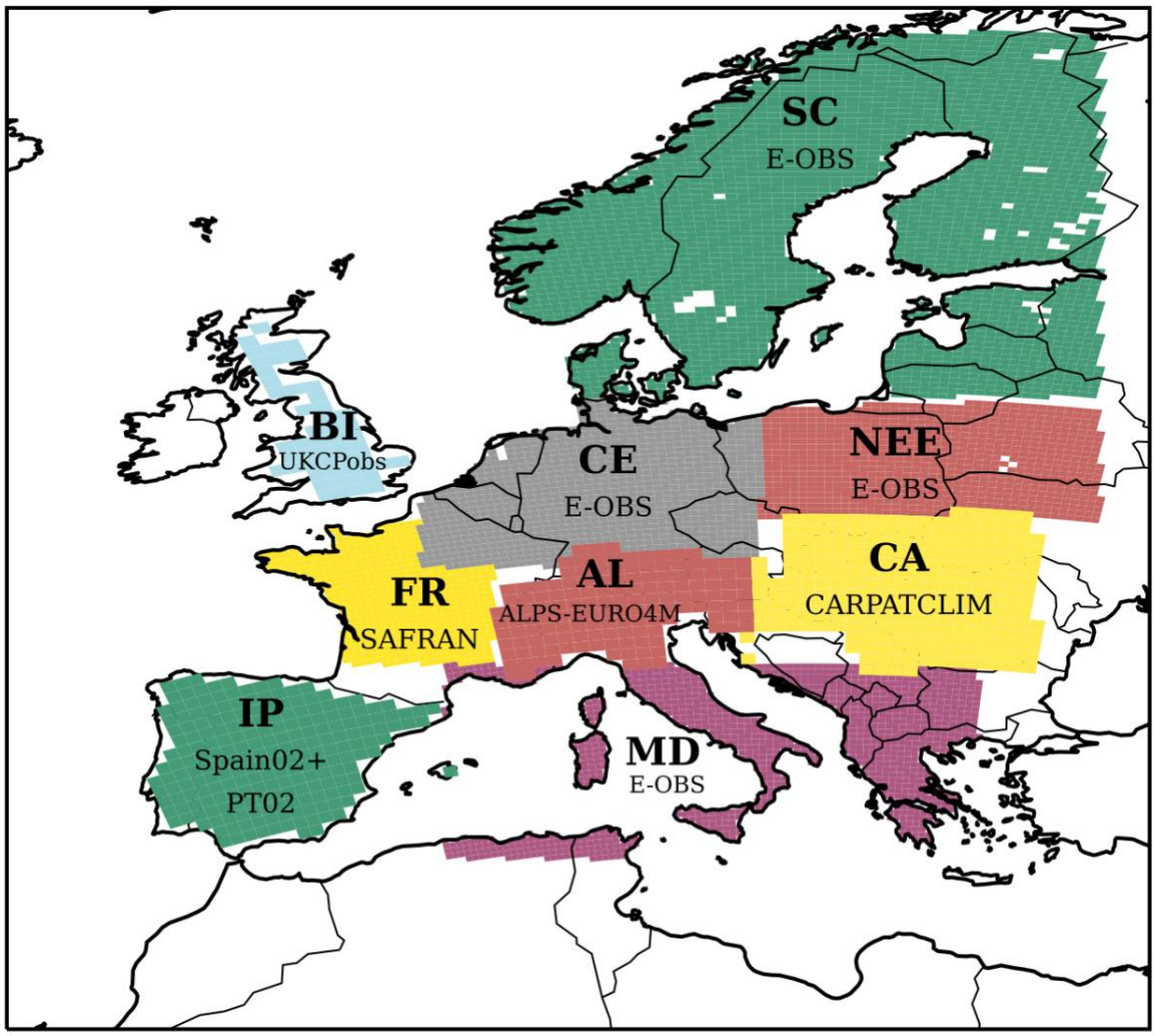

Figure S1: map showing the European regions used in this study. For the British Isles (BI), Iberian Peninsula (IP), France (FR), the Alps (AL) and the Carpathians (CA), we used high-resolution gridded datasets (Table 3). The regions are therefore defined following the observations coverage. For the other regions, we used E-OBS and defined the regions following the PRUDENCE regions.

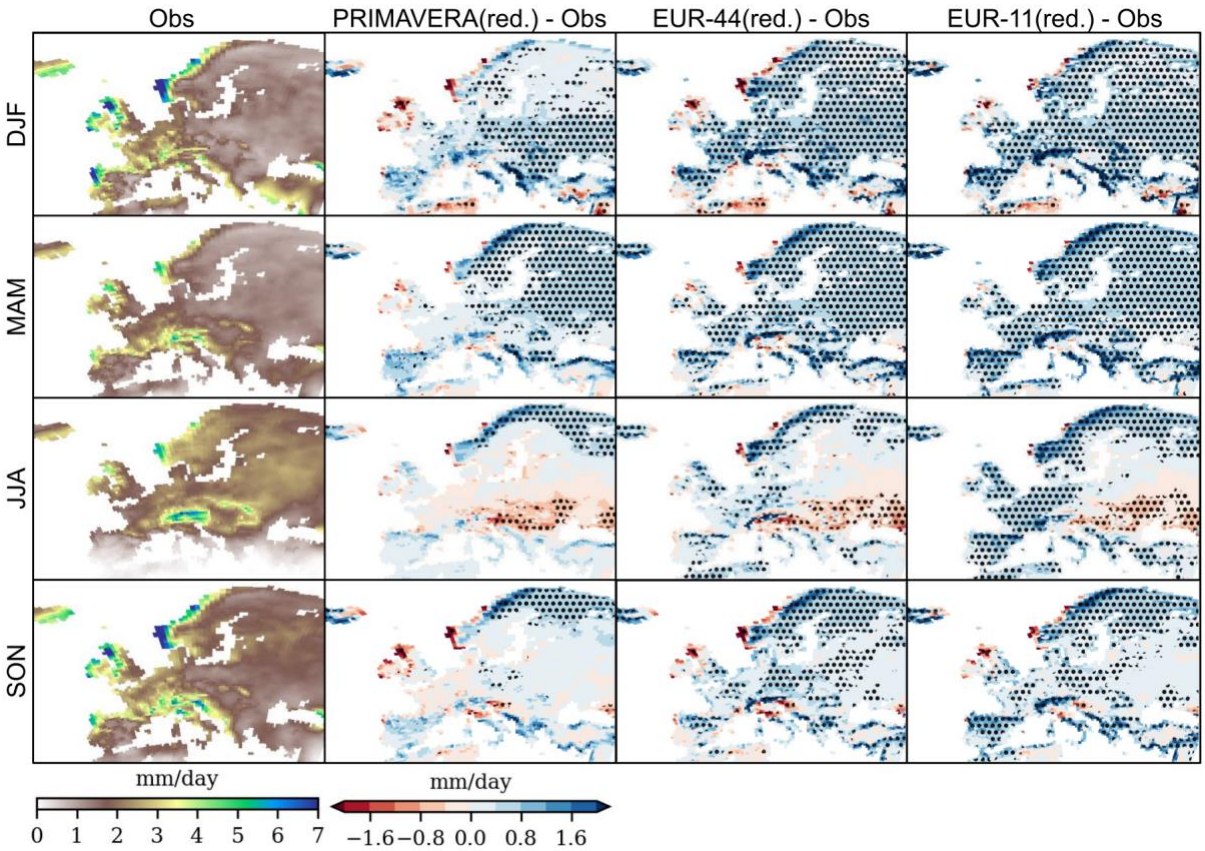

Figure S2: As Fig. 4 but for the reduced ensembles (common GCM families contributing to PRIMAVERA and also used to drive EURO-CORDEX RCMs).

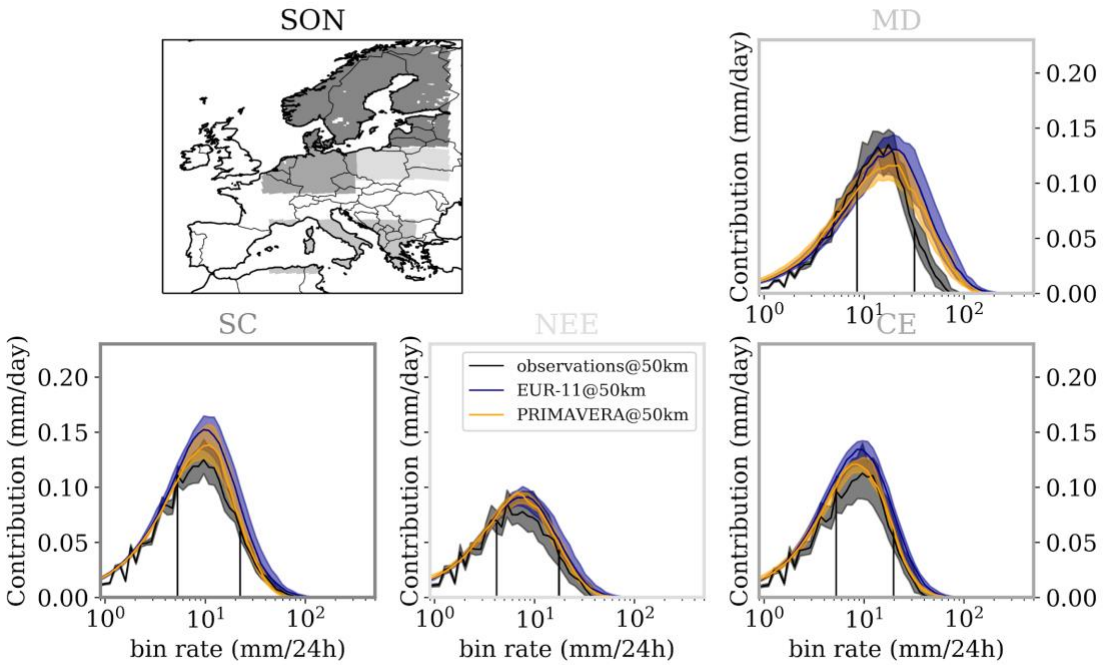

Figure S3: Precipitation contribution (frequency x bin rate) per precipitation rate in autumn (SON) over the Mediterranean (MD), Scandinavia (SC), North East Europe (NEE), Central Europe (CE) for observations (black), EUR-11 (blue), and PRIMAVERA (orange). All data are shown on the EUR-44 grid.

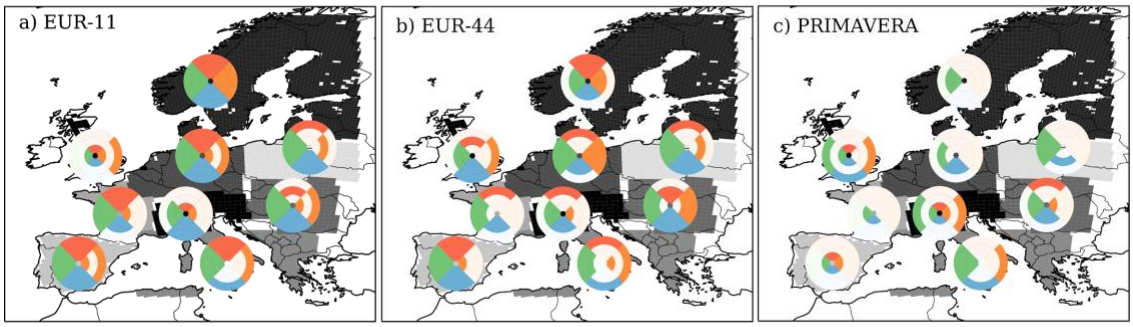

Figure S4: Comparison of each individual ensemble against the observations. A coloured pie section means that the ensemble is statistically different from the observations for this season and intensity interval (see Fig. 1 for full explanation).

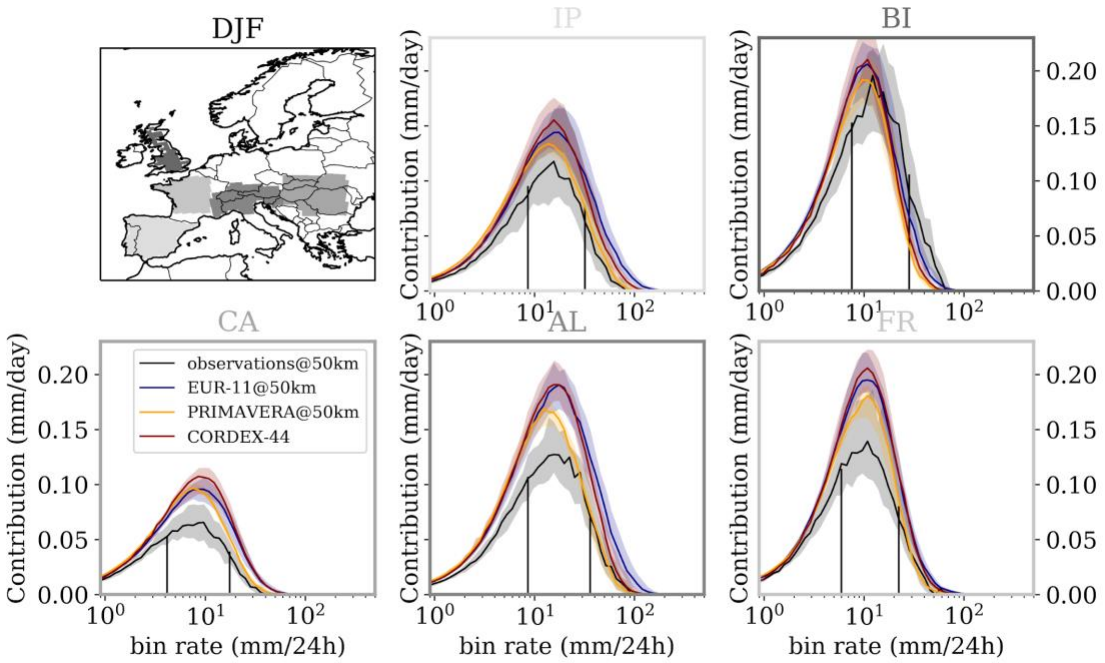

Figure S5: Precipitation contribution (frequency x bin rate) per precipitation rate in DJF over the Iberian Peninsula (IP), the British Isles (BI), the Carpathian region (CA), the Alps (AL), and France (FR), for observations (black), PRIMAVERA (yellow), EUR-44 (red) and EUR-11 (blue). All data are shown on the EUR-44 grid.

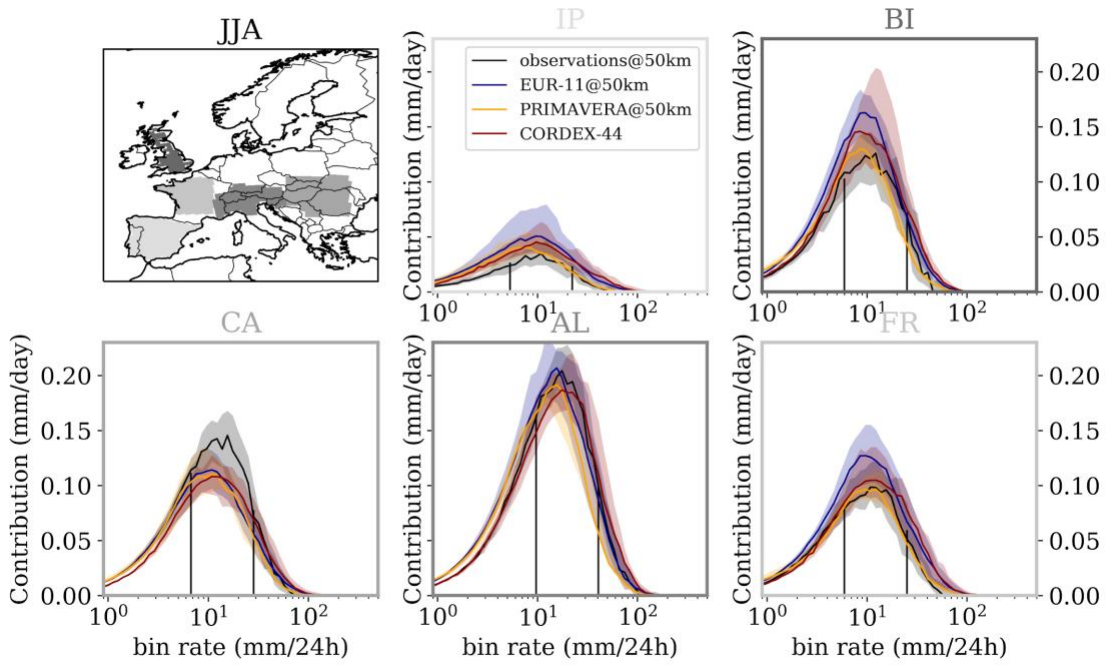

Figure S6: Same as Fig. S5 for JJA.

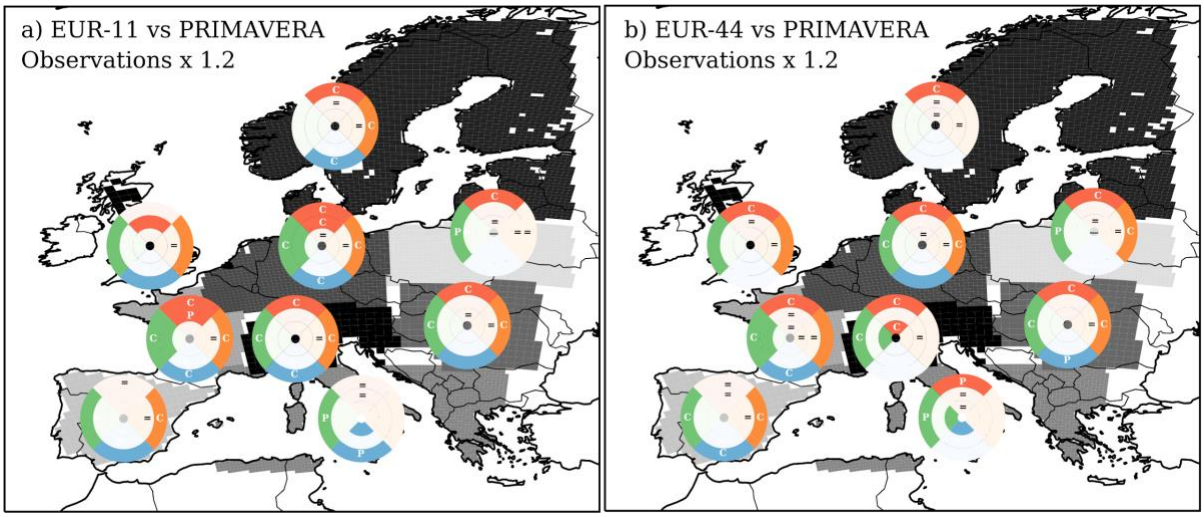

Figure S7: Same as Fig. 8a and 8c, using observations scaled by a factor of 1.2.

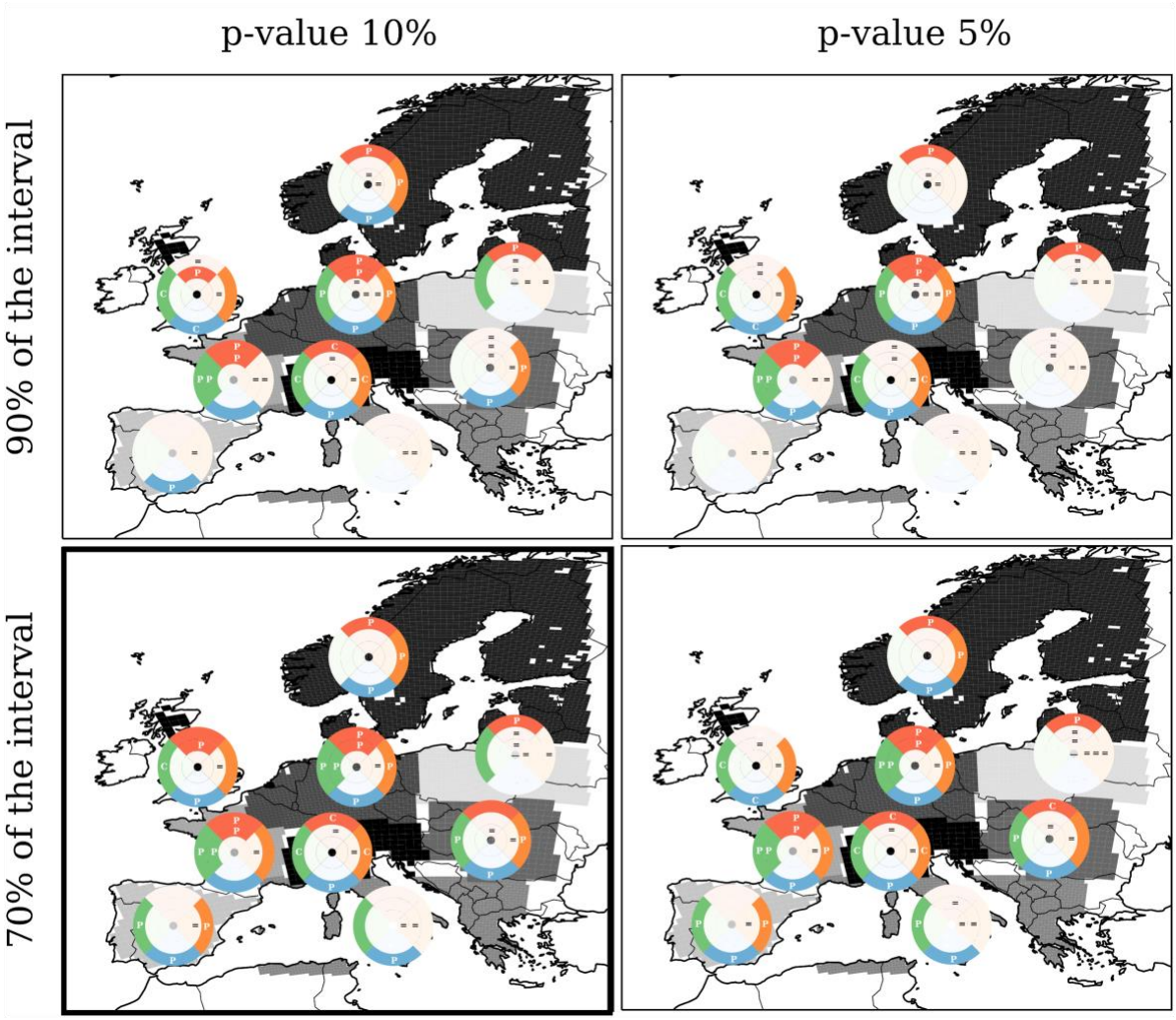

Figure S8: Pie plots for EUR-11 vs PRIMAVERA for different thresholds: the pie section is coloured if the two ensembles are different at the 10% (left) or 5% (right) significance level using a Student's t-test on either 70% (bottom) or 90% (top) of the interval. If the ensembles are not significantly different (white section), an "=" is placed if both ensembles do significantly agree with the observations on 10% of the interval (top) or 30% of the interval (bottom). The default figure used in the main article is in the bottom left panel.