

1 **SUPPLEMENTARY INFORMATION**

2

3 **Analysis of New Particle Formation (NPF) Events at Nearby**
4 **Rural, Urban Background and Urban Roadside Sites**

5

6 **Dimitrios Bousiotis, Manuel Dall'Osto, David C.S. Beddows and**

7 **Roy M. Harrison**

8 **Table S1:** Conditions per air mass origin for NPF event days (April – October average in
 9 parenthesis) for all areas of study.

Harwell				
	Continental	Arctic	Polar	Tropical
Condensation sink (s ⁻¹)	5.05E-03 (5E-03)	2.71E-03 (3.32E-03)	2.57E-03 (2.87E-03)	3.19E-03 (2.87E-03)
Wind speed (m s ⁻¹)	3.52 (3.63)	3.87 (3.47)	3.64 (3.69)	3.74 (4.17)
Temperature (°C)	15.5 (13.6)	12.2 (11.5)	13.6 (13.1)	16.3 (15)
SO ₂ (µg m ⁻³)	1.87 (1.81)	1.11 (1.82)	1.11 (1.27)	1.22 (1.36)
NO _x (µg m ⁻³)	9.58 (13.9)	5.49 (8.01)	4.66 (7.2)	5.81 (7.69)
SO ₄ ²⁻ (µg m ⁻³)	2.7 (3.3)	1.37 (2.05)	1.44 (1.64)	1.37 (1.57)
Particulate OC (µg m ⁻³)	2.85 (2.88)	1.35 (1.59)	1.52 (1.63)	1.98 (1.76)

10

North Kensington				
	Continental	Arctic	Polar	Tropical
Condensation sink (s ⁻¹)	7.2E-03 (9.35E-03)	5.2E-03 (6.37E-03)	5.4E-03 (6.38E-03)	4.89E-03 (6.32E-03)
Wind speed (m s ⁻¹)	3.89 (3.44)	3.92 (3.65)	4.46 (4.2)	4.74 (4.44)
Temperature (°C)	18.4 (15)	12.7 (13.1)	15.5 (14.6)	17 (16.4)
SO ₂ (µg m ⁻³)	1.68 (2.23)	1.33 (1.89)	1.73 (1.75)	1.74 (1.72)
NO _x (µg m ⁻³)	33.5 (55)	28.5 (39.2)	30.3 (39.4)	24 (34.9)
SO ₄ ²⁻ (µg m ⁻³)	1.93 (2.23)	0.95 (1.36)	0.98 (1.13)	1.3 (1.47)
Particulate OC (µg m ⁻³)	3.84 (4.9)	2.24 (2.95)	2.81 (2.96)	2.43 (3.03)

11

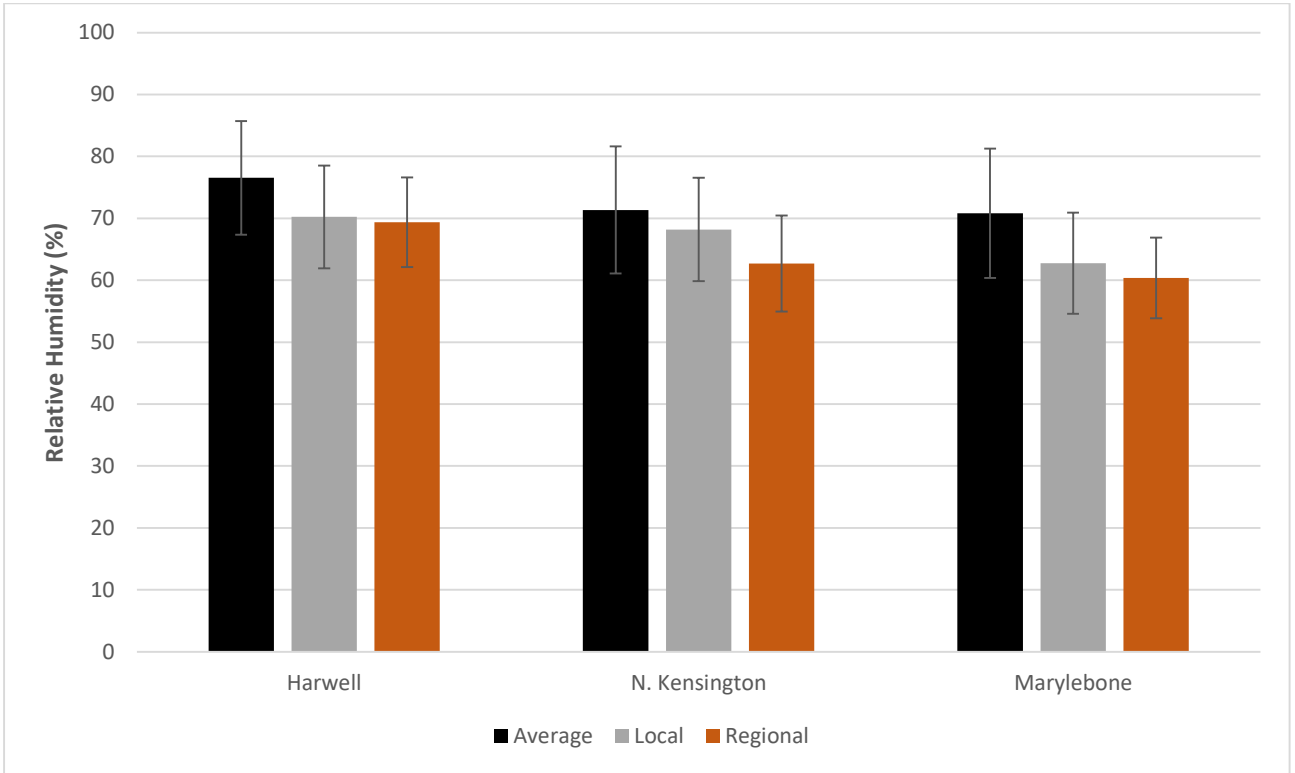
Marylebone				
	Continental	Arctic	Polar	Tropical
Condensation sink (s ⁻¹)	1.65E-02 (1.96E-02)	1.16E-02 (1.57E-02)	1.4E-02 (2.14E-02)	1.82E-02 (2.39E-02)
Wind speed (m s ⁻¹)	3.92 (3.41)	3.5 (3.64)	3.84 (4.13)	4.77 (4.4)
Temperature (°C)	17.4 (15.2)	13.4 (13.4)	15.3 (14.8)	16.9 (16.3)
SO ₂ (µg m ⁻³)	4.99 (6.39)	4.31 (5.63)	5.38 (7.43)	6.95 (8.17)
NO _x (µg m ⁻³)	172 (250)	139 (214)	191 (303)	269 (336)
SO ₄ ²⁻ (µg m ⁻³)	3.24 (3.35)	1.47 (1.6)	1.52 (1.61)	1.24 (1.8)
Particulate OC (µg m ⁻³)	6.03 (6.91)	3.81 (4.73)	4.67 (5.97)	5.31 (6.6)

12

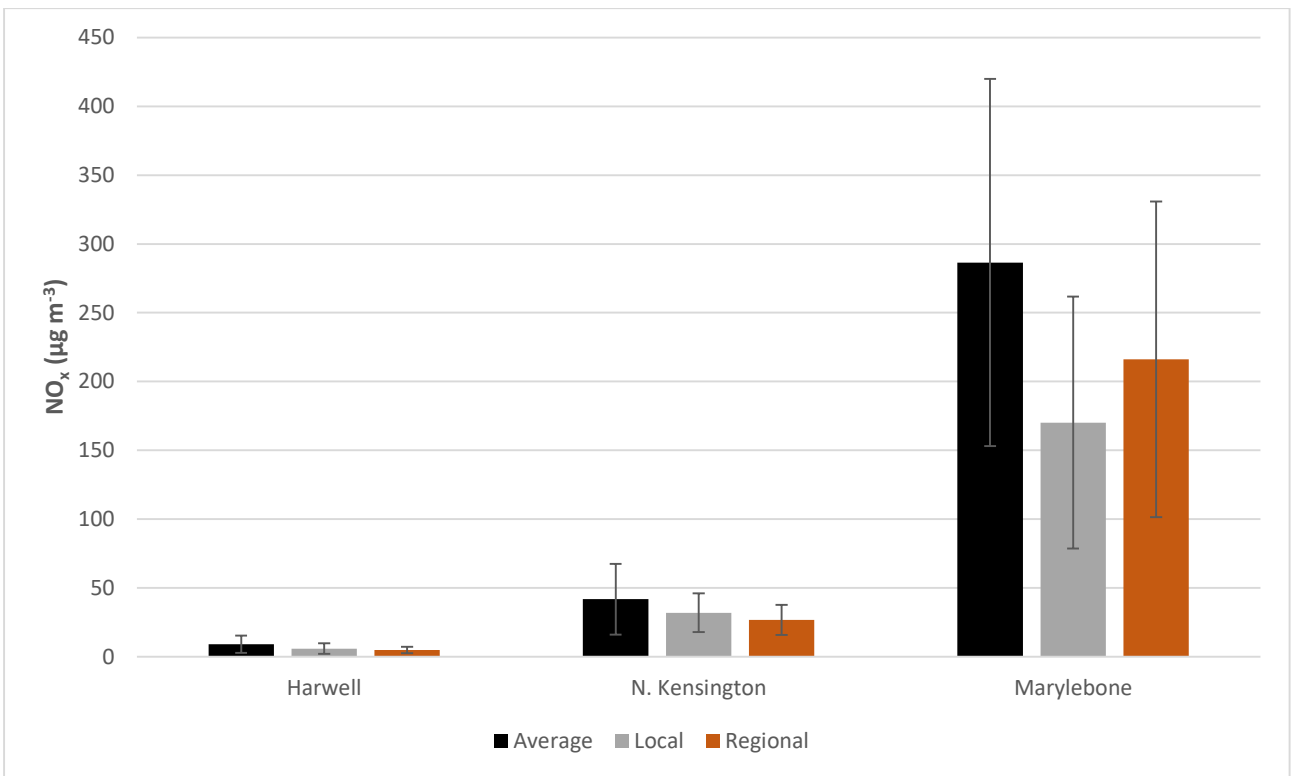
13

14

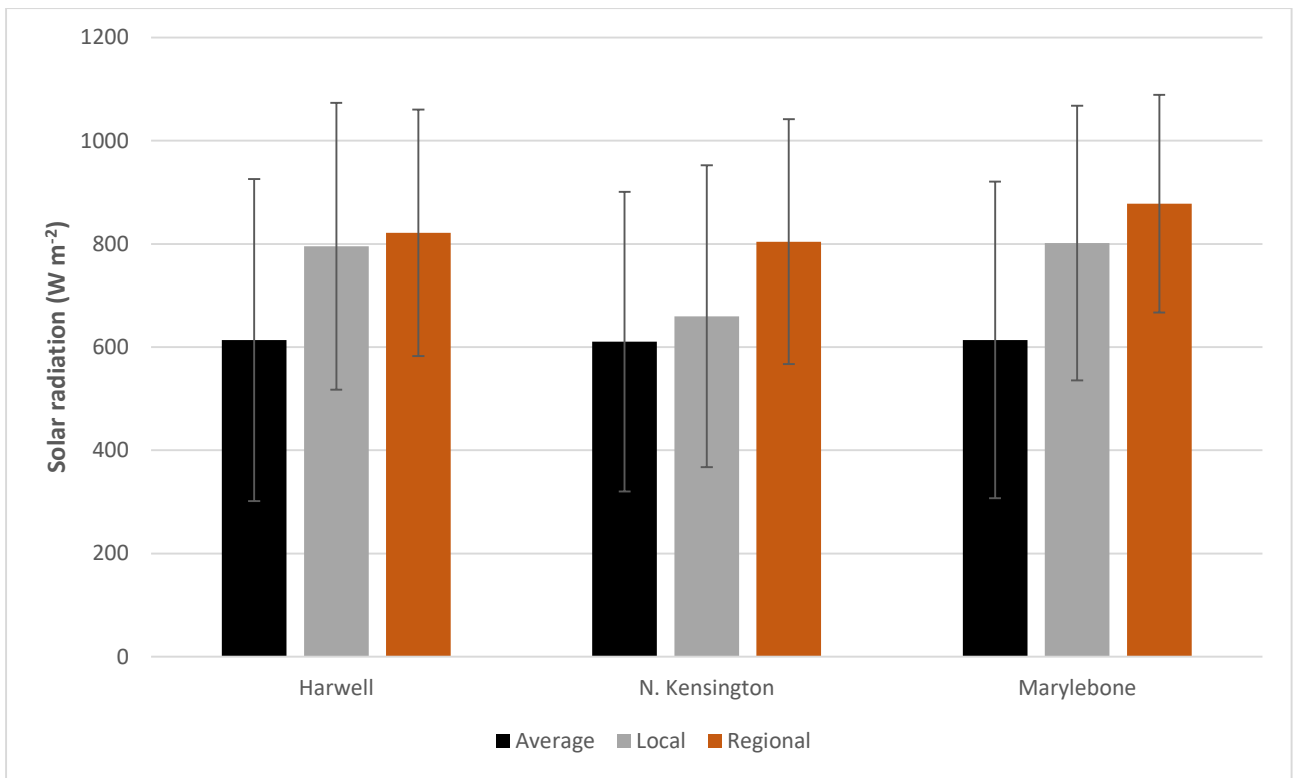
15



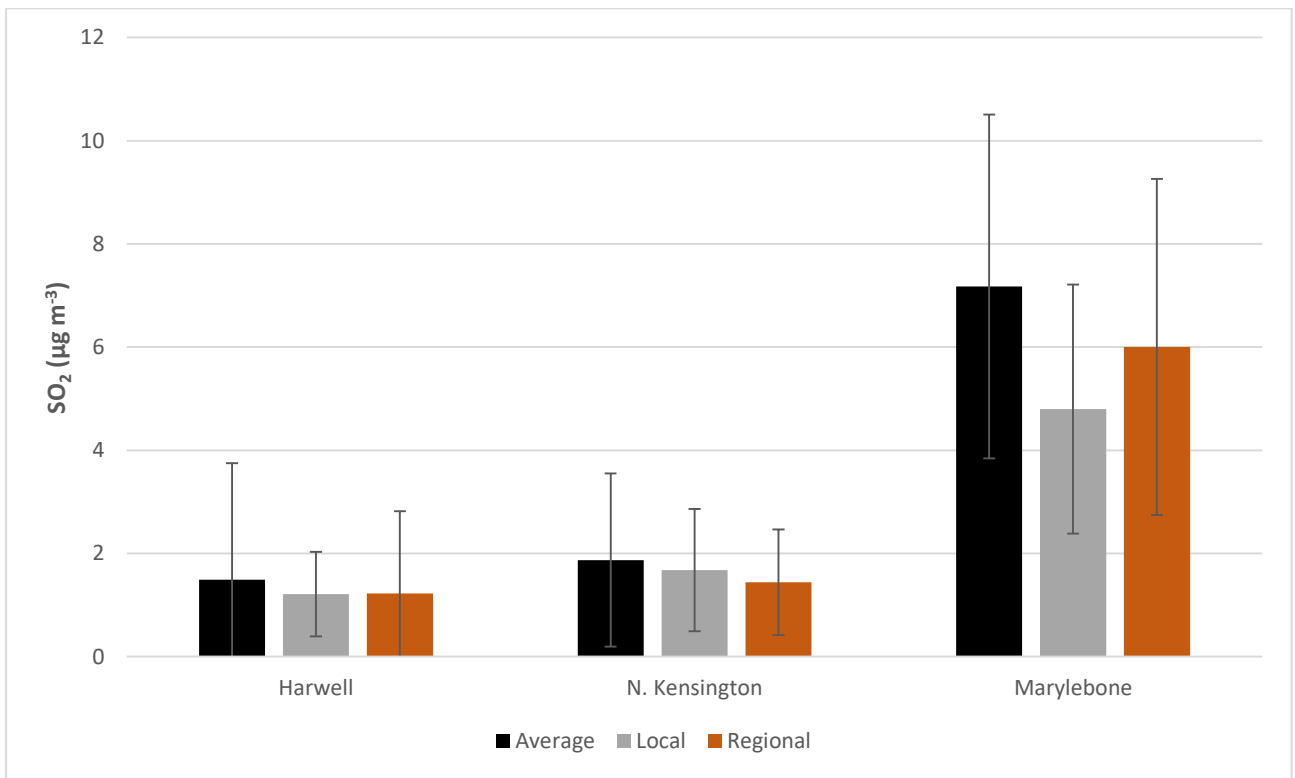
16



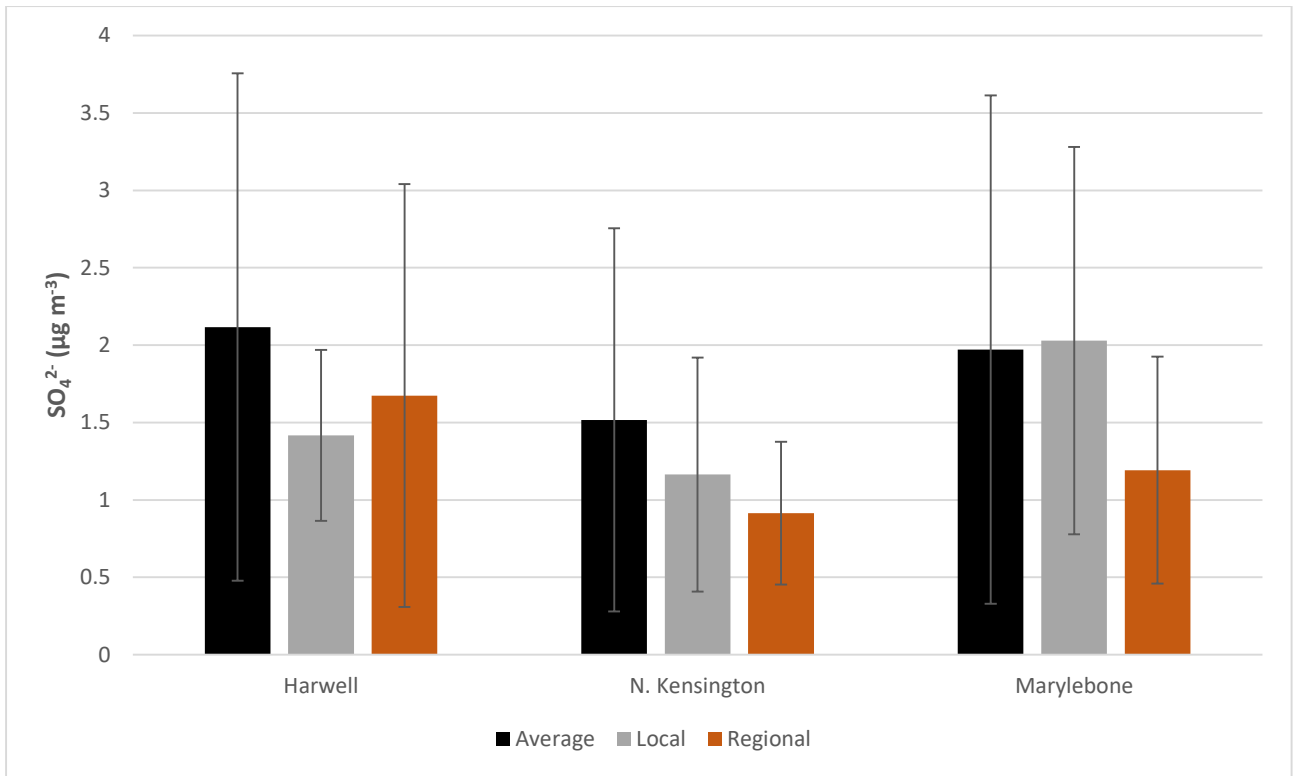
17



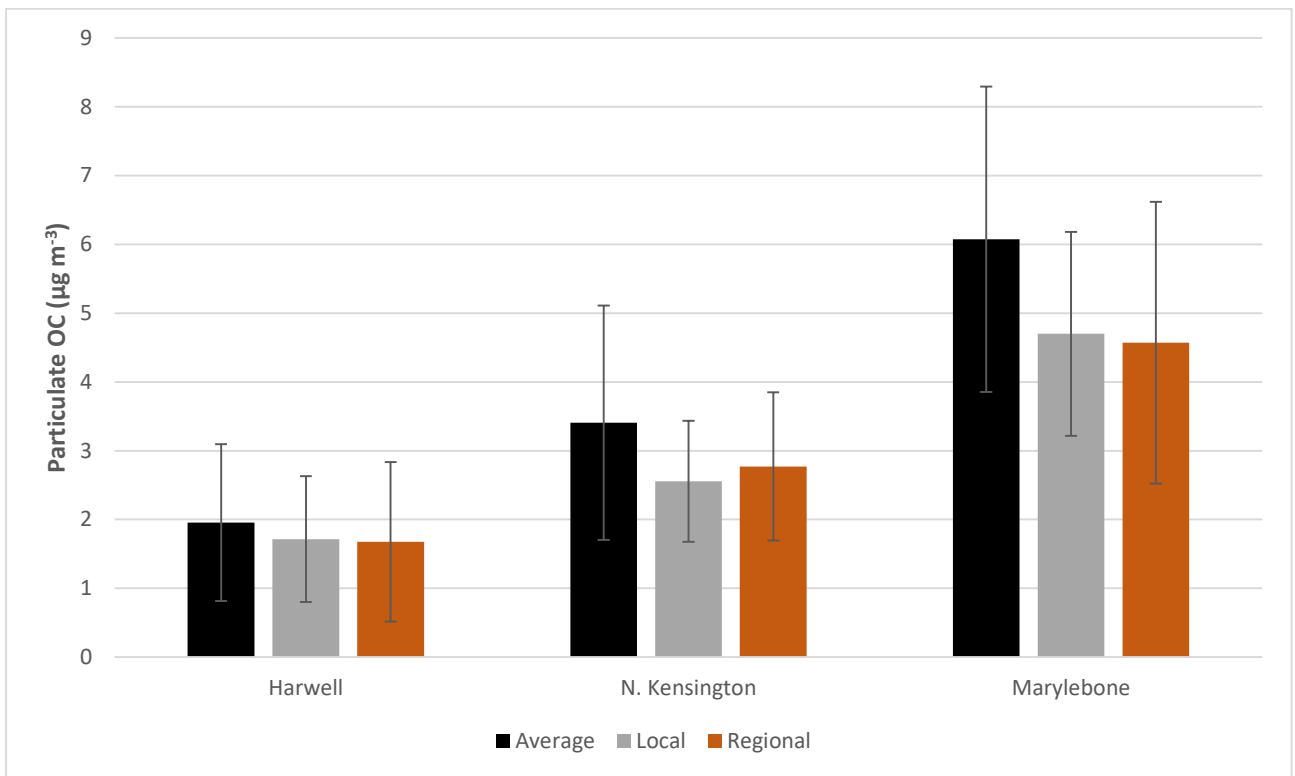
18



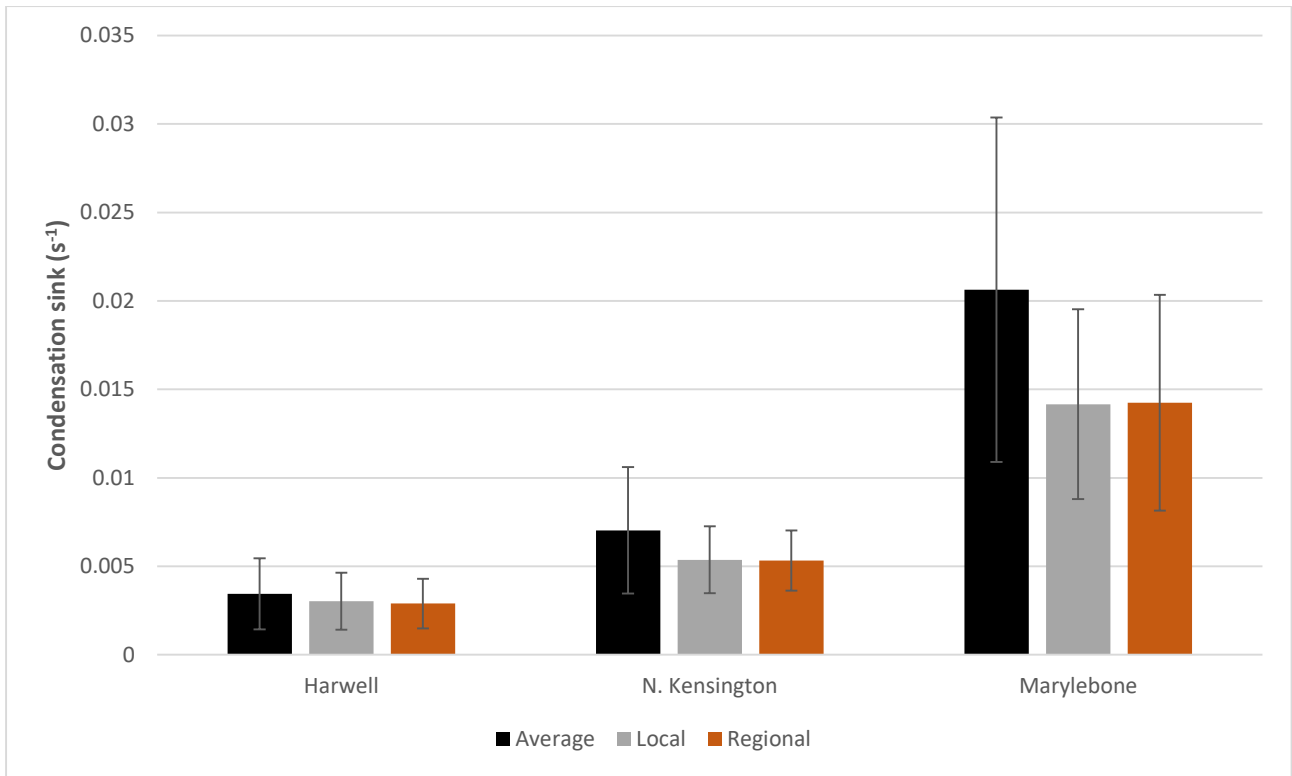
19



20
21



22



23

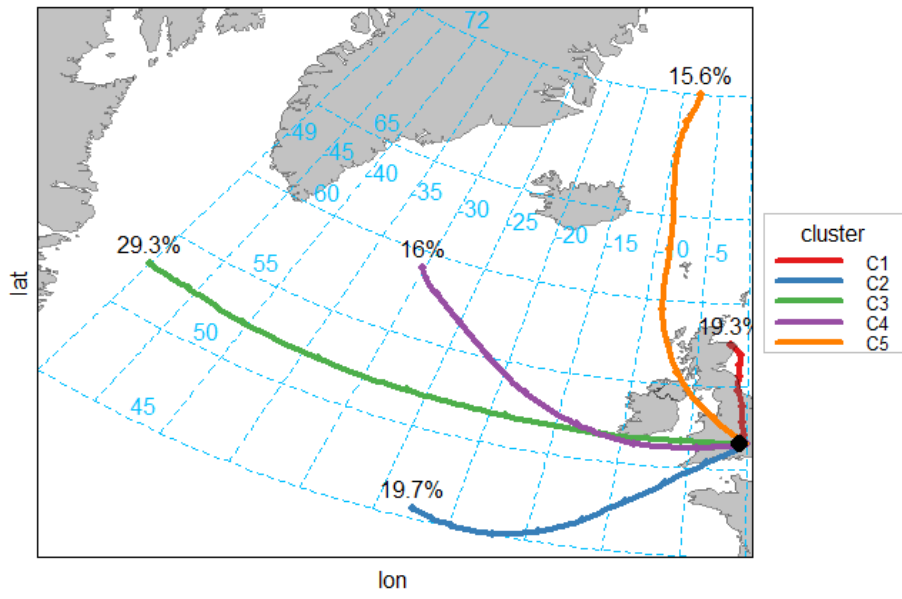
24 **Figure S1:** Average and NPF event conditions for Harwell and N. Kensington and Marylebone
 25 Road. On Marylebone Road, Regional events' conditions refer to the Regional event days for all 3
 26 sites.

27

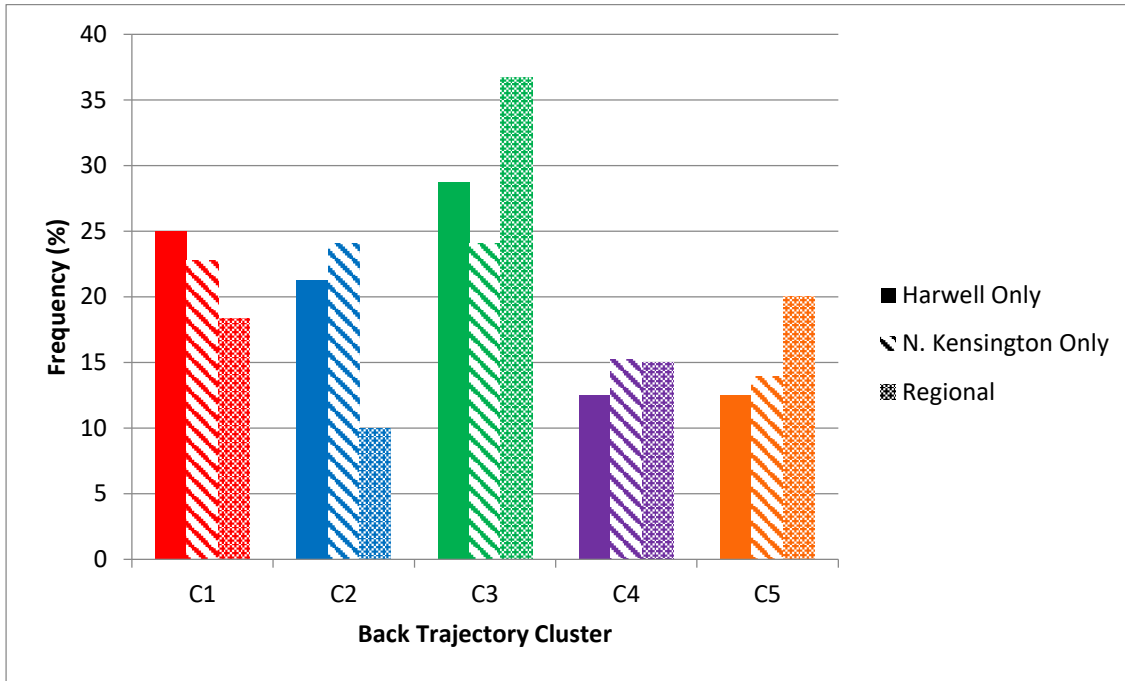
28

29

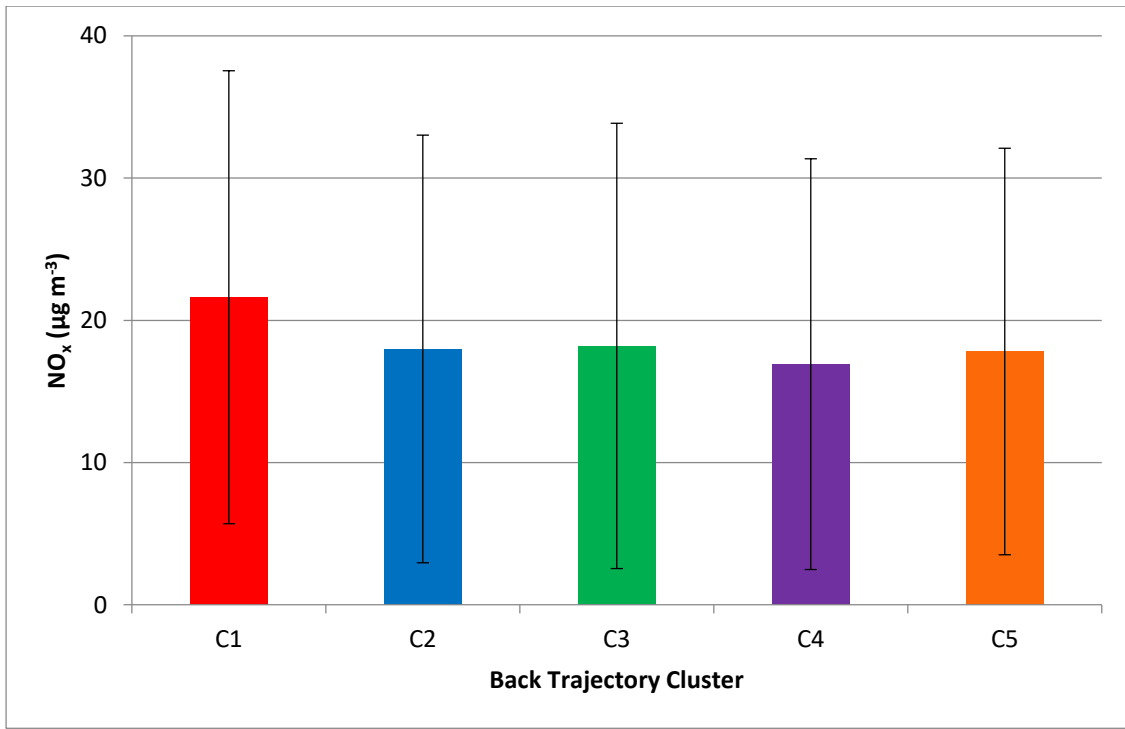
30



31

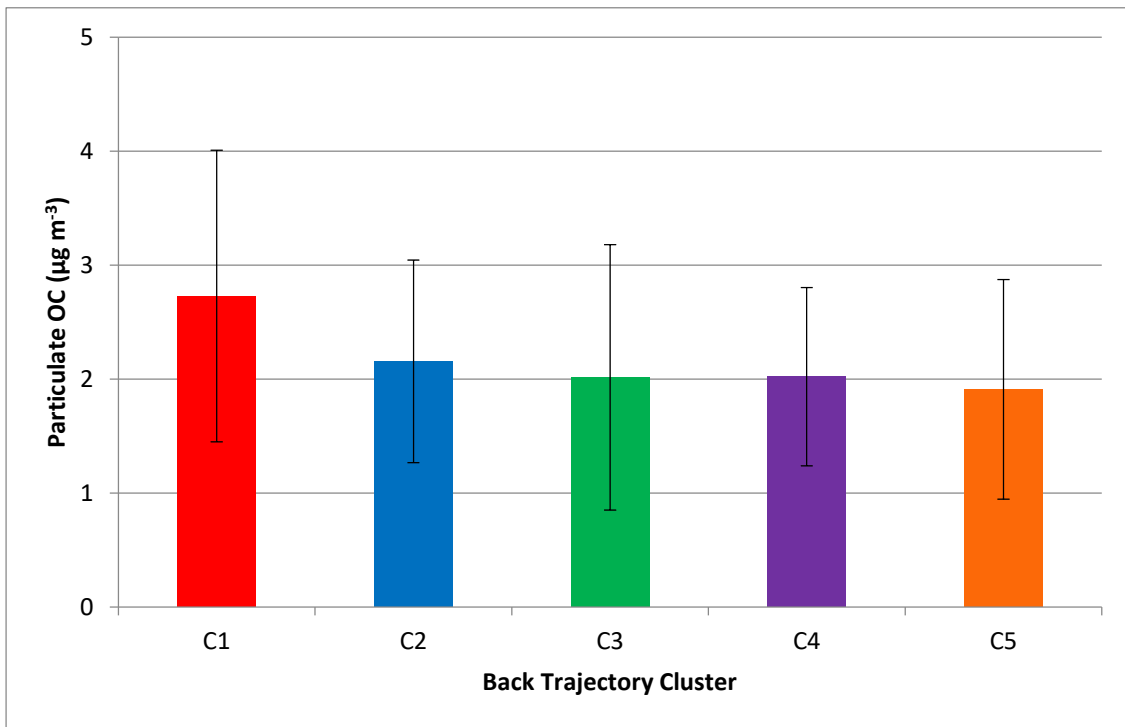


32



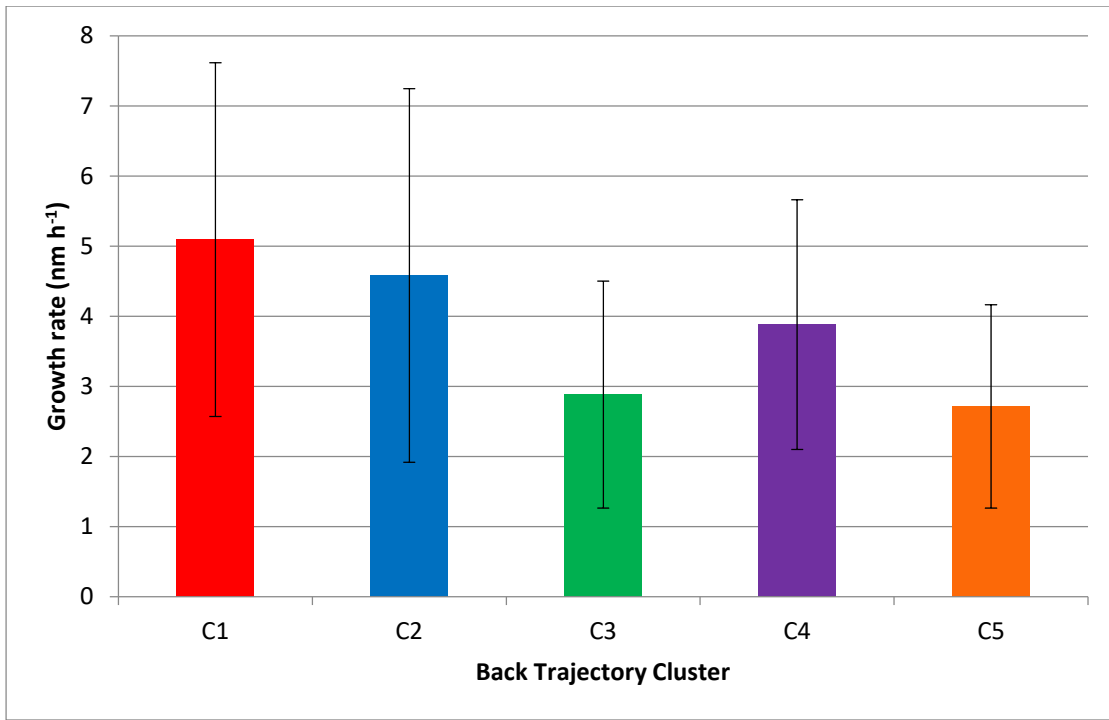
33

34

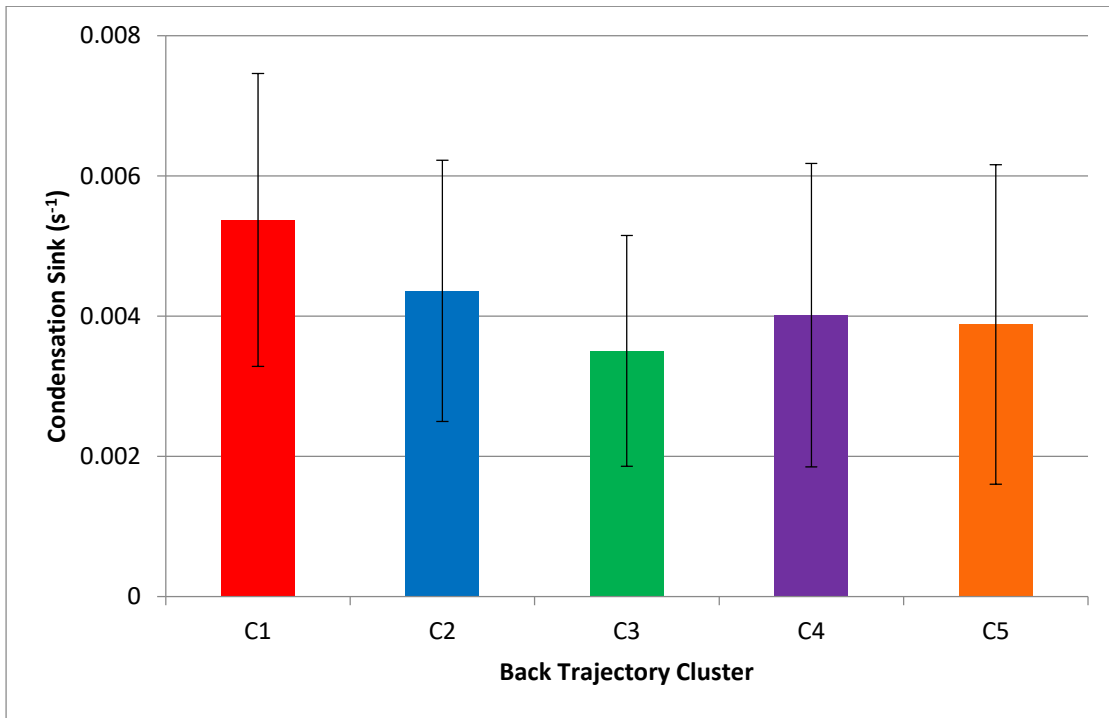


35

36

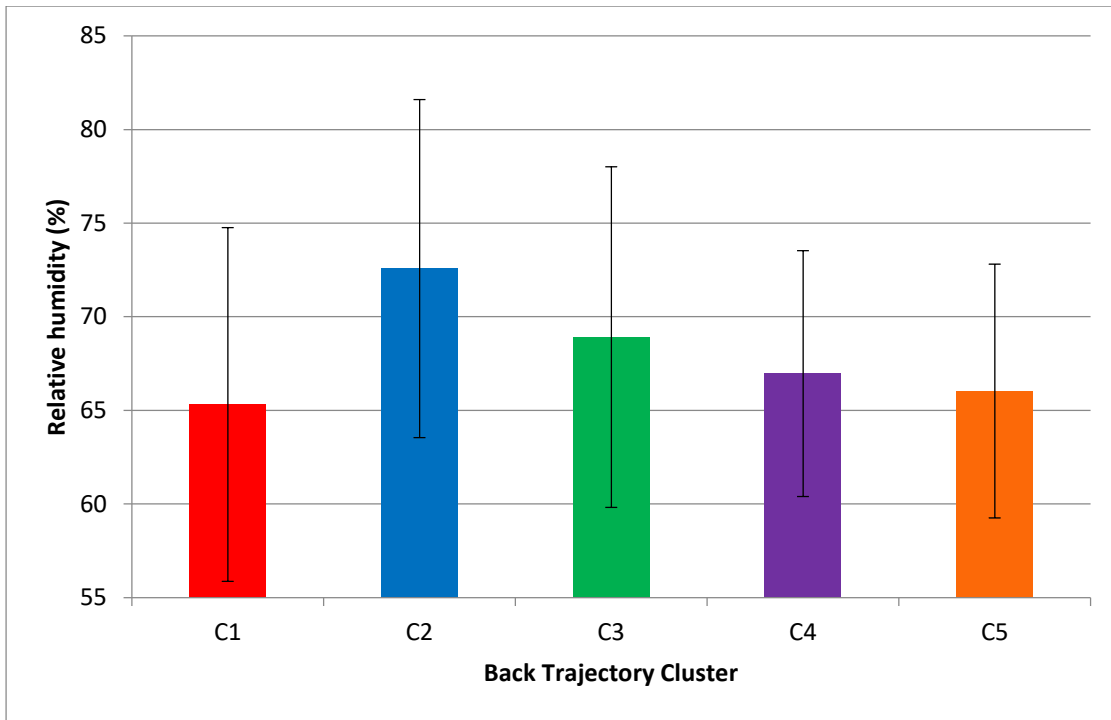


37

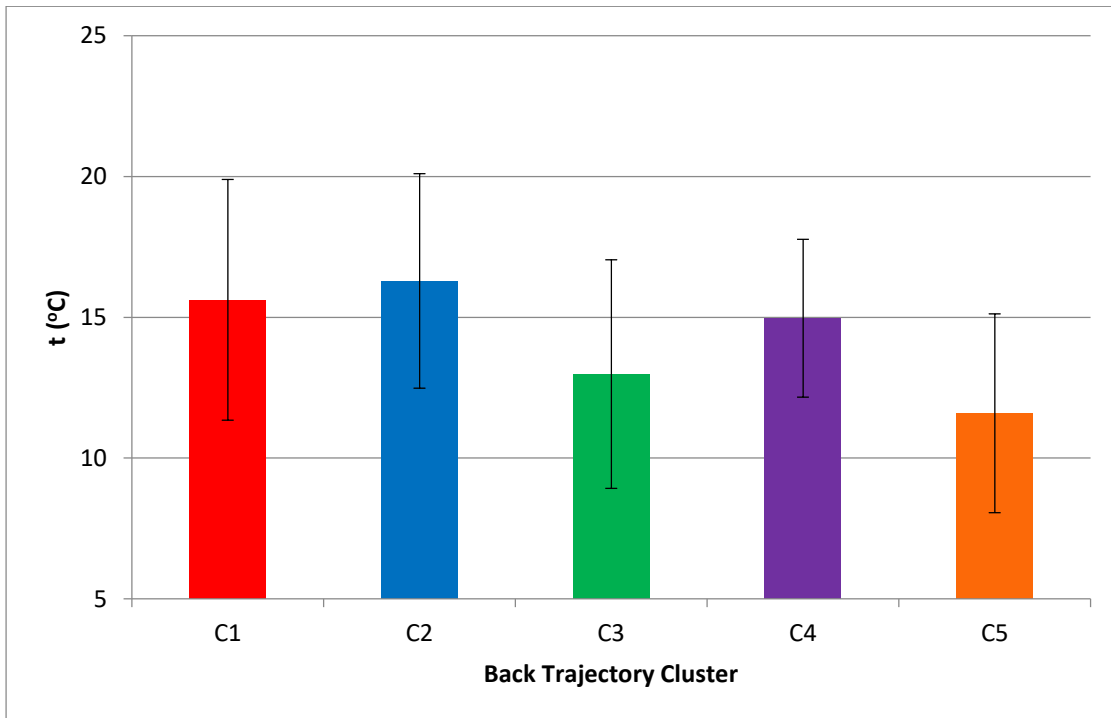


38

39

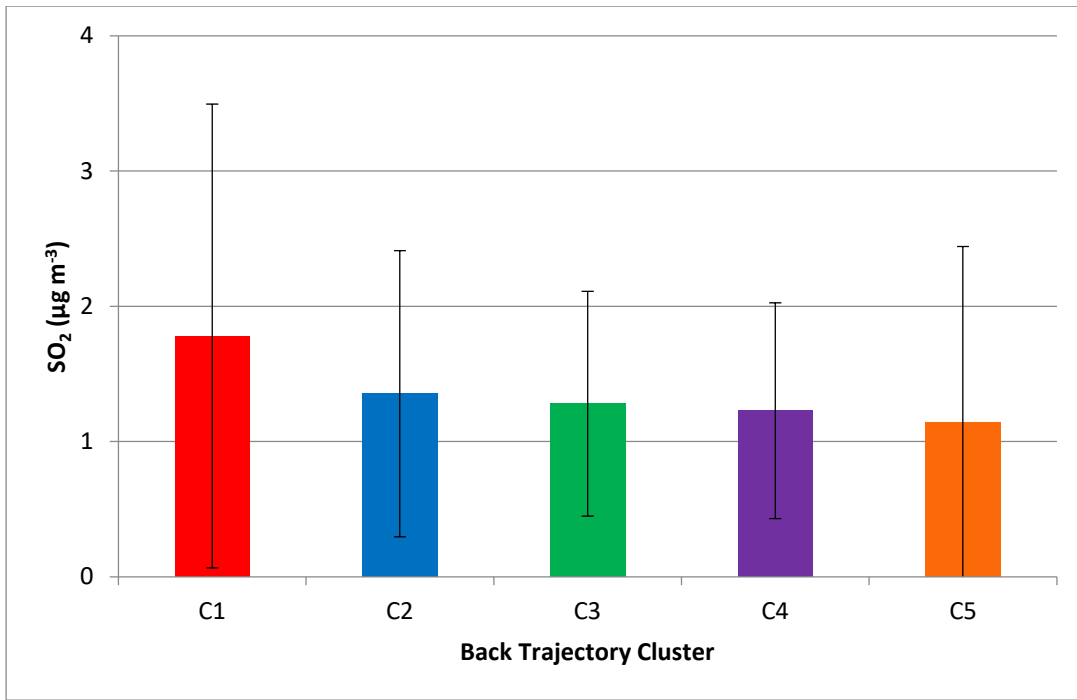


40

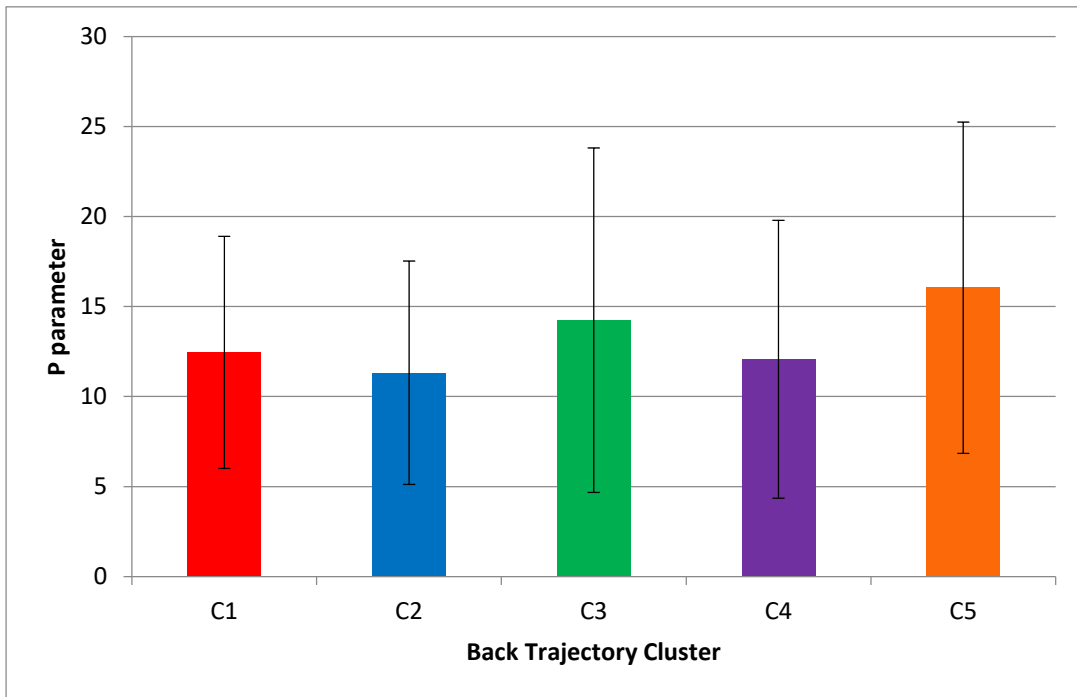


41

42



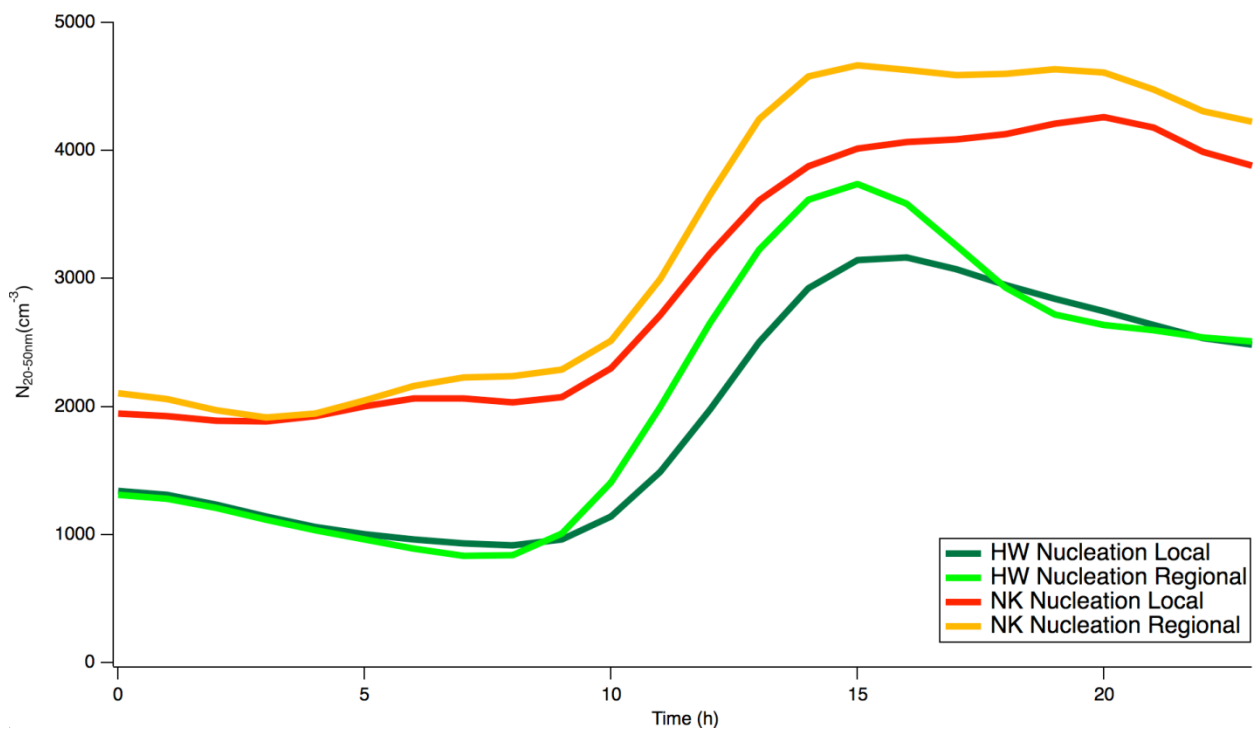
43



44

45 **Figure S2:** Air mass origin frequency and conditions for NPF events in Harwell and N. Kensington.

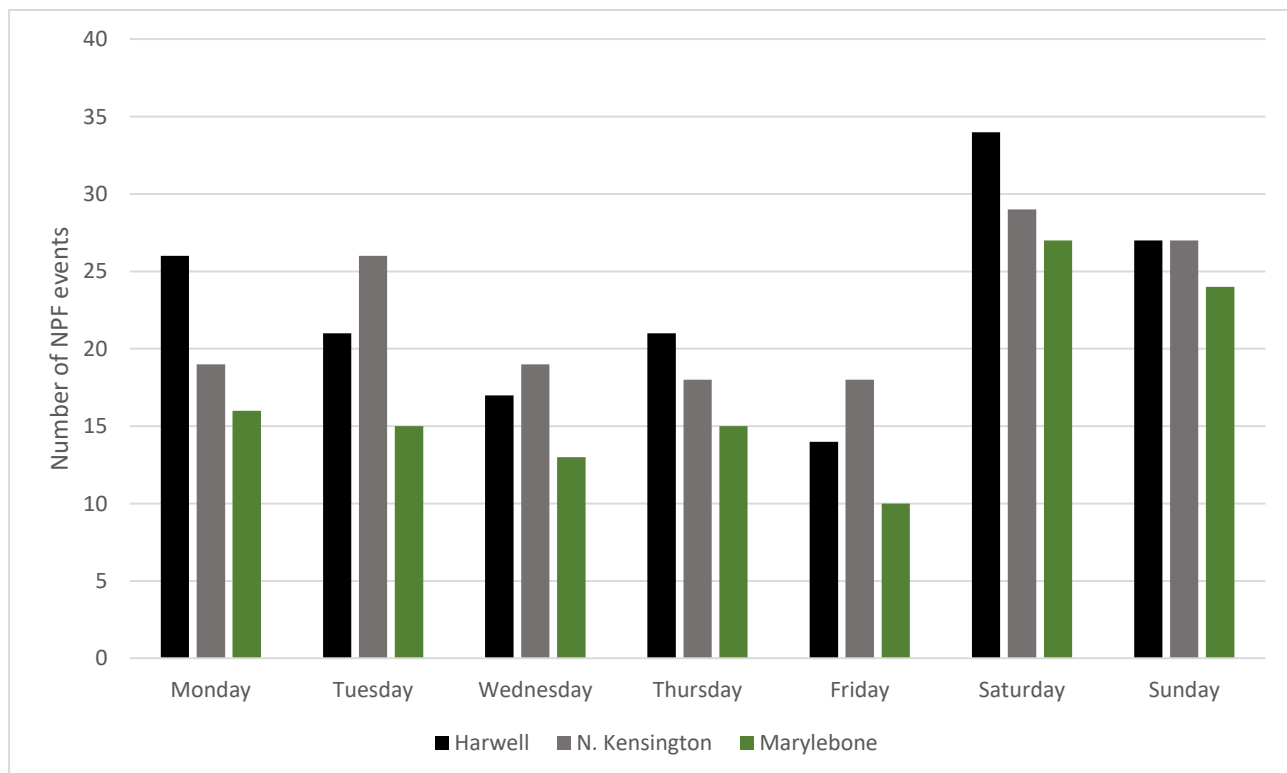
46



47

48 **Figure S3:** Diurnal variation of $N_{20-50nm}$ for Harwell and N. Kensington during local and regional
 49 NPF events.

50

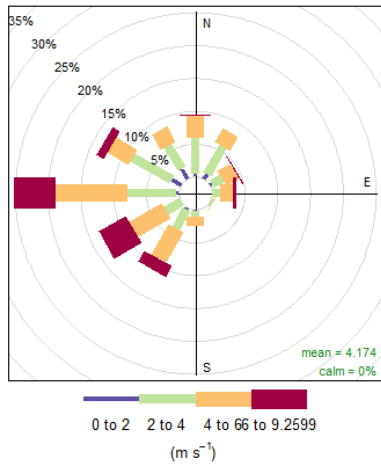


51

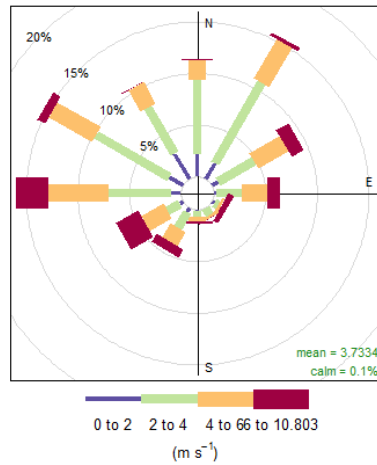
52 **Figure S4:** Weekly variation of NPF events in Marylebone Road.

53

54



Frequency of counts by wind direction (%)



Frequency of counts by wind direction (%)

55

56

57 **Figure S5:** Wind profile for Local (left) and Regional (right) NPF events in Marylebone Road.

58