



# Science in the City

## Monitoring Air Quality in the Barbican



### A brief summary

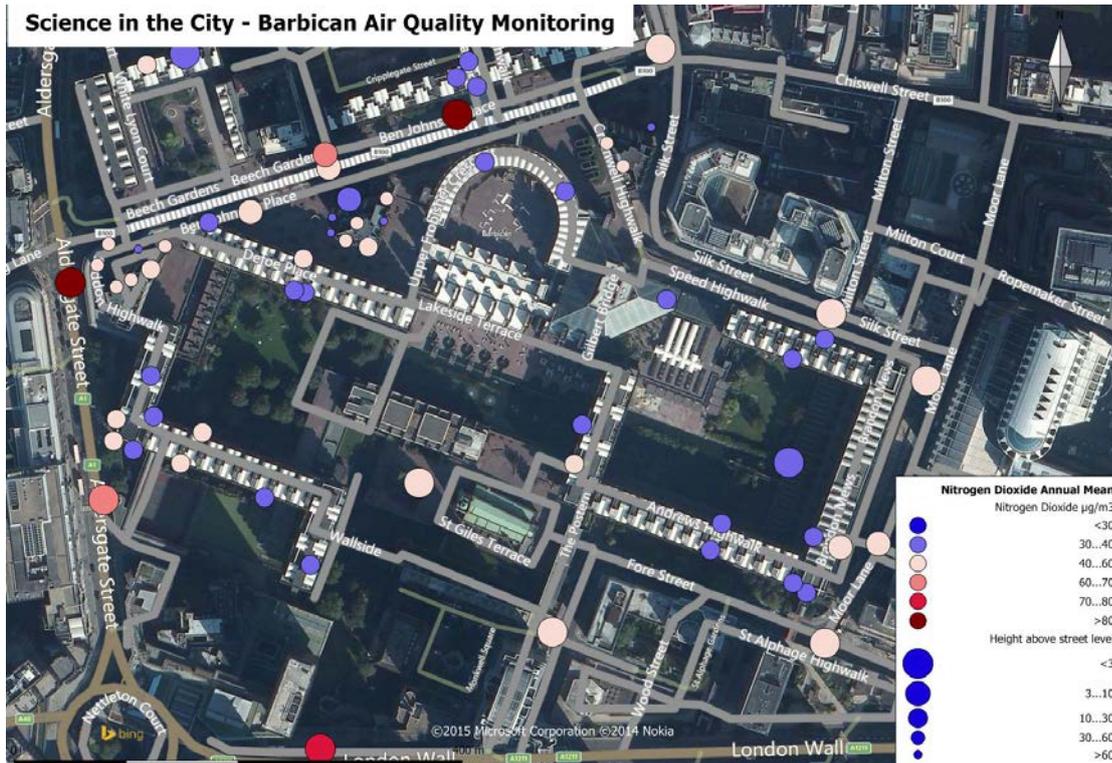
Science in the City was a citizen science project, carried out by Mapping for Change and commissioned by The City of London Corporation. Its aim was to increase understanding of the causes and effects of air pollution among the residents of the Barbican Estate and establish how concentrations of different pollutants vary over space and time.

The project focused on two of the major ambient air pollutants, nitrogen dioxide (NO<sub>2</sub>) and particulates, both of which are considered harmful to health. Mounting evidence suggests that air pollution contributes to the global burden of respiratory and allergic diseases, including asthma, chronic obstructive pulmonary disease, pneumonia, and possibly tuberculosis (Laumbach and Kipen, 2012). Various long and short-term studies also conclude that there is a positive association between poor air quality and mortality rates (Rückerl et al., 2011).

Forty-eight Barbican residents collected data over a twelve month period on local NO<sub>2</sub> concentrations using diffusion tubes, mainly positioned outside their residence. Twenty-one residents also monitored their personal exposure to particulate pollution using an aerosol monitor and a GPS tracking device. Each recorded their exposure over a week long period with the total monitoring period spanning four months.

The results found that nitrogen dioxide concentrations showed seasonal variations, in line with the previous years' data taken from the local authority managed monitoring station at Speed House. The lowest levels of NO<sub>2</sub> were recorded in June and the highest in November. Concentration levels of NO<sub>2</sub> exceeded the EU targets at 54% of monitoring sites, including all ten street level sites. Beech Street Tunnel, Aldersgate Street and London Wall were found to be the most polluted. The interior of the estate, however, proved to be less exposed to the same poor air quality, although residents living in Lauderdale Tower close to the Aldersgate Street and Beech Street junction were still exposed to potentially harmful concentrations of pollutants. Almost all of the monitoring sites which overlooked the lakes and gardens had NO<sub>2</sub> levels below the EU target.

The map overleaf shows the year's average NO<sub>2</sub> readings at each site across the Barbican. The blue dots show monitoring sites which are below the EU target, an annual mean limit value of 40µg/m<sup>3</sup>, whereas the pink and red dots show sites which have exceeded this limit.



The personal exposure monitoring coincided with the UK being affected by a dust storm blown over from the Sahara. This meant that residents were able to directly see the impact of the Saharan dust storm on local air quality conditions and the maps of the results clearly illustrate this change in air quality over several days.

Overall, the monitoring showed that more must be done to tackle the problem of air pollution within the City of London. The raised awareness of the issue among residents led to a great deal of debate at the meetings and workshops on the potential ways of improving local air quality. Ideas were also discussed on how to reduce their personal exposure to air pollution. A number of areas that are seen as key in trying to combat the City's air pollution problem were put forward to City of London for consideration. The local authority are already taking action to reduce air pollution, for example: by putting up signs to remind drivers to turn off their engines when stationary; by inviting residents to input in to the City of London Air Quality Strategy 2015-2020 and working with local businesses to increase awareness and encourage positive change. City of London have also developed a smart phone application 'CityAir', in collaboration with King's College. The app alerts users to episodes and areas of high pollution and offers tips on how to reduce their exposure to poor air quality. However, more could still be done and The City Corporation are open and willing to increase their efforts to improve the City's air quality.

Many suggestions were put forward that require action to be taken at an individual or community level and so can be put in to practice with immediate effect. A comprehensive list is available in the full report but include: planting up balconies with air filtering plants; avoiding Beech Street Tunnel; keeping road-side windows closed during rush hour and remaining informed about issue of air pollution in the City.

[See full report here.](#)