

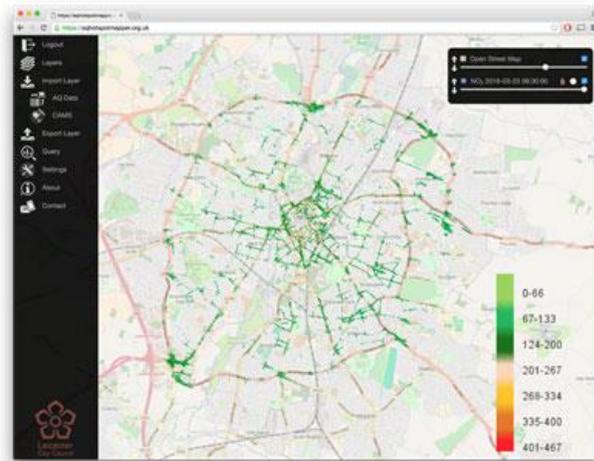
## University of Leicester – Air Quality Hotspot Mapper (AQHSM)

Air Quality is a persistent problem at national and local scales, with significant financial and health impacts. It is the world's largest single environmental health risk and is responsible for seven million premature deaths each year globally (WHO, 2006). In the UK alone, poor air quality is estimated to cost the economy up to £19 billion annually in adverse health effects on people (Defra, 2010).

Under European legislation, local authorities in the UK have a statutory duty to assess air quality and improve it where possible, or at least mitigate the negative effects. Poor air quality is a persistent problem at both national and local scales, and has significant health and financial impacts.

The feasibility of an Air Quality Hot Spot Mapper (AQHSM) was ascertained during SSGP's first phase which demonstrated a clear need to identify air quality hot spots and relate it to sources of air pollution. Dynamic datasets at fine spatial scales are required to enable local authorities to report and make informed decisions about their constituency. At present, such datasets are often disparate in nature and difficult to process.

AQHSM phase 2 built upon the feasibility results from the previous phase to develop a viable system design capable of delivering near-real time pollution monitoring over urban areas. The system assimilates data products from heterogeneous sources, such as the state-of-the-art Copernicus MACC II (CAS) regional air quality feeds, deployed in-situ sensors and traffic flow data. Additional local authority datasets can be integrated to derive specific data products to meet application needs.



The web-based visualisation tool facilitates users to interact with spatially distributed data. It has been designed to integrate seamlessly with existing services and packages commonly use by local authorities.

The functional system has been successfully demonstrated to Leicester City Council and Rotherham Metropolitan Borough Council within an operation setting and underwent a period of testing and verification. The local authorities were provided with a city-wide perspective of air quality, detailing the the sources and impacts of pollution. AQHSM is an innovative tool that enables informed decision and policy making in such areas as Environmental Protection, Traffic Management, Health and Planning.

### Lessons Learned

The assimilation of multiple data products can be used to generate output datasets based on the specific requirements of an individual local authority.

### Costs and Benefits

The tool offers the opportunity for local authorities to integrate their in-house data with many other sources, including satellite-derived products, to build a clear picture of air quality within their constituency. This improved insight could allow for better decision making and more efficient use of resources in order to mitigate risks to human health due to poor air quality.

### Next Steps

With significant interest and positive feedback from local authorities, there is scope to further develop the business model. This would need to cover aspects such as the software, data and / or service provision and required processes.

Further engagement with potential end-users is required to refine data product specifications to suit operational demands. Understanding how users access and exploit data for their work is paramount to Air Quality Hot Spot Mapper becoming fully realised, operational service.

- Provider: University of Leicester
- Technology utilised: Earth observation (EO)
- End user(s): Local Authorities