INTEGRATING HUMAN PERSPECTIVES INTO ENVIRONMENTAL GOVERNANCE

A CASE STUDY IN PARTICIPATORY AIR QUALITY MONITORING

WHAT IS MEANT BY 'HUMAN PERSPECTIVES'?

People are the original sensing technology. We are receptive to our environments and sensitive to changes in the places we know. Over time we even develop shared, localised understandings of 'normal' conditions within our communities. This local knowledge does not take the form of data in a scientific sense, but that doesn't mean it's not reliable. We are all experts of our own lives. Communities often hold detailed insights about when environmental problems come about, where they are, and even why they are happening. They also know what they want to see change, what would improve local conditions and how that could be achieved. Research by social scientists stresses that recognising community insights makes for more equitable management and improves scientists' ability to make reliable assessments.

WHY IS IT IMPORTANT TO INCLUDE HUMAN PERSPECTIVES IN ENVIRONMENTAL MANAGEMENT?

Science has come to speak for environmental problems and public knowledge is often considered unreliable. This is a position increasingly embodied by practitioners and publics alike in the form of assumptions and expectations about the role and status of each in addressing hazards. The hierarchical and disempowering relationships that result can prevent those key public insights from coming to the fore. Creating opportunities for residents to become actively engaged in local environmental governance can help demystify scientific processes, demonstrate the value of local knowledge, tailor research and policy according to real community needs and guidance, and improve the effectiveness and perceived legitimacy of the whole process.

THIS IS NOT THE SAME AS PUBLIC ENGAGEMENT.

Many research projects and management efforts have woken up to the need for more transparency in their work, and endeavour to make their findings publicly accessible. Whilst access to reliable information is indeed important, just providing fully-formed facts does not represent meaningful engagement or invite people into the knowledge production process in any way. 'Communication' means not just speaking effectively, but listening too. Public engagement therefore needs to begin much earlier in the knowledge production process.

SOCIAL RESEARCH UNDERTAKEN BY THE OXAIR PROJECT AIMED TO RESPOND TO THESE IMPORTANT CONSIDERATIONS BY EXPLORING NEW FORMS OF 'PUBLIC ENGAGEMENT' ON THE SUBJECT OF AIR QUALITY MONITORING, MANAGEMENT & GOVERNANCE.

THE OXAIR 'COMPETENCY GROUP 'CASE STUDY EXPERIMENT

BACKGROUND

Regulatory conceptions of air pollution are rigid, and vary significantly from those held by affected members of the public. From a societal standpoint, regulators, scientists and other technical position holders are the ones conventionally attributed authority to determine what counts as evidence of air pollution existing. Common critiques reinforce how, despite good intentions, the consultations, questionnaires and survey typically employed in environmental governance projects, approach the incorporation of local perspectives in management plans as a more instrumental relationship that does not enable residents to exert any meaningful influence[1]. The Competency Group (CG) experiement was designed to approach these challenges as part of the overarching OxAir project, which was a Defra-funded initiatve managed by the Oxford City Council to trial lower cost, portable air quality sensing devices. Our research objectives included establishing a process for dismantling the hierarchical relationship among AQ stakeholders found in traditional settings, and generating new knowledge about local air quality monitoring and management more aligned with local expertise and interests.

METHODS

The structure and activities of the OxAir CG were inspired by the success of a similar study on flood risk in Yorkshire[2]. We thus developed a protocol to solicit a demographically representative group of Oxford residents to take part in a series of successional meetings over a period of six months. We then designed four, in-person sessions each focused around a theme and featuring a unique set of 'hands-on' activities, including mapping, collecting air pollution data using handheld sensors and discussing the results as a group. The OxAir CG ultimately held five sessions in total: three in person prior to COVID-19 physical distancing restrictions, a series of virtual one-on-one sessions with the resident CG members, and finally two virtual group sessions.

KEY FINDINGS

A strong and robust social component to any environmental governance, management or research can:

» **...Improve public literacy** in the capabilities and functions of science. Portrayals in the press and social media can cultivate unrealistic and harmful assumptions and expectations about the abilities of science and its role in society. Activities that engage people in the practical work of science can give a clearer picture of concepts like scientific uncertainty, temper some of these expectations and ultimately encourage greater public trust in the contribution of science.

» **...Support successful science.** Many of our community-led findings and outputs were designed to assist the execution of good science and policy. Our 'Map of Anecdotes', for example, lets the public advise technicians on locations for setting up sensors based on their perception of where air quality is poorest. They can also give insights on likely causes of poor quality air; the 'why' to complement science's 'what'.

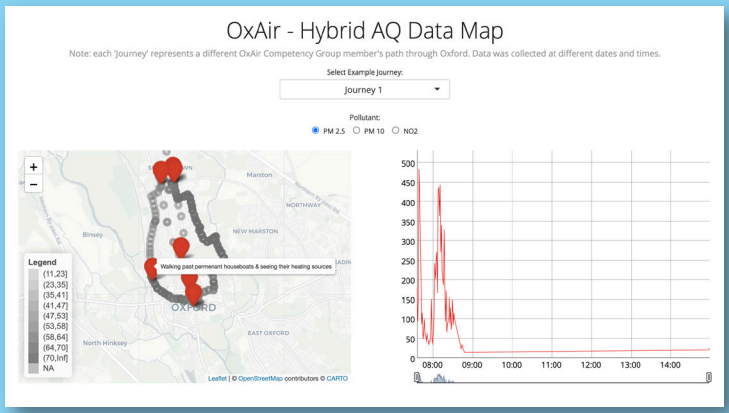
» **...Adapt when things go wrong.** We encountered significant challenges when some of our sensors malfunctioned during participant data collecting. As a result we ended up drawing much more heavily on qualitative and experiential data than we had planned. Far from a failure, this led to some of our most successful outputs and results. This flexibility comes from recognising local knowledge as a form of data in its own right, which can complement - and even stand in for - scientific findings when necessary.

» **...Generate its own engagement.** Humans are social animals. By inviting people to bring the research process into their own lives, it starts conversations and acquires a reputation within the community. Resident participants repeatedly told us of the significant curiosity the sensing devices inspired among their friends, family and even strangers; curiosity they were then able to satisfy by explaining the technology and describing the project.

OUTPUTS PAGE 1

1. The OxAir Hybrid Air Quality Data Map

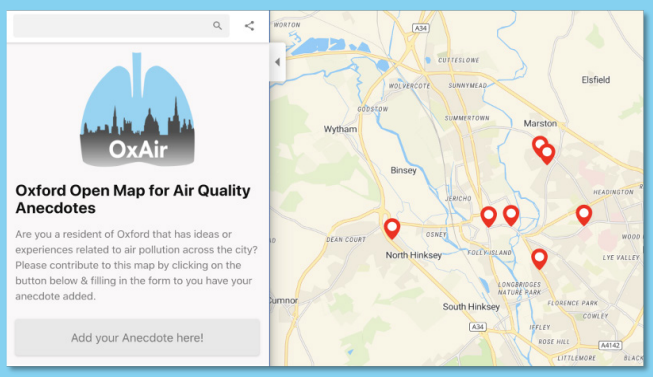
The Hybrid map combines two types of data: qualitative, contextualising reflections from CG resident participants on perceived air pollution hotspots and their possible causes, alongside quantitative representations of the same routes recorded by sensors when carried by the CG resident participants. The goal of the Hybrid Map is to provide interested publics and practitioners with a tool for visualizing these two forms of empirical evidence, usually held and used entirely separately, in a mutually complementary way. In its current prototypic state, the Hybrid map output is not intended to be used as an instrumental tool, but rather as a heuristic 'snapshot' that illustrates an alternative way of looking at AQ and its intersections with community experiences.

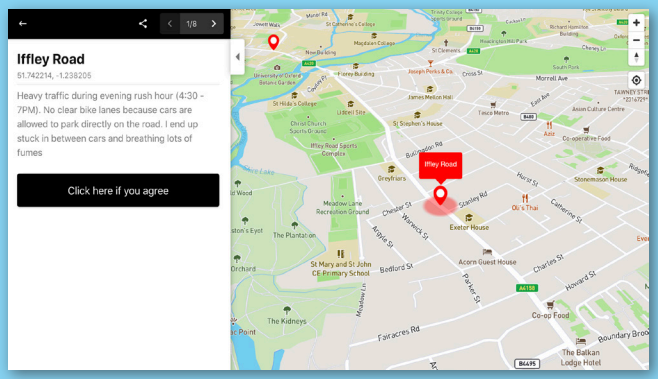


Prototype OxAir Hybrid AQ Data Map - accesible via **https://www.oxair.org/outputs**

2. The Oxford Map of Air Quality Anecdotes

The Map of Air Quality Anecdotes is intended to be a live, visually intuitive and interactive platform for users to input entirely anecdotal information about perceived hotspots around Oxford. Members of the public are able to 'pin' inputs on a map of Oxford, along with photographs or other media. Over time, the goal is to facilitate the emergence of a citizens' consensus that would show practitioners where sensing activities should be concentrated, while directing policymakers where to look for possible AQ infrastructure investments. The Map of Anecdotes is a direct outgrowth of the CG process, where extensive conversation surrounding informational needs was able to materialise into a potential solution. The Map has been live for several months (https://viewer.mapme.com/oxford-airquality-openmap/) and has already garnered the interest of other local authorities, while facilitating the expansion of an active, usable citizen science database that can inform future sensor deployment, maximise resource efficiency, and most importantly best serve the Oxford community.





Landing page for the Oxford Map of Air Quality Anecdotes & example anecdote

3. 'Human Perspectives': What information matters to OxAir CG resident members within the context of LAQM and future mobile monitoring.

This broadly-defined output comprises the recommendations emerging from the CG process that address the project's objective of better integrating 'human perspectives' of AQ at each stage of monitoring and management processes. These recommendations come in two forms. Firstly, a number of key considerations advocated by the social research team, extrapolated from our research analysis and pertaining to general changes that can be made to the ethos and objectives of AQ research. Secondly, a more specific list of suggestions amalgamated from across discussions held in the CG meetings. The latter is provided in response to a need for greater channels of communication between practitioners, policy makers and members of the public regarding all the above's informational needs and key interests. The list thus offers an indication of areas of agreement between participating members, and can be explored in greater detail via the OxAir website here: **https://www.oxair.org/human-perspectives**

4. Sensor Useability Feedback

Resident use of the sensors was central to the CG framework, and thus provided an opportunity to reflect on our chosen sensors' useability and improvability. While the response to this mandate is contained in the Sensor Usability Indicators section of the report, a significant portion of the insights contained there were gathered during the CG sessions and one-on-one interviews with resident participants. See the OxAir website here: **https://www.oxair.org/outputs**

5. Virtual 'Open House' presentation on the OxAir CG social research process

As a way of extending the benefits of this project beyond the final report and share some of our findings with the Oxford community, the CG group hosted a presentation of our key findings and methods for local residents, policy-makers and members of the academic community. This addresses a considerable local interest in the outcomes of the CG framework and represents an important gesture in ensuring that Oxford city sees benefits from the project. The event took place via Zoom on Wednesday October 7th from 12:00 - 1:00PM. It was recorded and the recording is available via the OxAir website here: **https://www.oxair.org/virtual-open-house**

CITATIONS

1 *Rose, N. 1999. Powers of Freedom: Reframing political thought. Cambridge University Press.*

2 *Rice, J.L., Burke, B.J. and Heynen, N., 2015. Knowing climate change, embodying climate praxis: Experiential knowledge in Southern Appalachia. Annals of the Association of American Geographers, 105(2), pp.253-262.*

3 *Whatmore, S.J. and Landström, C., 2011. Flood apprentices: an exercise in making things public. Economy and society, 40(4), pp.582-610 WEBSITE: http://knowledge-controversies.ouce.ox.ac.uk/*

4 *Wynne, B., 2002. Risk and environment as legitimatory discourses of technology: reflexivity inside out?. Current sociology, 50(3), pp.459-477.*

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