



# Sounding Out Pollution: Can you *hear* what's in the air?

***Sounding Out Pollution* is a brand new collaboration between sound artist Robert Jarvis and researchers from the University of Birmingham's WM-Air team.**

Three new sound works have been composed using air quality data from urban and rural locations, and at different times of the day, to communicate differences in air quality across Birmingham and the UK. This audible, visceral experience invites listeners to 'hear' air pollution. The Composers' narrative below provides details about how the presentations were composed and the information they are communicating.

## **Audience Guide (by Robert Jarvis)**

The audio for the three pieces in this exhibition fall into the category of *sonification* - the musical notes heard have been created from air quality data appropriate to each piece. The air quality data was provided as numbers: recorded levels of different pollutants such as nitrogen dioxide, nitric oxide and particulate matter. These numbers were different for the various locations, rising and falling throughout the day, depending on the activity in those locations. To enhance the audio expression of this data, each sonification was synchronised with a visual component to assist the listener in understanding what the sound represents.

### **1 LOCATION MATTERS (*The importance of place*)**

The annual average air quality readings for a range of urban and rural locations are presented. These vary enormously for the different settings, presenting a wide numeric range. The sound chosen not only reflects that range, but also connects with the rural and urban settings, and conveys a sort of increasing tension or urgency as locations with higher pollutant levels are introduced. For these reasons this data is presented through the sound of the string family using the deep-toned double bass for the lowest readings, through to the cello, viola and violin for the highest readings. The data readings were converted directly into frequency and were assigned the closest musical notes. These were then synchronised with the displayed air quality readings, with the nitric oxide (NO<sub>x</sub>) readings sounding in the left speaker and the nitrogen dioxide (NO<sub>2</sub>) levels in the right speaker. The map on the left hand side of the screen displays the whereabouts of the various chosen locations.

### **2 PICK YOUR MOMENT (*The difference the time of day makes*)**

Nitrogen Dioxide (NO<sub>2</sub>) levels across the West Midlands region are presented both visually and aurally. The map displays the seven different counties of the West Midlands and the changing levels of nitrogen dioxide, hour by hour, throughout an average day. Each of the counties has its own place within the stereo spectrum (west to east being represented as left to right). The different levels of pollution, as indicated by the map, are assigned a musical tone, with the higher levels being mapped to higher pitch. The volume for each of these levels is mapped to the pollution spread and the total area that a particular level of pollution extends to as indicated on the map. For example, if a pollution level extends halfway across a county, then it is given a volume setting of 0.5; if it's a third, then it would be 0.33, and so on.

### **3 CHOOSE YOUR PATH CAREFULLY (*Taking the scenic route*)**

Nitrogen Dioxide (NO<sub>2</sub>) and Particulate Matter levels are presented for a series of locations on a route through the centre of Birmingham from its rural outskirts. The journey (from Lickey Hills to Sutton Park) is traced on an accompanying map and synchronised with the sound of the rising and falling particulate pollutants PM<sub>2.5</sub> and PM<sub>10</sub> (in the left-hand and right-hand loudspeakers respectively). At each location, the NO<sub>2</sub> levels are presented as three-note chords representing the minimum, mean and maximum levels of modelled air quality data for each site. According to Google Maps, it is possible to cycle this route in just under 2 hours - with this composition the journey is made in just under two minutes!

*For more information about the sound artist, Robert Jarvis, please visit [www.robertjarvis.co.uk](http://www.robertjarvis.co.uk)  
To experience this sound composition online, please visit [wm-air.org.uk/sound](http://wm-air.org.uk/sound)*