



**The Scottish
Government**
Riaghaltas na h-Alba



Ricardo
Energy & Environment

Overview of Air Quality in Scotland

Scottish Air Quality Database and Website Annual Seminar

David Hector - Ricardo Energy and Environment

22nd January 2018

Content

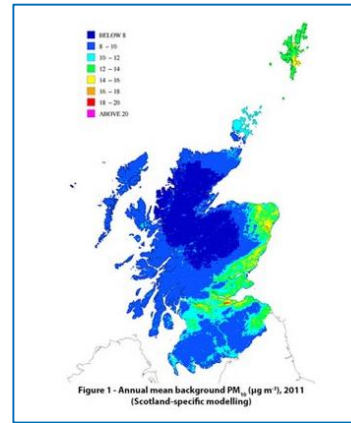
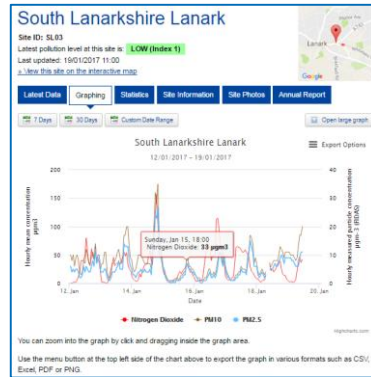
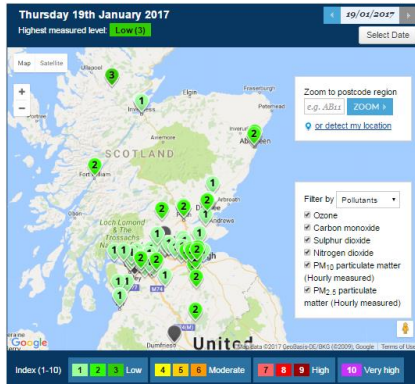
1. Scottish Air Quality Database and Website (SAQDW)
2. SAQDW and CAFS
3. SAQD Network
4. SAQD Data: Exceedances and Analysis
5. Recent and future Updates to the SAQDW
6. Questions

Scottish air Quality Database and Website

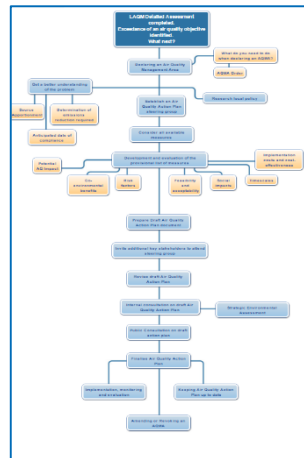
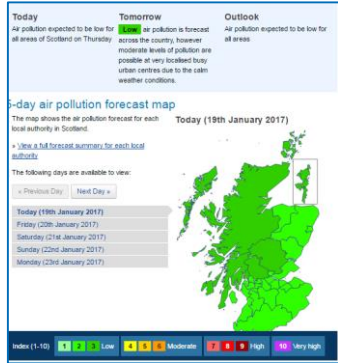
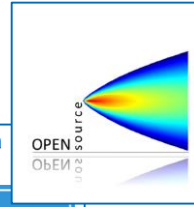
- Harmonise and Standardise the data quality being produced by local authorised to better inform policy and improve air pollution.
- High quality comparable data that is easily accessible to all.
- Project officially launched April 2007 – c.50 monitoring sites in the database
- January 2018 – 96 automatic sites
- It is an important component in helping to Deliver Cleaner Air for Scotland Strategy (CAFS) and
- Inform the Implementation of Scotland's Low Emissions Zones



Functions within the Website



Advanced Data Analysis



Scottish Air Quality Database (SAQD) and CAFS

Transport:

A Scotland that reduces transport emissions by supporting the uptake of low and zero emission fuels and technologies, promoting a modal shift away from the car, through active travel (walking and cycling) and reducing the need to travel.



Health:

A Scotland which protects its citizens from the harmful effects of air pollution, reducing health inequalities.



Legislation and Policy:

A Scotland where all European and Scottish legal requirements relating to air quality are as a minimum complied with.



Placemaking:

A Scotland where air quality is not compromised by new or existing development and where places are designed to minimise air pollution and its effects.



Communication:

A Scotland where all citizens are well informed, engaged, and empowered to improve our air quality.



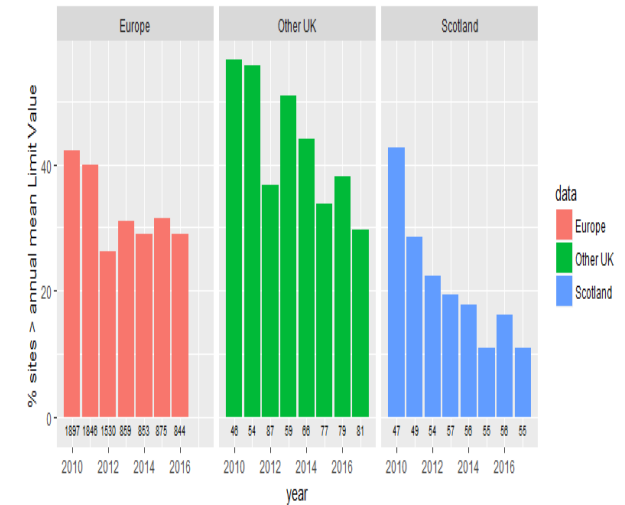
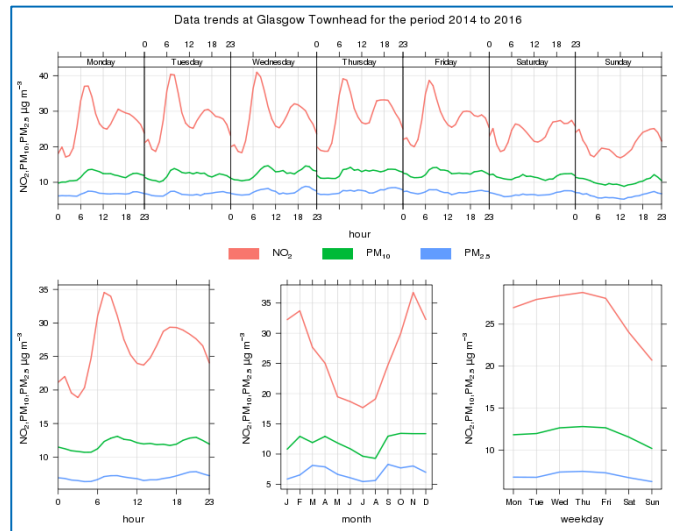
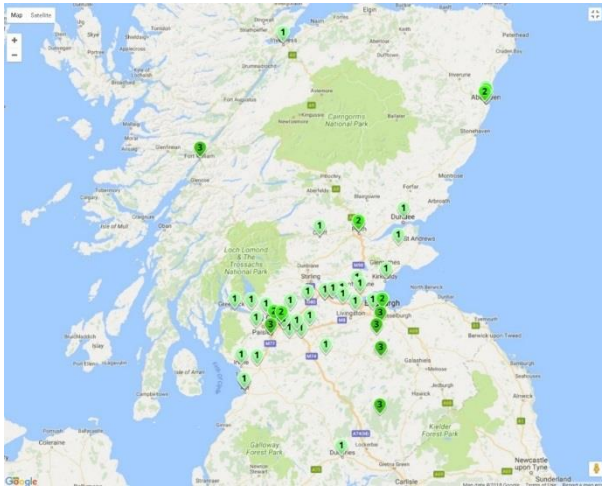
Climate Change:

A Scotland that reduces greenhouse gas emissions and achieves its renewable energy targets whilst delivering co-benefits for air quality.



- Provides High Quality Data
- Informs Policy
- Educates


SAQD Network, Exceedances and Data Analysis



Air Quality in Scotland Network and Data

- **96 automated sites within the SAQD (circa 50 in 2007)**
 - **Network Broken down by pollutants measured;**
 - **80 - NO_x, 77 - PM₁₀, 40 - PM_{2.5}, 11 - O₃, 10 - SO₂, 1 - CO,**
 - **Now collecting data for PM₁, PM₄, & TSP at 31 sites**
 - **2 new sites during 2017**
 - **Edinburgh Nicolson St (NO_x/PM₁₀)**
 - **Renfrewshire Johnston (PM)**
 - **1 sites closed during 2017**
 - **North Lanarkshire Moodiesburn**
- **Biggest Change to the network in 2017 - Increased number of PM_{2.5} sites**
 - **15 new sites included in 2017**
 - **40 sites monitoring PM_{2.5} in the network.**
 - **This is an increase of 26 sites since the introduction of PM_{2.5} Objective in April 2016.**
 - **PM_{2.5} is now monitored at 16 local authorities**
 - **13 out of the 14 LAs with AQMAs are now monitoring PM_{2.5}**

Scotland's most polluted streets for 2017 revealed



Small improvement for polluted streets
By Kevin Keane
BBC Scotland's environment correspondent
21 January 2018

Friends of the earth monitor air quality in Scotland's most polluted streets. Published: 14:27 Sunday 21 January 2018

Share this article

Environmentalists say air pollution from diesel cars has continued to break Scotland's four towns and cities.

It described air pollution as a leading cause of early deaths every year, costing the economy £1.1 billion annually.

Air quality has improved slightly on Scotland's most polluted streets, according to figures from Friends of the Earth (FoE) Scotland.

But the data suggests the total number of official "pollution zones", where levels regularly exceed legal limits, has remained static at 38.

The Scottish government said it was doing all it can to protect people from the effects of air pollution.

It has committed to measures including phasing out petrol and diesel cars.

Hope Street in Glasgow remains the most polluted street for nitrogen dioxide but levels have decreased from 65 micrograms per cubic metre to 58.

Salamander Street in Edinburgh is the worst for Particulate Matter, overtaking Queensferry Road in the capital and Atholl Street in Perth.

Most Polluted sites for NO₂:

Glasgow Hope St – 58 $\mu\text{g}/\text{m}^3$

Edinburgh St Johns Rd – 50 $\mu\text{g}/\text{m}^3$

Glasgow Dumbarton Rd – 43 $\mu\text{g}/\text{m}^3$

Dundee Seagate – 43 $\mu\text{g}/\text{m}^3$

Dundee Loch Road – 42 $\mu\text{g}/\text{m}^3$

Edinburgh Queensferry Rd – 41 $\mu\text{g}/\text{m}^3$

Most Polluted sites for PM₁₀:

Edinburgh Salamander St – 23 $\mu\text{g}/\text{m}^3$

Edinburgh Queensferry Rd – 23 $\mu\text{g}/\text{m}^3$

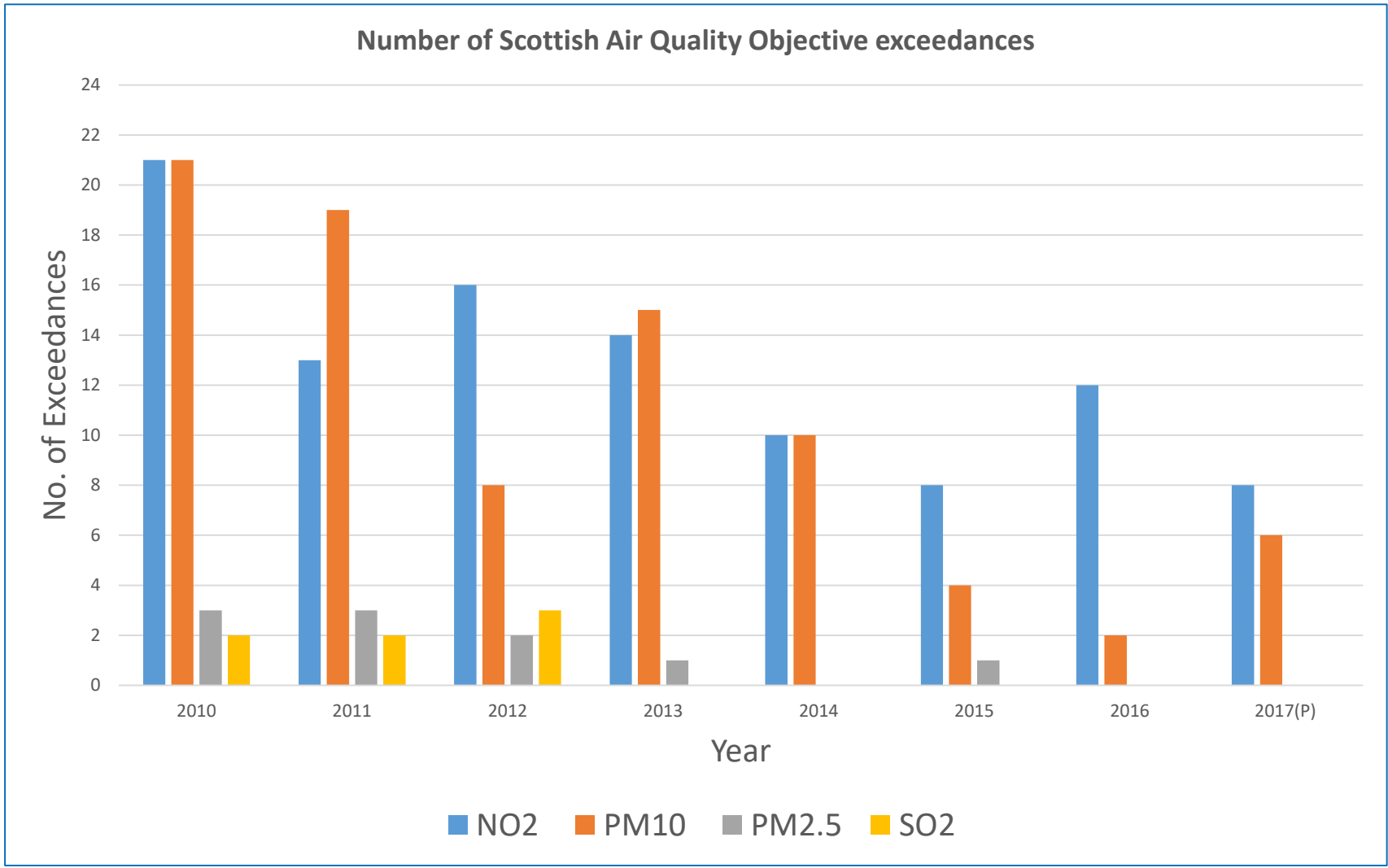
Perth Atholl St – 21 $\mu\text{g}/\text{m}^3$

Glasgow Clarence Drive – 19 $\mu\text{g}/\text{m}^3$

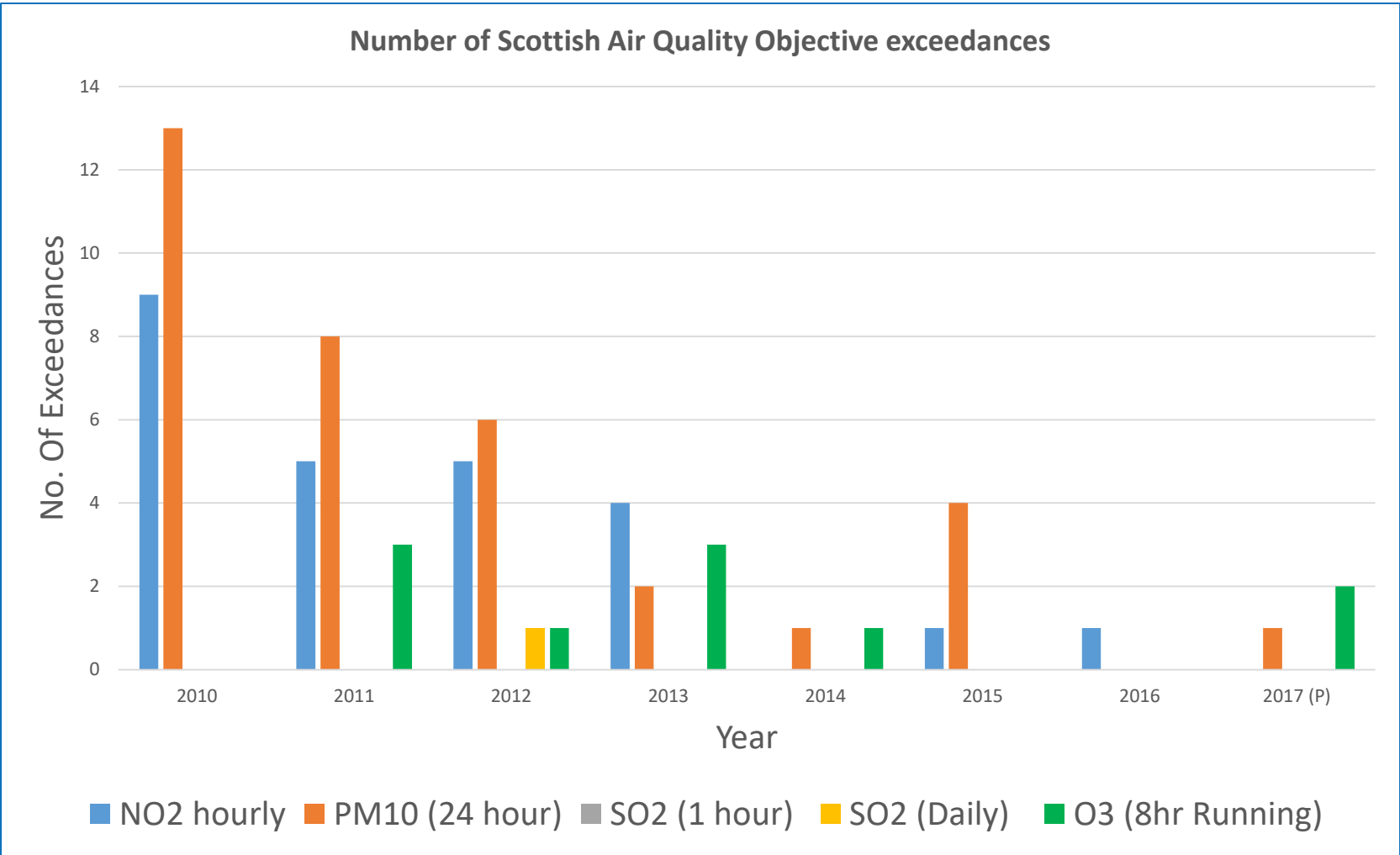
Edinburgh Glasgow Rd – 19 $\mu\text{g}/\text{m}^3$

Glasgow Dumbarton Rd – 19 $\mu\text{g}/\text{m}^3$

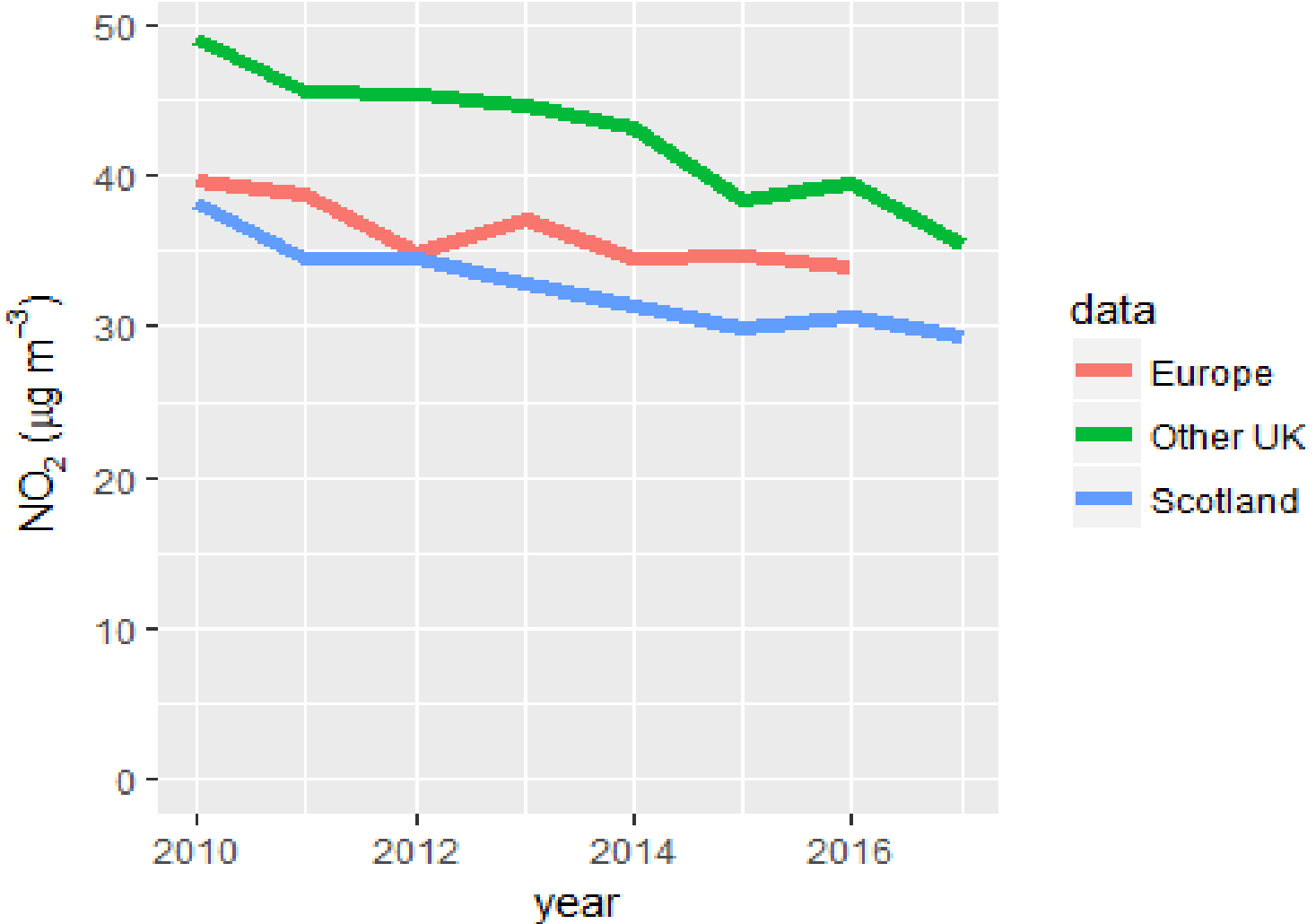
SAQD Data – Number of annual mean Objective Exceedances



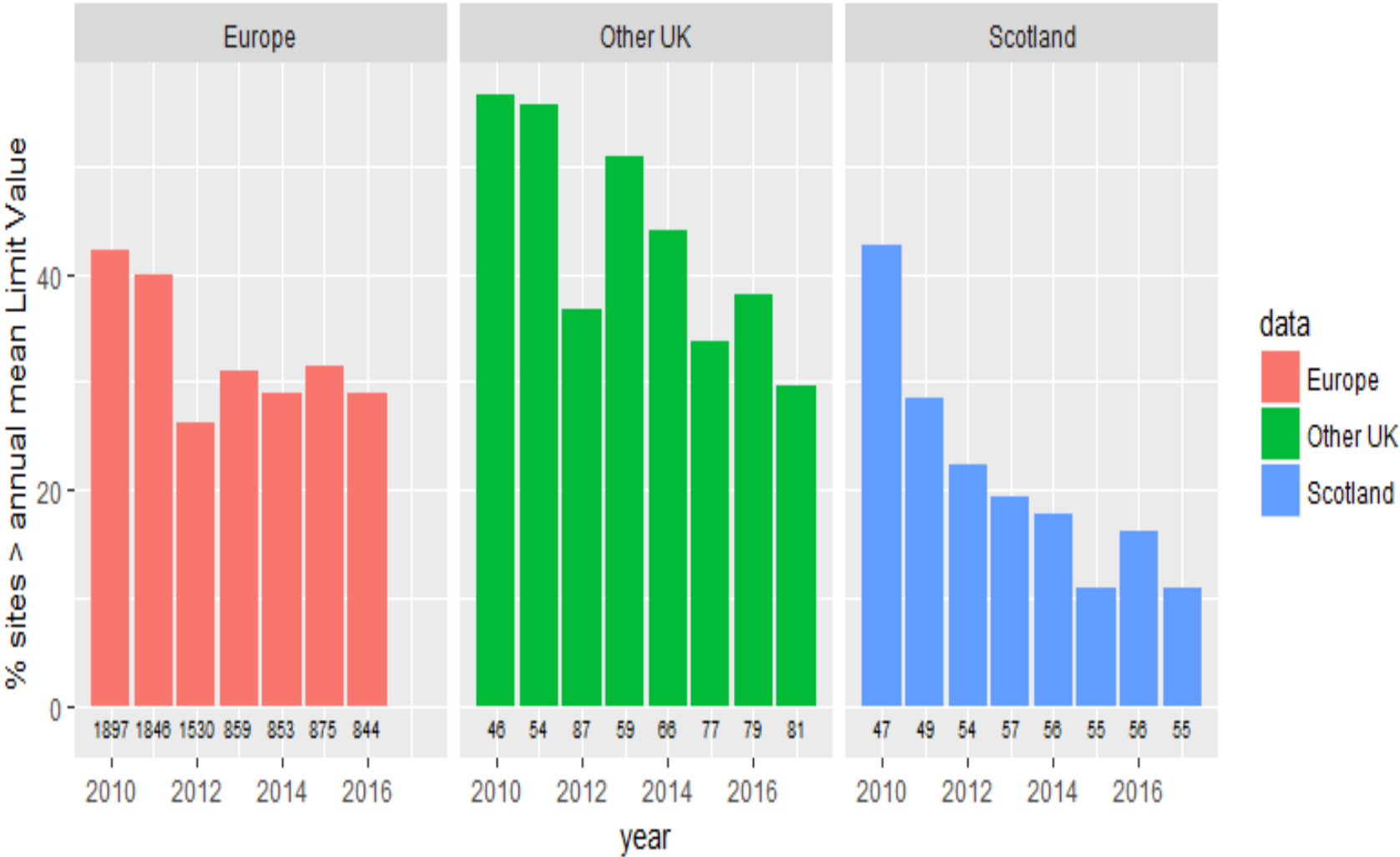
SAQD Data – Short Term objective Exceedances



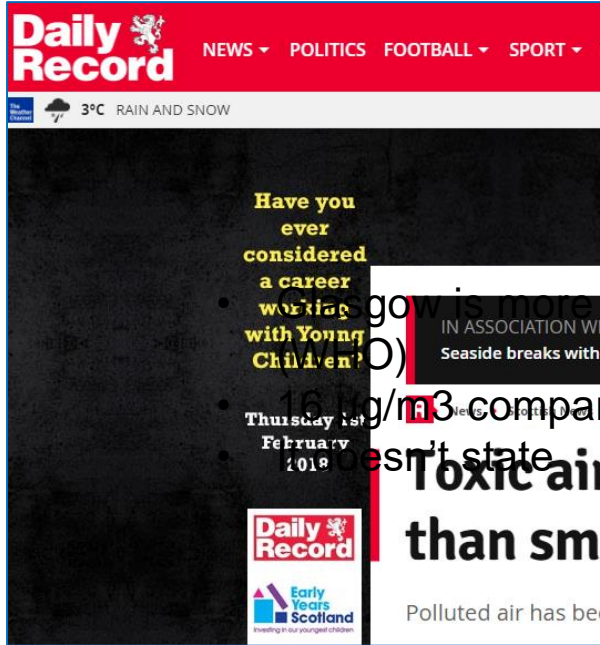
SAQD Data Comparison : Average Concentration at NO₂ Roadside sites



SAQD Data Comparison: Proportion (%) of sites Exceeding NO₂ annual mean objective (40 µg/m³)



SAQD Data: Air pollution in Scotland 2017 – Media article



Have you ever considered a career working with Young Children?

Thursday 1st February 2018

Daily Record

Early Years Scotland
Investing in our youngest children



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Glasgow more polluted than London, WHO says

31 October 2017

So what did the article say?



IN ASSOCIATION WITH Seaside breaks with...

16 $\mu\text{g}/\text{m}^3$ compared to next highest London and Leeds at 15 $\mu\text{g}/\text{m}^3$

Doesn't state the duration of the study

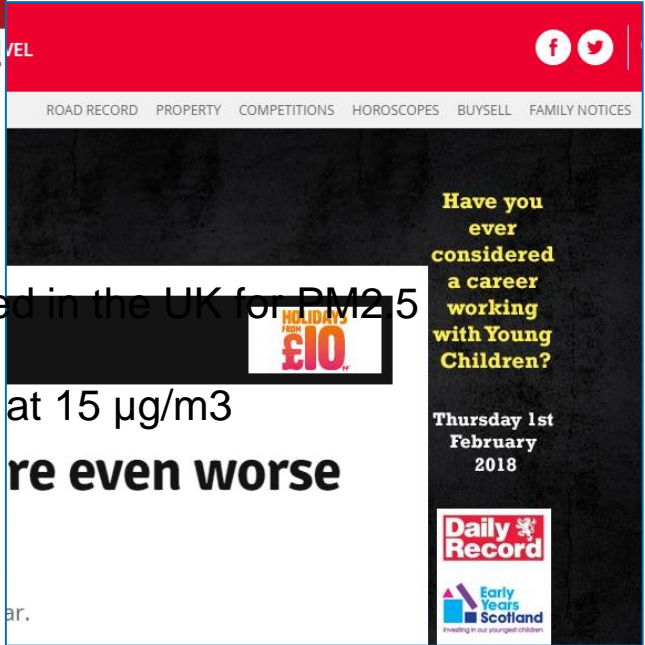
how many locations were involved

Or type of location

Glasgow is one of the most polluted parts of the UK, an air quality report has shown.

The World Health Organization (WHO) said it had tested 51 towns and cities for fine sooty particles linked to heart disease and premature death.

Glasgow had 16 micrograms of the particles per cubic metre of air, exceeding the 10 micrograms safe limit.



Have you ever considered a career working with Young Children?

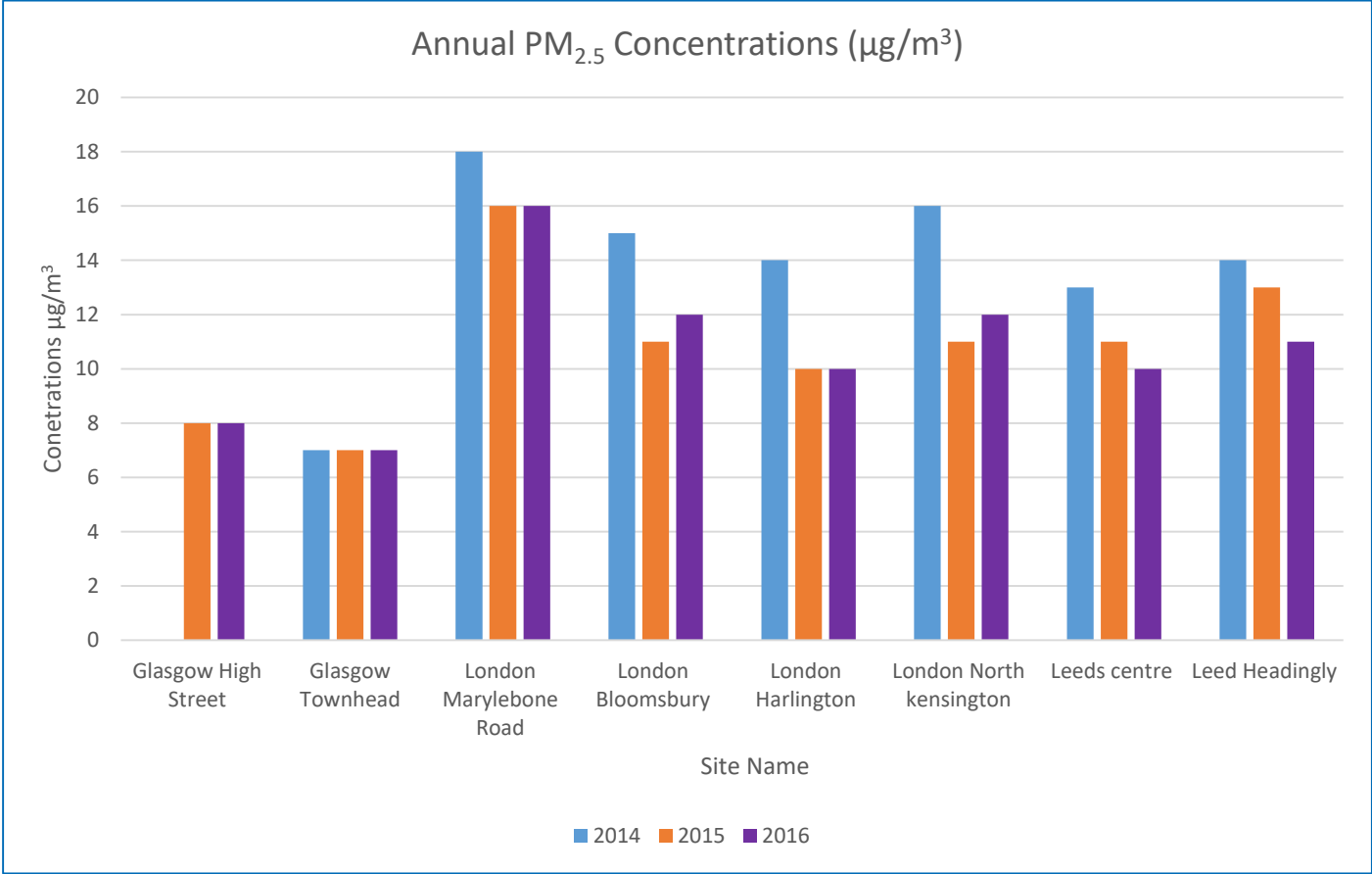
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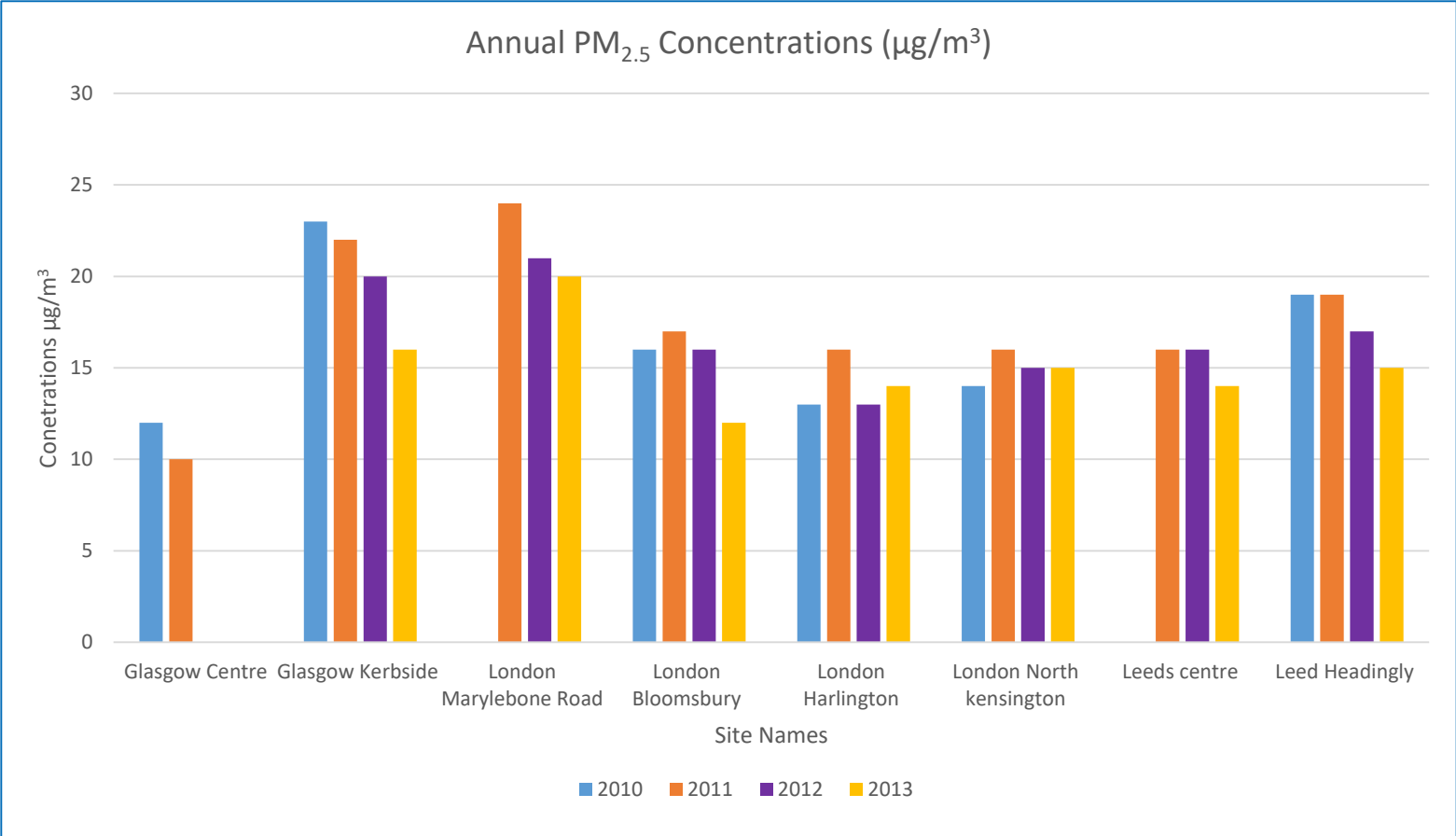
Early Years Scotland
Investing in our youngest children

- Lets look at the SAQD data to compare,

Air pollution in Scotland 2017 – Media articles



Air pollution in Scotland 2017 – Media articles



Air pollution in Scotland 2017 – Media articles

Summary of Findings:

- Data suggests in recent years Glasgow locations have significantly lower levels than London and Leeds contrary to what the article says.
- However, historical data from the closed Glasgow kerbside (Hope Street) site suggests that levels may be/have been similar to that at comparable London sites.

Actions:

- Proposed Low Emissions Zones.
- Scotland only country in Europe to Introduce PM_{2.5} objective (10 µg/m³)
- Increased monitoring of PM_{2.5} throughout Scotland. Most recently in Glasgow itself at Byres Rd, Dumbarton Rd, Waulkmillgen.

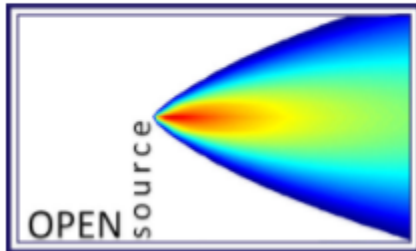
SAQD Data: Data Analysis - Time Variation Plots

- What information does it provide?
- Can the information provided be used to assist the implementation of policy?
- Plots were generated using the Analysis tools on the air quality website
- Openair – Time variation plots

Examples used: Glasgow Dumbarton Road (RS) and Glasgow Townhead (UB)

<http://www.scottishairquality.co.uk/data/openair?build=timevariation>

Openair Analysis



Public Air Quality Information



Advanced Data Analysis

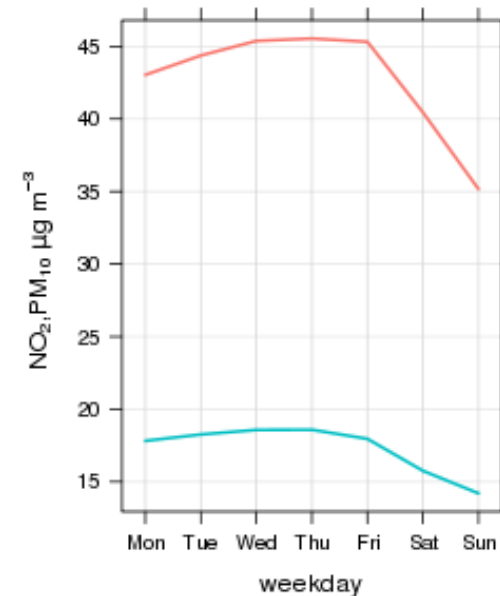
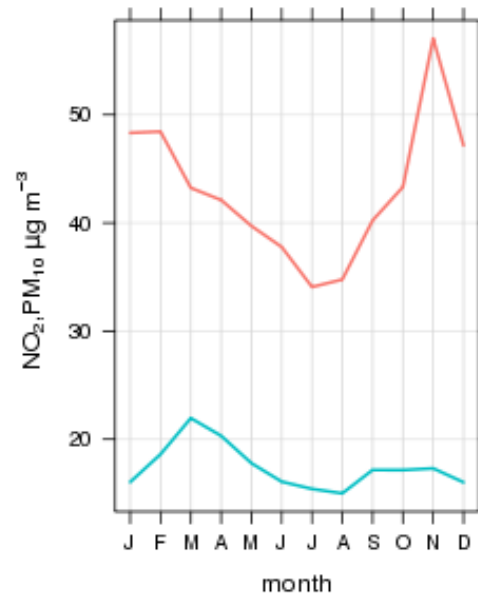
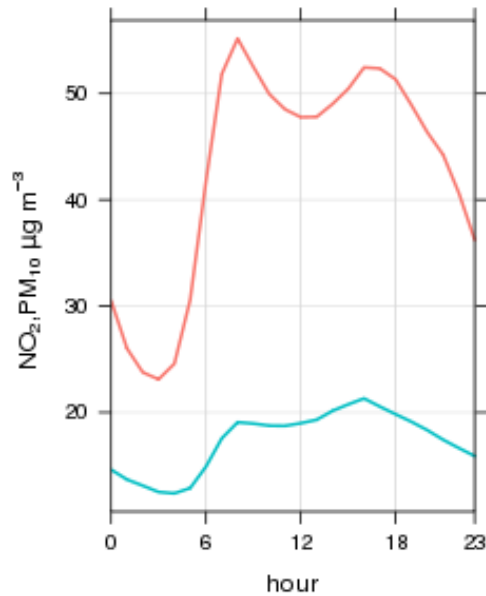
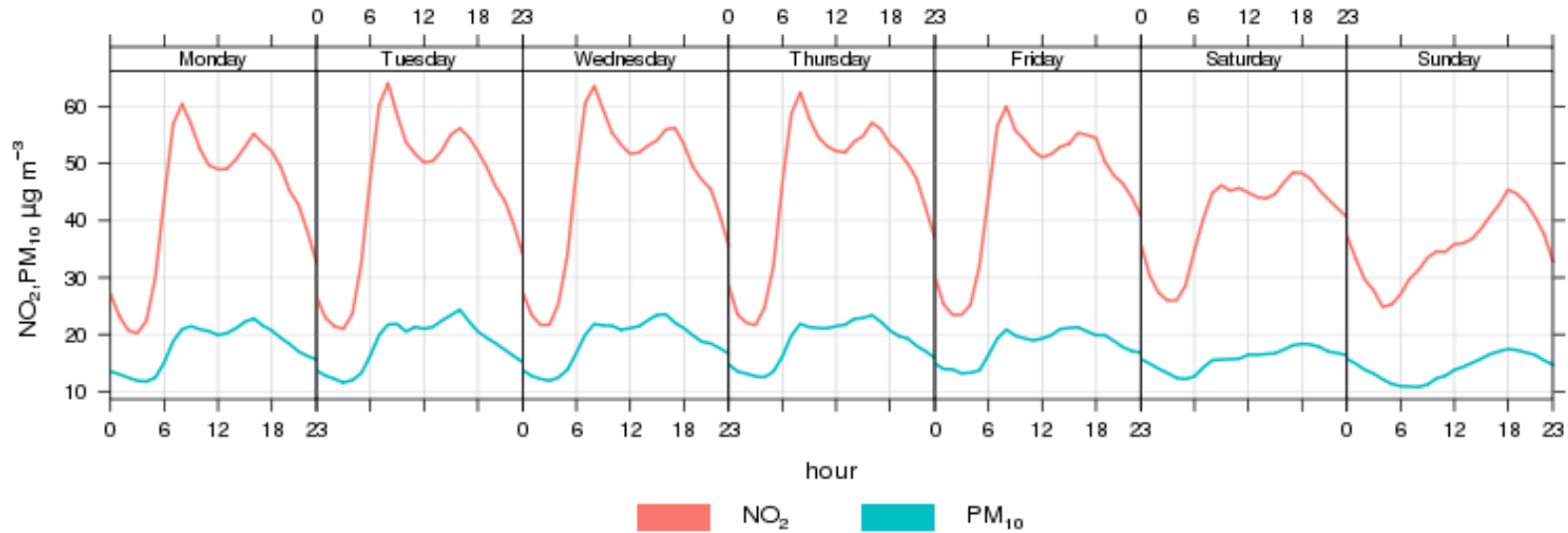


Local Authority NMF Area



SAQD Data: SAQD Data: Data Analysis Time Variation Plot Analysis

Data trends at Glasgow Dumbarton Road for the period 2012 to 2016



SAQD Data: Time variation Plot Analysis

How can this type of data analysis be used?

- Accurately identify where the peak periods occur in turn revealing useful information concerning the source.
- It could be combined with traffic data to make a more detailed evidence base to work with when implementing policy.
- It can help identify if policies implemented are having an effect through pre and post comparison.
- But Could it also help refine policy so that its specific to the location and pollutant?

Recent & Future Developments to the Scottish Air Quality Database and Website

Cleaner Air for Scotland - The Road to a Healthier Future (CAFS)

Cleaner Air for Scotland - The Road to a Healthier Future (CAFS) is a national strategy that sets out how the Scottish Government will deliver its commitment to further improving air quality to protect human health and fulfil Scotland's legal responsibilities.

Working in partnership, the organisations tasked with supporting CAFS are:

- Scottish Government
- Transport Scotland
- SEPA
- Local authorities
- NGOs
- Health bodies
- Representatives from the Scottish transport sector

The strategy aims to achieve the ambitious vision for Scotland "to have the best air quality in Europe". A National Modelling Framework (NMF) and National Low Emission Framework (NLEF) will provide the tools and mechanism to put in place measures that will improve air quality.

Low emission zone

Scotland's first low emission zone will be implemented by the end of 2018. Working with local authorities, the Scottish Government has committed to delivering a low emission zone as a tool to improve air quality. CAFS partners are working together, using the evidence and tools available, to identify the most suitable location. Transport organisations, businesses and members of the public will all be engaged in the development of the zone to share information on how it will affect them and the benefits to the city.

Further information

A [briefing note](#) summarising the implementation of CAFS is available to download. Copies of minutes from the CAFS Governance Group are available from air_quality@gov.scot

Latest Updates

[2016 CAFS progress report published 15th June 2017](#)

Today	Tomorrow	Outlook
Moderate pockets of air pollution are possible in the far north and west of Scotland, otherwise Low air pollution levels are expected.	Low air pollution levels are expected. Possible moderate levels in Orkney and Shetlands.	Isolated Moderate levels of air pollution are possible in Orkney and Shetlands, otherwise air pollution levels are expected to be Low.

5-day air pollution forecast map

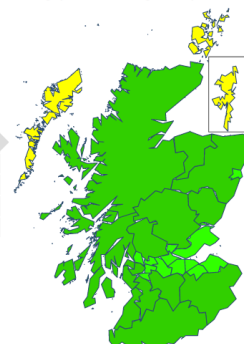
The map shows the air pollution forecast for each local authority in Scotland. **Today (19th January 2018)**

[View a full forecast summary for each local authority](#)

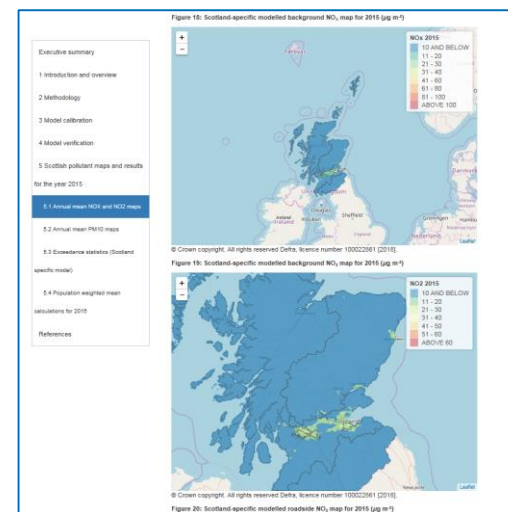
The following days are available to view:

« Previous Day Next Day »

- Today (19th January 2018)**
- Saturday (20th January 2018)
- Sunday (21st January 2018)
- Monday (22nd January 2018)
- Tuesday (23rd January 2018)



Index (1-10) 1 2 3 Low 4 5 6 Moderate 7 8 9 High 10 Very high



Recent Updates to the Website:

- CAFS Page (<http://www.scottishairquality.co.uk/air-quality/CAFS>)
 - Publish Governance Group meeting minutes
 - Regular Updates
- Updated Scotland Specific Background Maps using a base year of 2015 (<http://www.scottishairquality.co.uk/data/mapping?view=data>)
- Updated LAQM tools (<http://www.scottishairquality.co.uk/laqm/tools>)
- New monitoring sites added and current sites updated continuously

Coming soon to the Website

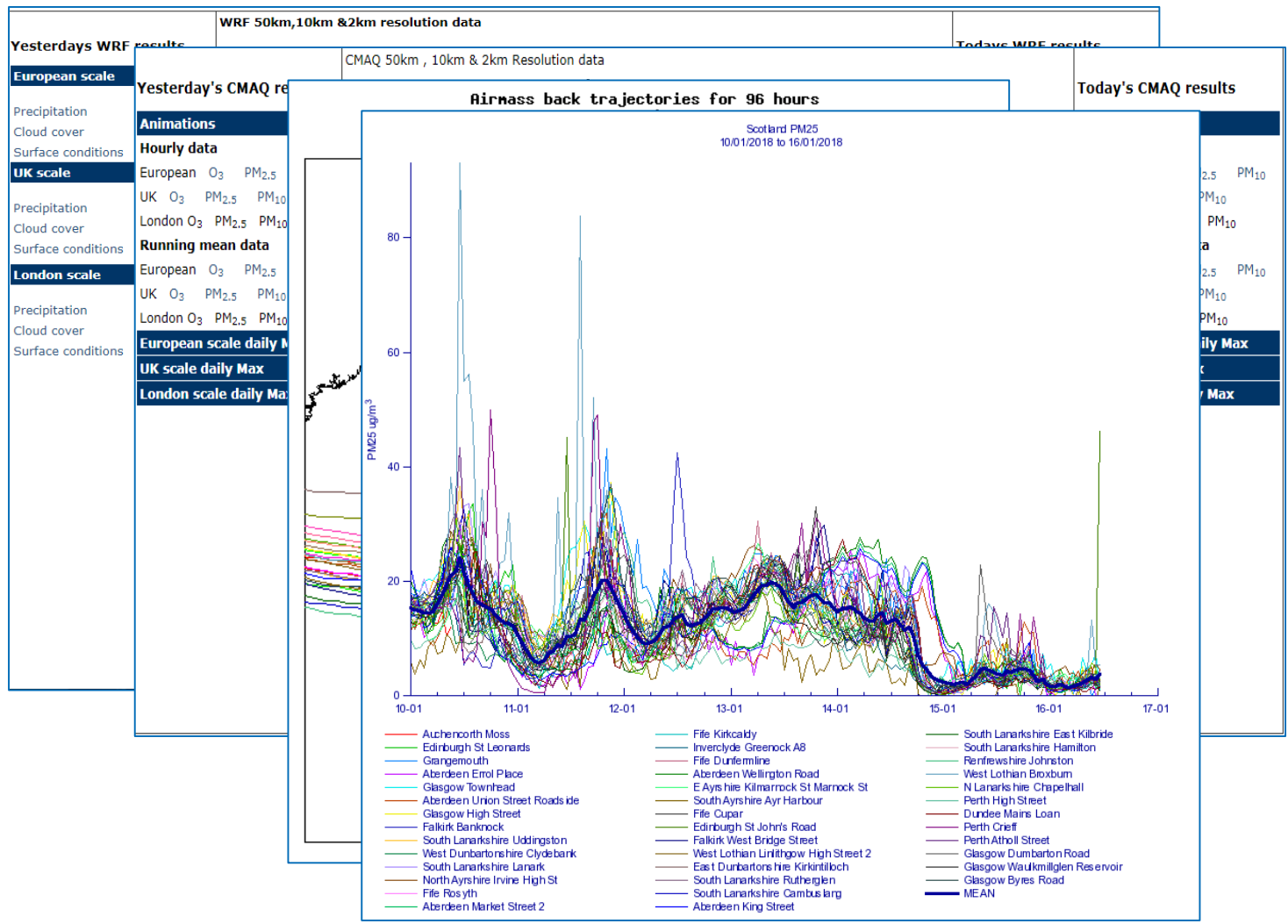
- Scotland Specific Air Quality Forecast
- Interactive Mapping Report
- Proposed that the Air Quality Scotland Website is to be the “Central repository for Low Emission Zone information” (“Consultation on Building Scotland’s Low Emission Zones”, Transport Scotland, Sept 2017)

Scotland Specific Forecasting

- Since 2014 the Met office has provided the Air Quality forecast for the UK.
- Over this period it has been observed that the accuracy of the Forecast in terms of Scotland has reduced significantly resulting in;
 - A lack of confidence in the forecasts produced
 - the issuing of false alerts through the Know and Respond Application
 - Criticism by users and Environmental pressure groups
- to resolve this, Scottish government commissioned Ricardo to produce Scotland Specific forecasting and revamp the current look of the forecasting pages.
- Scottish Specific Forecasting will include:
 - Technical analysis of the forecast by an experienced (Scottish based) Ricardo forecaster
 - Use of additional forecasting resources such as WRF and CMAQ models and Air Mass back trajectories
 - Utilisation of localised knowledge and understanding of air pollution in Scotland.



Scotland Specific Forecasting – resources used



<http://preview.scotarc.aeat.com/latest/forecast>

New Interactive Mapping Report



<http://preview.scotarc.aeat.com/news/reports?view=technical&id=560>

Your feedback and suggestions are important

info@scottishairquality.co.uk

<http://www.scottishairquality.co.uk>



Questions



David Hector
SAQD Project Manager
Ricardo Energy & Environment
18 Blythswood Square, Glasgow, G2 4BG, UK
david.hector@ricardo.com