Changes in Ambient Air Quality and Atmospheric Composition and Reactivity in the South East of the UK as a Result of the COVID-19 Lockdown

Supplementary Material

K. P. Wyche[1*], M. Nichols[2], H. Parfitt[3], P. Beckett[3], D. J. Gregg[1], K. L. Smallbone[1], P. S. Monks[4]

1. Air Environment Research, University of Brighton, Lewes Road, Brighton, BN2 4GJ, UK

2. Hydrock Consultants Ltd, Merchant's House North, Wapping Road, Bristol, BS1 4RW

3. Phlorum Ltd, 12 Hunns Mere Way, Brighton, BN2 6AH, UK

4. Department of Chemistry, University of Leicester, University Road, Leicester, LE1 7RH, UK

*Corresponding author

Kevin P. Wyche

Air Environment Research,

School of Environment and Technology,

University of Brighton,

Brighton, BN2 4GJ, UK

+44 (0) 1273 64 1665

k.p.wyche@brighton.ac.uk

Table S1: Data capture (%) for 1st January 2015 – 16th June 2020 for monitoring sites used in this study.

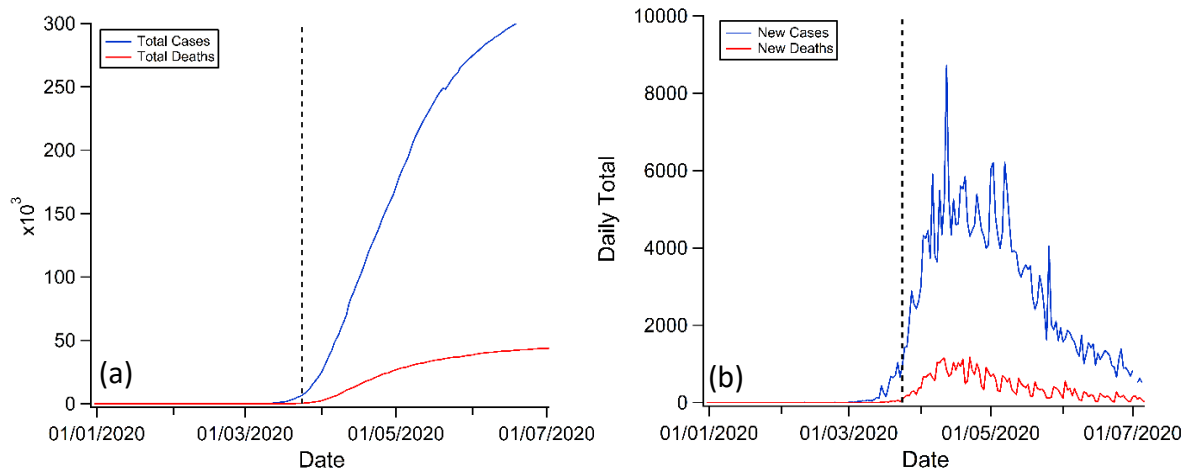| Site	NO$_2$	O$_3$	PM$_{10}$	PM$_{2.5}$
	Data Capture (%)	Data Capture (%)	Data Capture (%)	Data Capture (%)
Kerbside				
AD1	71.1		71.1	
BH4	98.9		98.9	
BH6	98.9		98.9	
CI1	100.0		100.0	
CI4	81.2			
CI5			100.0	
HO2	99.8		99.8	
HO4	99.8			
HOT	99.8			
HT1	99.8		99.8	
LS5	99.9		100.0	
RG7	44.0			
RY2	100.0			
Urban Background				
BH0	99.8	99.8		99.8
CA2	99.8		99.8	99.8
EB1	84.8	84.8	84.8	
EB3	99.9		100.0	
EF1			25.6	25.6
Suburban Background				
FAL	80.0	80.0		
RG1	99.8		99.8	
RG5	99.8		99.8	
RG6	81.2			
Rural Background				
LL1	100.0	100.0		
RG3	99.8	99.8		
AR1		99.7		
AR2		99.9		
RY1		81.2		

Figure S1: Total number of confirmed COVID-19 cases and deaths in the UK from 1st January 2020 to 6th July 2020. UK lockdown period (starting 24/03/2020) denoted by vertical dashed line. Panel (a) shows cumulative figures, panel (b) shows daily totals. Data source: Global Change Data Lab, University of Oxford.
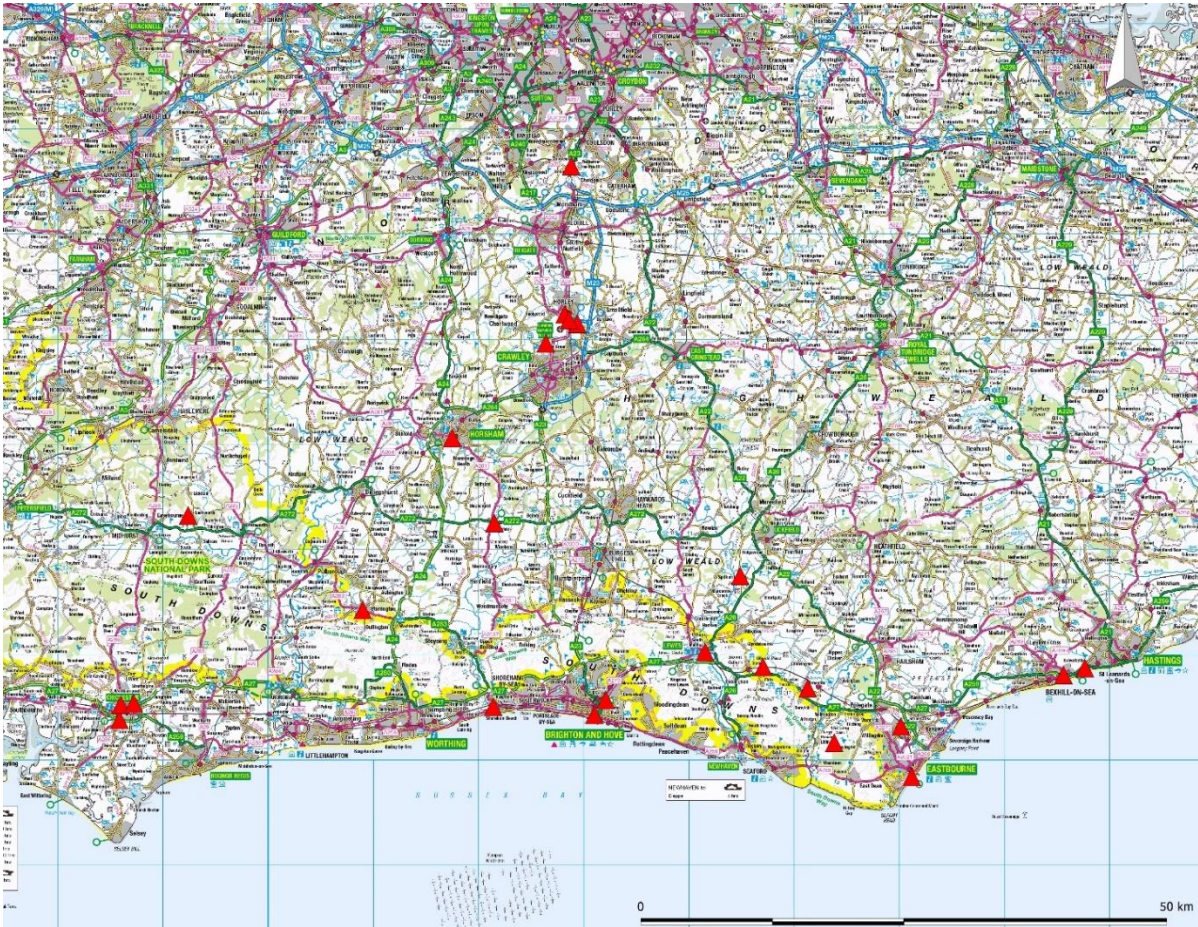
Figure S2: Map showing the location of the monitoring sites employed with the study. Contains OS data © Crown copyright and database right (2020).
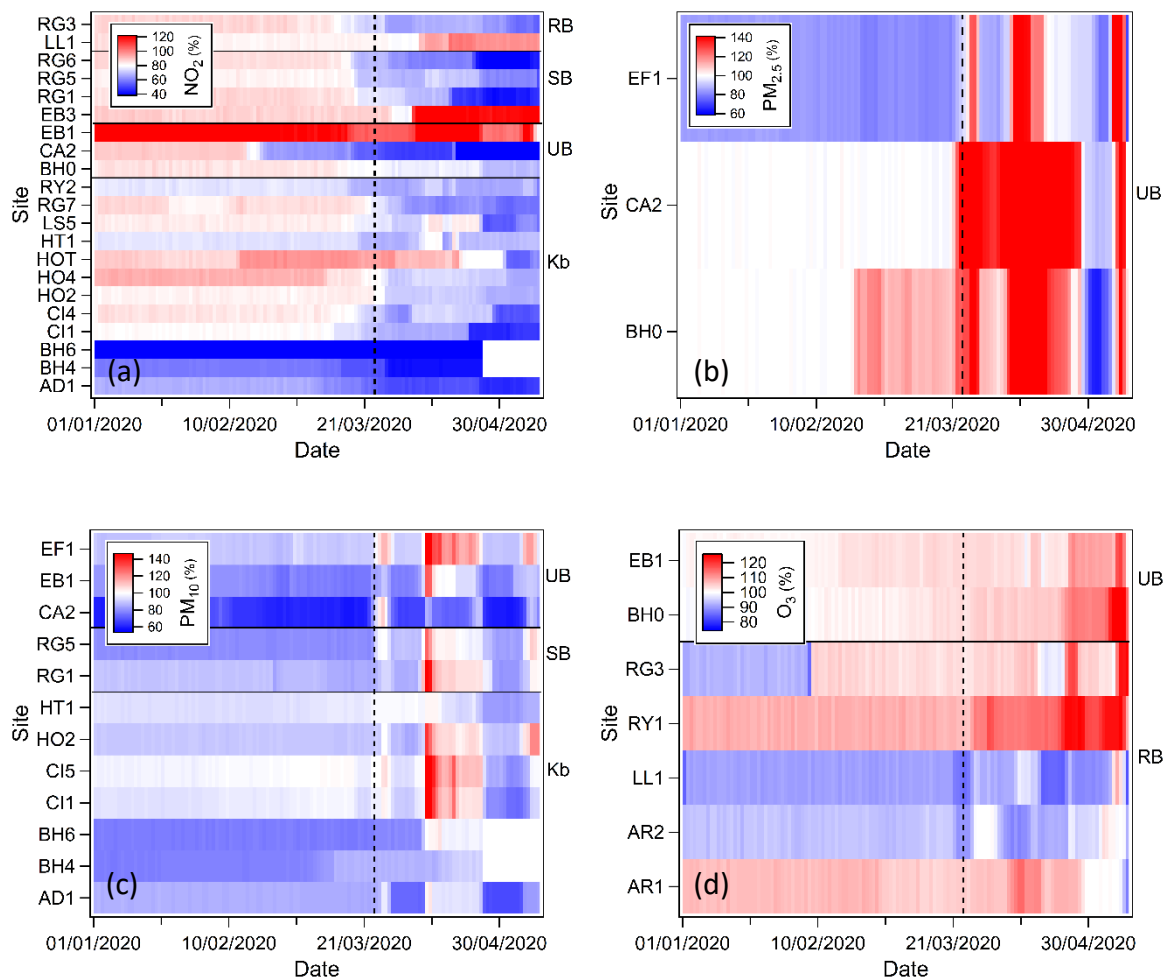
Figure S3: Relative changes in air pollutant abundance in the southeast of the UK during the pandemic lockdown period (starting 24/03/2020; denoted by vertical dashed line) with respect to the preceding 5-year annual average (i.e. 2015 – 2019, inclusive). Data grouped by site; site identifiers: Kb = kerbside, UB = urban background, SB = suburban background, RB = rural background. See Table 1 for site codes.
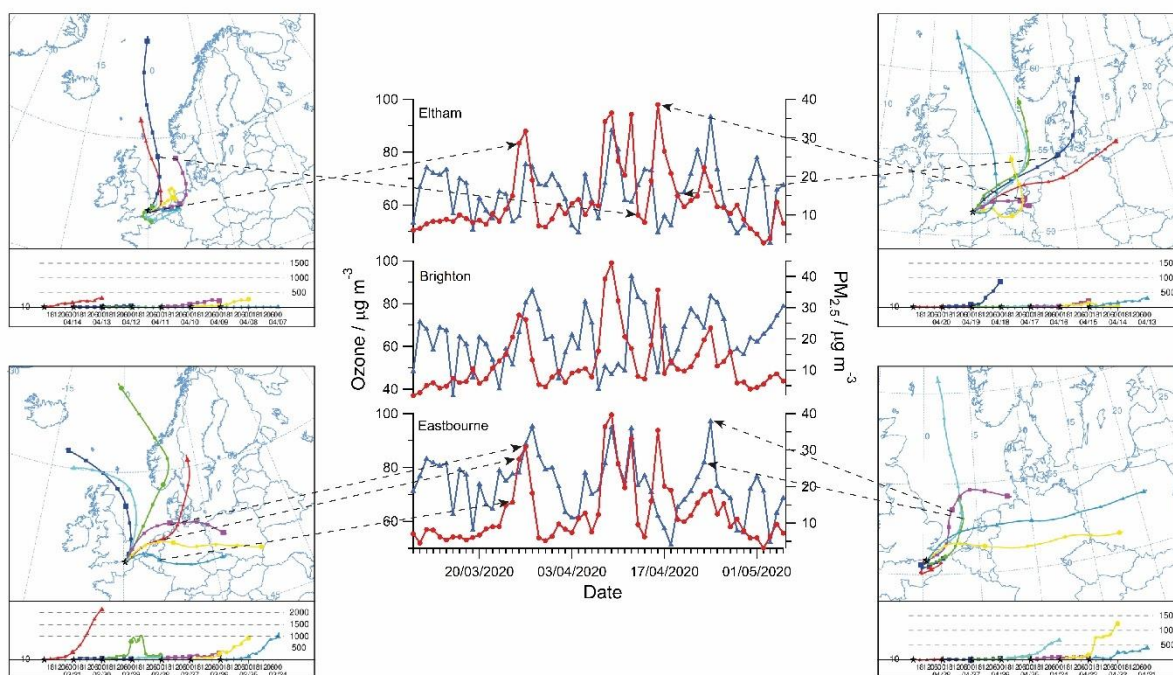
Figure S4: Daily mean PM_{2.5} (red) and O₃ (blue) concentrations in Eltham (south London), Brighton and Hove (BH0) and Eastbourne (LL1 and EB1) during the period 10/03/2020 – 05/05/2020 with accompanying HYSPIT 48-hour back trajectory models for selected weeks. Model starting height = 10m; time resolution = 6-hours for Eastbourne and Eltham.