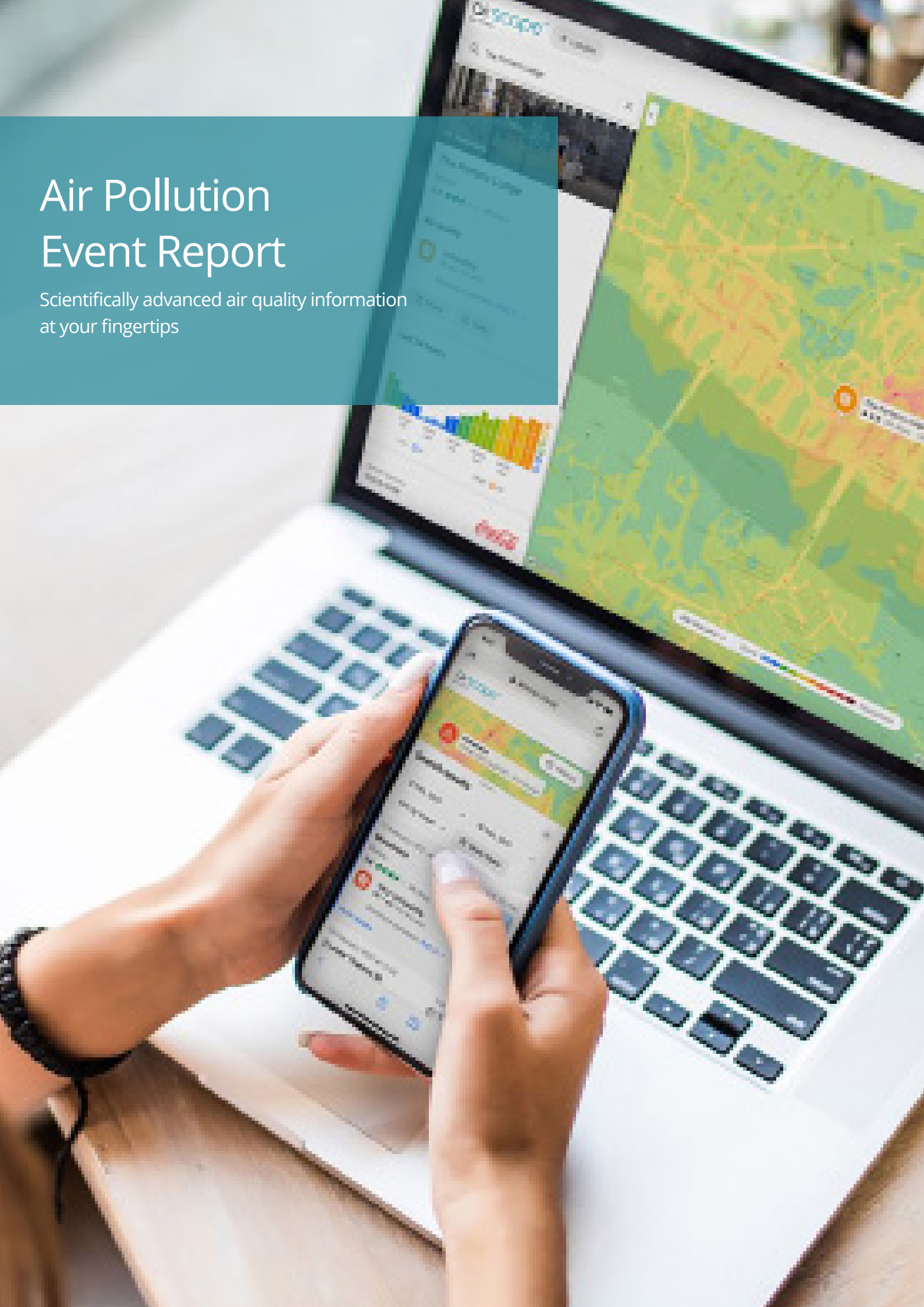


# Air Pollution Event Report

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# Camden, London March 2023

Title	Camden pollution events report (March 2023)
Report no	TR009
Report type	Event Assessment
Description	Report on recent pollution events in Camden, London
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Reviewers	Matthew S. Johnson
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## Background

This document is an analysis of pollution patterns during March 2023 over a sensor network in Camden, London. For this report a representative sample of 80 nodes (1/3 of the whole network) was analysed based on hourly average of the following pollutants: PM<sub>2.5</sub>, O<sub>3</sub> and NO<sub>2</sub>. The pollutant concentrations were also compared to previous months and the findings are presented in this report.

## Analysis

For the comparison purposes the data of Camden AirNodes covers the period between January 2023 and March 2023. Nevertheless, the focus of this report is on March.

Based on the analysis of the **NO<sub>2</sub>** data from the representative Camden devices, it can be seen that there are no big differences between the months, and that the average monthly concentrations vary little (Table 1, Fig. 1) suggesting stable daily patterns for the pollutant formation. The tendency for NO<sub>2</sub> to increase with decreasing temperatures and slower wind speed is still intact in March. Highest NO<sub>2</sub> concentration correlates well with lower temperatures. At least three periods of elevated NO<sub>2</sub> concentration can be seen in March where the temperature was close, or fell under 0°C - on 8th, 11th and 15th March. **On average NO<sub>2</sub> concentration in March was clearly higher than WHO guidelines for 24-hour NO<sub>2</sub> average (25 ug/m3) as was also the case in previous winter months this year (Fig. 2).**

Month/Pollutant	NO <sub>2</sub> in ug/m <sup>3</sup>	O <sub>3</sub> in ug/m <sup>3</sup>	PM <sub>2.5</sub> in ug/m <sup>3</sup>
January	40.5	29.9	8.6
February	41.3	30.5	10.3
March	40.8	37	6
3 months average	40.9 ± 0.4	32.5 ± 3.9	8.3 ± 2.1

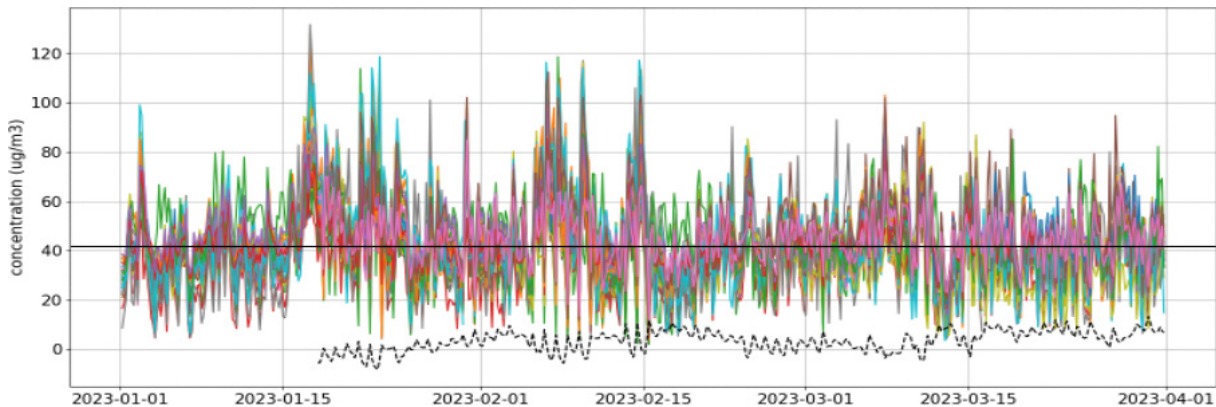


Fig. 1: NO<sub>2</sub> 4h average in January-March period.

The black horizontal line represents an average of AirNodes for that time period. The black dashed line represents temperature observed in the AirNode.

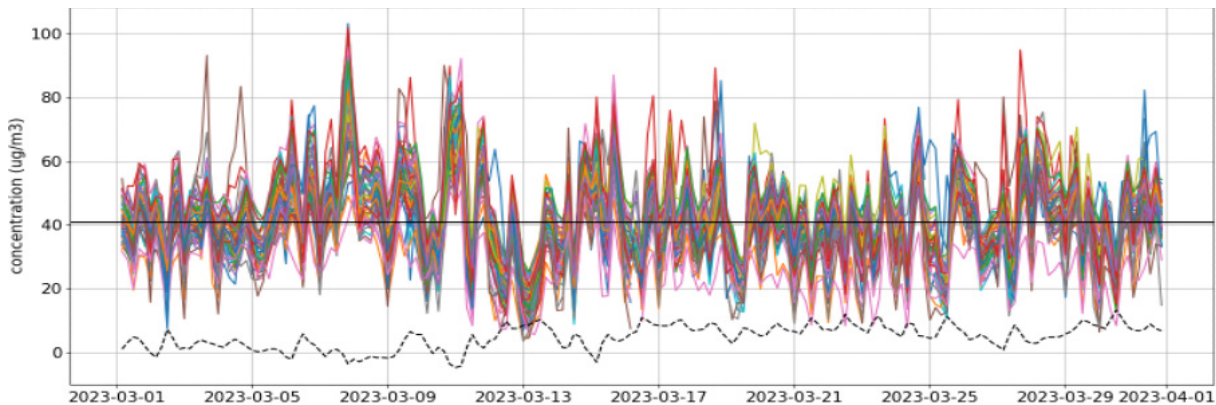


Fig. 2: NO<sub>2</sub> 4-hour average in March.

The black horizontal line represents an average of AirNodes for March. The black dashed line represents temperature observed in the AirNode.

The **Ozone** concentration saw a much higher variability in March compared to NO<sub>2</sub>. The average concentration of O<sub>3</sub> in the last three months (from January to March) is increasing month over month probably due to increasing sunshine duration. March saw a big increase in O<sub>3</sub> compared to previous months (Table 1), especially in the 2nd part of the month, which correlates well with increasing average temperature and longer sunlight.

Low wind speed and northerly wind (Fig. 9) contributed the most to the low ozone concentration in the first 2 weeks of March (Fig. 4). **In the later part of March winds from south west dominated, bringing more ozone from continental Europe and contributing to the higher Ozone levels seen in Camden.** Again, the correlation between wind speed and its direction with ozone is very noticeable.

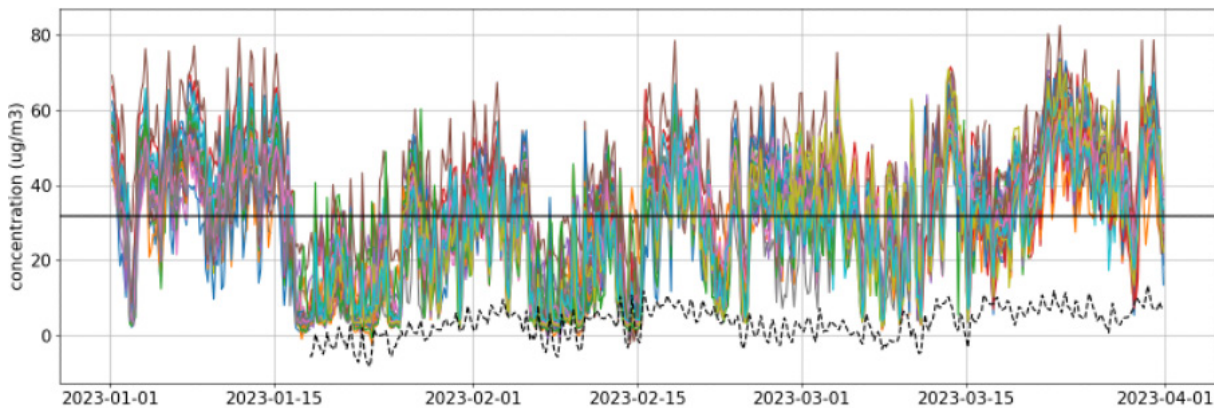


Fig. 3: O<sub>3</sub> 4h average in January - March.  
The black horizontal line represents an average of AirNodes for that period.

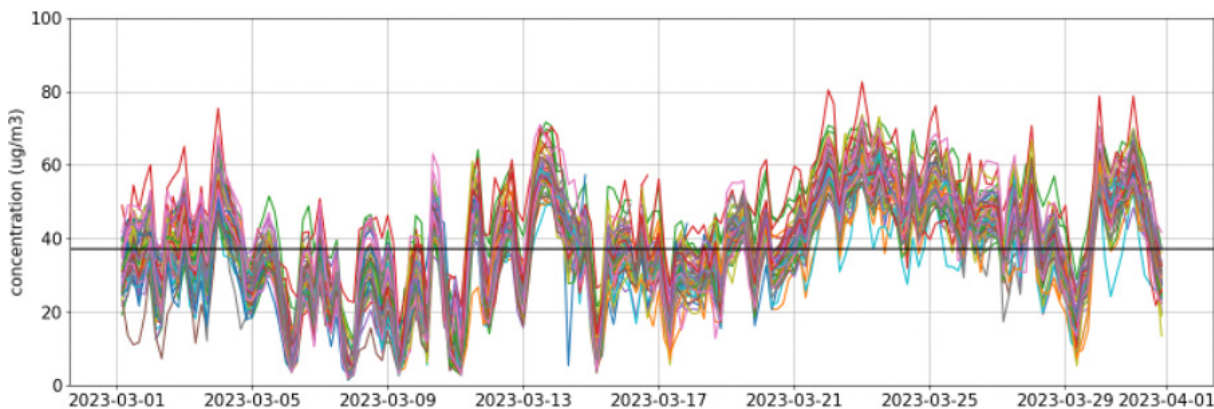
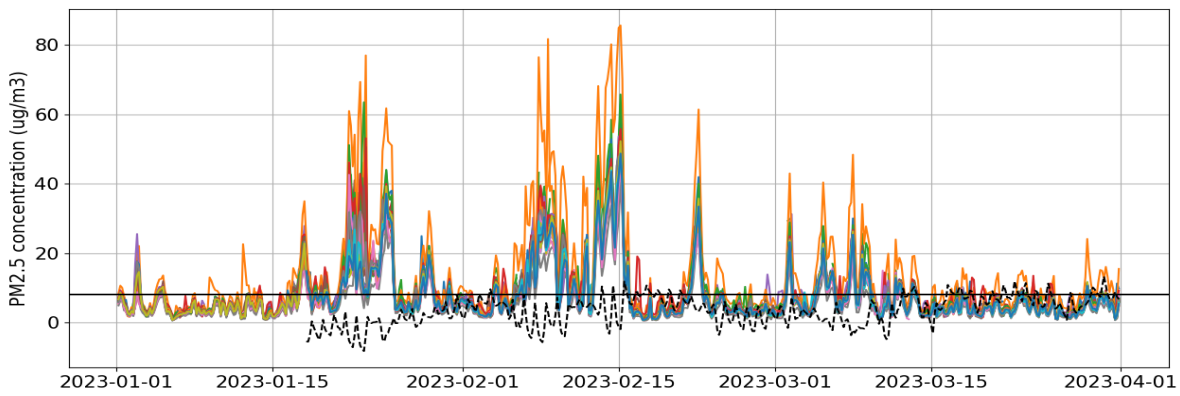


Fig. 4: O<sub>3</sub> 4h average in March.  
The black horizontal line represents an average of AirNodes for March.

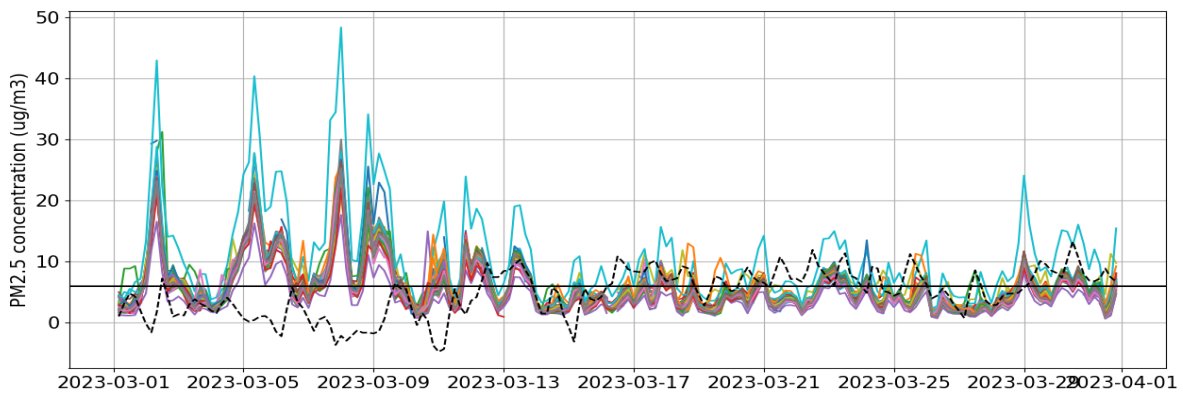
The **PM<sub>2.5</sub>** data shows increased concentration strongly above the average for a few days in early March (Fig. 5, Fig. 6). On the other hand the PM concentration in March fell significantly compared with previous months (Table 1). However, the first 10 days of March saw high PM spikes correlating well with low temperatures and low wind speed as seen also in case of NO<sub>2</sub>.

**A possible hot spot of PM pollution has been noticed in March.** Most of the nodes between Regent Canal and the railroad to the north of it are affected by higher PM concentration as can be seen by the blue line AirNode in Fig 6, and on airescape.ai in Fig. 7. This might be attributed to the particles coming from the train tracks and possibly barges on the canal. The hotspot was easier to identify due to generally lower PM pollution in March compared to other months. This made the hotspot stand out more than in previous months where big scale PM events were seen all over the Camden borough.

**AQI levels** in March were still high (Fig. 8) but have slightly decreased compared to January and February.



**Fig. 5: PM<sub>2.5</sub> 4h average in January-March.**  
 The black horizontal line represents an average of AirNodes for that time period. The black dashed line represents temperature observed in the AirNode.



**Fig. 6: PM<sub>2.5</sub> 4h average in March.**  
 The black horizontal line represents an average of AirNodes for that time period. The black dashed line represents temperature observed in the AirNode.

## Summary

Based on the data gathered by the Camden Network in London, March saw a decrease in PM pollution, an increase in O<sub>3</sub> and almost no change in NO<sub>2</sub> compared to previous months.

- NO<sub>2</sub> concentration in March was clearly higher than WHO guidelines for 24-hour NO<sub>2</sub> average (25 ug/m<sup>3</sup>) and correlates with lower temperatures and slower wind speed.
- Ozone concentration saw much higher variability in March compared to NO<sub>2</sub>, and the average concentration of O<sub>3</sub> in the last three months is increasing month over month. In the later part of the month, winds from the southwest brought more ozone from continental Europe.
- PM<sub>2.5</sub> data shows increased concentration strongly above the average for a few days in early March, with a possible hot spot of PM pollution identified in the area between Regent Canal and the railroad to the north of it.
- AQI levels in March were still high but have slightly decreased compared to January and February.



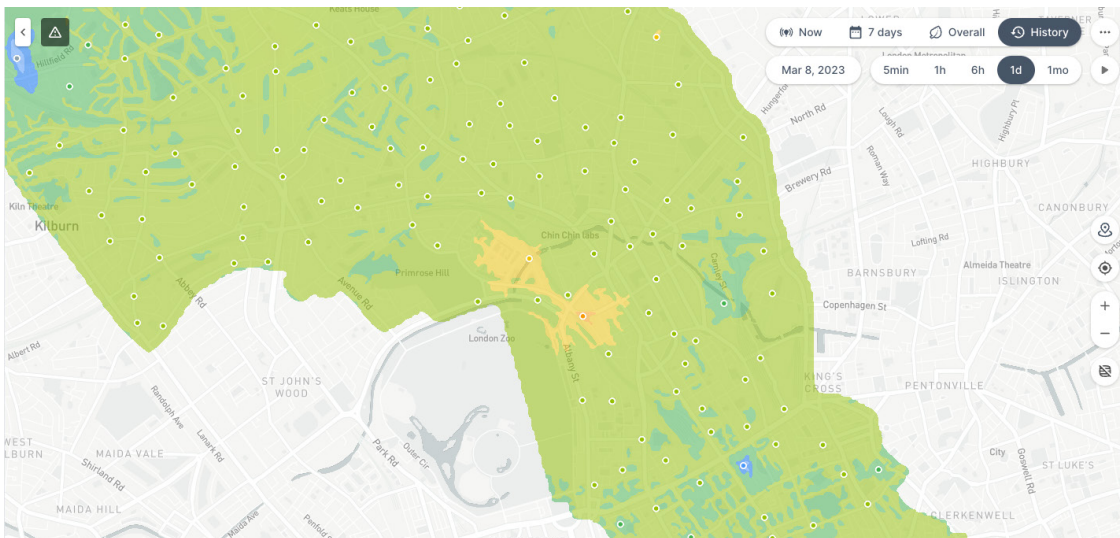


Fig. 7: PM<sub>2.5</sub> a possible hotspot on 8th March @ [airscape.ai](https://airscape.ai)

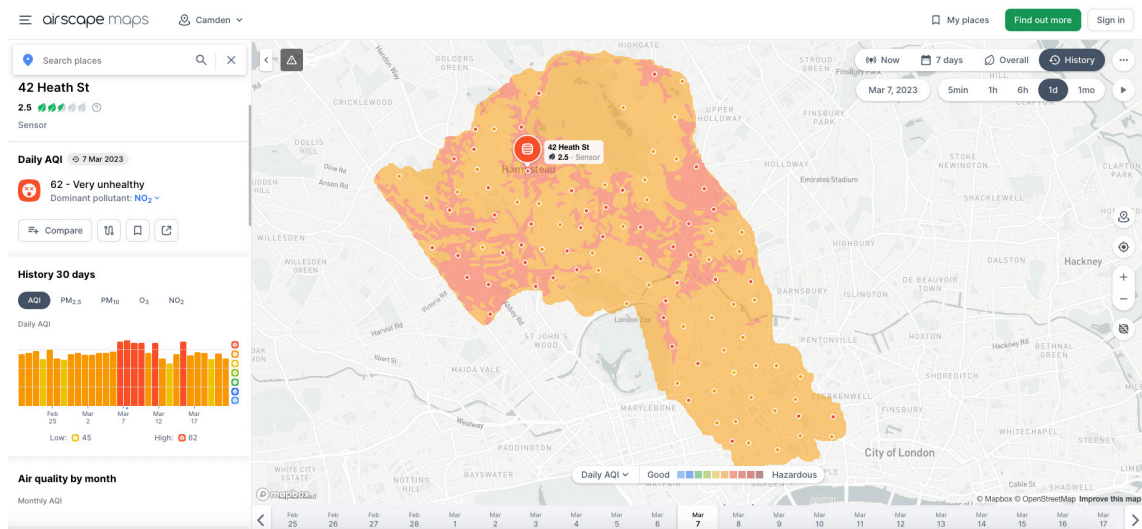


Fig. 8: AQI over Camden on 7th March @ [airscape.ai](https://airscape.ai)

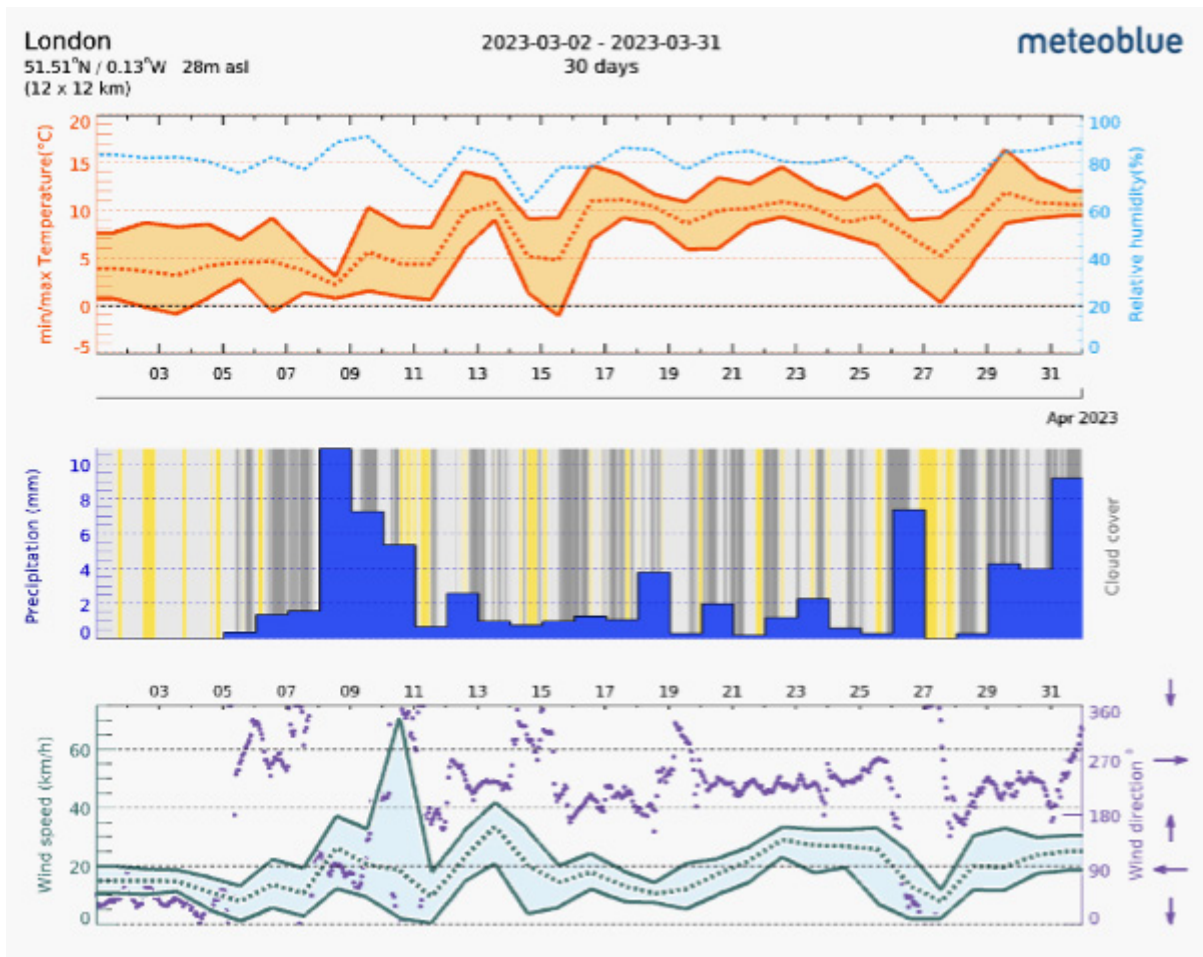


Fig. 9: Historical weather data from March 2023 ([meteoblue.com](https://www.meteoblue.com))

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