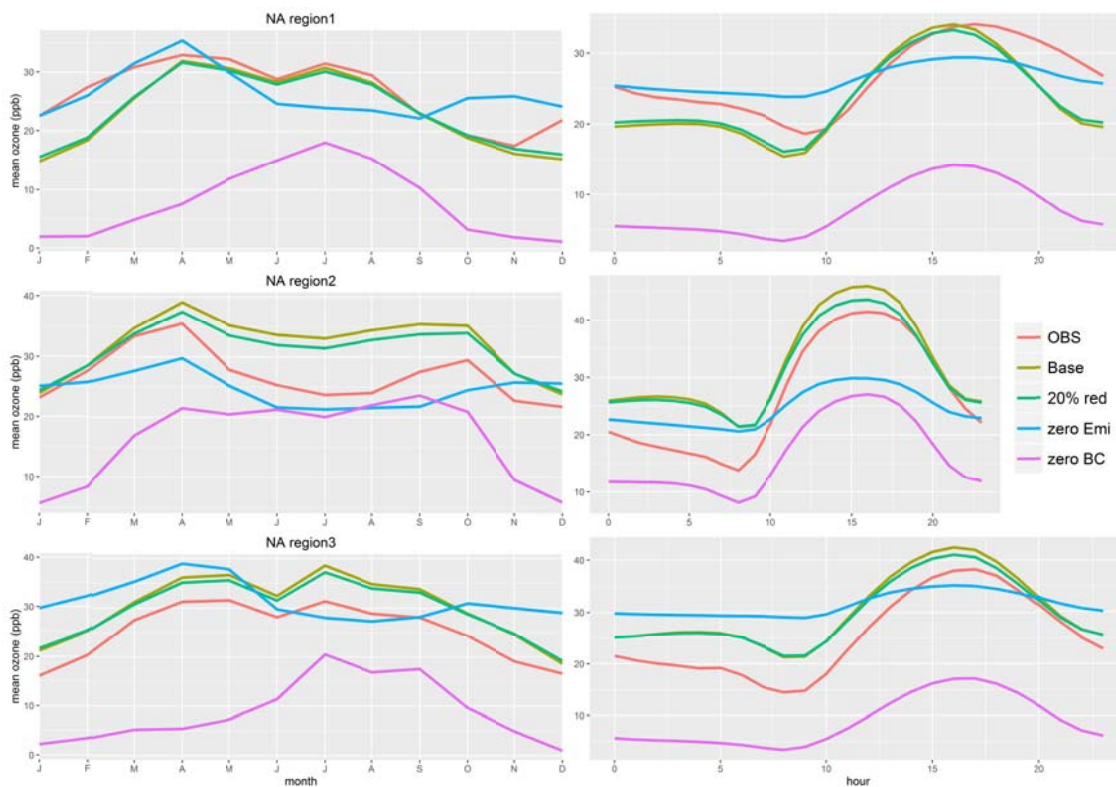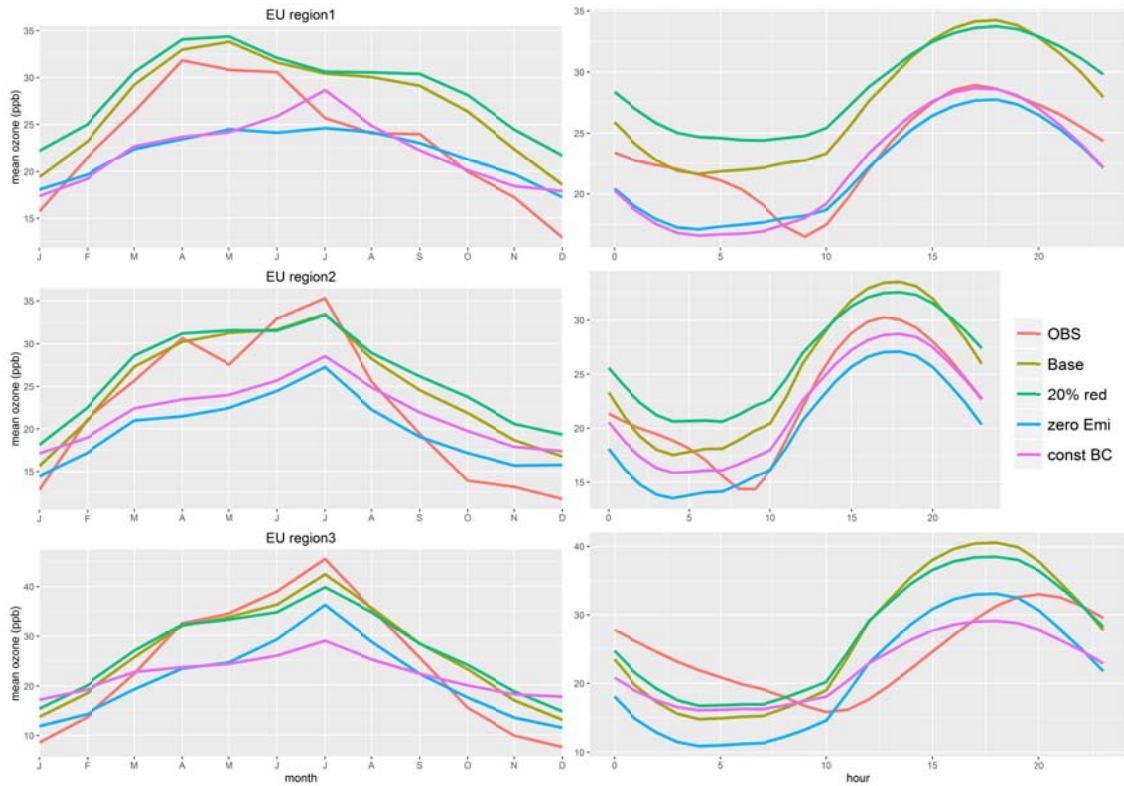976

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FIGURE S1 Annual aggregated ozone time series for the North American sub-regions (Urban stations only). Average monthly and diurnal curves

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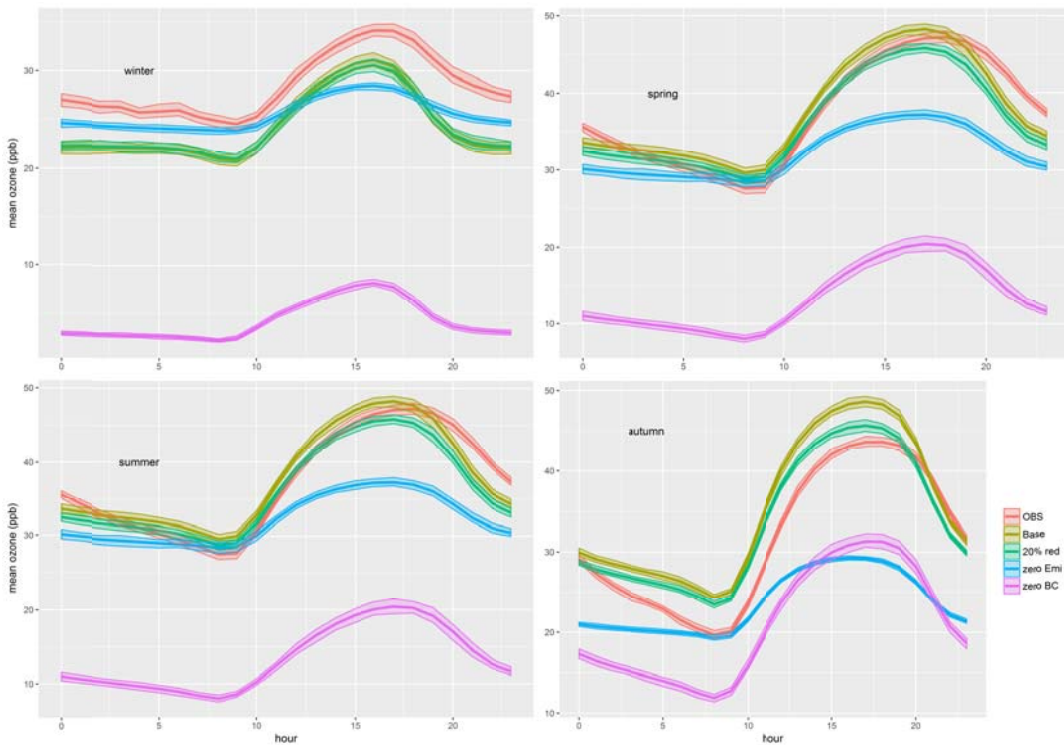981

982

983 **FIGURE S2.** Annual aggregated ozone time series for the European sub-regions (urban stations only). Average monthly and diurnal curves
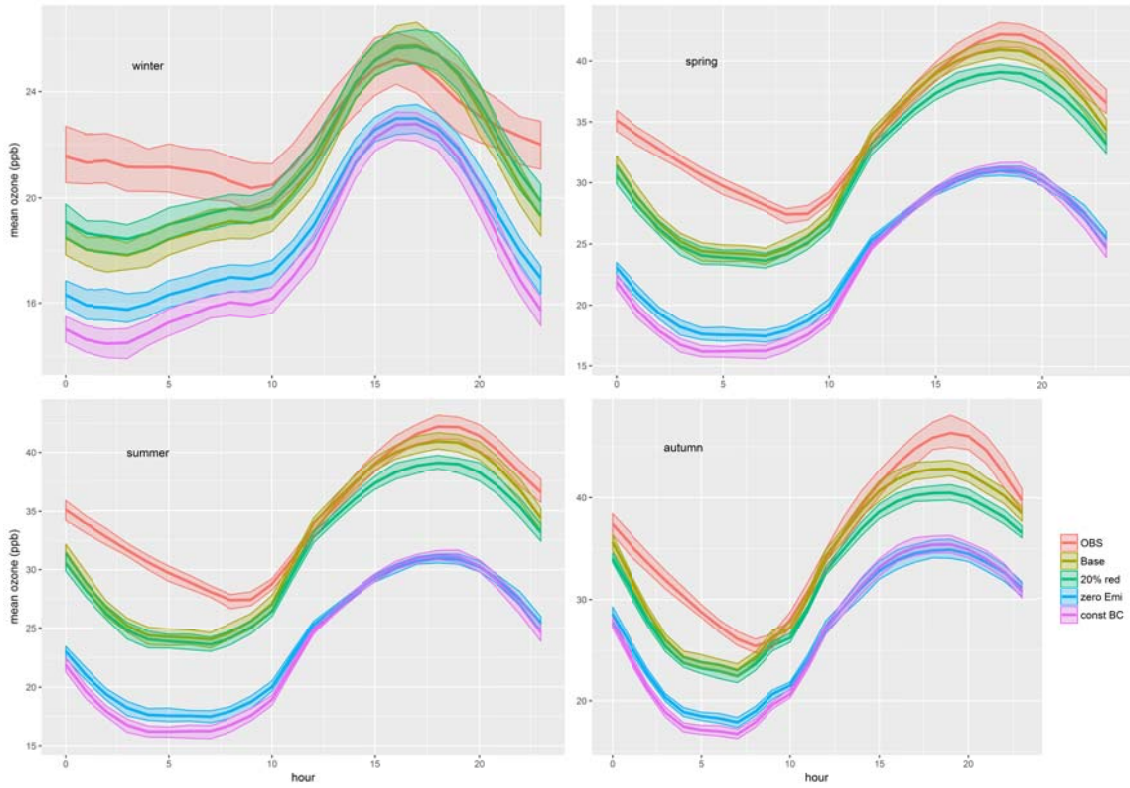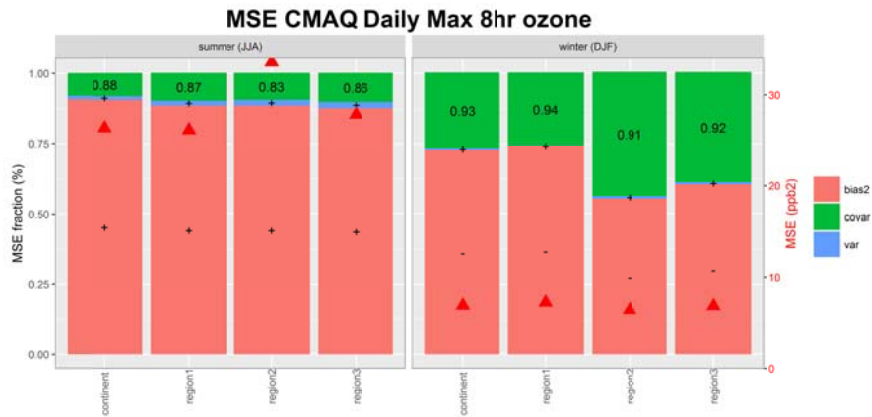

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985 **FIGURE S3** Network average seasonal daily ozone profiles for North America. The confidence bands indicate the 95% confidence interval of
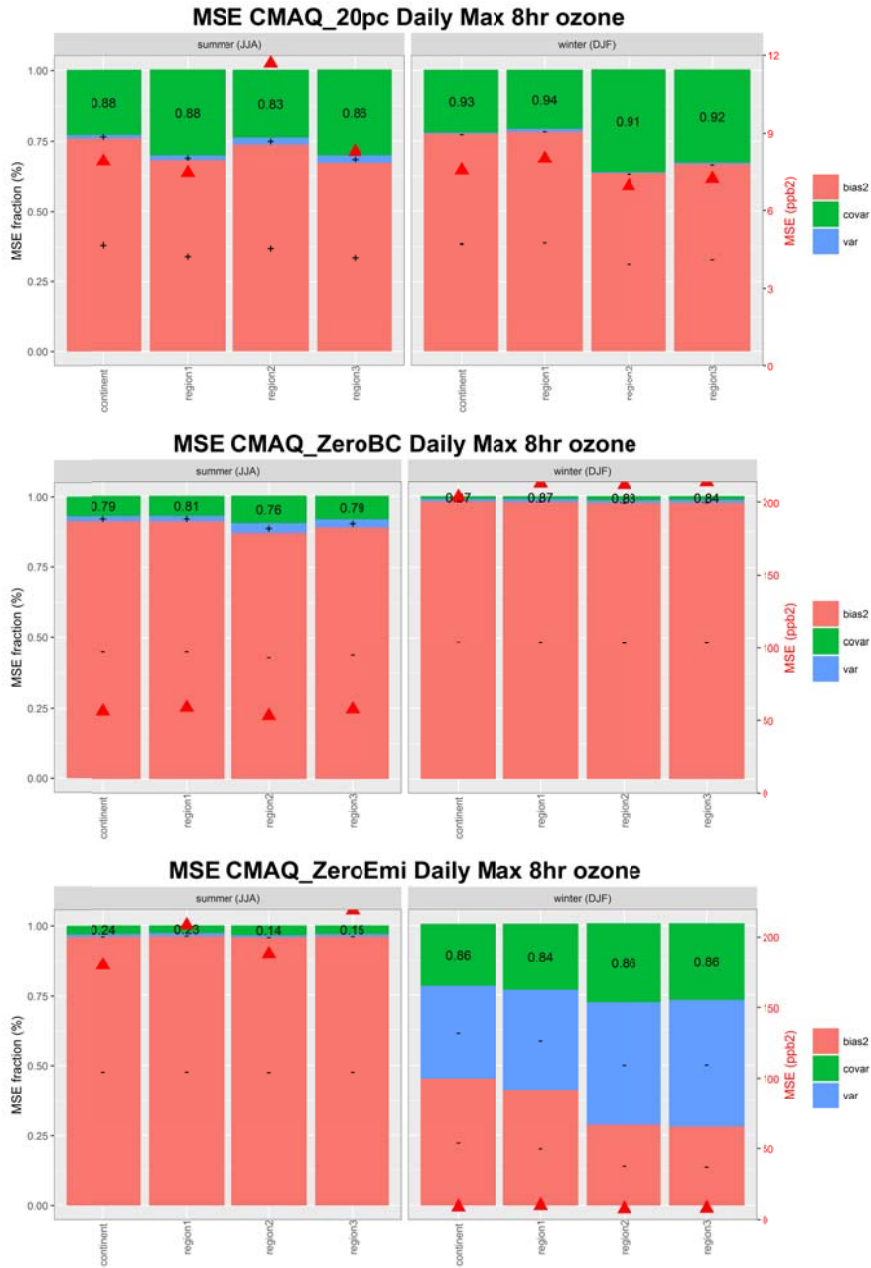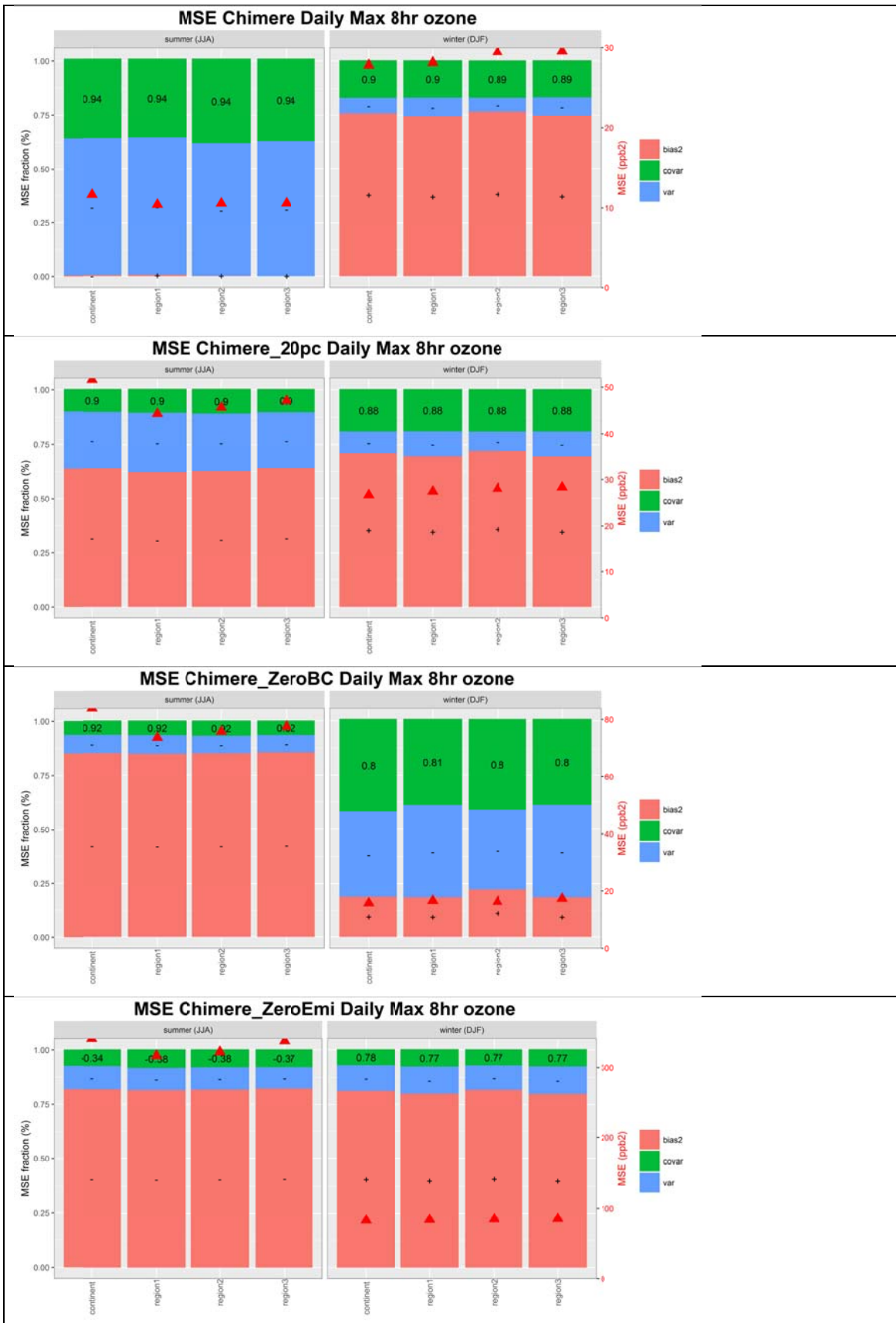986 the mean

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988 **FIGURE S4.** Network average seasonal daily ozone profiles for Europe. The confidence bands indicate the 95% confidence interval of the
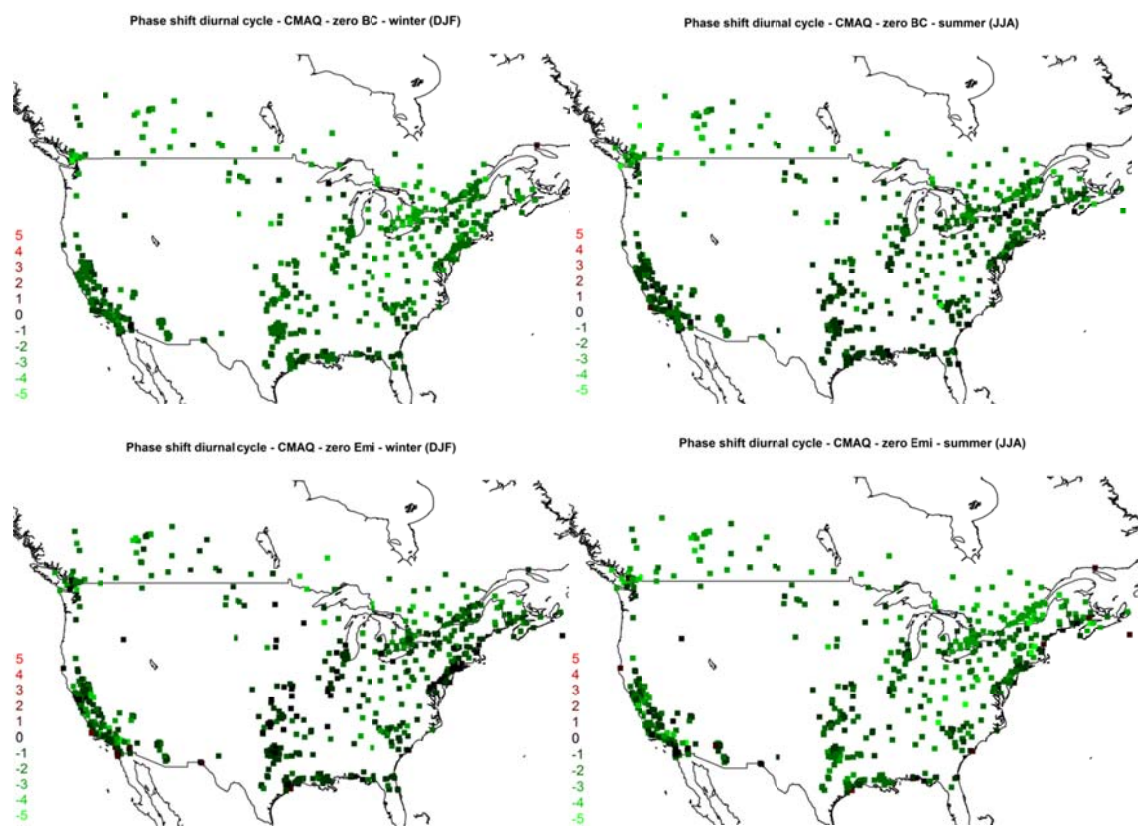989 mean

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991   **FIGURE S5. SAME AS FIGURE 6 OF THE MAIN TEXT FOR THE DAILY MAXIMUM 8-HOUR ROLLING AVERAGE OZONE**

FIGURE S6. SAME AS FIGURE 7 OF THE MAIN TEXT FOR THE DAILY MAXIMUM 8-HOUR ROLLING AVERAGE OZONE

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FIGURE S7. Phase shift of the diurnal cycle (in hour) for the network of receptors in NA (includes all stations types). A positive phase shift indicates that the model peak is 'late', vice-versa if the phase shift is negative, the model peak occurs earlier than the observed peak. Top panels 'Zero BC' case (winter and summer); lower panels: 'Zero EMI' case (winter and summer)
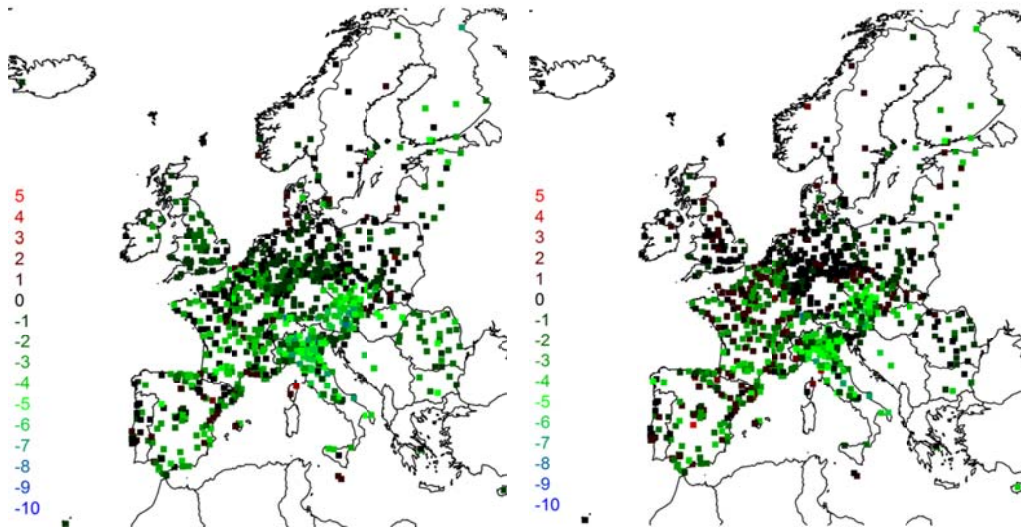
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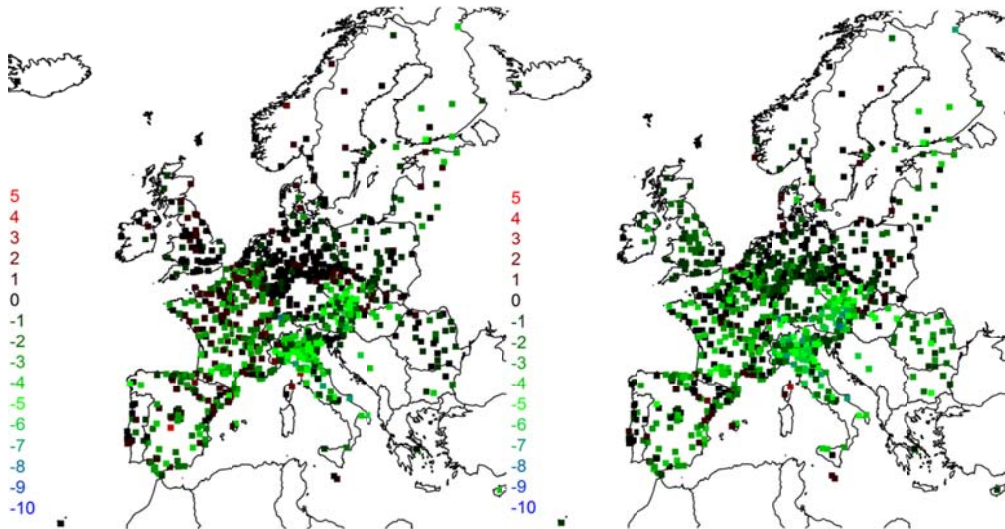Phase shift diurnal cycle - Chimere - const BC - summer (JJA)

Phase shift diurnal cycle - Chimere - const BC - winter (DJF)

Phase shift diurnal cycle - Chimere - zero Emi - winter (DJF)

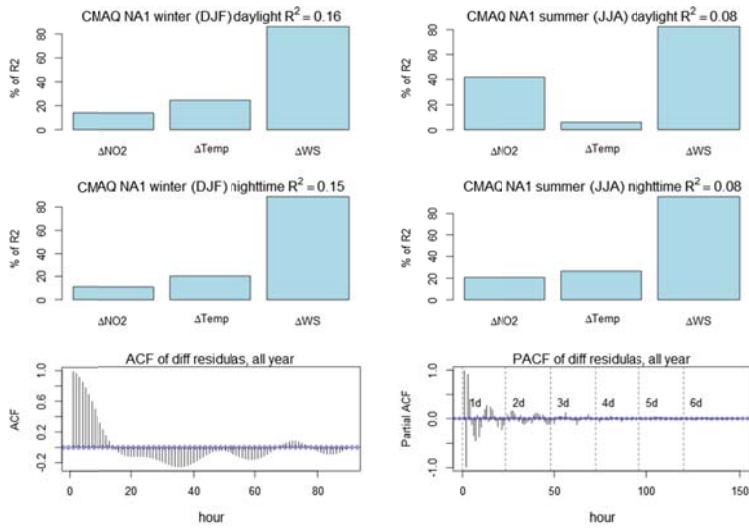Phase shift diurnal cycle - Chimere - zero Emi - summer (JJA)

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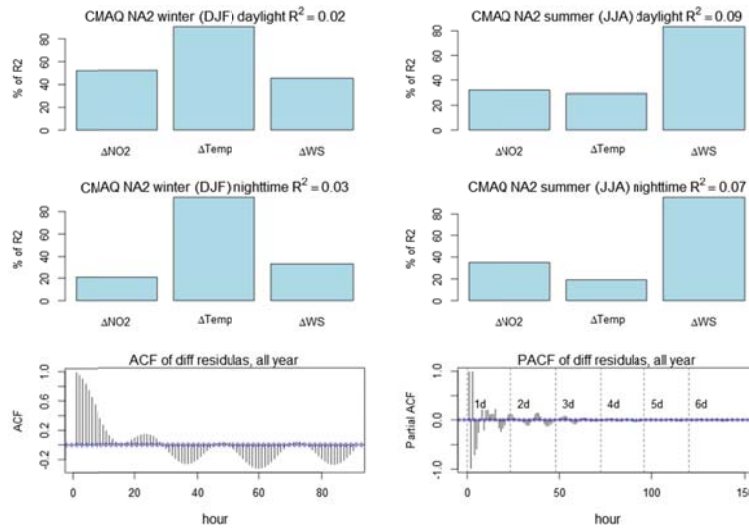1004

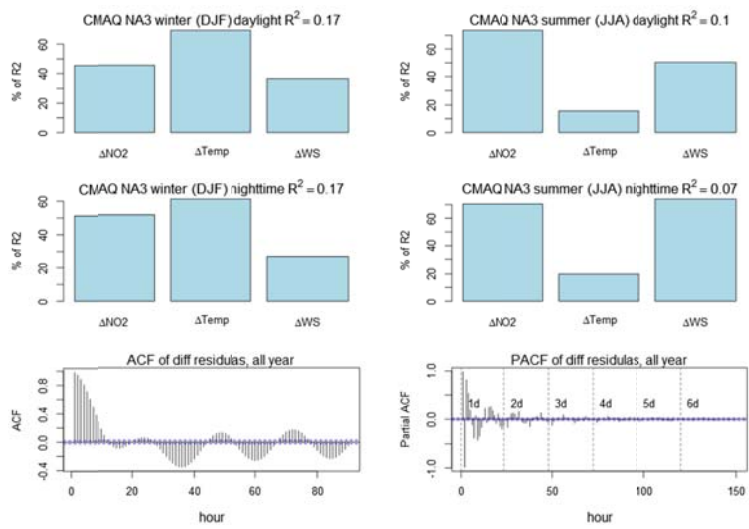1005   Figure S8. As in Figure S7 for Europe

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1011 **FIGURE S9.** Percentage of variance explained by the regressors (the total R^2 for the regression is reported in the title of each panel) when
1012 the diurnal fluctuations are removed. The relative importance of each variable is assessed by using a bootstrap resampling. The plots at

1013   the bottom show the ACF and PACF of the yearly time series of residual of the fit, that is of what is not captured by the linear regressions
1014   on the available variables.

1015
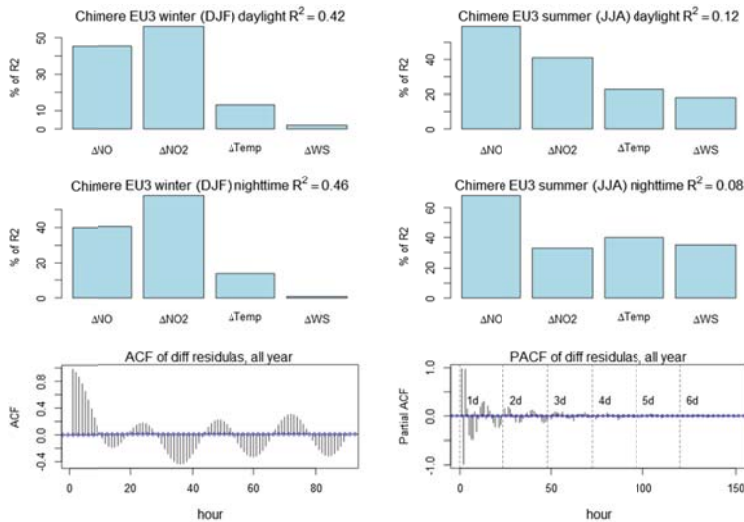
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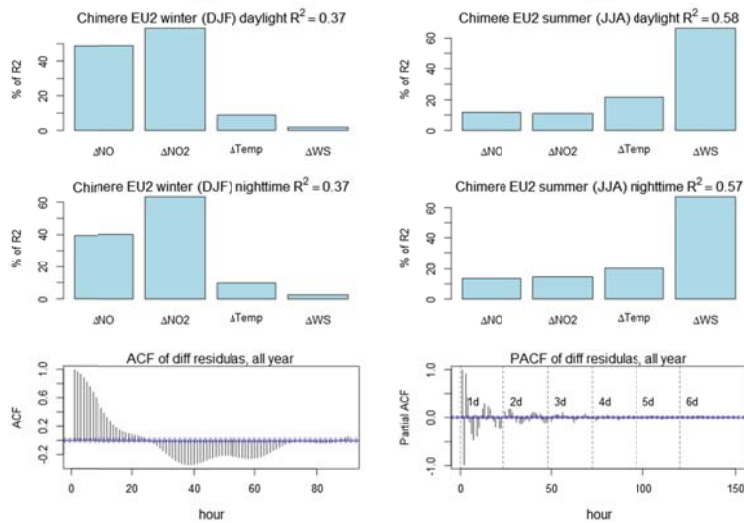
1017   Figure S9

1018
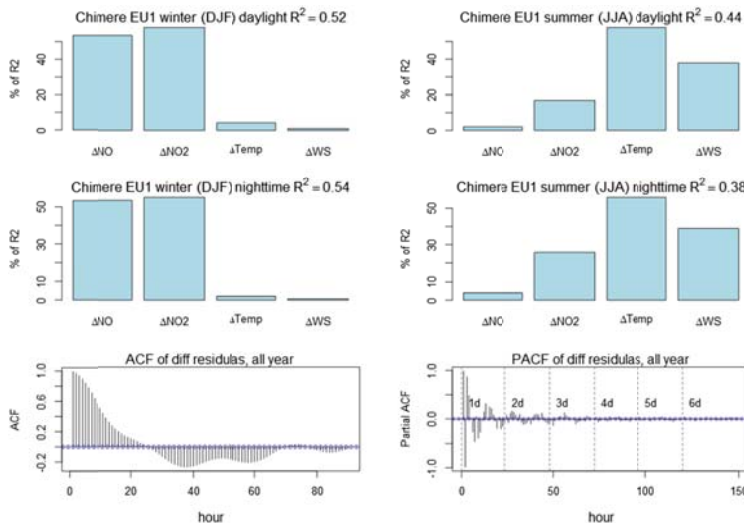
1019   **FIGURE S10.** Same as for **FIGURE S9** EU

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