

Air Quality in Scotland

Welcome to the eighth Scottish Air Quality Database (SAQD) stakeholder's newsletter. This newsletter is produced on behalf of the Scottish Government by Ricardo Energy & Environment (Ricardo) and is designed to provide regular updates and news regarding the SAQD and local air quality matters to all stakeholders. This may include; updates to the network; new information on air quality issues; updates on changes in policy and procedures; new initiatives and events; technical reports; and how to access data using the Air Quality in Scotland website.

If you have any information which you think would be beneficial to include in a future newsletter, please email us at info@scottishairquality.co.uk.

NEWS

2018 DATA NOW FULLY RATIFIED AND AVAILABLE VIA THE AIR QUALITY SCOTLAND WEBSITE

Please be advised that the 2018 dataset is now fully ratified and available via the Air Quality Scotland website. You can access the data itself via the "Data & Maps" tab (<http://www.scottishairquality.co.uk/laqm/statistics-pdf>). The statistics can be accessed either from the Data and Maps tab or the individual sites "Statistics" tab (http://www.scottishairquality.co.uk/latest/siteinfo?site_id=ABD8&view=statistics). You can also produce an annual statistics report with all the relevant LAQM statistics via the website. This can be accessed within the individual site Annual Report tab or the Annual Statistic Report page within the LAQM tab (<http://www.scottishairquality.co.uk/laqm/statistics-pdf>).

NATIONAL LOW EMISSIONS FRAMEWORK JANUARY 2019

Scottish Government have published the National Low Emissions Framework. The Framework provides a methodology for local authorities to undertake air quality assessment to inform decisions on transport related actions. The document can be found [here](#).

SCOTTISH AIR QUALITY DATABASE AND WEBSITE ANNUAL SEMINAR – TUESDAY 12TH FEBRUARY 2019 – PRESENTATIONS

The annual Scottish Air Quality Database and Website Annual Seminar took place on Tuesday 12th February 2019 in Edinburgh. The presentations from the day are now available to view [on the Seminars page](#). These subjects included amongst others; A trend analysis approach to air quality network data (Polly Lang), Exploring synergies for air pollution and carbon reduction through citizen engagement (Enda Hayes), Air Quality and Health (Dr Jackie Hyland), Three Decades of Real World Driving Emission – Remote Sensing (Niranjan Vescio), Application of Real-World Driving Emissions for Air Quality Modelling and Impact Assessments (Dr Nicola Masey), Low cost sensors for the measurement of atmospheric composition (Prof Alastair Lewis), PM analyser replacement (Brian Stacey), Engaging Schools in AQ through an EU Wide Citizen Science Programme (Colin Gillespie), Transport Bill and Low Emission Zones (Dr Stephen Thomson), Air Quality in Scotland Project Developments (David Hector), Effects of Vegetation on Urban Air Pollution (David Fowler), Clean Air Day 2019 (John Bynorth).

NEW PUBLICATIONS

Two new reports have been published on the Scottish Air Quality website since the last edition of the newsletter. These are

1. "[Investigation into Diffusion Tube Bias Adjustment Factors](#)"; Prof. Duncan Laxen, Prof. Mat Heal, Georgia Zygmunt and Tom Richardson
2. "[A review of biases in the measurement of ambient nitrogen dioxide \(NO₂\) by Palmes passive diffusion tube](#)"; Prepared for the Scottish Government by Prof. Mathew Heal (The University of Edinburgh) & Prof. Duncan Laxen and Dr Ben Marner (Air Quality Consultants Ltd.)

In addition, the latest version (3/19) of the National diffusion tube bias adjustment factor database spreadsheet has been uploaded to the Air Quality in Scotland website for use in local authority's APR 2019. It can be found here; <http://www.scottishairquality.scot/laqm/tools>

CLEAN AIR DAY – THURSDAY 20TH JUNE 2019

Many thanks to John Bynorth, Policy and Communications Officer at Environmental Protection Scotland (EPS) for contributing to this issue!

ENVIRONMENTAL PROTECTION SCOTLAND

Scotland is gearing up for Clean Air Day which aims to promote ways we can all contribute to improving the air we breathe.

The event which takes place on **Thursday June 20th** is witnessing a surge in popularity partly thanks to increased awareness of climate change policies to curb car use in towns and cities to reduce air pollution.



Figure 1. 2019 Clean Air Day logo

The four biggest cities, Glasgow, Edinburgh, Aberdeen and Dundee, have signed up to take part in Clean Air Day which aims to raise awareness of how people can improve air quality by encouraging alternatives to driving petrol or diesel cars, particularly for short journeys, and to cycle, walk or use public transport where possible or consider the purchase of an Ultra-Low Emission vehicle.

There are also powerful no idling messages for drivers with interest high among councils that are keen to stop the practice, especially outside their schools.

Highland, Stirling, Renfrewshire, Falkirk, East Dunbartonshire, North Lanarkshire, Midlothian, West Lothian, Perth and Kinross are among the 32 councils in Scotland that are planning to hold Clean Air Day events. Charities such as the British Lung Foundation and Living Streets are also planning to raise awareness of how behaviour change can help make Scotland's air quality the best in Europe.

In Aberdeenshire, council officers will be going into a school to discuss no idling and handing out leaflets outside the gates to parents on the school run.

Last year 99 pupils from Sciennes Primary marched through the centre of Edinburgh waving placards with messages calling on people to consider leaving the car at home and not to idle their engines. This year they will be having a Clean Air Day stall at their summer fete.

Farr Primary School in Inverness-shire, which has only 75 pupils, is hoping to hold a 'walking bus' to school to cut down on school drop offs by car and will have cycle maintenance crew in the playground to encourage cycling to school.

The 11 pupils at Rhuanaharoinne Primary in Tayinloan, Argyll and Bute, are planning to measure air quality on the busy A83 route which passes close to the school.

Health practitioners are holding Clean Air Day activities from the Western Isles to Grampian and Tayside as the messages behind the event encourage better fitness through cycling and walking.

Clean Air Day has a growing social media presence with Environmental Protection Scotland again coordinating the campaign on behalf of the Scottish Government's Cleaner Air for Scotland (CAFS) strategy.

Pledge cards which are available for download from the Clean Air Day Scotland website give people the opportunity to say publicly what they will be doing to improve air quality either by leaving the car at home, not idling their vehicle engines and cycling or walking to work or on the school run or working from home to cut vehicle congestion.

Among celebrities to sign a pledge card is the former professional cyclist Chris Boardman, who is currently Greater Manchester's Cycling and Walking Commissioner.

Clean Air Day has an excellent range of resources geared towards the various stages of the school curriculum, to health professionals, communities and in the workplace.

They show how to organise and publicise an event with the media and on social media, from awareness raising of the importance of not idling vehicle engines to pledge cards which allow people to promise to try less polluting activities such as cycling, walking or using/buying an electric car.

To sign up to download the resources visit <https://www.cleanairday.org.uk/clean-air-scotland>

Contact: John Bynorth, Communications and Policy Officer

SCOTTISH ENVIRONMENT PROTECTION AGENCY (SEPA)

CITIZEN SCIENCE AND SCHOOL PROJECTS

SEPA is currently working with partner environment agencies and the European Environment Agency (EEA) on a project to look at a variety of methods for engaging schools on air quality and how data and information can be used specifically to inform and educate children and their parents. The project will assess the effectiveness of different citizen science approaches (from direct monitoring of emissions to simple awareness-raising) and the impact they have had on behaviour change.

As part of this work, Stirling Council and SEPA are conducting an air quality monitoring exercise at the Balfron School Campus and in the

surrounding village. The purpose is to assist pupils in an air quality project looking at emissions of NO₂ from transport accessing the Campus. Despite its rural location, Balfron receives pupils, via bus and car, from a large part of rural Stirlingshire and is also on a main bus route between Stirling and Glasgow. Five monitors have been installed and will run for one month from the 3rd of April (which also captures a period of half-term) to measure the levels of pollutants at peak times from the school drop-off and pick-up. SEPA is also working with Glasgow City and East Renfrewshire Council to run school banner competitions to raise awareness with pupils of the impacts of air pollution and how behaviour change can help reduce and minimise these impacts. This outputs of this (and future) work will also feed into the EEA project.

If your local authority, or schools, wish to express an interest to participate in air quality citizen science projects coordinated by SEPA, please contact colin.gillespie@sepa.org.uk or graham.applegate@sepa.org.uk for more information.

Contact: Graham Applegate & Colin Gillespie

LOCAL AUTHORITY EXPERIENCE

In this section, we plan to showcase local authority's contribution to Local Air Quality Management (LAQM). The aim of this section will be to provide information on what air quality initiatives the local authority is undertaking, and the experiences gained. If you would be interested in contributing, please send an email to info@scottishairquality.co.uk. Many thanks to Shauna Clarke and Emma Mayes, Environmental Health Officer (Team Leader) at Edinburgh City Council, for contributing to this issue!

EDINBURGH CITY COUNCIL

Edinburgh has declared six Air Quality Management Areas (AQMA), five for nitrogen

dioxide (NO₂) and one for Particulate Matter 10 P(M₁₀).

Long term trends of NO₂ and PM₁₀ in Edinburgh show concentrations are decreasing.

Salamander Street AQMA

Our newest AQMA was declared in 2017 in the Leith Docks area for PM₁₀. Road traffic and fugitive emissions from industrial activities and operations here are the likely sources of the pollutant. New housing developments have been proposed in the nearby vicinity.

A new FIDAS PM monitor was installed within the western boundary of the AQMA at Tower Street in October 2018. The Action Plan being developed in conjunction with SEPA, Forth Ports and relevant stakeholders will be published for consultation this year.

Currie Monitoring Station

Works are currently underway to replace the monitoring station at our suburban background site in the grounds of Currie High School. The ageing station is a mobile trailer with overhead wire power connection which has a leaky roof. This will be replaced with the former Queen Street walk-in unit with an underground power supply.

Edinburgh's Low Emission Zone

In May 2018, the Transport and Environment Committee agreed to the Council taking an ambitious and comprehensive approach to developing the LEZ in Edinburgh (including combinations of geographical and vehicle-type restrictions). The decisions taken in May were in line with the Council's commitment to 'improve Edinburgh's air quality and reduce carbon emissions and explore the implementation of low emission zones.

The Council has worked with SEPA to develop an Edinburgh-specific air quality model that predicts kerbside NO₂ concentrations. The

Council is now working with SEPA to use the model to inform and test LEZ options.

Edinburgh is on track to have a LEZ in place by 2020. Specific LEZ proposals will be available for public consultation in May 2019.

Contact: Emma Mayes, Environmental Health Officer

SAQD QAQC ACTIVITIES

Ricardo completed the winter six monthly audits in April 2019. After each local authority audit, a summary of the auditor's findings should have been emailed to you. If you have not received an audit summary, please contact info@airqualityscotland.co.uk.

The Summer 2019 audits will commence in June. Ricardo field team staff will contact the relevant local authority before visiting sites. If you have new members of staff that carry out calibrations or have staff that need a refresher, please attend the audit and the Ricardo field team member will provide the relevant training.

QUESTION AND ANSWERS SECTION

This section will provide answers to frequently asked questions that relate to different aspects of LAQM ranging from Local Site Operator (LSO) duties to advanced data analysis queries. If you have a question you would like to be answered in this section, please contact info@scottishairquality.co.uk.

Q: What is the difference in monitoring site classifications?

A: Monitoring sites can be classified according to the type of environment in which they are located, to permit more meaningful evaluation of data. The site description will generally reflect the influence of a specific pollutant source or of overall land use. Typical monitoring location types, as used in national automatic monitoring networks, are described in Table 2 below.

CLASSIFICATION	DESCRIPTION
Industrial	Located such that its pollution level is influenced predominantly by emissions from nearby single industrial sources or industrial areas with many sources. Industry source is here taken in its wide meaning including sources like power generation, incinerators and waste treatment plants. Air sampled at industrial sites must be representative of air quality for an area of at least 250 metres (m) × 250 m. The sampling point shall be installed downwind of the source in the nearest residential area.
Suburban	Largely built-up urban area. 'Largely built-up' means contiguous settlement of detached buildings of any size with a building density less than for 'continuously built-up' area. The built-up area is mixed with non-urbanised areas (e.g. agricultural, lakes, woods). It must also be noted that 'suburban' as defined here has a different meaning than in every day English i.e. 'an outlying part of a city or town' suggesting that a suburban area is always associated to an urban area. In our context, a suburban area can be suburban on its own without any urban part. For the measurement of ozone, suburban areas include where population, sensitive crops or natural ecosystems located in the outer fringe of an agglomeration are exposed to high ozone levels. Suburban sites should measure air quality which is representative of some tens of kilometres (km ²).
Urban	Continuously built-up urban area meaning complete (or at least highly predominant) building-up of the street front side by buildings with at least two floors or large detached buildings with at least two floors. With the exception of city parks, the built-up area is not mixed with non-urbanised areas. For the measurement of ozone, the urban area is defined as locations such as residential and commercial areas of cities, parks (away from the trees), big streets or squares with very little or no traffic, open areas characteristic of educational, sports or recreation facilities. Urban sites should measure air quality which is representative of a few km ² .
Background	Located such that its pollution level is not influenced significantly by any single source or street, but rather by the integrated contribution from all sources upwind of the station e.g. by all traffic, combustion sources etc. upwind of the station in a city, or by all upwind source areas (cities, industrial areas) in a rural area. These sampling points shall, as a general rule, be representative for several square kilometres. At rural background sites, the sampling point should not be influenced by agglomerations or industrial sites in its vicinity, i.e. sites closer than five kilometres.
Traffic	Located such that its pollution level is determined predominantly by the emissions from nearby traffic (roads, motorways, highways). Air sampled at traffic sites must be representative of air quality for a street segment no less than 100 m length. Sampling probes shall be at least 25 m from the edge of major junctions and no more than 10 m from the kerbside.
Airport	Monitoring within the boundary of an airport perimeter.
Rural	<p>Sampling points targeted at the protection of vegetation and natural ecosystems shall be sited more than 20 km away from agglomerations and more than 5 km away from other built-up areas, industrial installations or motorways or major roads, so that the air sampled is representative of air quality in a surrounding area of at least 1 000 km². Stations can be located in small settlements and/or areas with natural ecosystems, forests or crops.</p> <p>At all site types, the flow around the inlet sampling probe shall be unrestricted (free in an arc of at least 270°) and at least 50cm away from buildings and trees. The inlet sampling point shall normally be between 1.5 m and 4 m above the ground, in the breathing zone, and shall not be positioned in the immediate vicinity of sources.</p> <p>In accordance with Directive 2008/50/EC, air quality need not be assessed at any locations situated within areas where members of the public do not have access and there is no fixed habitation. This includes factory premises and industrial installations where health and safety at work regulations apply. It also includes the carriageway and central reservations of roads except where there is normally pedestrian access to the central reservation.</p>

Table 2. Site classification from DEFRA UK Air website (<https://uk-air.defra.gov.uk/networks/site-types>)

POLLUTION EVENT: April 2019

Throughout the majority of April, ozone concentrations had been elevated with concentrations consistently reaching the moderate banding throughout Scotland but especially in the Highlands and islands.

In addition to this, from around the 19th April Particulate Matter (specifically PM₁₀) concentrations started to become elevated across much of Scotland especially on the east coast. This culminated on the 24th April when large swathes of Scotland experienced moderate, high and very high concentrations (see Figure 2). The very high were seen down the east coast especially in the Aberdeen area.

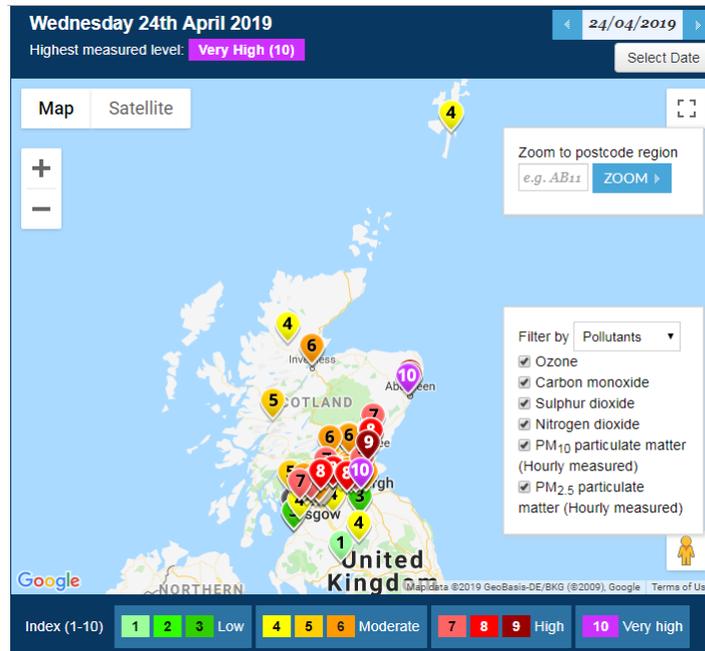


Figure 2. Interactive monitoring map on the SAQD website on the 24th April 2019

Investigations into what caused this air pollution episode identified that air masses from the east (see Figure 3) along with strong easterly winds affecting the country, brought over polluted air from the continent. It was also identified that these strong winds blew over smoke from large wild fires located in eastern Europe and Russia. The satellite image below (Figure 4) identifies the fires and smoke in eastern Europe (highlighted by the green circle) as well as smoke blowing over Scandinavia towards the east coast of Scotland (highlighted by the red circle). In addition, wild fires in southern Norway added to these poor air quality conditions resulting in the very high particulate matter measured in eastern Scotland.

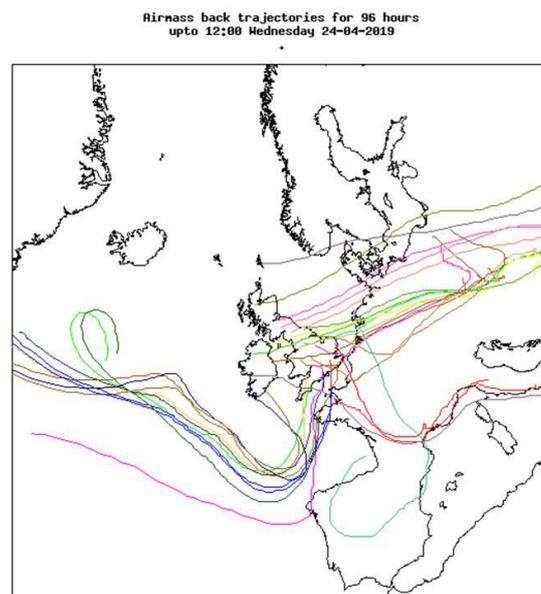


Figure 3. Air mass trajectory from Wednesday 24th April 2019

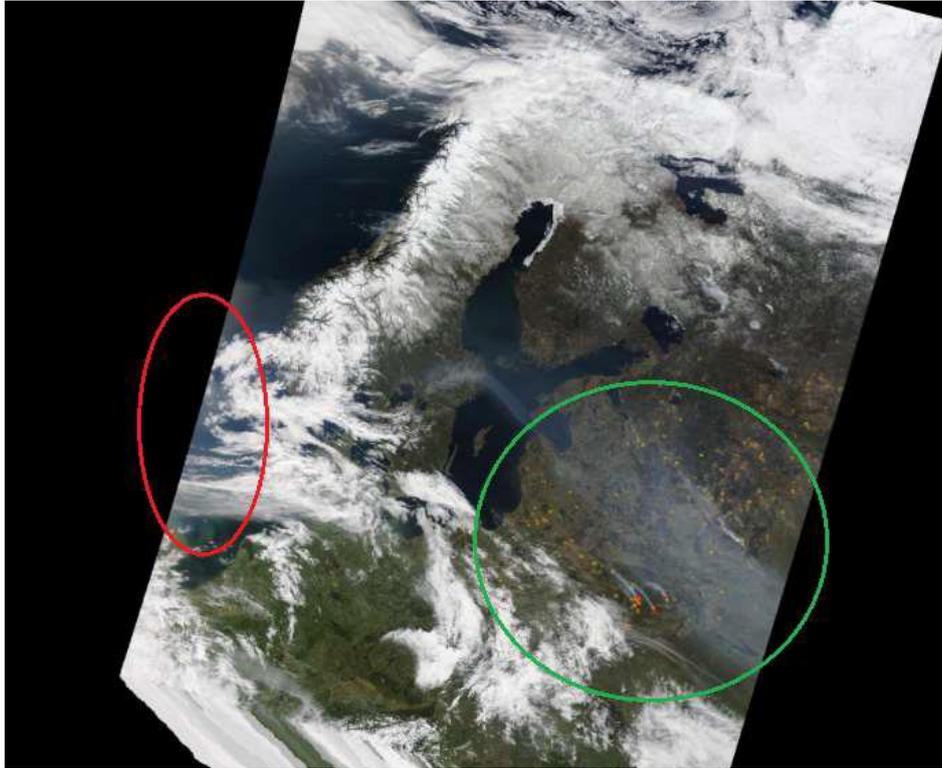


Figure 4. Satellite image from Dundee Satellite Receiving Station, Dundee University, available at <http://www.sat.dundee.ac.uk/auth.html>

On the 25th April air mass trajectories switched to be sourced from the North Atlantic (see Figure 5) bringing in clean air resulting in concentrations to drop back down to the low banding.

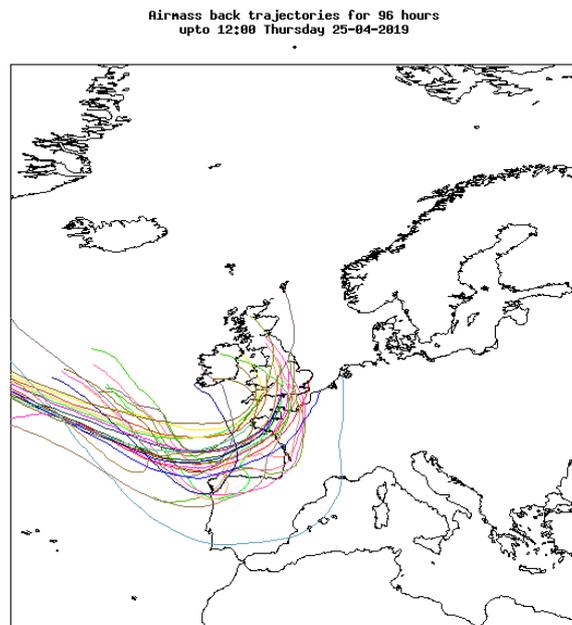


Figure 5. Air mass trajectory from Thursday 25th April 2019

STAY CONNECTED

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