

Supplementary material to ‘The impact of differences in large-scale circulation output from climate models on the regional modeling of ozone and PM’

Statistical evaluation

Table S1a. Annual average behavior of temperatures, 1989-2009. Standard deviations represent the day to day variability

station	RLE_ERA				RLE_ECHAM				RLE_MIROC			
	# T>25	# T<5	T _{max}	std	# T>25 C	# T<5 C	T _{max}	Std	# T>25	# T<5	T _{max}	std
Vredepeel	28	54	13.63	7.91	16	46	13.12	7.03	30	44	14.12	7.72
Sniezka	30	105	11.89	9.43	17	96	11.55	8.54	29	101	12.17	9.12
Melpitz	37	81	13.13	9.09	20	73	12.62	8.2	39	74	13.59	8.89
Paris	37	41	14.63	7.88	25	35	14.05	7.07	29	33	14.57	7.33
Barcelona	126	1	21.37	8.46	124	1	21.20	8.21	99	1	20.08	6.99
Madrid	109	6	19.21	9.30	105	7	18.57	9.35	76	4	17.43	7.86
Montelibretti	63	0	18.27	5.90	19	0	17.19	5.00	55	0	18.24	5.49

Table 1b. Annual average behavior of rain 1989-2009. Wet days are days with more than 0.5 mm rain.

station	RLE_ERA		RLE_ECHAM		RLE_MIROC	
	wet days	yearly rain (mm)	wet days	yearly rain (mm)	wet days	yearly rain (mm)
Vredepeel	196	748.25	227	956.3	199	751.9
Sniezka	184	653.35	212	803.0	198	708.1
Melpitz DE44	168	532.9	194	668.0	175	584.0
Paris	179	689.9	212	872.4	201	759.2
Barcelona	71	335.8	80	383.2	93	452.6
Madrid	93	430.7	124	675.3	116	543.9
Montelibretti	98	481.8	109	595.0	137	803.0

Table S1c. Annual averages wind speed 1989-2009

station	RLE_ERA		RLE_ECHAM		RLE_MIROC	
	#v<2m/s	average v	#v<2m/s	average v	#v<2m/s	average v
Vredepeel	40	4.0	32	4.30	44	3.85
Sniezka	55	3.2	48	3.40	66	3.05
Melpitz DE44	34	3.99	28	4.24	41	3.75
Paris	26	3.87	23	4.16	31	3.83
Barcelona	123	2.84	101	3.14	125	2.92
Madrid	64	3.04	52	3.41	67	3.14
Montelibretti	34	3.86	30	4.35	40	4.01

TableS 2a. Average behavior of temperature, 2041-2060

station	RLE_ECHAM				RLE_MIROC			
	# T>25 C	# T<5 C	T _{max}	std	# T>25 C	# T<5 C	T _{max}	std
Vredepeel	25	33	14.26	7.08	55	21	16.28	7.66
Sniezka	26	76	12.78	8.37	53	65	14.44	8.98
Melpitz	27	53	13.77	7.96	65	42	15.69	8.72
Paris	38	21	15.23	7.30	65	12	17.02	7.46
Barcelona	148	0	22.92	8.63	145	0	23.16	7.53

Madrid	129	2	20.72	10.01	123	0	20.97	8.79
Montelibretti	59	0	18.52	5.29	102	0	20.79	5.76

Table S2b. Averages rain 2041-2060. Wet days are days with more than 0.5 mm rain

station	RLE_ECHAM		RLE_MIROC	
	wet days	yearly rain (mm)	wet days	yearly rain (mm)
Vredepeel	228	992.8	199	832.2
Snieszka	219	868.7	202	770.2
Melpitz	200	744.6	177	635.1
Paris	210	887.9	193	788.4
Barcelona	74	335.8	87	394.2
Madrid	104	616.9	97	463.6
Montelibretti	103	609.6	129	759.2

Table S2c. Averages wind speed 2041-2060.

station	RLE_ECHAM		RLE_MIROC	
	#v<2m/s	average v	#v<2m/s	average v
Vredepeel	31	4.29	50	3.77
Snieszka	47	3.39	68	3.00
Melpitz	31	4.18	47	3.66
Paris	23	4.16	34	3.72
Barcelona	99	3.16	123	2.89
Madrid	54	3.38	61	3.09
Montelibretti	26	4.35	41	3.99

Table S3. Summer average daily maximum O₃ concentrations and annual average PM₁₀ concentrations, present-day and future period. Standard deviations represent the day to day variability.

RLE_ERA (1989-2009)				
station	O ₃ max	O ₃ max	PM10	PM10
	average	stdev	average	stdev
Vredepeel	100.26	27.69	13.59	6.27
Snieszka	108.23	18.22	8.74	4.25
Melpitz	107.11	20.34	8.65	4.28
Paris	99.36	26.43	36.30	20.93
Barcelona	118.00	19.19	8.89	4.80
Madrid	97.91	14.75	17.80	7.39

Montelibretti	123.47	16.98	10.75	4.32
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RLE_ECHAM	(1989-2009)				(2041-2060)				Relative change %	
station	O _{3max} average	O _{3max} stdev	PM10 average	PM10 stdev	O _{3max} average	O _{3max} stdev	PM10 average	PM10 stdev	O ₃	PM10
Vredepeel	90.53	23.63	12.58	5.90	93.06	26.95	12.64	5.97	+2.9	+0.5
Sniezka	102.28	17.31	8.15	4.05	105.58	20.13	7.81	3.88	+3.2	-4.2
Melpitz	99.95	19.30	8.21	4.12	102.69	21.28	7.99	3.98	+2.7	-2.7
Paris	90.59	23.63	32.33	20.05	96.16	27.10	31.67	19.57	+6.1	-2.0
Barcelona	113.09	19.11	7.56	4.44	118.76	21.24	7.76	4.53	+5.0	+2.6
Madrid	98.46	14.92	15.32	7.36	102.39	15.97	15.68	7.51	+4.0	+2.3
Montelibretti	120.19	16.75	10.05	4.04	124.30	18.55	10.01	4.11	+3.4	-0.4

RLE_MIROC	(1989-2009)				(2041-2060)				Relative change %	
station	O _{3max} average	O _{3max} stdev	PM10 average	PM10 stdev	O _{3max} average	O _{3max} stdev	PM10 average	PM10 stdev	O ₃	PM10
Vredepeel	106.77	25.87	13.83	6.38	114.94	29.29	14.47	7.18	+7.7	+4.6
Sniezka	109.93	15.93	8.57	4.17	116.11	17.67	8.40	4.30	+5.6	-2.0
Melpitz	111.02	18.55	8.50	4.32	116.80	20.49	8.52	4.60	+5.2	+0.2
Paris	105.27	26.93	35.63	20.42	112.56	30.16	36.35	19.69	+6.9	+2.0
Barcelona	114.51	17.78	8.04	4.50	122.14	18.86	8.15	4.56	+6.7	+0.1
Madrid	96.16	14.57	17.30	7.50	100.75	16.05	17.34	7.39	+4.8	+0.2
Montelibretti	122.61	16.90	10.08	4.17	129.75	11.94	10.25	4.32	+5.8	+1.6

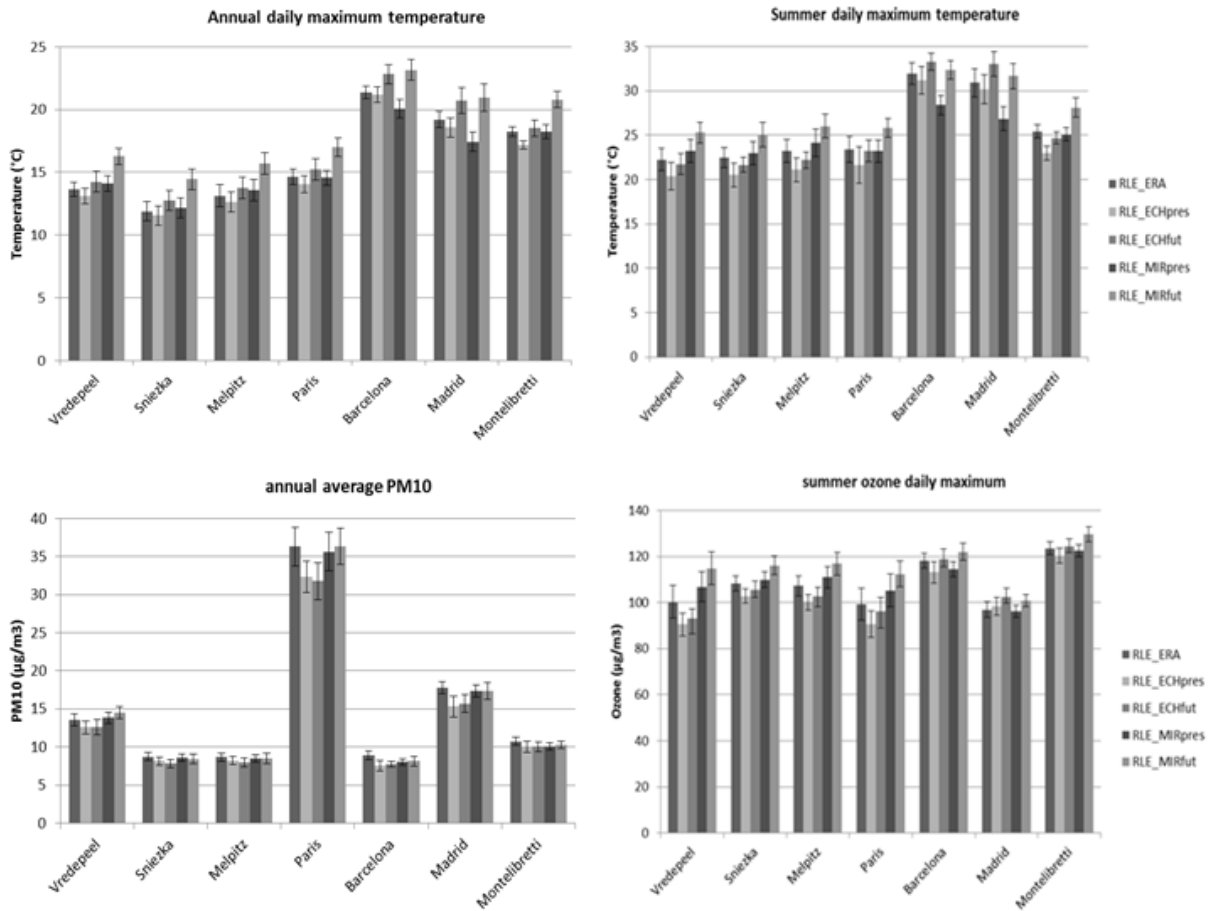


Figure S1. Average values for daily maximum temperature (annual and summer averages) and PM10 (annual) and ozone concentrations (summer averages), with standard deviations to indicate the interannual variability.

