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Atmospheric Chemistry and Physics Discussions

Supplement of

Using proxies to explore ensemble uncertainty in climate impact studies: the example of air pollution

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1 Mid Europe

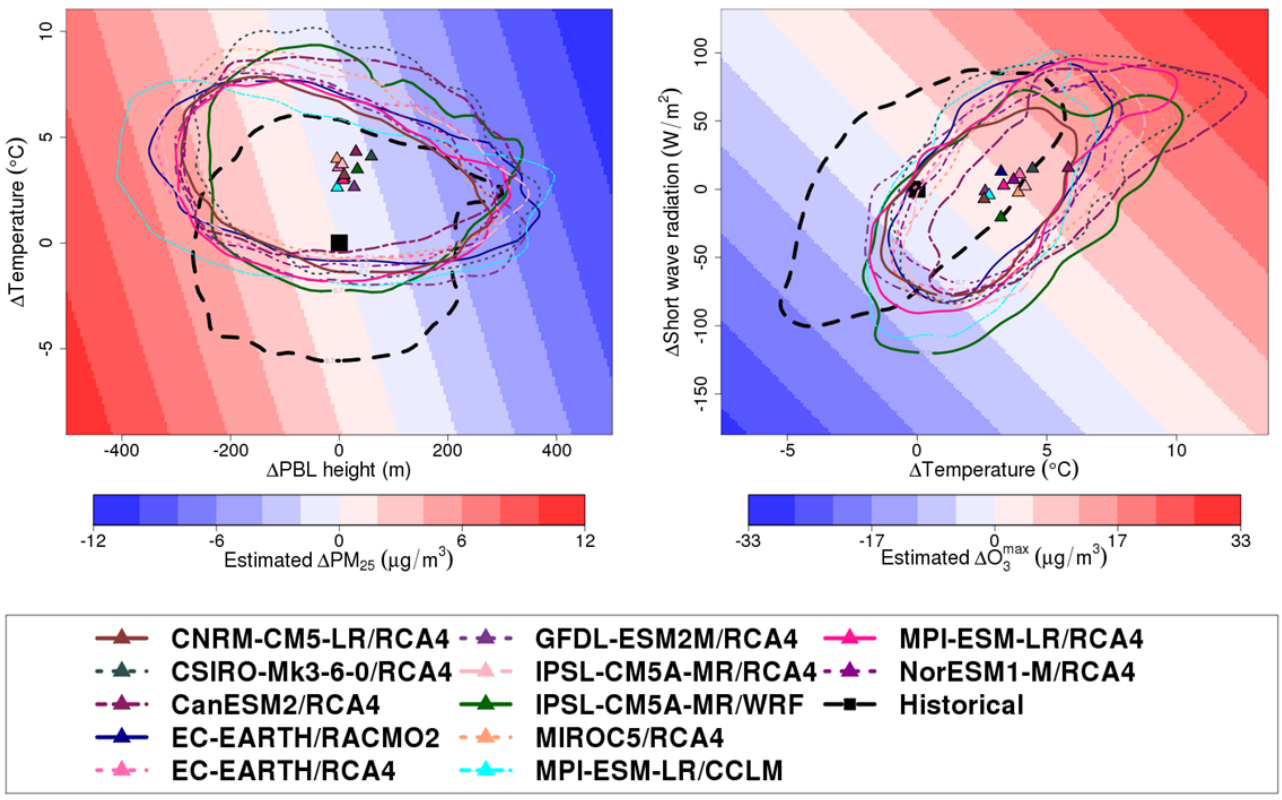

Figure S1: The left figure presents the proxy of ensemble projections for daily average de-seasonnalised PM2.5 concentrations in Mid Europe. The right figure represents the proxy for daily maximum de-seasonnalised summer ozone for Mid Europe. For both figures, the shaded background represents the evolution of pollutants estimated by the statistical models. The contours are representing the regional climate projections and the triangles their mean. The black dashed contour represents the historical – IPSL-CM5A-MR/WRF – and the square its mean.

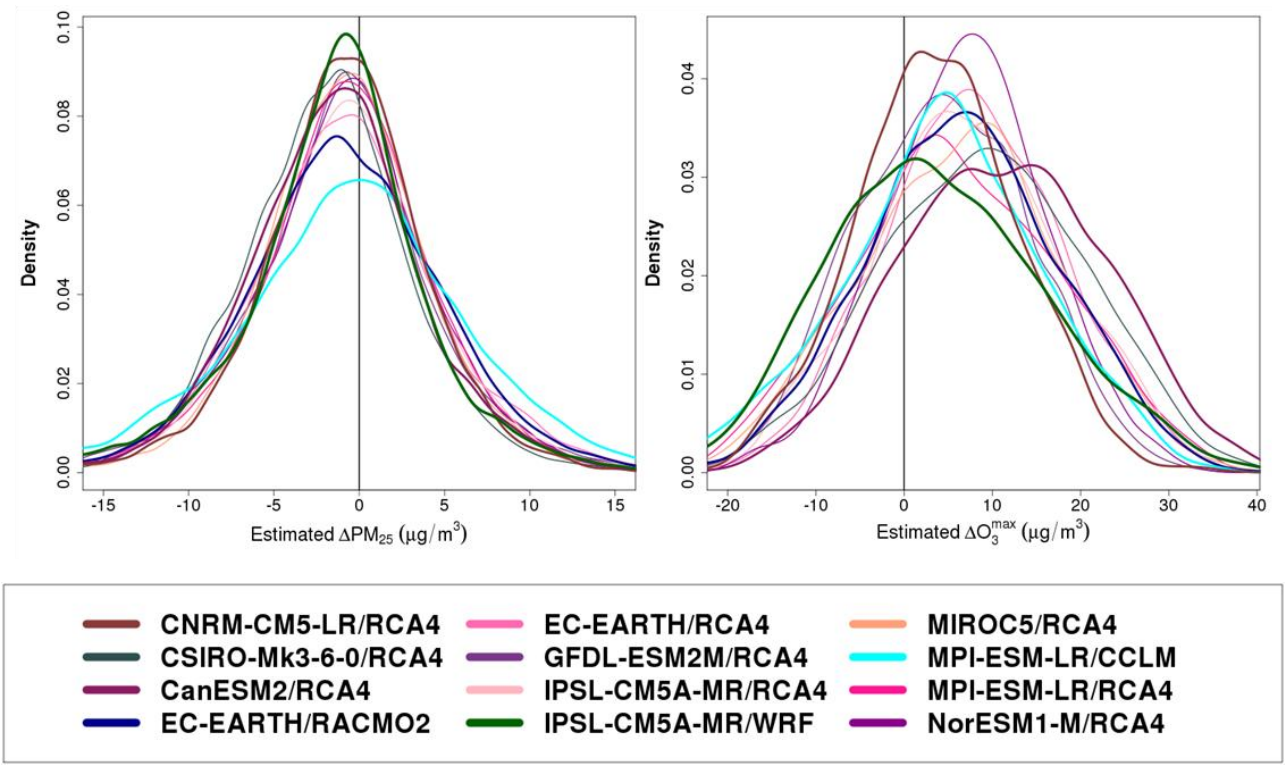

Figure S2: The left figure represents, for each regional climate model the probability density function (PDF) of the concentrations estimated with the bivariate linear model at the end of the century minus the estimated concentrations of the historical period for daily average de-seasonnalised PM2.5 concentrations in Mid Europe. The right figure presents the results for daily maximum de-seasonnalised summer ozone for Mid Europe.

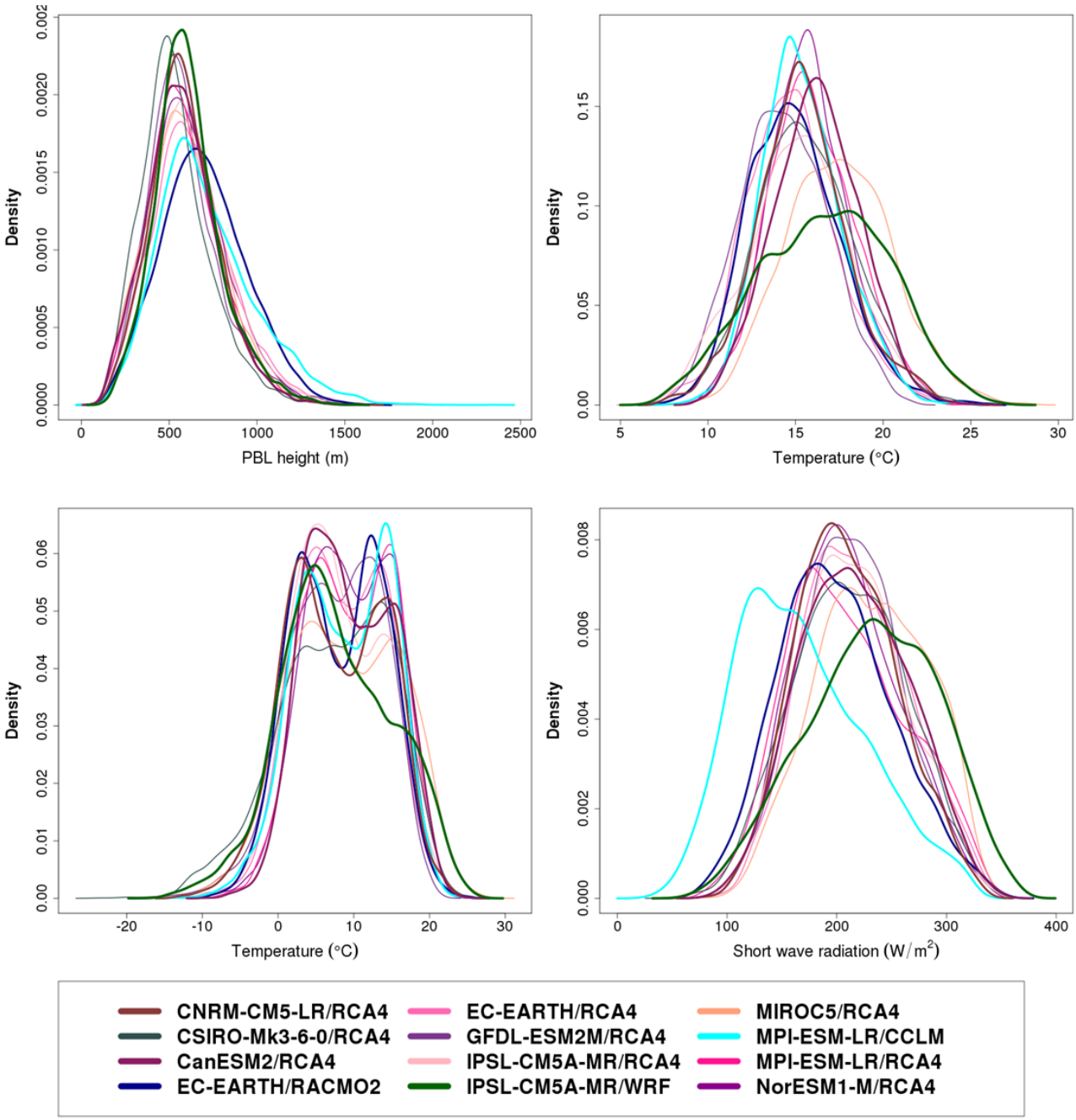

Figure S3: The first column of the panel represents the historical distribution of the meteorological variables identified by our statistical models as the two major drivers (a. PBL Height; b. near surface temperature) for PM2.5 in Mid Europe. The second column represents the historical JJA distribution of the two main drivers for summer ozone (a. near surface temperature; b. specific humidity).

2 Northen Italy

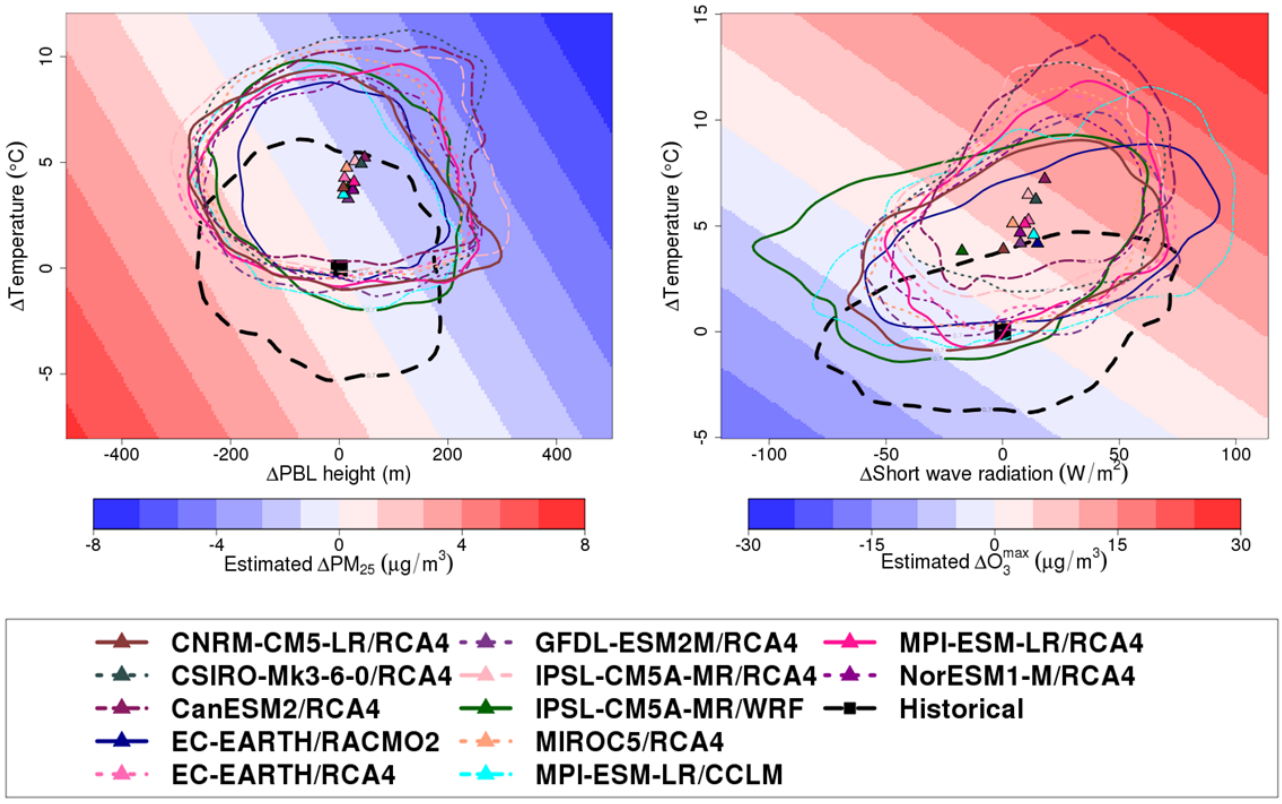

Figure S4: Same as S1 for Northern Italy.

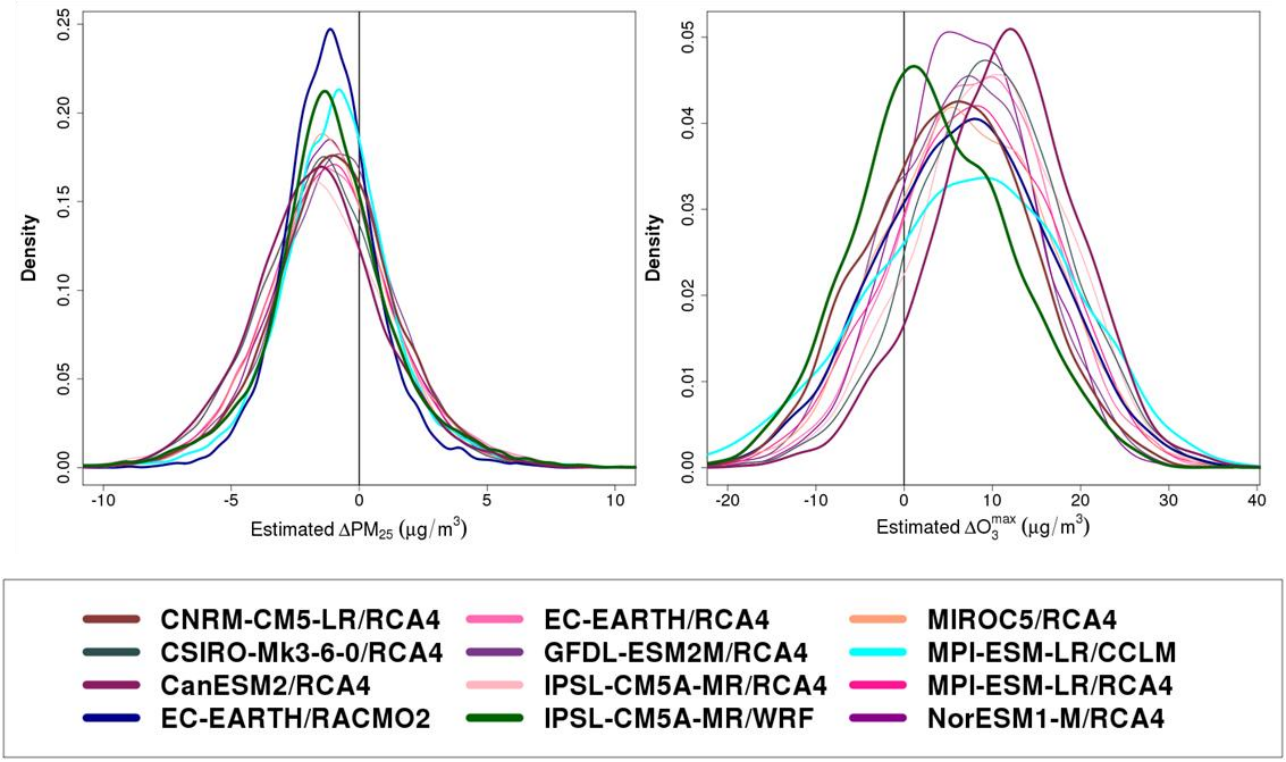

Figure S5: Same as S2 for Northern Italy.

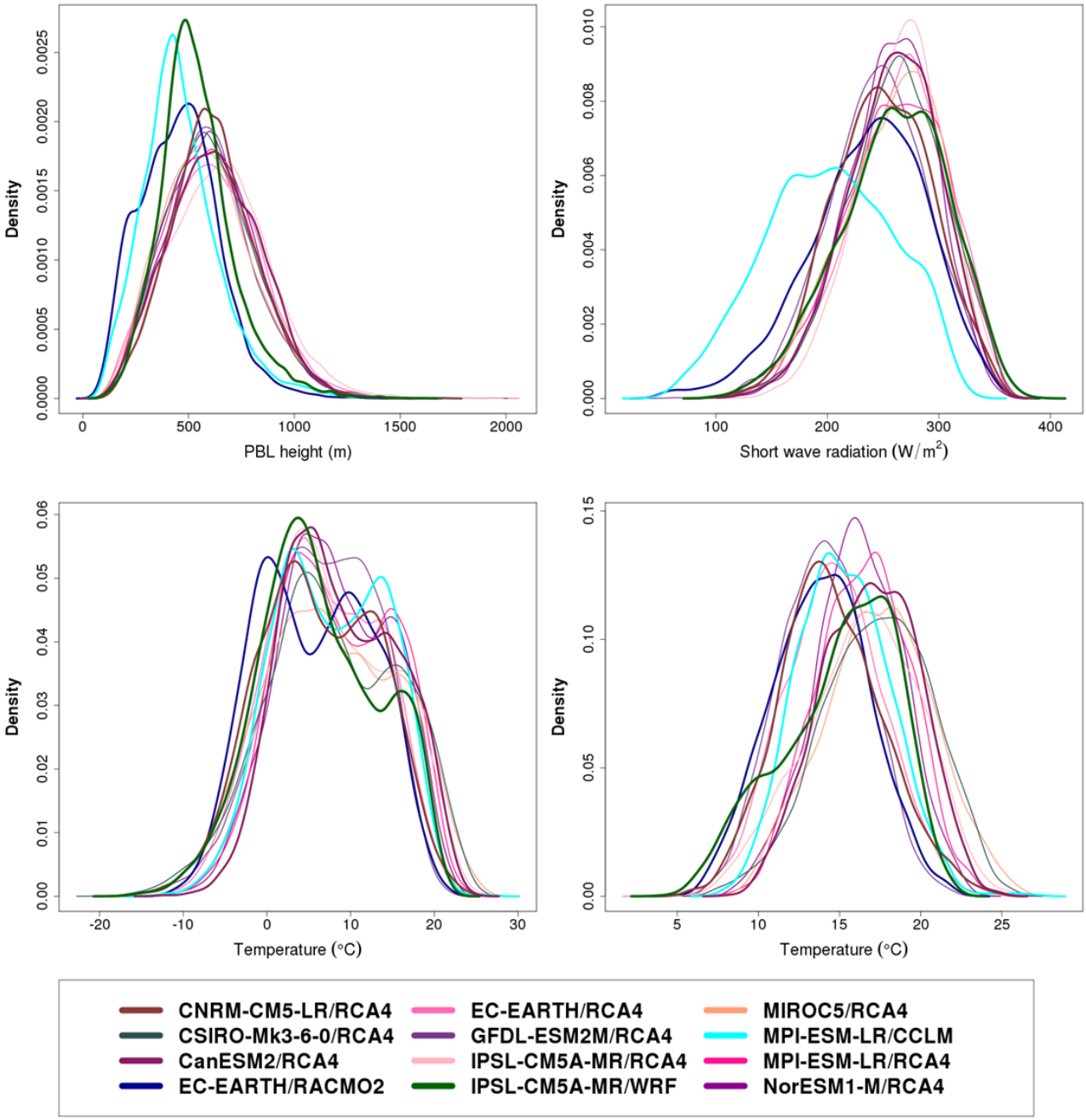

Figure S6: Same as S3 for Northern Italy.

France and Iberian Peninsula

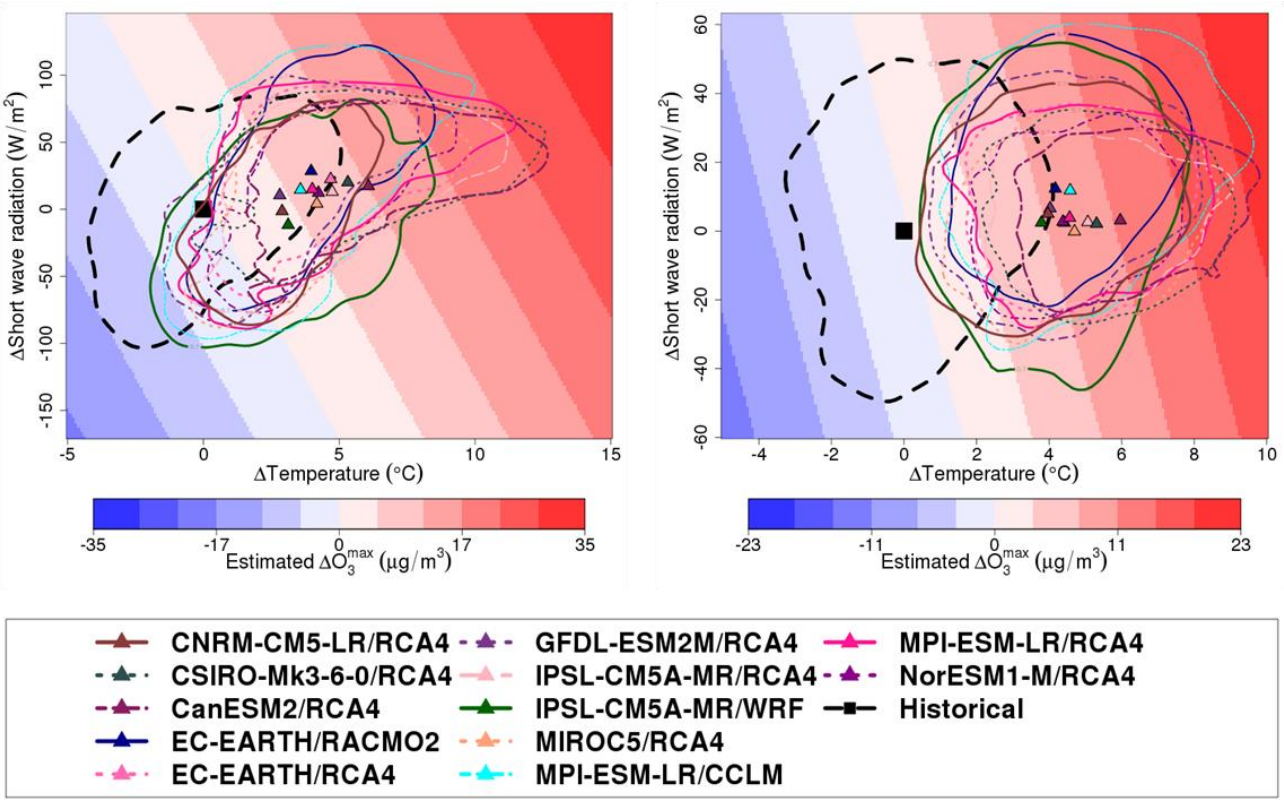

Figure S7: The left figure presents the proxy of ensemble projections for daily maximum de-seasonnalised summer ozone for France. The right figure represents the same for Iberian Peninsula. For both figures, the shaded background represents the evolution of pollutants estimated by the statistical models. The contours are representing the regional climate projections and the triangles their mean. The black dashed contour represents the historical – IPSL-CM5A-MR/WRF – and the square its mean.

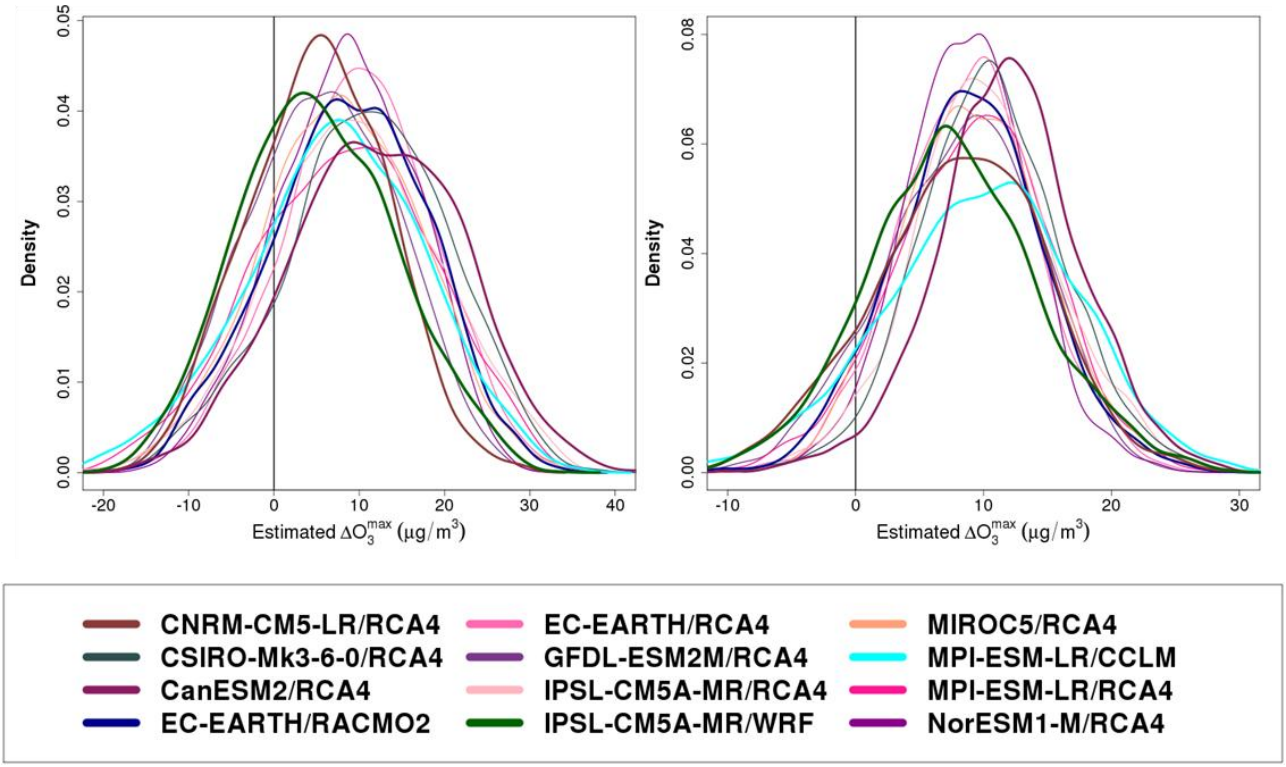

Figure S8: The left figure represents, for each regional climate model the probability density function (PDF) of the concentrations estimated with the bivariate linear model at the end of the century minus the estimated concentrations of the historical period for daily maximum de-seasonnalised summer ozone in France. The right figure presents the results same for Iberian Peninsula.

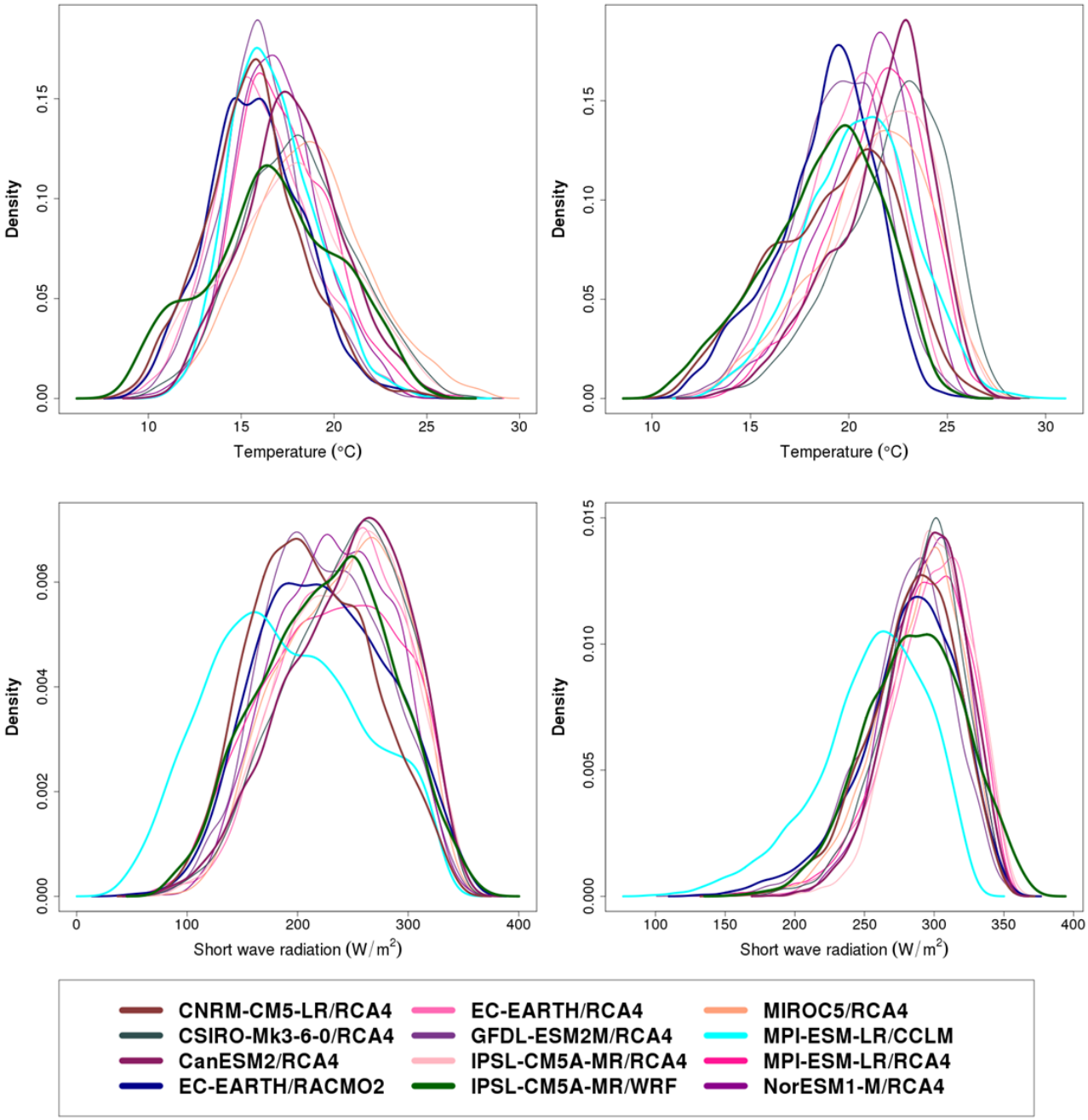

Figure S9: The first column of the panel represents the historical JJA distribution of the meteorological variables identified by our statistical models as the two major drivers (a. near surface temperature; b. incoming short wave radiation) for summer ozone in France. The second column represents the same for Iberian Peninsula (a. near surface temperature; b. incoming short wave radiation).