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Supplement of

Simulating the formation of carbonaceous aerosol in a European Megacity (Paris) during the MEGAPOLI summer and winter campaigns

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Table S1. Contribution (%) of major sources to primary OA and BC emissions in Paris during the MEGAPOLI summer and winter campaigns.

Source sector	Summer		Winter	
	POA	BC	POA	BC
Traffic	33	72	8	41
Residential combustion	20	7	81	45

Table S2. Prediction skill metrics of PMCAMx against factor-analysis AMS data for vehicular POA during the MEGAPOLI summer and winter campaigns.

vehicular POA	Summer				Winter			
	LHVP	SIRTA	GOLF	Average	LHVP	SIRTA	GOLF	Average
Mean predicted ($\mu\text{g m}^{-3}$)	0.3	0.15	0.2	0.25	0.35	0.2	0.25	0.3
Mean observed ($\mu\text{g m}^{-3}$)	0.2	0.2	-	0.2	0.7	0.8	0.65	0.7
FERROR	0.6	0.5	-	0.6	0.8	1.2	0.9	1
FBIAS	0.3	-0.4	-	0.1	-0.7	-1.2	-0.8	-0.9
MAGE ($\mu\text{g m}^{-3}$)	0.2	0.15	-	0.2	0.4	0.6	0.4	0.5
MB ($\mu\text{g m}^{-3}$)	0.15	-0.1	-	0.05	-0.4	-0.6	-0.3	-0.4

Table S3. Prediction skill metrics of PMCAMx against factor-analysis AMS data for BBOA during the MEGAPOLI winter campaign.

BBOA	Winter			
	LHVP	SIRTA	GOLF	Average
Mean predicted ($\mu\text{g m}^{-3}$)	1.3	0.7	0.8	0.95
Mean observed ($\mu\text{g m}^{-3}$)	1	1	0.65	0.85
FERROR	0.7	0.8	0.8	0.7
FBIAS	0.2	-0.3	0.3	0.1
MAGE ($\mu\text{g m}^{-3}$)	0.8	0.7	0.6	0.7
MB ($\mu\text{g m}^{-3}$)	0.3	-0.3	0.15	0.1

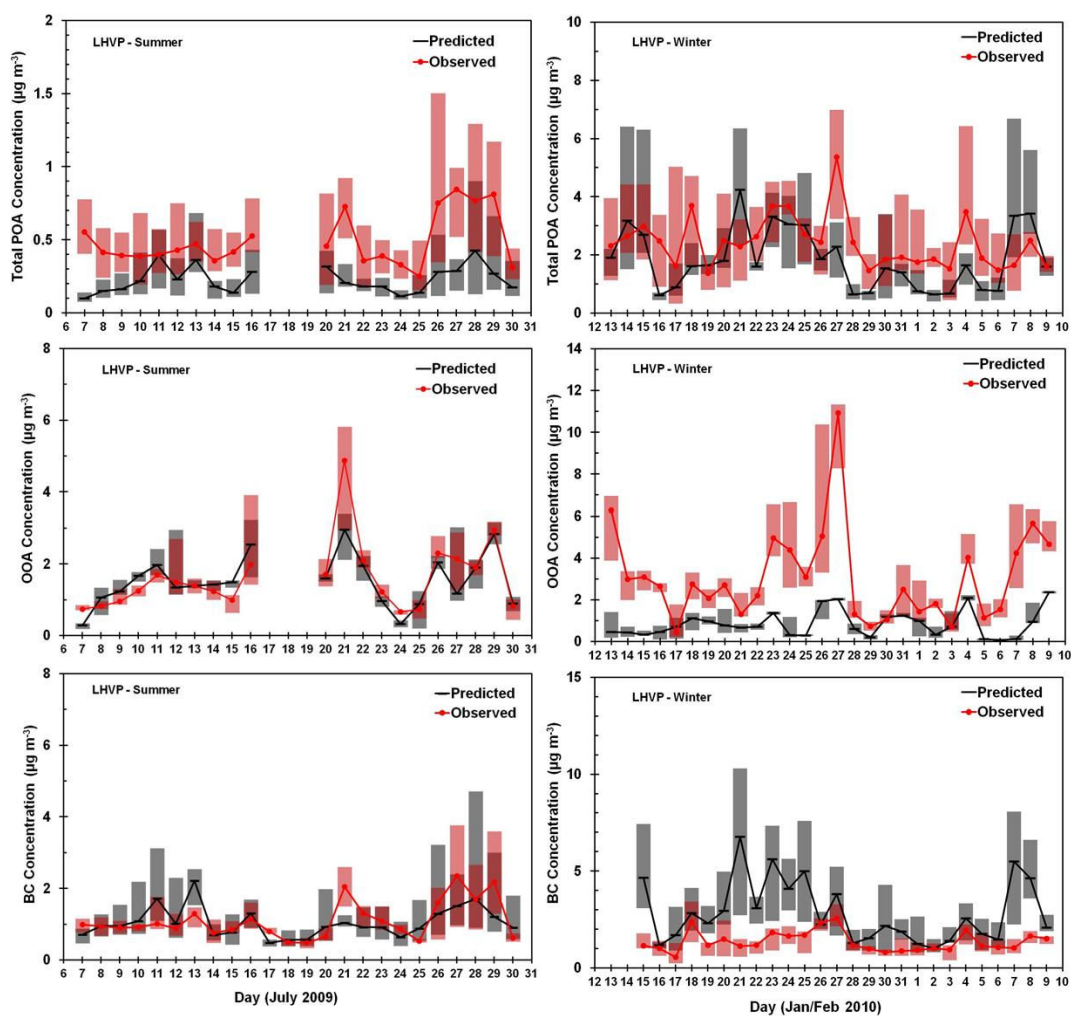


Figure S1. Daily-averaged concentrations of predicted and observed total POA, OOA and BC in Paris city center during the MEGAPOLI summer and winter campaigns. The shaded vertical bars indicate the 25th and 75th percentiles (gray color represents the predicted and pink the observed values).

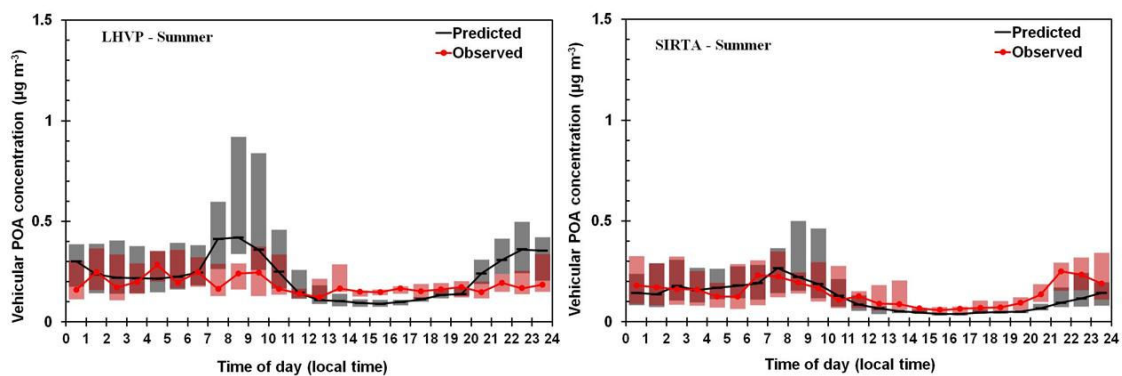


Figure S2. Average diurnal profiles of predicted and measured vehicular POA concentrations on LHVP and SIRTA during the MEGAPOLI summer campaign. The shaded vertical bars indicate the 25th and 75th percentiles (gray color represents the predicted and pink the observed values).

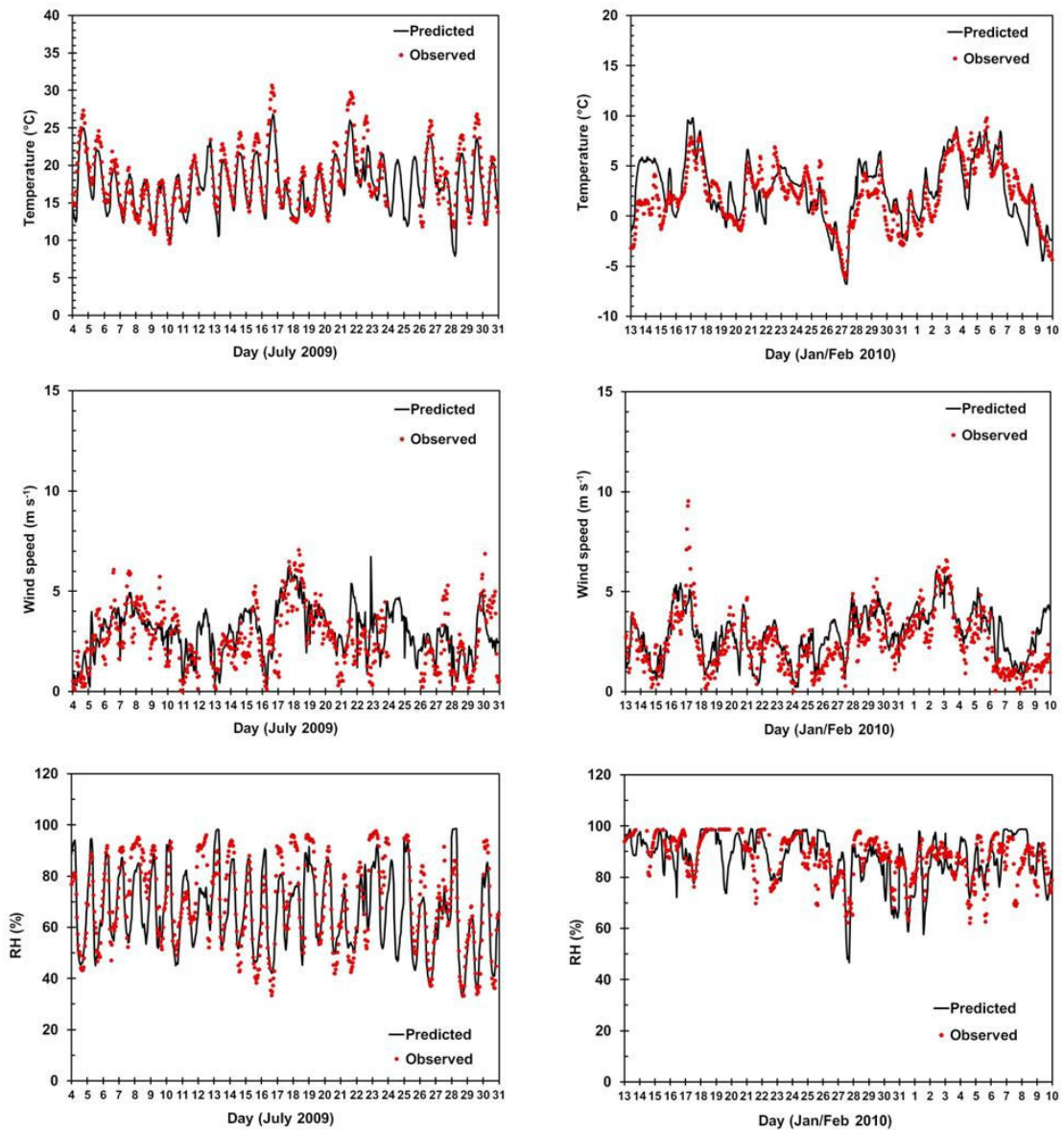


Figure S3: Comparison of simulated (black lines) and observed (red dots) temperature, wind velocity, and relative humidity at SIRTA during the MEGAPOLI summer and winter campaigns.

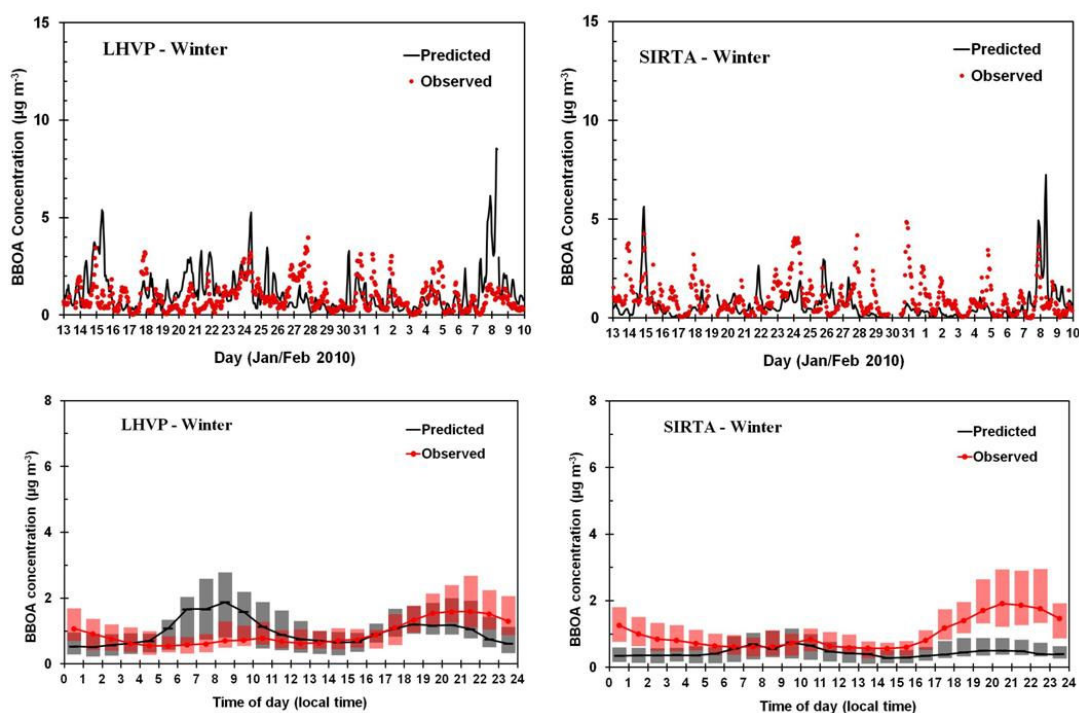


Figure S4: Comparison of simulated (black lines) and observed (red dots) BBOA concentrations at LHVP and SIRTA during the MEGAPOLI winter campaign. The shaded vertical bars indicate the 25th and 75th percentiles (gray color represents the predicted and pink the observed values).

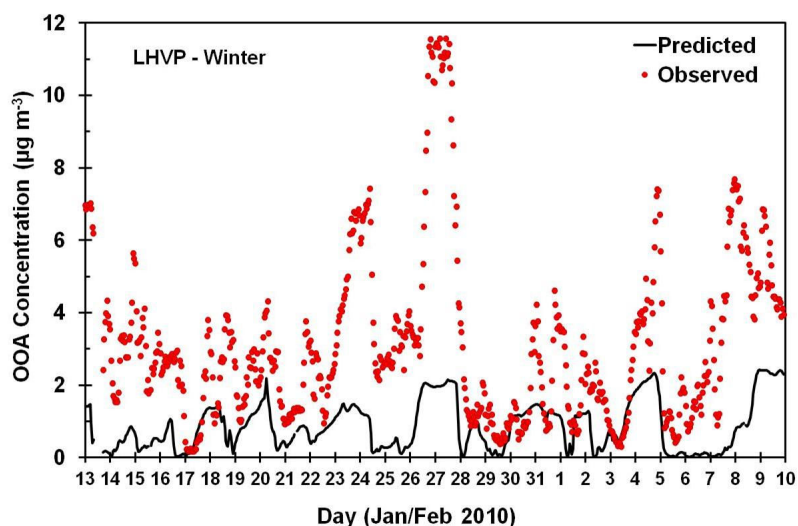


Figure S5: Comparison of simulated (black lines) and observed (red dots) OOA concentrations at LHVP during the MEGAPOLI winter campaign.

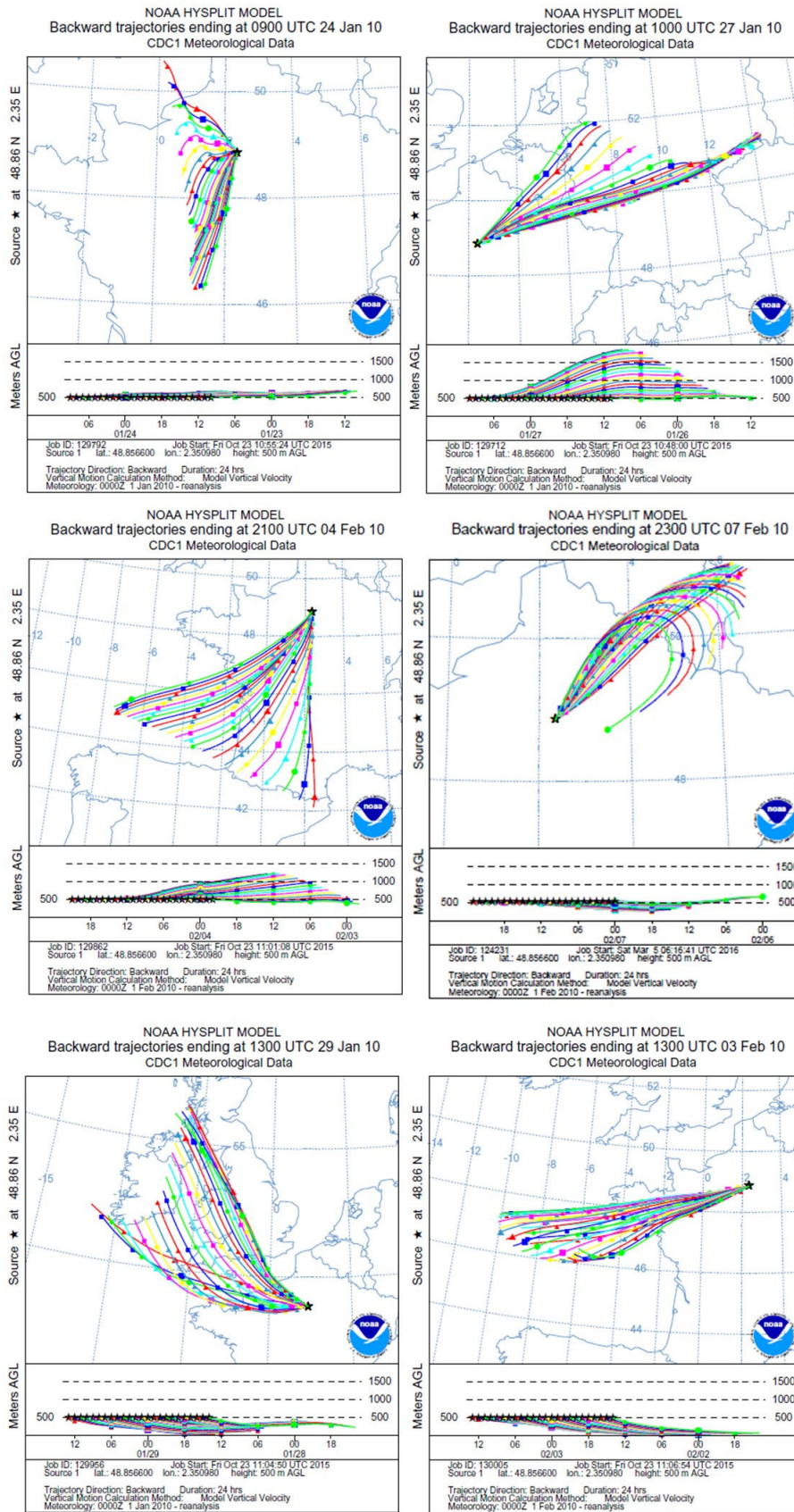


Figure S6: HYSPLIT backward trajectory analysis for 6 days during the MEGAPOLI winter campaign.

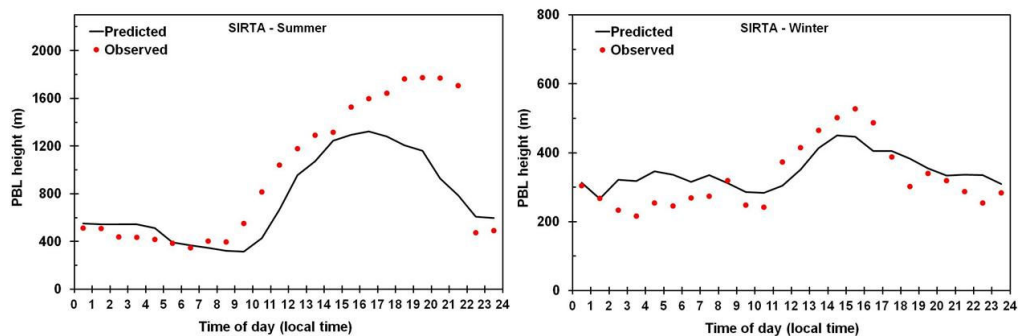


Figure S7. Average diurnal profiles of predicted and observed mixing height in SIRTAs during the MEGAPOLI summer and winter campaigns.

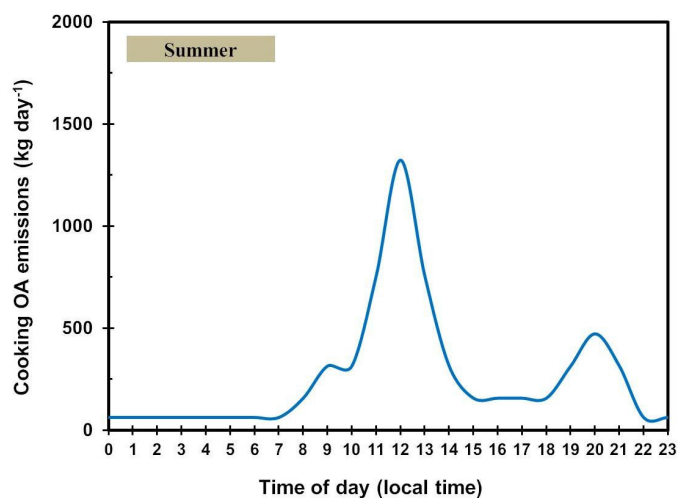


Figure S8. Temporal profile of cooking OA emissions added in the Paris inventory during the MEGAPOLI summer campaign.

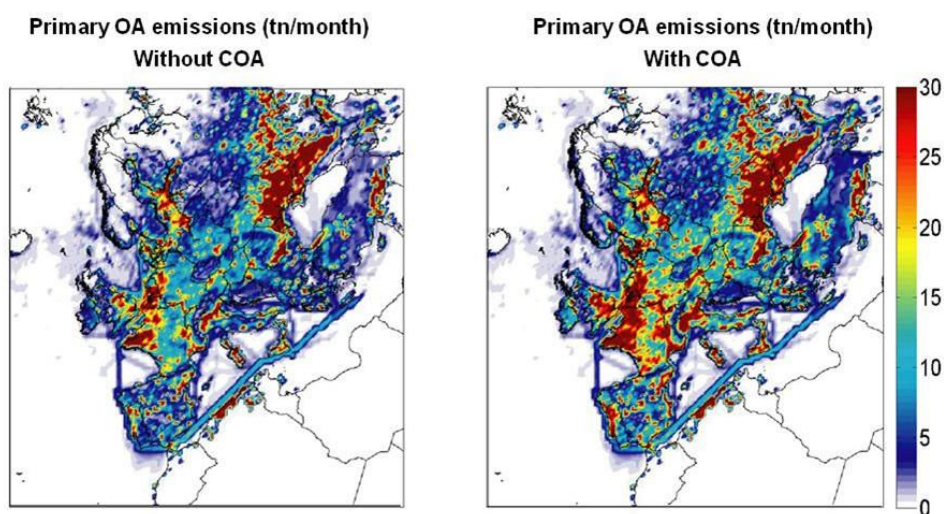


Figure S9. Total primary OA emissions during the July 2009 period in Europe.