

Supplementary Materials

Table S1. Weather stations of the surface synoptic observations network (SYNOP) used in this study with their true location (latitude and longitude), their true altitude (z), and location and altitude of the model grid cell containing the location of the weather station. Light grey accounts for $z < 100\text{m}$, moderate grey for $100\text{m} < z < 300\text{m}$ and dark grey for $z > 300\text{m}$.

Station name	real Latitude	real Longitude	real Altitude	MAR Latitude	MAR Longitude	MAR Altitude
Ostende	51,20	2,87	0	51,20	2,86	0
Koksijde	51,08	2,65	6	51,11	2,72	0
Deurne	51,20	4,47	7	51,21	4,44	10
Gent	51,08	3,70	8	51,12	3,73	6
Beitem	50,90	3,12	25	50,93	3,16	21
Schaffen	51,00	5,07	30	51,03	5,16	30
Munte	50,94	3,74	50	50,94	3,73	29
Zaventem	50,88	4,52	55	50,85	4,58	70
Chievres	50,58	3,83	60	50,58	3,73	59
Uccle	50,80	4,36	101	50,76	4,30	72
Beauvechain	50,75	4,77	102	50,76	4,73	96
Ernage	50,59	4,67	150	50,58	4,72	156
Bierset	50,64	5,41	170	50,66	5,44	149
Charleroi	50,46	4,45	187	50,40	4,44	170
Florennes	50,24	4,65	279	50,22	4,58	246
Spa	50,48	5,91	479	50,48	6,00	509
SaintHubert	50,04	5,41	557	50,03	5,42	562
Elsenborne	50,49	6,18	570	50,47	6,28	645
MontRigi	50,51	6,07	673	50,48	6,14	673

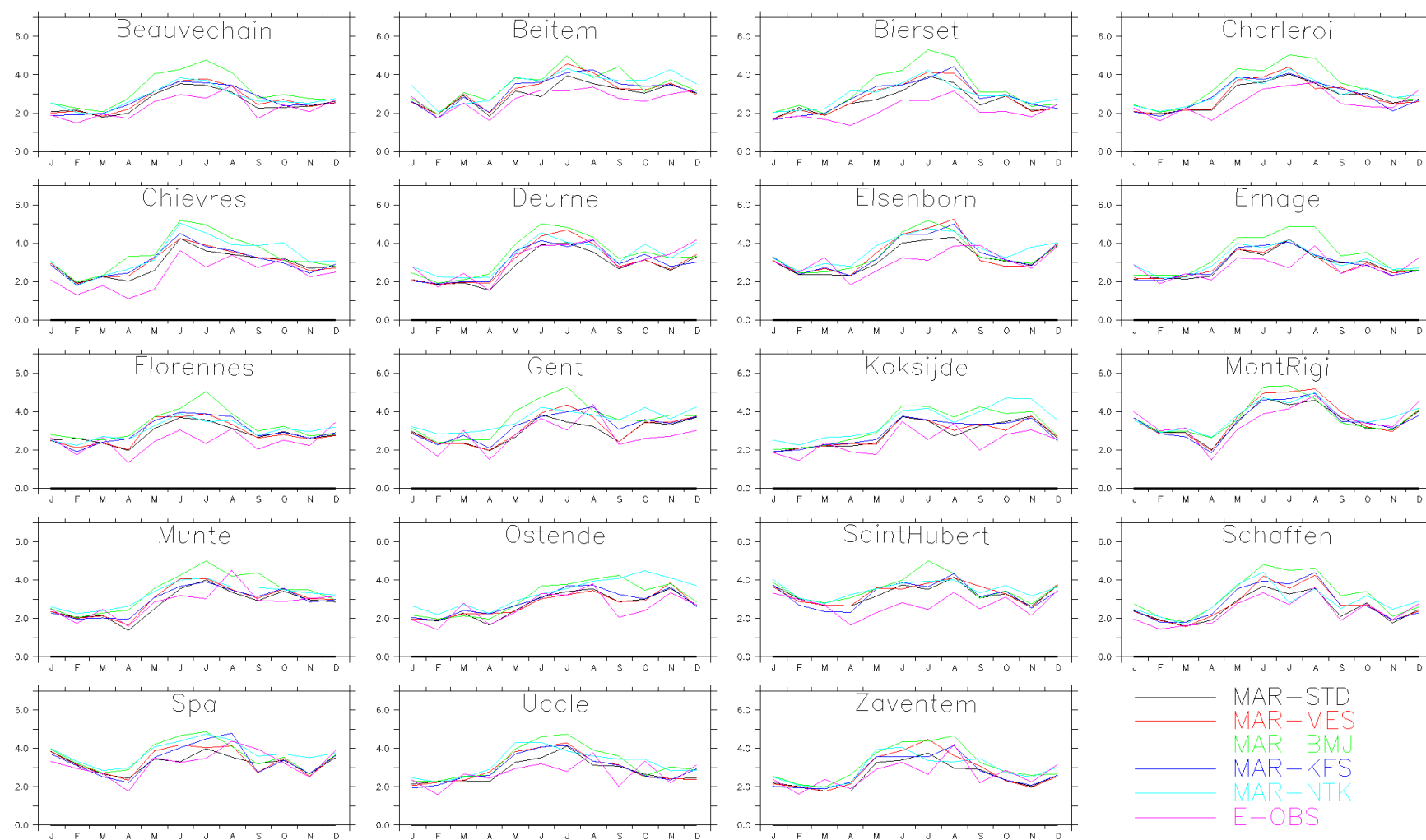


Figure S1. Monthly mean NRMSE (Normalized Root Mean Square Error) of daily precipitation simulated by MAR for each experiment and provided by E-OBS with respect to SYNOP observations (in mm/day).

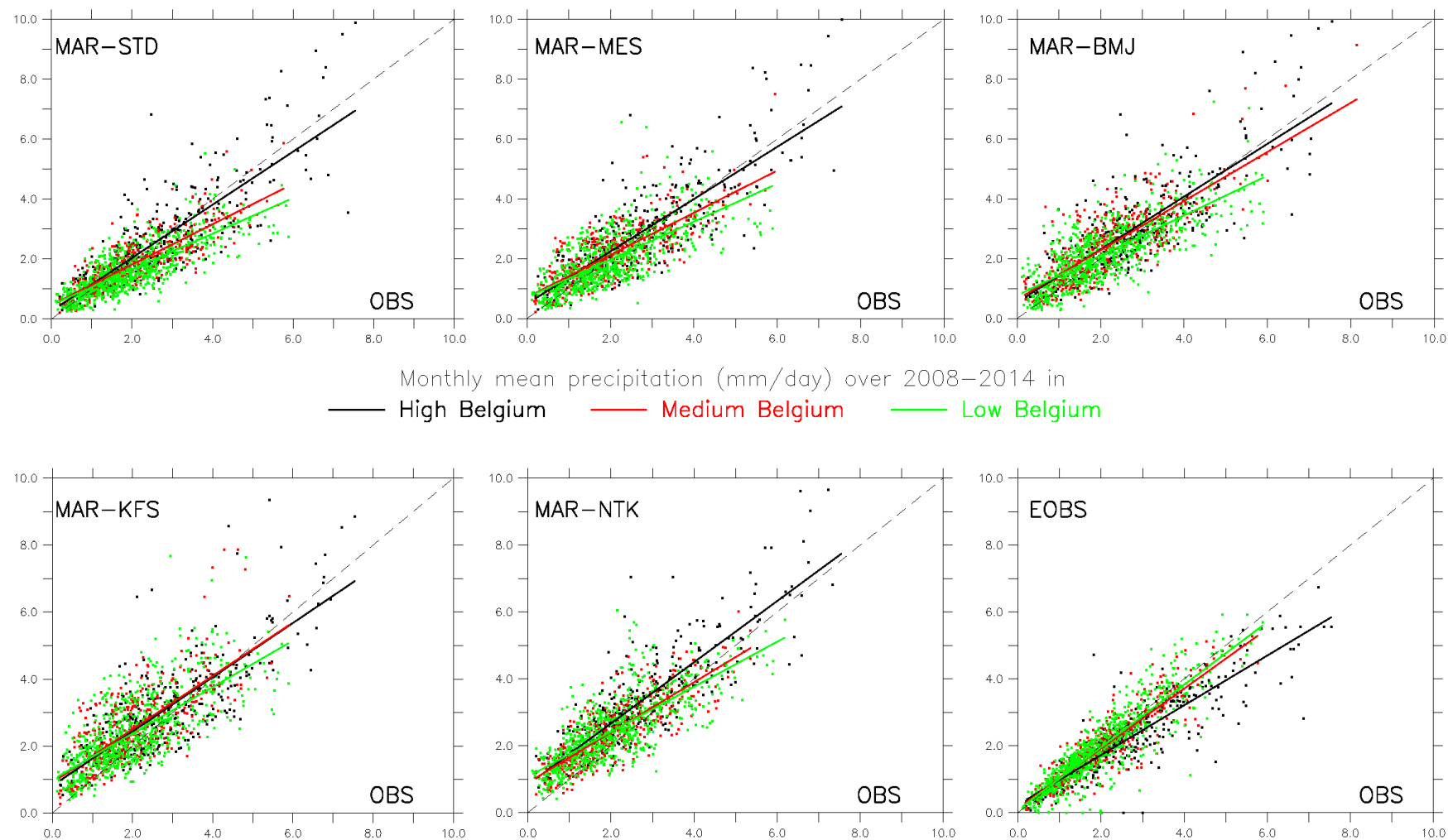


Figure S2. Monthly mean of daily precipitation simulated by MAR for each experiment and provided by E-OBS situated in the y-axis compared to the SYNOP observation situated in the x-axis (in mm/day).

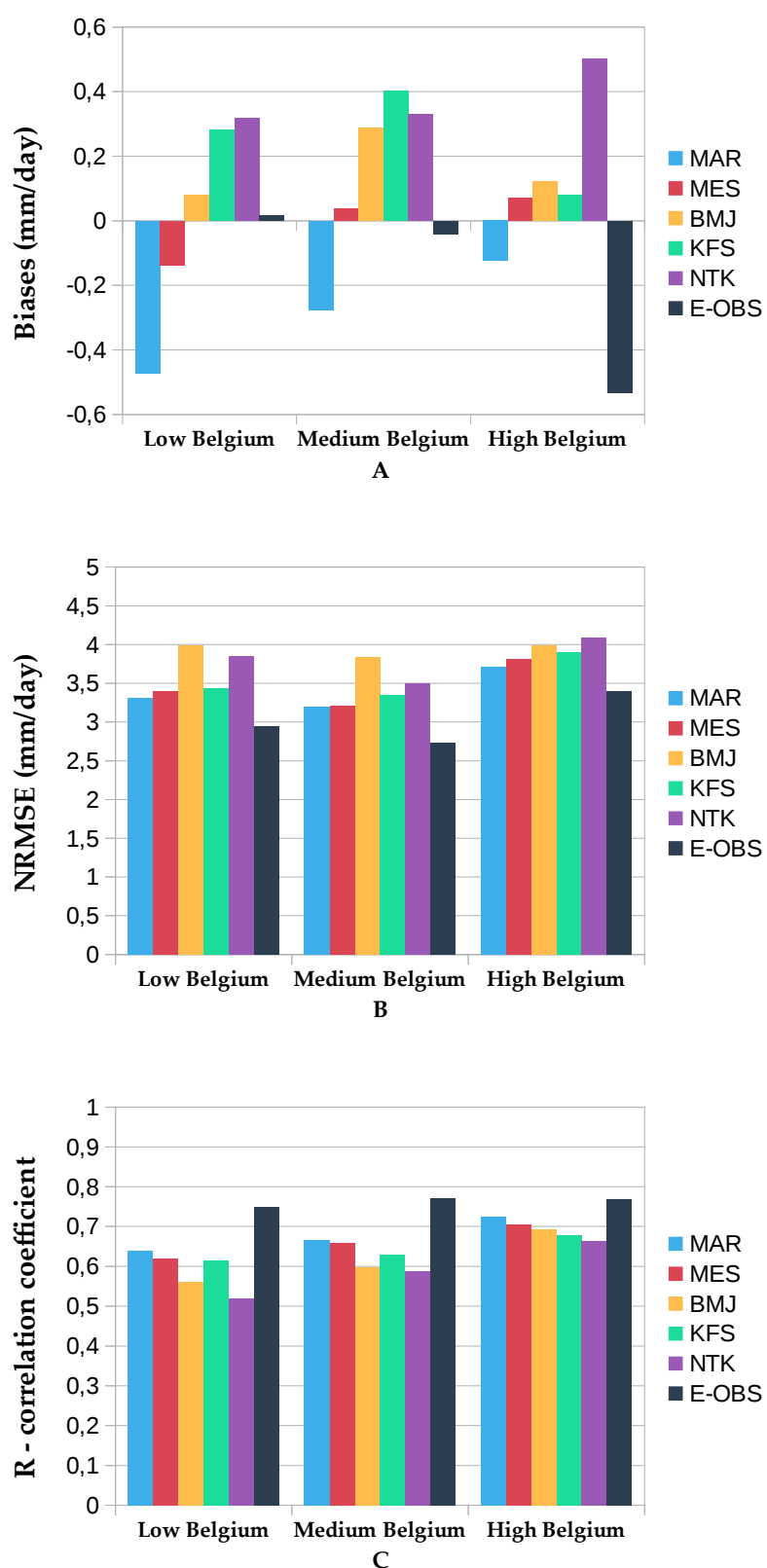


Figure S3. Regional averages of biases (A), NRMSE (B) and correlation coefficient (C) for each experiment and provided by E-OBS with respect to SYNOP observations.

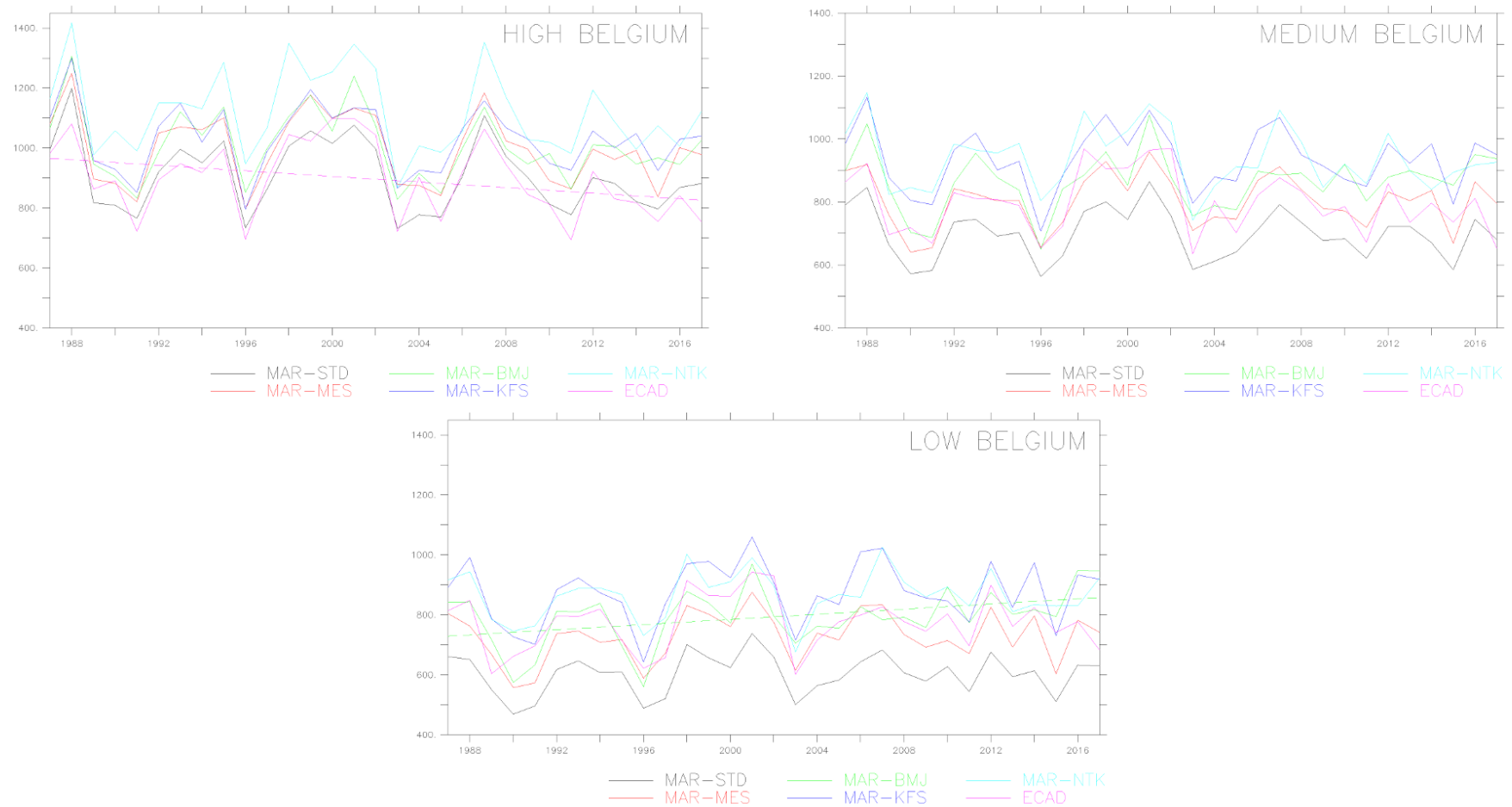


Figure S4. Evolution of annual precipitation in High, Medium and Low Belgium (in mm/year) simulated by MAR for each model experiment and provided by E-OBS. The significant trends are plotted in dotted lines. The delimitation of High ($z > 300$ m), Medium ($100 \text{ m} < z < 300$ m) and Low Belgium ($z < 100$ m) areas are based on the MAR 10-km (resp. E-OBS 0.22°) topography.

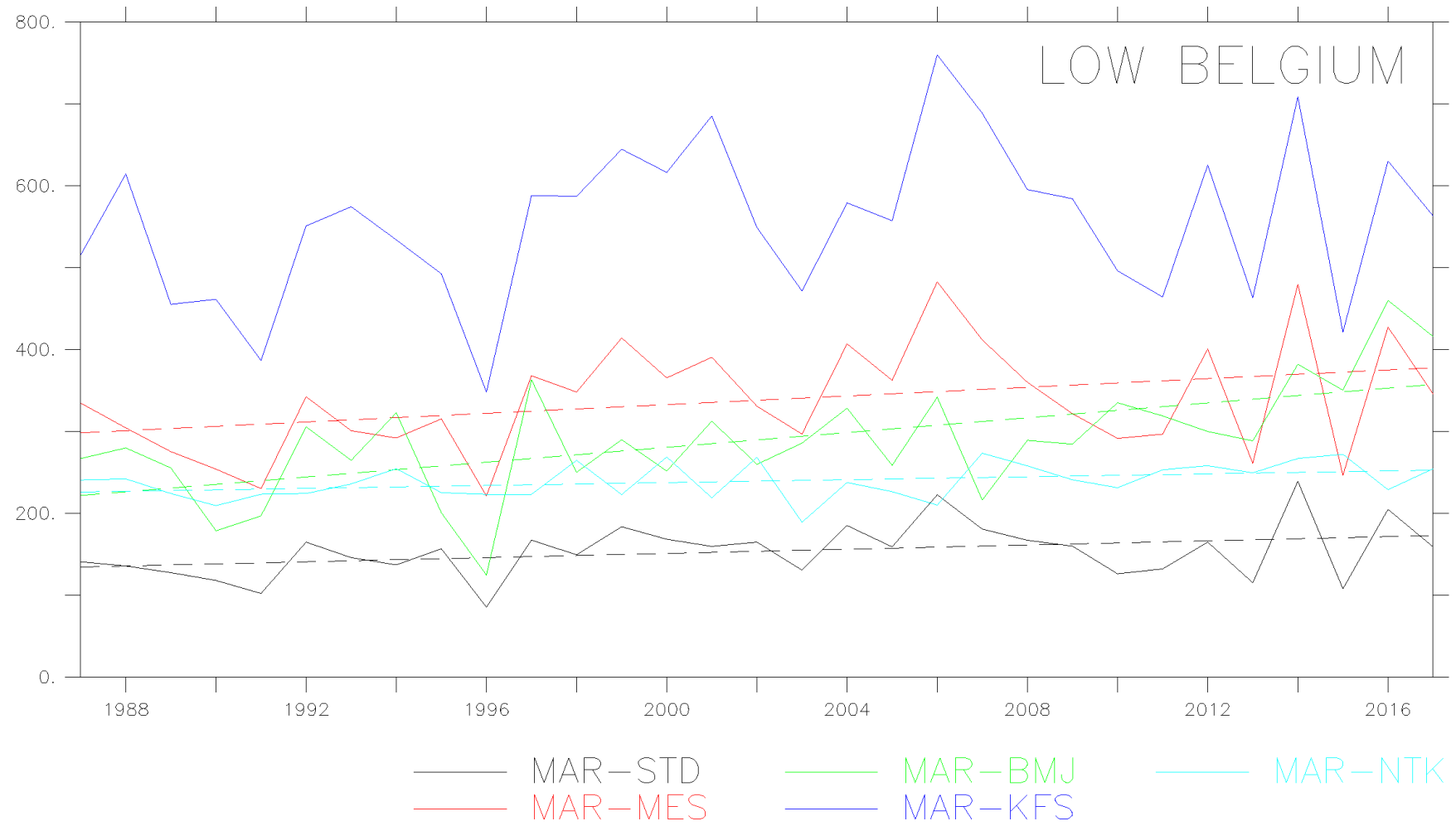


Figure S5. Idem as Figure S3 but for convective precipitation over Low Belgium.

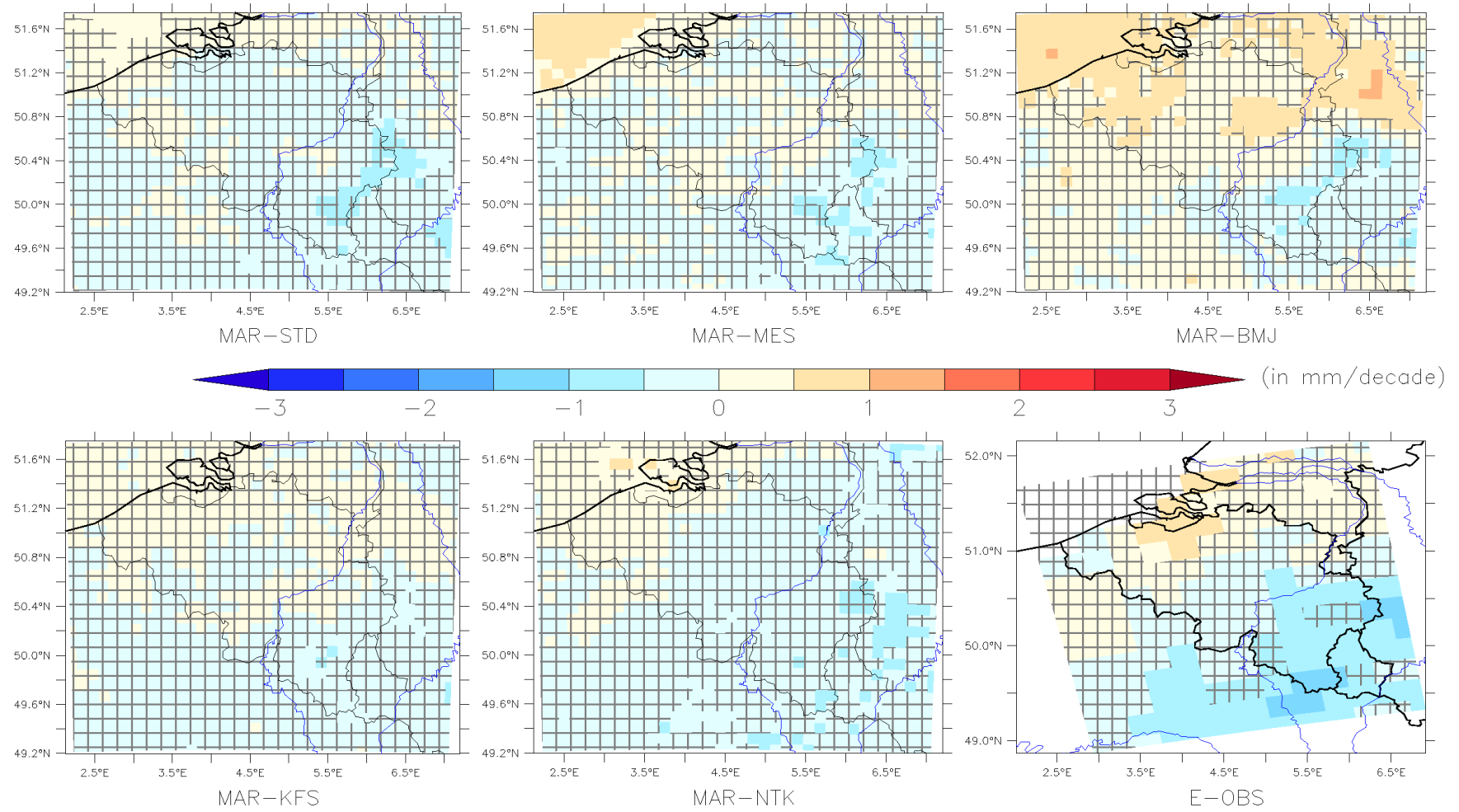


Figure S6. Trends over 1987-2017 of the yearly 95th percentile of daily precipitation simulated by MAR for each experiment and provided by E-OBS in mm/decade. Crosshatched pixels indicate statistically non-significant trends.

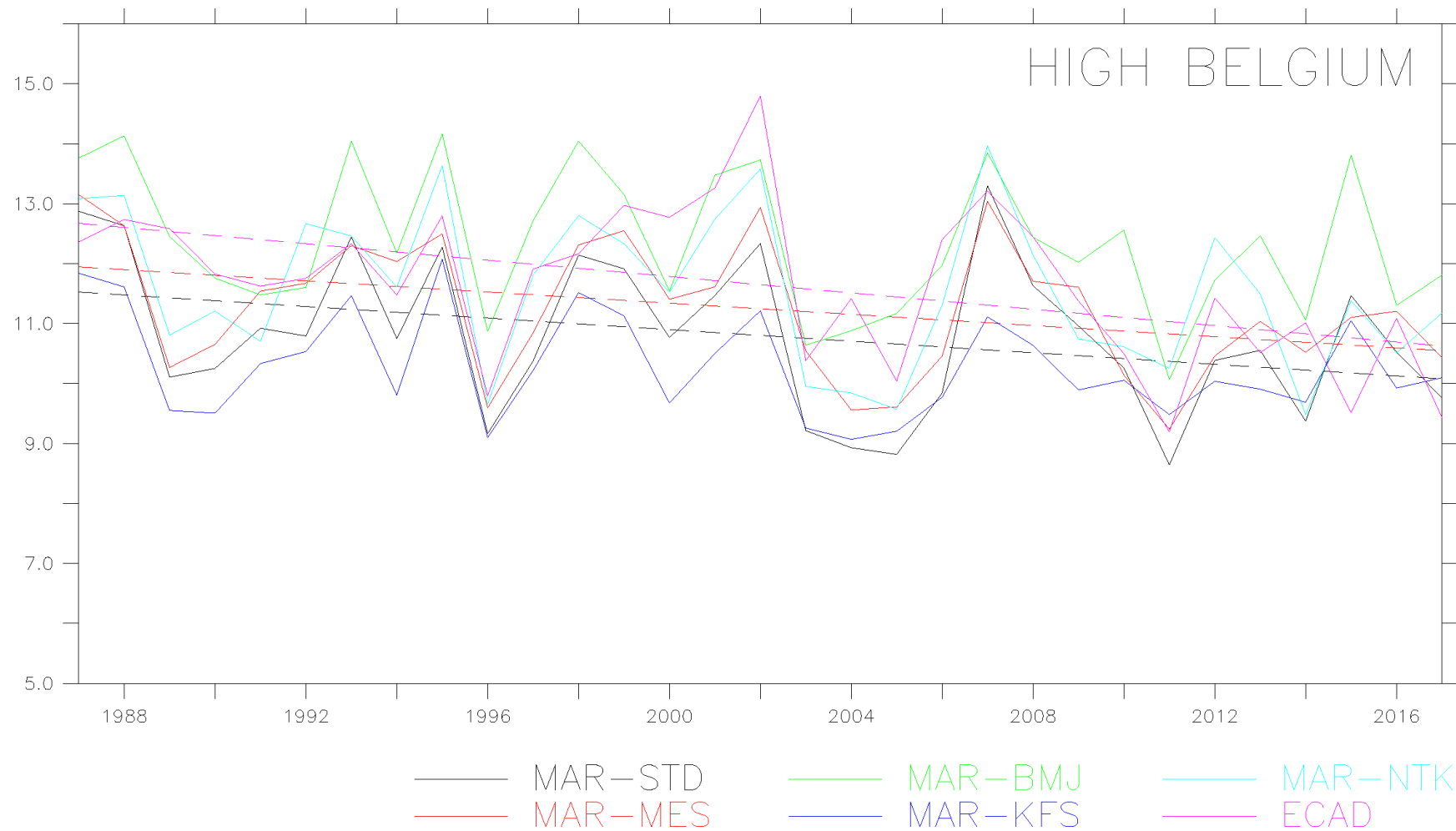


Figure S7. Idem as Figure S3 but for the 95th percentile of precipitation over High Belgium.

