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Supplementary Materials

Ozone Trends in the United Kingdom over the Last 30 Years

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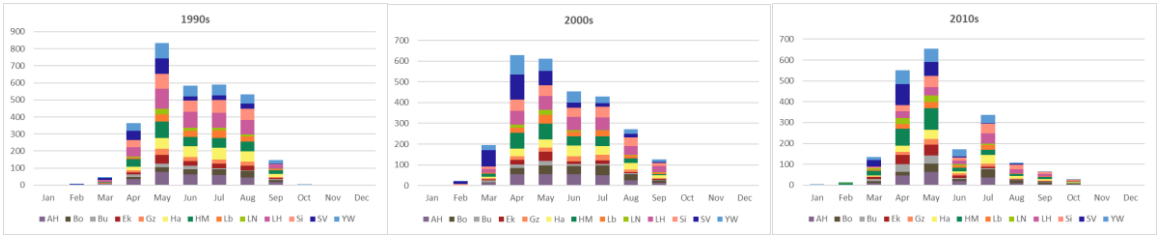
Table S1. The annual average ozone maximum and the trend of maximum ozone and average ozone for the period of 1992–2019.

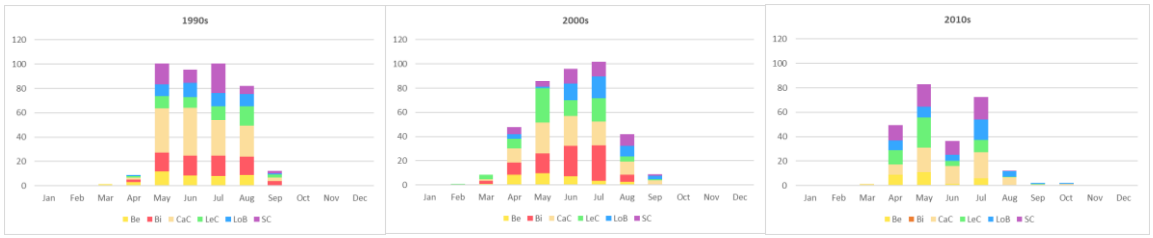
Sites	Average Ozone Maximum (ppb)	Trend of Ozone Maximum ppb/yr	Trend of Average Ozone ppb/yr
Rural Sites			
Aston Hill	83.2	−1.00 (1.2), $p = 0.04$	0.09 (0.3), $p = 0.001$
Bottesford*	87.0	−1.16 (1.3), $p < 0.001$	0.30 (1.3), $p < 0.001$
Bush Estate**	68.5	−0.46 (0.7), $p = 0.003$	0.12 (0.4), $p = 0.07$
Eskdatemuir	76.4	−0.67 (0.9), $p = 0.001$	0.16 (0.6), $p = 0.02$
Glazebury	80.8	−0.93 (1.2), $p < 0.001$	0.24 (1.2), $p = 0.002$
Harwell*	91.6	−1.65 (1.8), $p = 0.05$	0.09 (0.4), $p < 0.001$
High Muffles	85.6	−0.91 (1.1), $p = 0.002$	0.15 (0.5), $p = 0.001$
Ladybower	82.6	−1.46 (1.8), $p = 0.01$	0.10 (0.4), $p < 0.001$
Lough Navar	70.8	−0.18 (0.3), $p = 0.005$	0.08 (0.3), $p = 0.04$
Lullington Heath	92.2	−1.74 (1.9), $p = 0.03$	0.07 (0.2), $p < 0.001$
Sibton	97.8	−1.08 (1.1), $p = 0.01$	0.10 (0.4), $p = 0.001$
Strathvaich	72.4	−0.31 (0.4), $p = 0.05$	−0.01 (0.0), $p = 0.08$
Yaner Wood	88.8	−0.99 (1.1), $p = 0.008$	0.11 (0.4), $p = 0.005$
Urban Sites			
Belfast Centre	65.0	−0.32 (0.5), $p < 0.001$	0.15 (0.7), $p = 0.01$
Birmingham Centre***	77.0	−0.80 (1.0), $p = 0.02$	0.26 (1.4), $p = 0.005$
Cardiff Centre	81.7	−1.02 (1.2), $p < 0.001$	0.27 (1.4), $p = 0.001$
Leeds Centre****	71.1	−0.42 (0.6), $p < 0.001$	0.26 (1.5), $p = 0.009$
London Bloomsbury	74.1	−0.92 (1.2), $p < 0.001$	0.25 (2.1), $p = 0.001$
Southampton Centre****	72.2	−0.64 (0.9), $p < 0.001$	0.16 (0.9), $p = 0.009$

Note: The percentage trend of maximum ozone and average ozone per year has been shown in parenthesis. *data coverage from 1992 to 2016, **data coverage from 1999 to 2019, ***data coverage from 1992 to 2009, ****data coverage from 1994 to 2019.



(a) (b) (c)

Figure S1. Monthly ozone exceedances in rural sites for last three decades, (a) 1990s, (b) 2000s and (3) 2010s. Total exceedance is calculated as the total number of hours at ozone concentration ≥ 50 ppbv for each month in a year and then yearly averaged for each decade.



(a) (b) (c)

Figure S2. Monthly ozone exceedances in urban sites for last three decades, (a) 1990s, (b) 2000s and (3) 2010s. Total exceedance is calculated as the total number of hours at ozone concentration ≥ 50 ppbv for each month in a year and then yearly averaged for each decade.

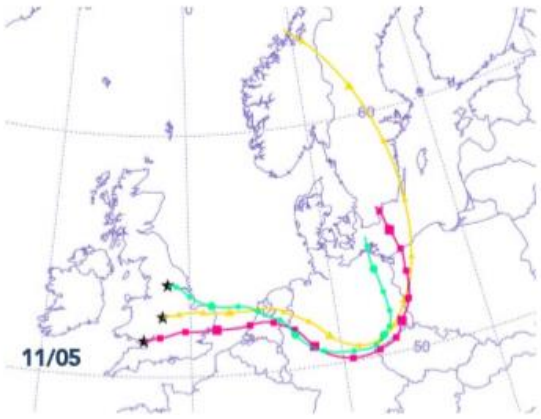


Figure S3. Trajectories arriving in Birmingham Centre (Bi), Cardiff Centre (CaC) and Leeds Centre (LeC) at 4 pm (local time) on 11 May 2008.

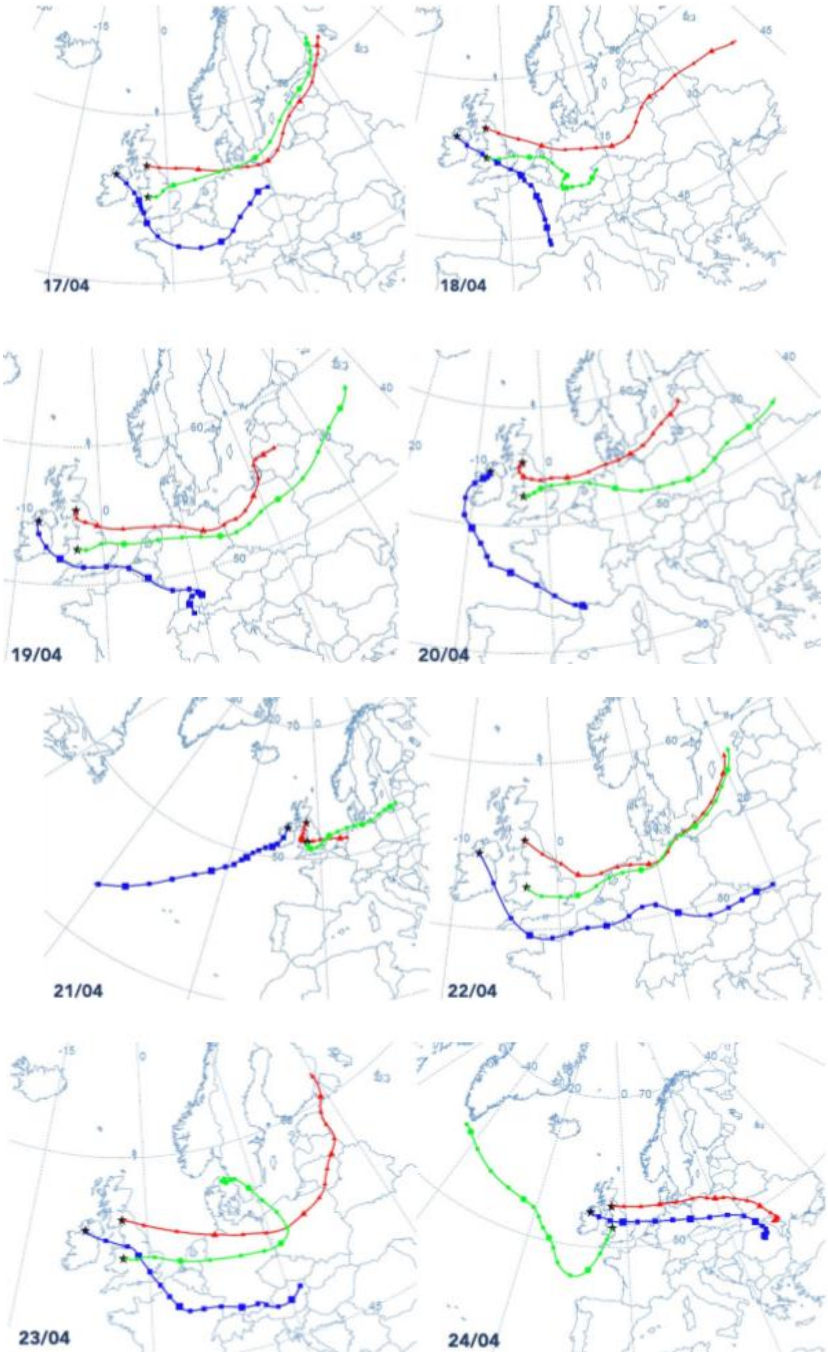


Figure S4. Trajectories arriving in Eskdatemuir (Ek), Aston Hill (AH) and Lough Navar (LN) at 4 pm (local time) for the period of 17 April to 24 April 2019.