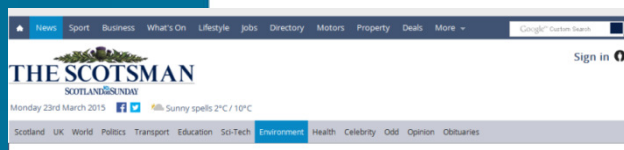


Developing Data Analysis and Visualisation Tools within the SAQD

Dr Colin Gillespie
Scottish Environment Protection Agency

Air quality hits the news...



Calls for free buses after Scots air pollution rise



2,094

Deaths in
Scotland
each year



306
Glasgow



205
Edinburgh



Glasgow air pollution
among UK's worst

29 April 2015 Last updated at 14:50 BST

The Supreme Court has ruled that the UK government must take immediate measures to reduce air pollution under European law.

The ruling represents a victory for campaigners who began legal action after the UK breached EU limits for nitrogen dioxide.



UK air pollution: Court
orders government to bring
levels down

29 April 2015 Last updated at 22:38 BST

The government has been ordered by Supreme Court judges to take action on air pollution by the end of the year.

The UK's highest court ruled in favour of environmental campaigners who are angry that the UK is breaching European Union limits for nitrogen dioxide in predominantly urban areas.

Scotland on toxic smog alert as a potentially
dangerous cloud of air pollution blows over



- Greater public interest in AQ, the data collected and the information presented
- Need to inform at the correct level...

Cleaner Air for Scotland

Vision:

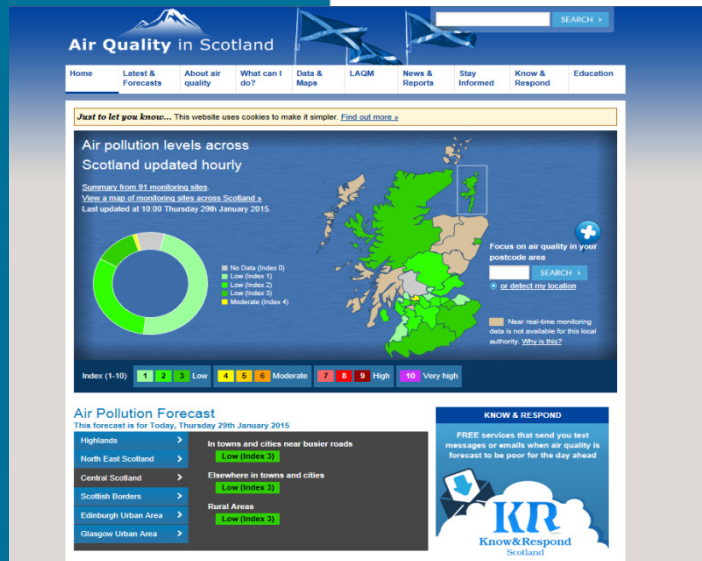
Scotland's air quality will be the best in Europe

Information is key to success

- Communicating the issues
- Increasing the level of ownership
- Developing appropriate actions
- Reporting successes and failures



Integration in to the Air Quality in Scotland website



SAQD Development Project:

- Build on the capacity developed within our Pilot Project
- Develop AQ data analysis and visualisation tools for the Air Quality in Scotland website
- Enhancements are aimed at:
 - Local Authorities to assist in their air quality duties (including additional requirements introduced through Cleaner Air for Scotland Strategy)
 - Providing appropriate information for the general public

Our plan...

- To work with wider stakeholders, agencies and LAs
- To ensure that we delivered user requirements now and in to the future – particularly with CAFS and heightened interest in air quality
- Link to wider databases – TS national traffic database and SEPA's modeling database, Met office and SAQD
- Develop different levels of tools, looking at different usage of the data and reporting requirements

**Public
Interactive
Tool**

**Advanced
Analysis Tool**

**Local
Authority
Modelling Tool**

- Develop tools that are fully interactive...

What we have done...

- Data - following datasets were identified to be used in the analysis tools:
 - Air Quality Monitoring Station Data
 - Met Office Data (wind speed, wind direction, air pressure and temperature)
 - Transport Scotland Data (Trunk Road Network)
 - Diffusion Tube Data
- The focus of tool development has been on the Advanced Analysis Tools and Public Interactive Tools
- Mocked-up webpages have been developed to form part of the Air Quality in Scotland website
- We are working with others to incorporate future datasets suitable for the SAQD

Stakeholder Engagement

- Continual engagement with stakeholders...from requirement gathering through to development – this will continue towards the launch and beyond
- **Local Authorities:** stakeholder workshops at key milestones to develop the requirements and to demo the tools
- **Other interested stakeholders:** public stakeholder workshops, including the 2050 Climate Group, Centre for Sustainable Living and Practice, STEP
- **Local Authority Working Group:** regular meetings to help develop the tools through technical working groups

Analysis Tools

[Transport Scotland - Air Quality](#)[Scotland's Environment Web](#)[Daily Air Quality Index & Health Advice](#)[European Environment Commission database](#)[Transport Scotland – NTDS](#)[Comeap](#)

Analysis Tools

This page contains links to various analytical tools designed to bring together air quality data with other relevant data sources. These tools use interactive mapping functionalities that can retrieve and display complex data whilst allowing the user to customise their analysis and filter requirements by specific parameters, to meet their reporting needs.

Public Interactive tool



This tool is aimed at the general public, providing analyses of local, regional and national air quality data.

Advanced Analysis Tool



This application is aimed at providing a more analytical platform for reporting in air quality. This application is intended for local authorities to assist in more detailed air quality analysis.

Local Authority Modelling Tool



This application provides detailed spatial analysis of modelled air quality across low emission zones or specific city areas.

Open Air

To be provided by contractor.

[Link to Open air](#)

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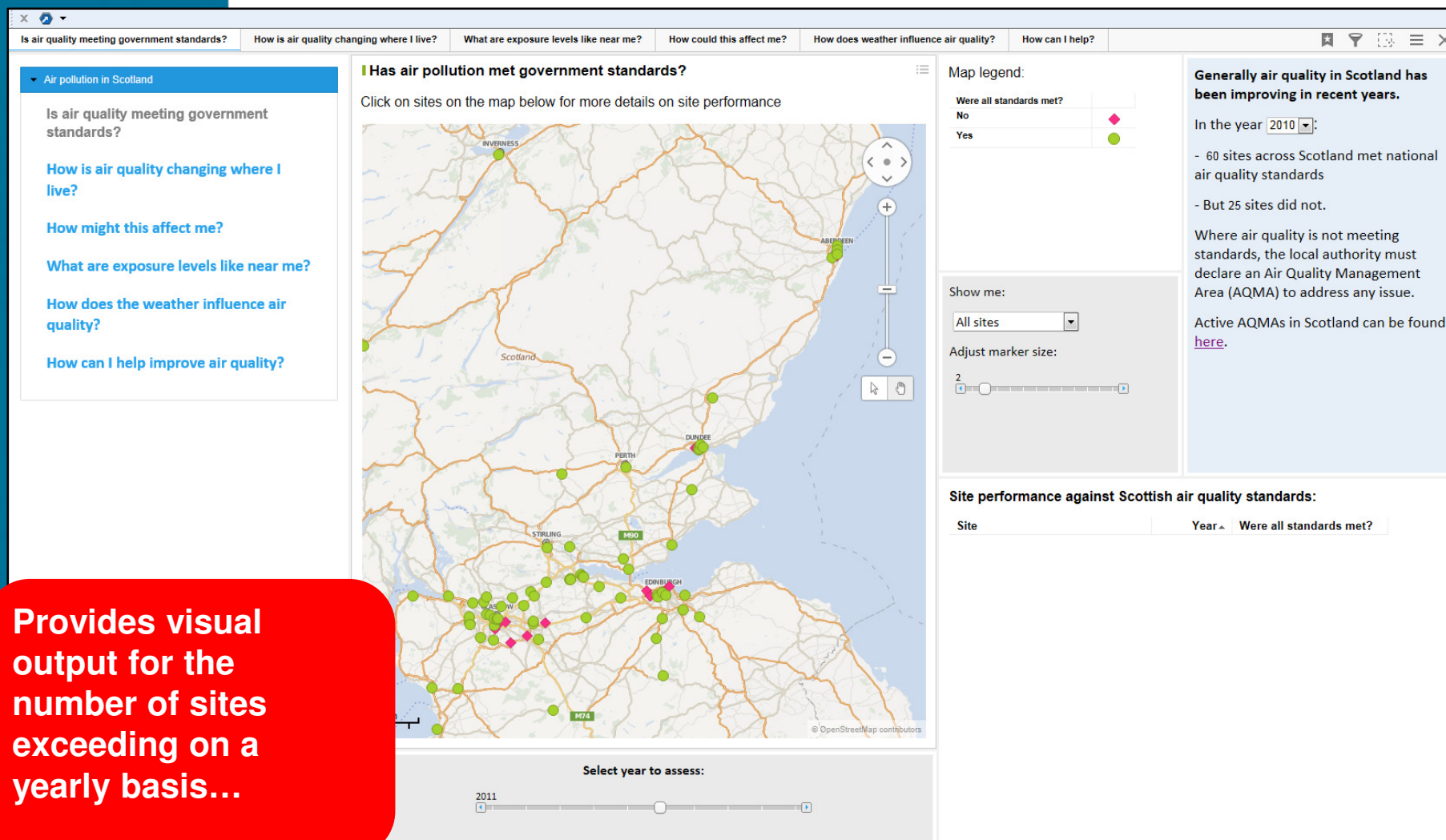


You can follow us on twitter for all the latest

Don't miss...

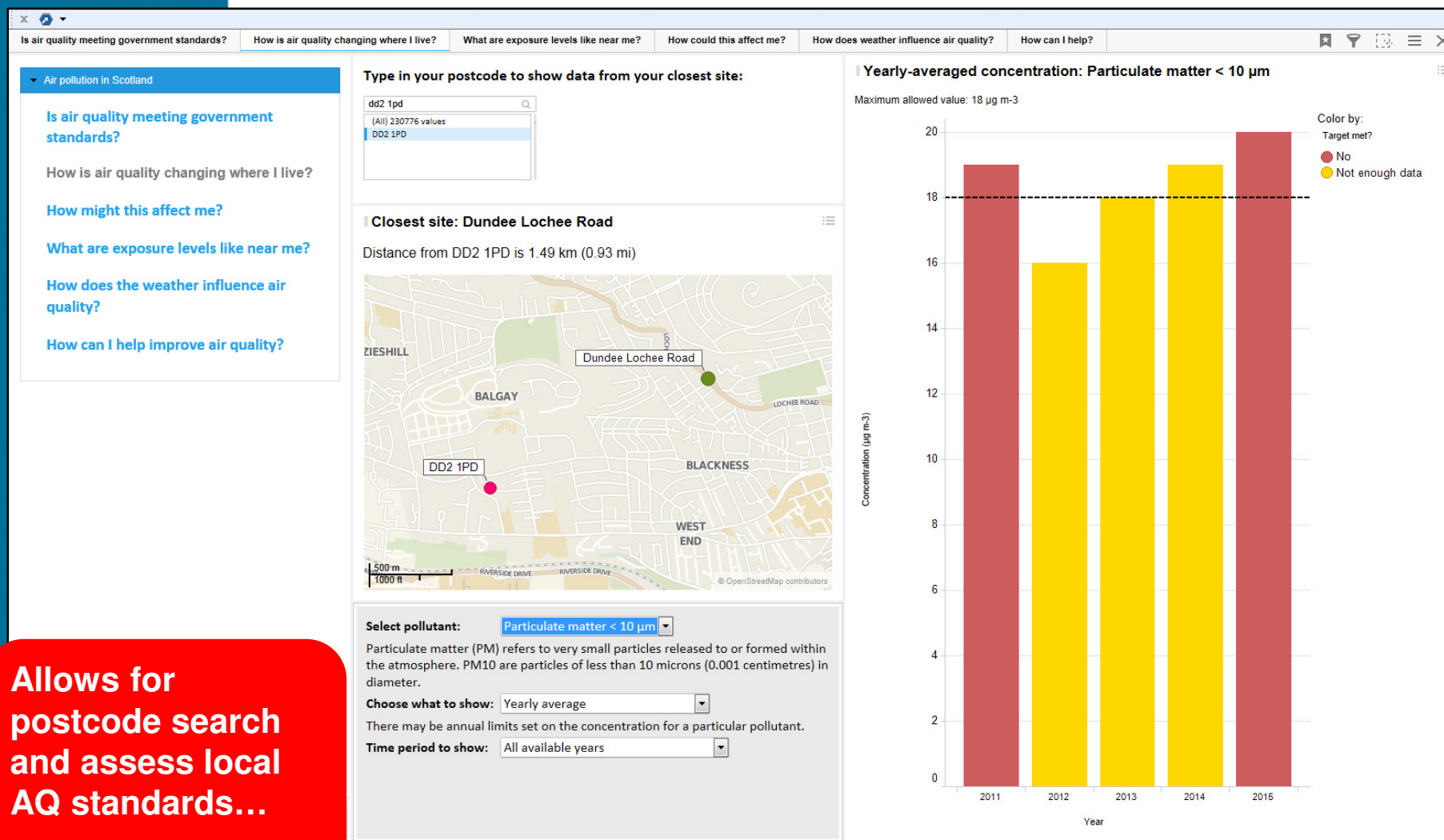
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Public Interactive Tools...



Provides visual output for the number of sites exceeding on a yearly basis...

Public Interactive Tools...



**Allows for
postcode search
and assess local
AQ standards...**

Analysis Tools

[Transport Scotland - Air Quality](#)[Scotland's Environment Web](#)[Daily Air Quality Index & Health Advice](#)[European Environment Commission database](#)[Transport Scotland – NTDS](#)[Comeap](#)

Advanced Analysis Tools

Advanced Analysis Tools	Description of Tool
Live Analysis Tool	This tool focuses on current conditions and the recent past. It includes the ability to compare time series of air quality and weather data.
Reporting Tool	This tool is aimed at supporting local authorities with their annual reporting requirements. The analysis includes the ability to look at annual means, daily/hourly exceedances and linear trends.
Transboundary Tool	This tool is aimed at supporting local authorities with their annual reporting requirements. The analysis includes the ability to look at annual means, daily/hourly exceedances and linear trends.

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Local Authority Reporting Tool

Summary tables...

Guidance Monitoring site overview **Summary table** Annual means & percentiles Exceedances - Analysis Diurnal cycles AQ trends Wind analysis Data download

Select site(s)

Local Authority:

Type to search in list

(All) 27 values

Aberdeen City

Angus

City of Edinburgh

Clackmannanshire

Site name:

Type to search in list

(All) 7 values

Aberdeen Anderson Dr

Aberdeen Errol Place

Aberdeen King Street

Aberdeen Market St

Environment type:

Type to search in list

(All) 3 values

Roadside

Unknown

Urban background

Select pollutant & year(s)

Choose what to plot

Cell colouring

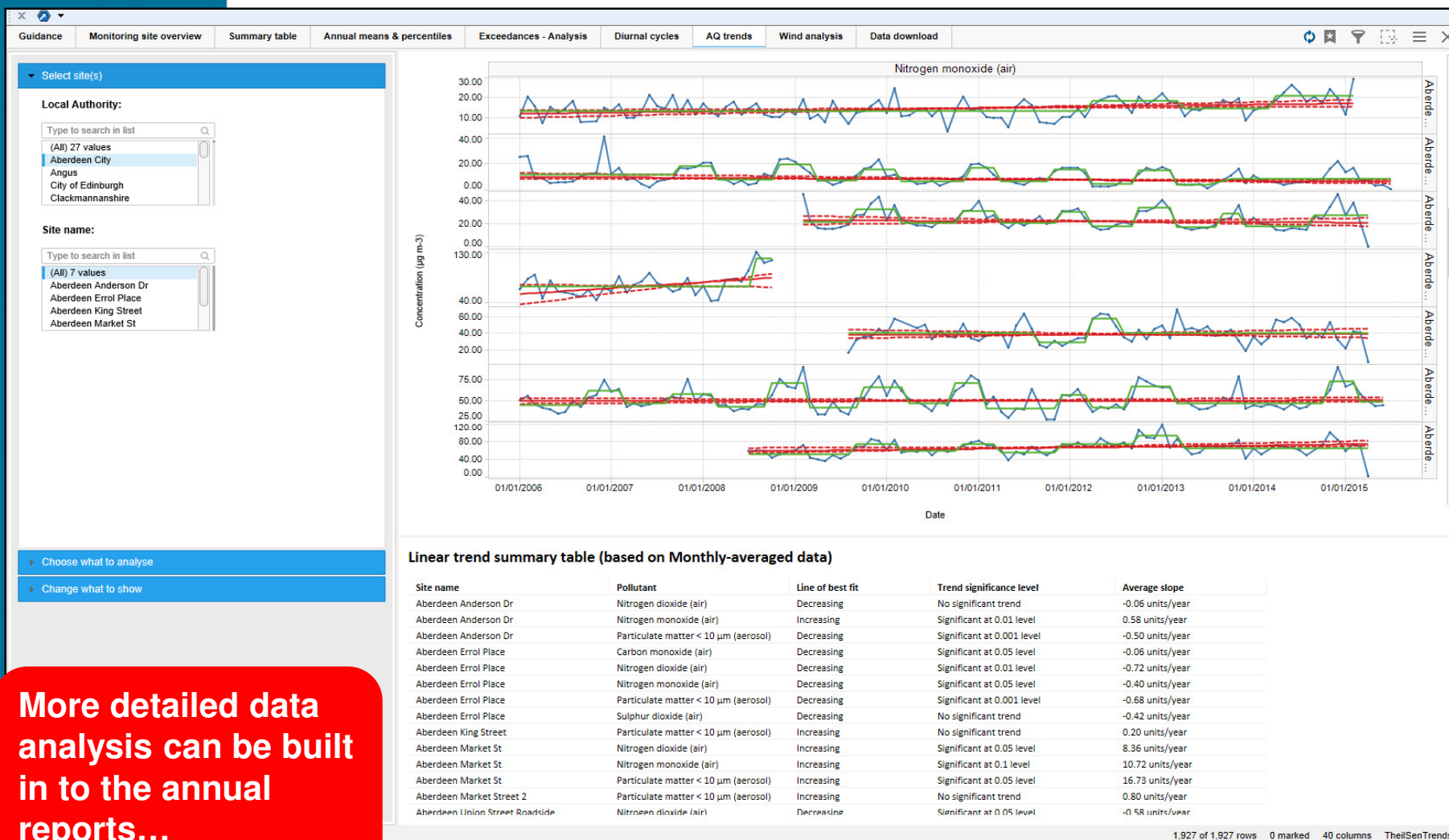
Summary statistics for selected sites & years

Site ID	Site name	Valid data capture in 2014	Annual mean concentration ($\mu\text{g m}^{-3}$)									
			2007	2008	2009	2010	2011	2012	2013	2014		
ABD	Aberdeen Errol Place	94	24	25	26	22	23	21	20	22		
ABD0	Aberdeen Market Street 2	95	---	---	39	44	40	44	43	40		
ABD1	Aberdeen Anderson Dr	76	28	25	24	27	23	30	22	26		
ABD2	Aberdeen Market St	(Empty)	62	73	---	---	---	---	---			
ABD3	Aberdeen Union Street Roads...	92	53	55	52	58	44	53	48	47		
ABD8	Aberdeen Wellington Road	77	---	40	43	52	51	59	52	48		
AD1	Aberdeen King Street	94	---	---	32	29	32	29	28	27		

Allows Local Authorities to build their own reports as part of their annual reporting requirements, providing self ownership of their data...

Local Authority Reporting Tool

Trend analysis...



**More detailed data
analysis can be built
in to the annual
reports...**

Local Authority Reporting Tool

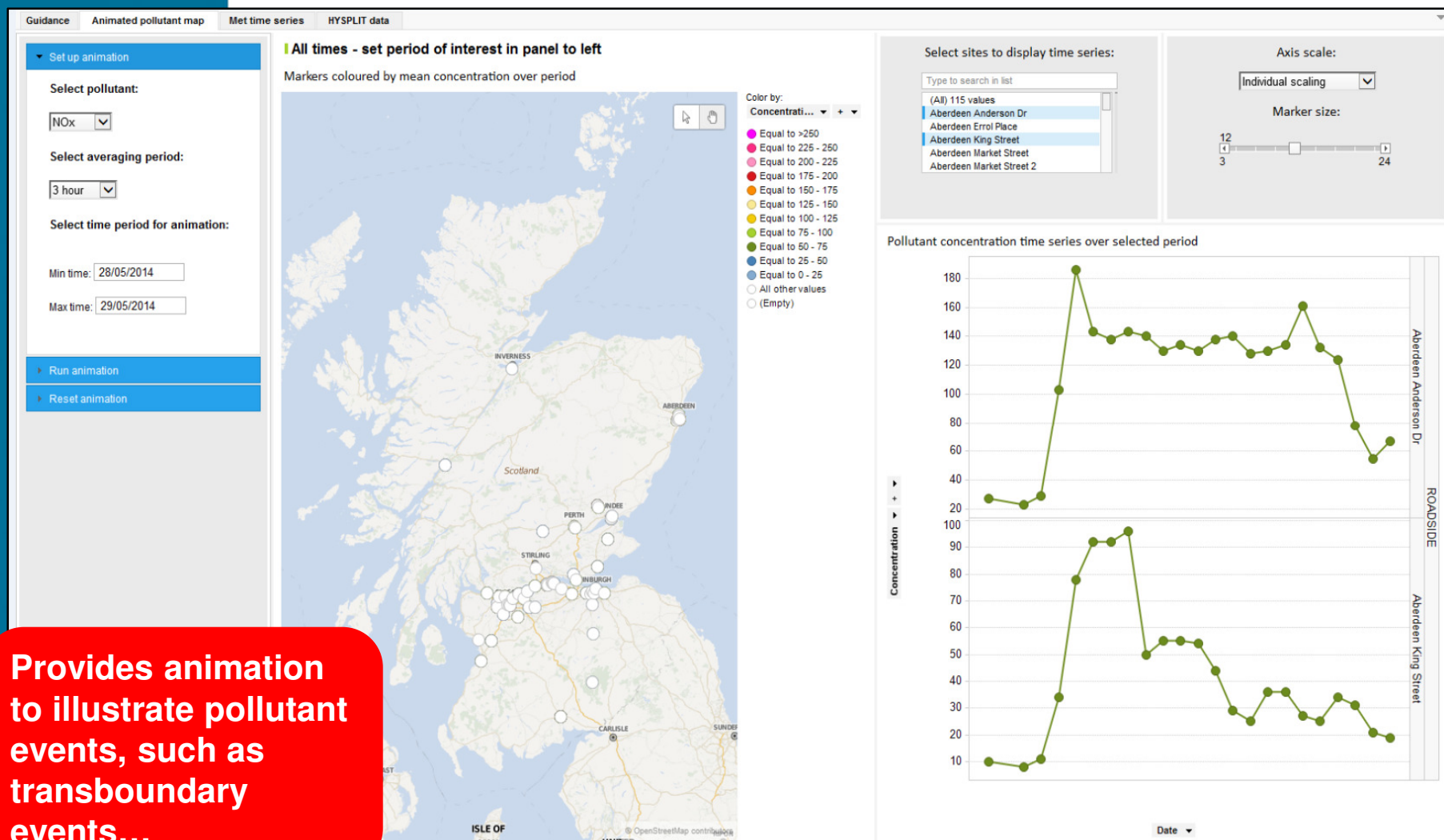
Influence from local weather...



**Analysis of data
against other factors,
linking datasets and
other open source
tools such as
OpenAir...**

Transboundary Tool

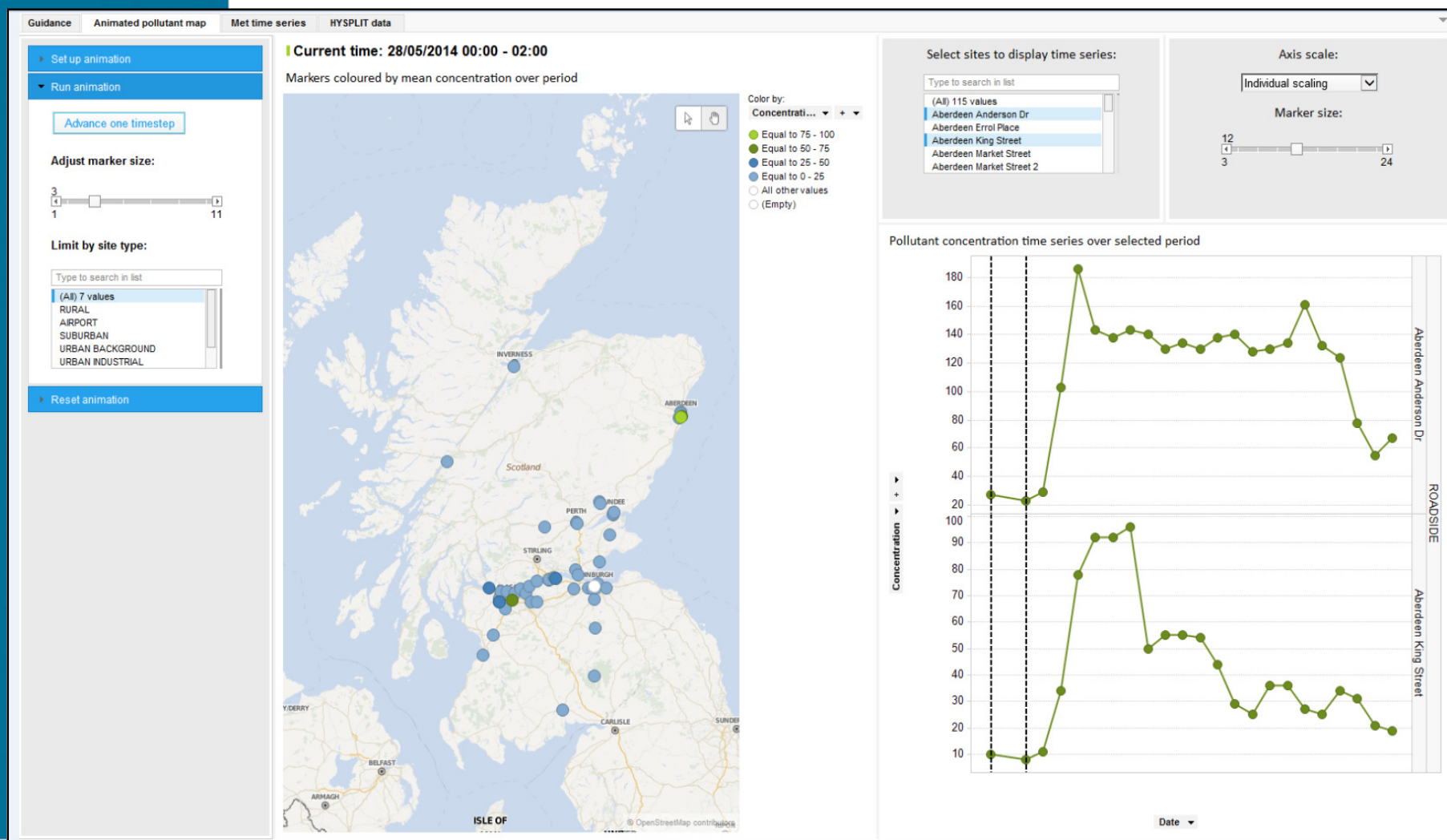
Pollution event animation...



Provides animation to illustrate pollutant events, such as transboundary events...

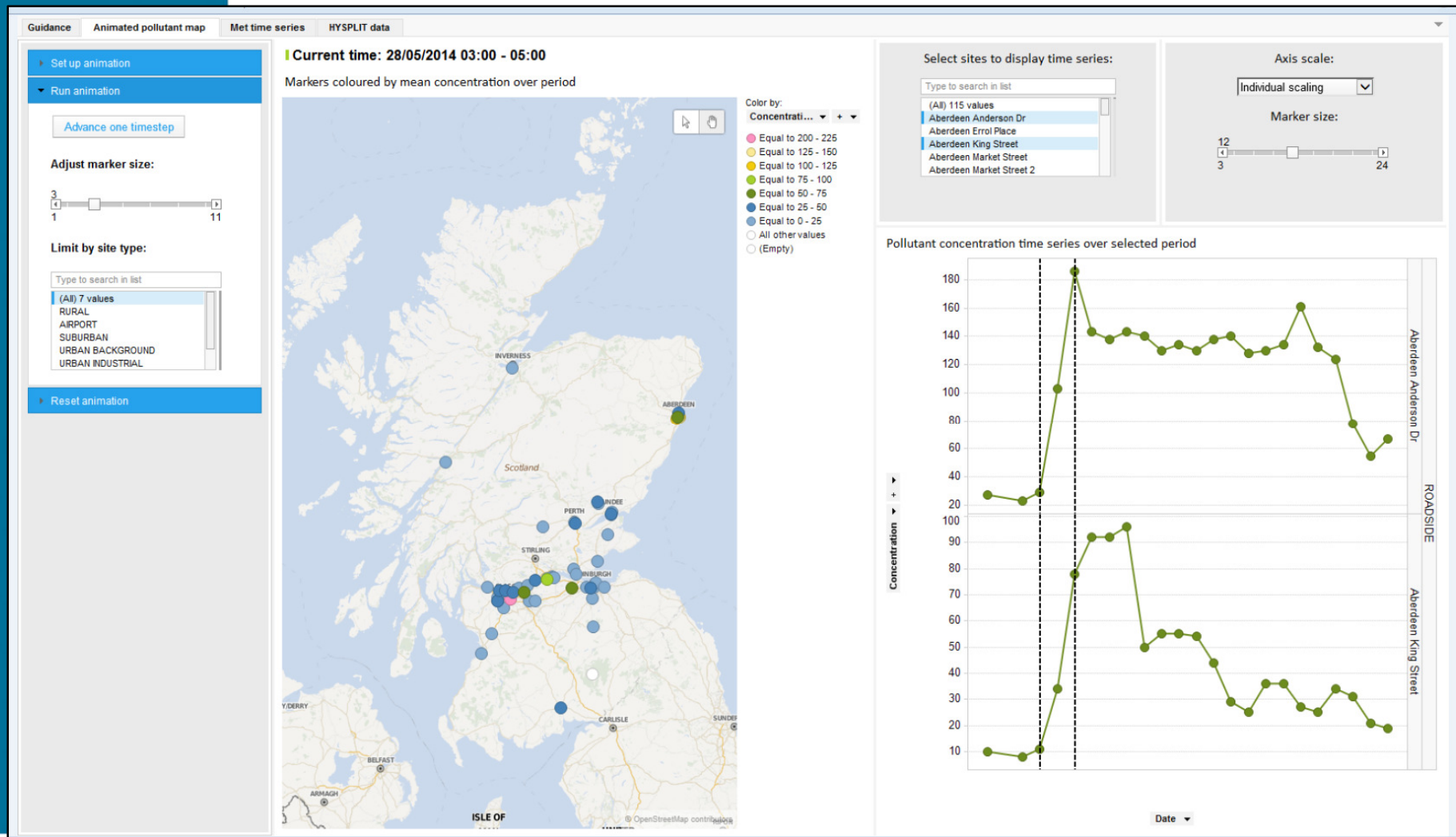
Transboundary Tool

Pollution event animation...



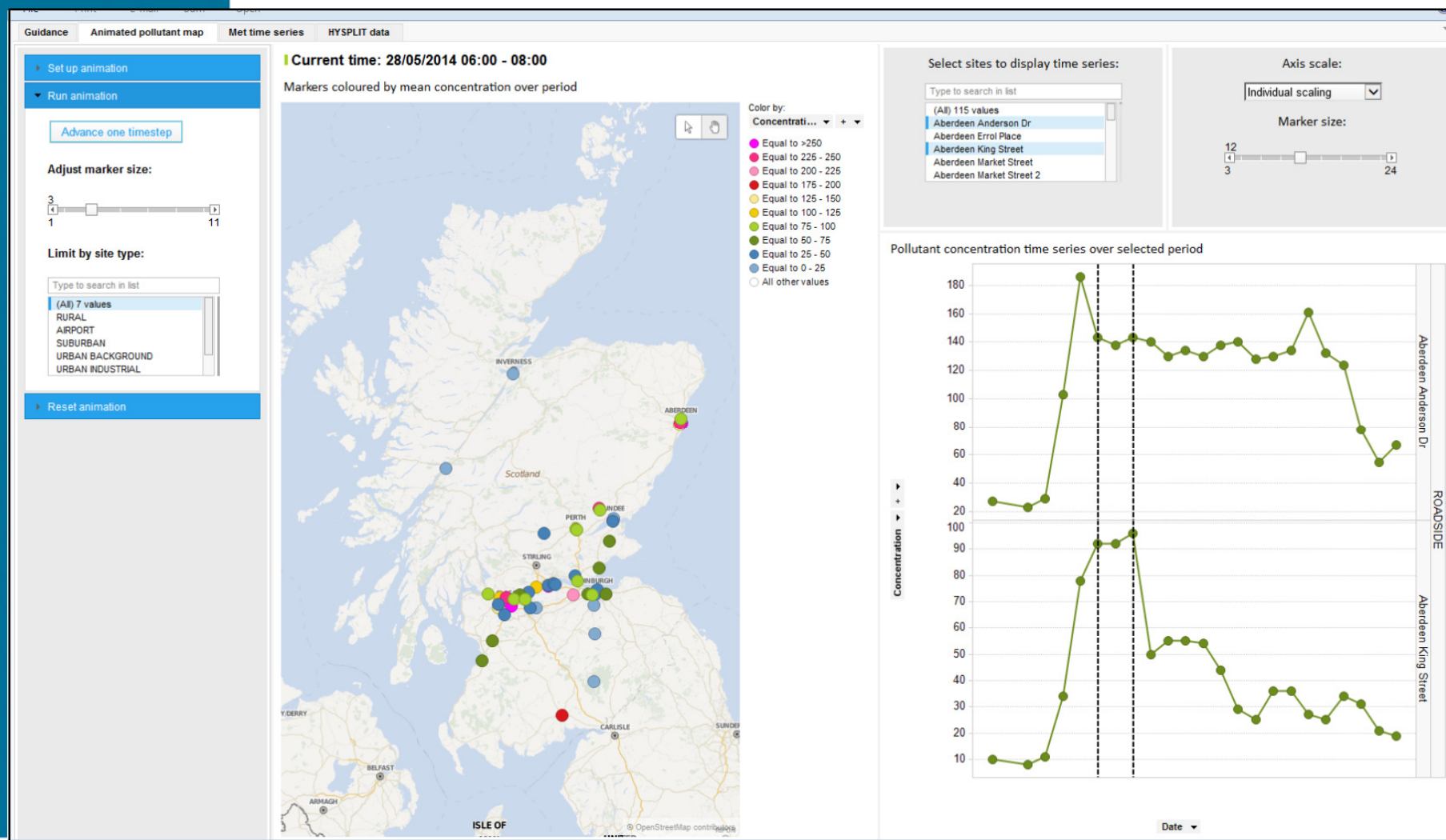
Transboundary Tool

Pollution event animation...



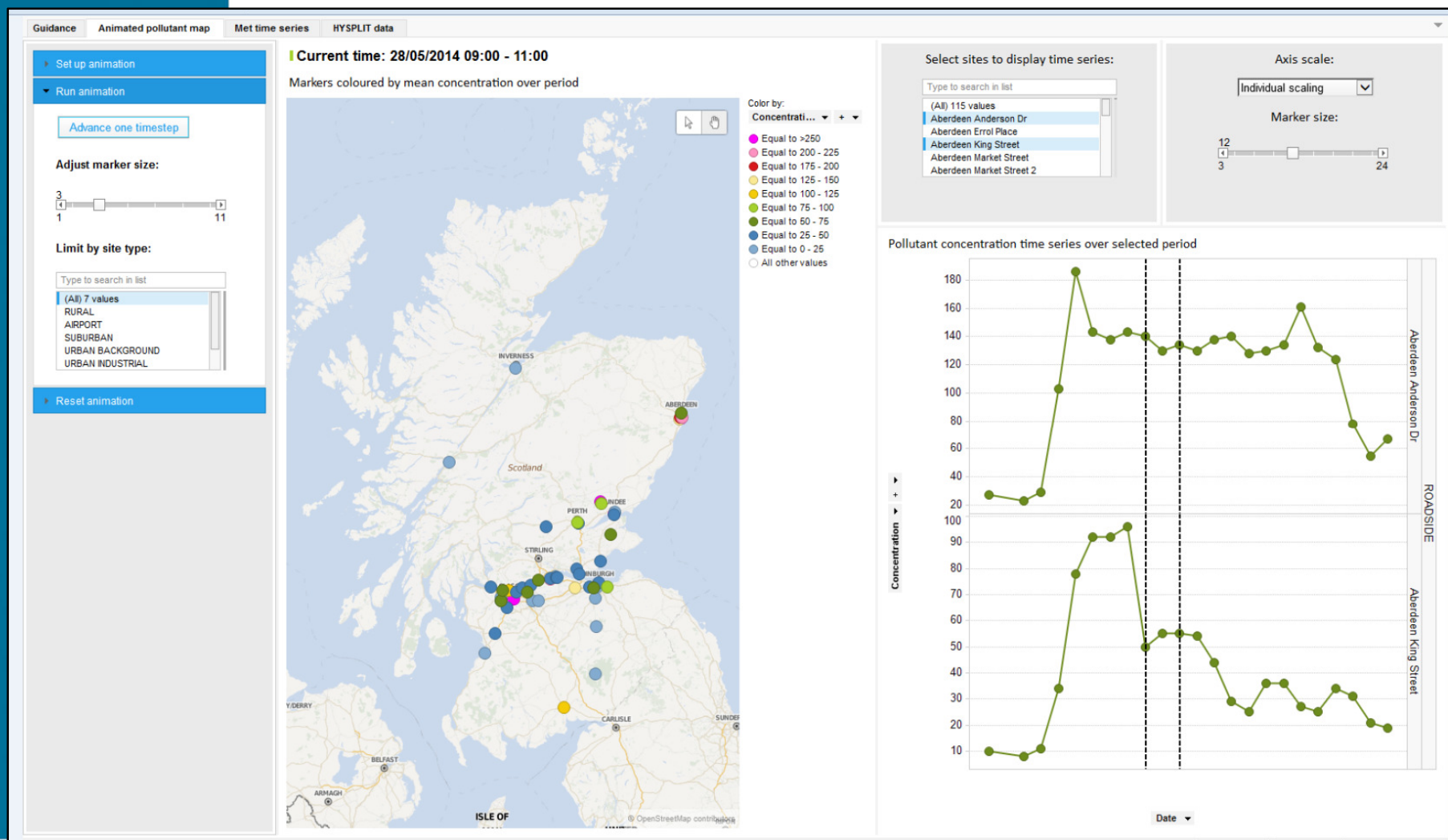
Transboundary Tool

Pollution event animation...



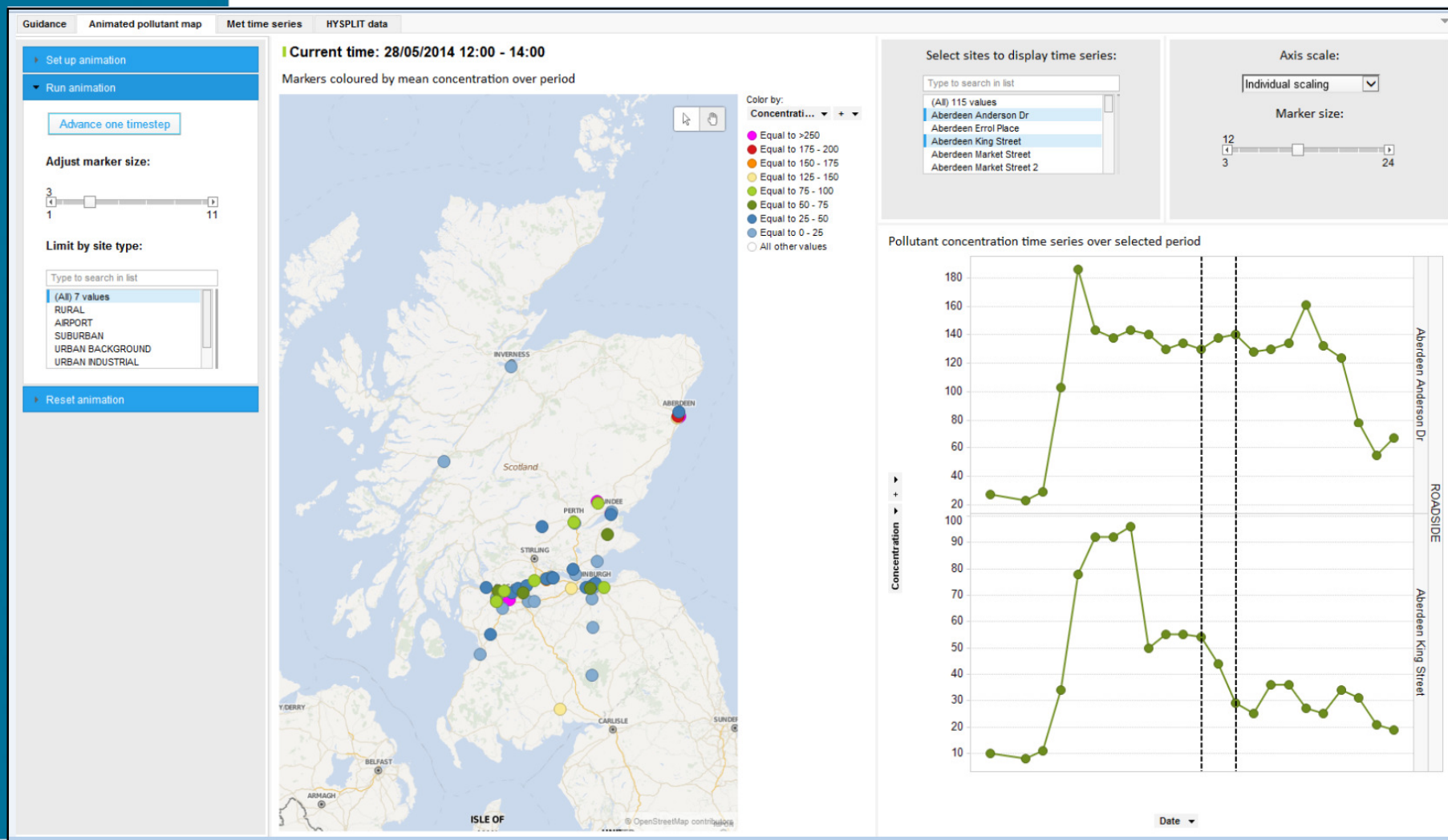
Transboundary Tool

Pollution event animation...



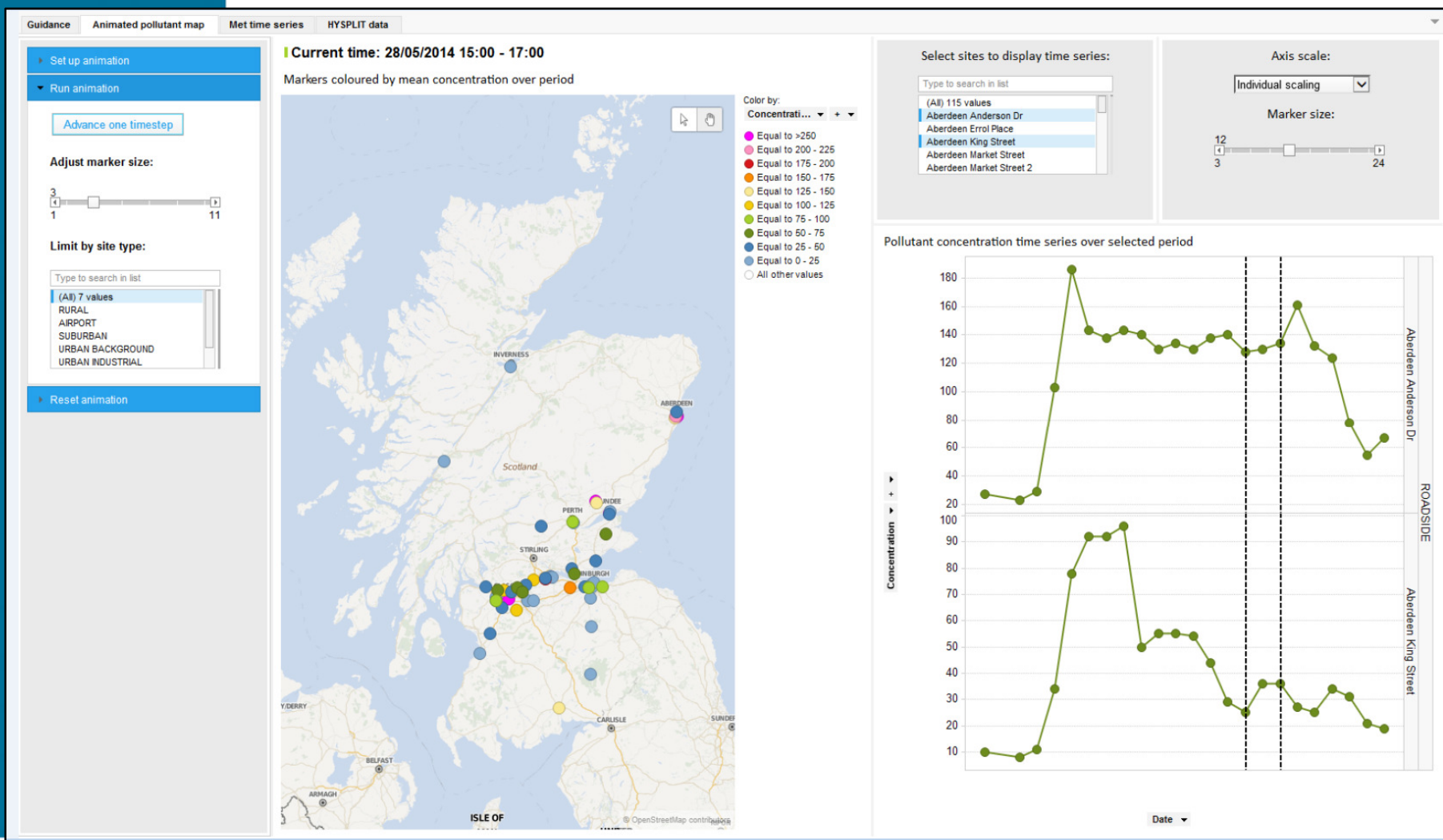
Transboundary Tool

Pollution event animation...



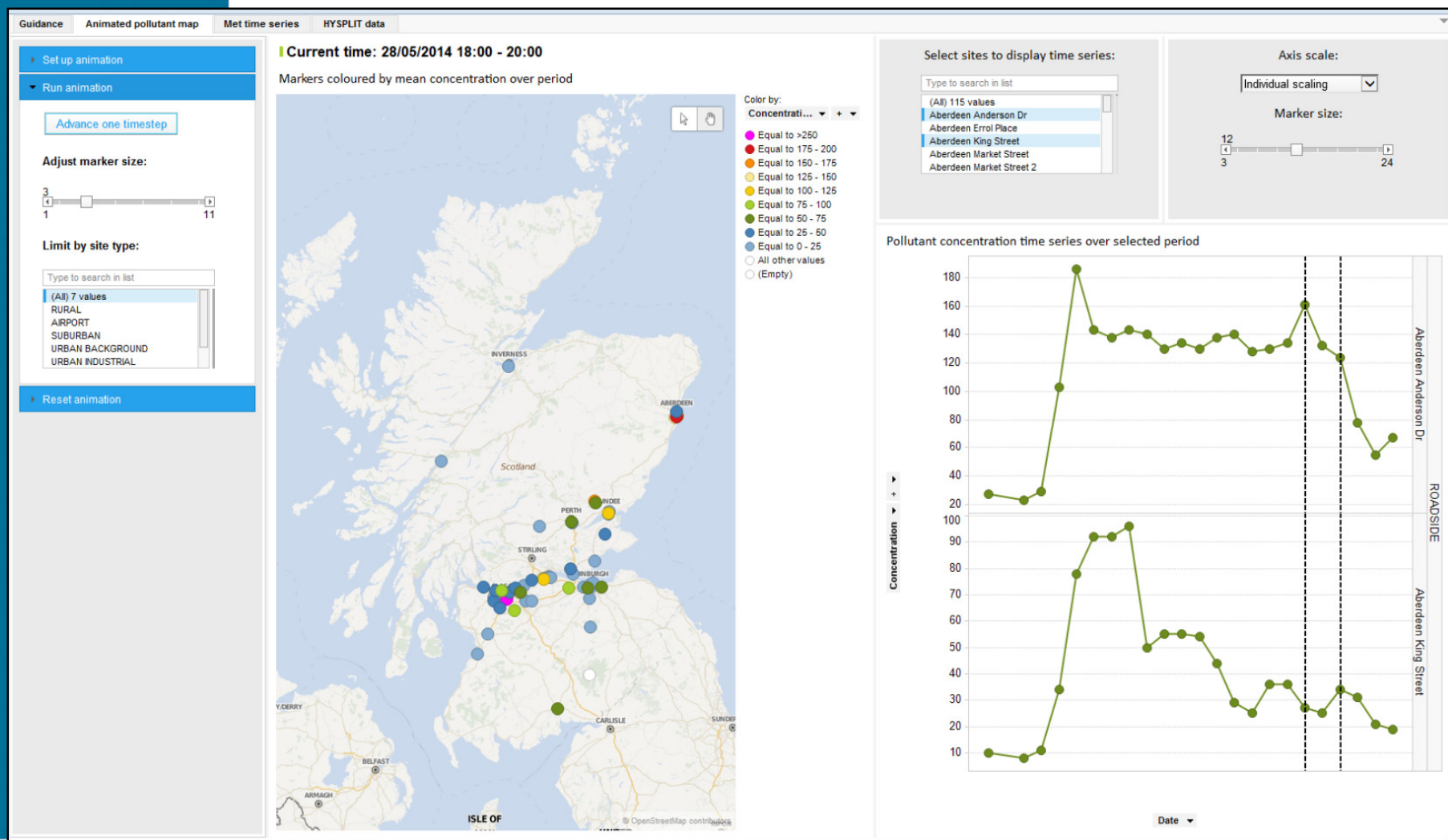
Transboundary Tool

Pollution event animation...



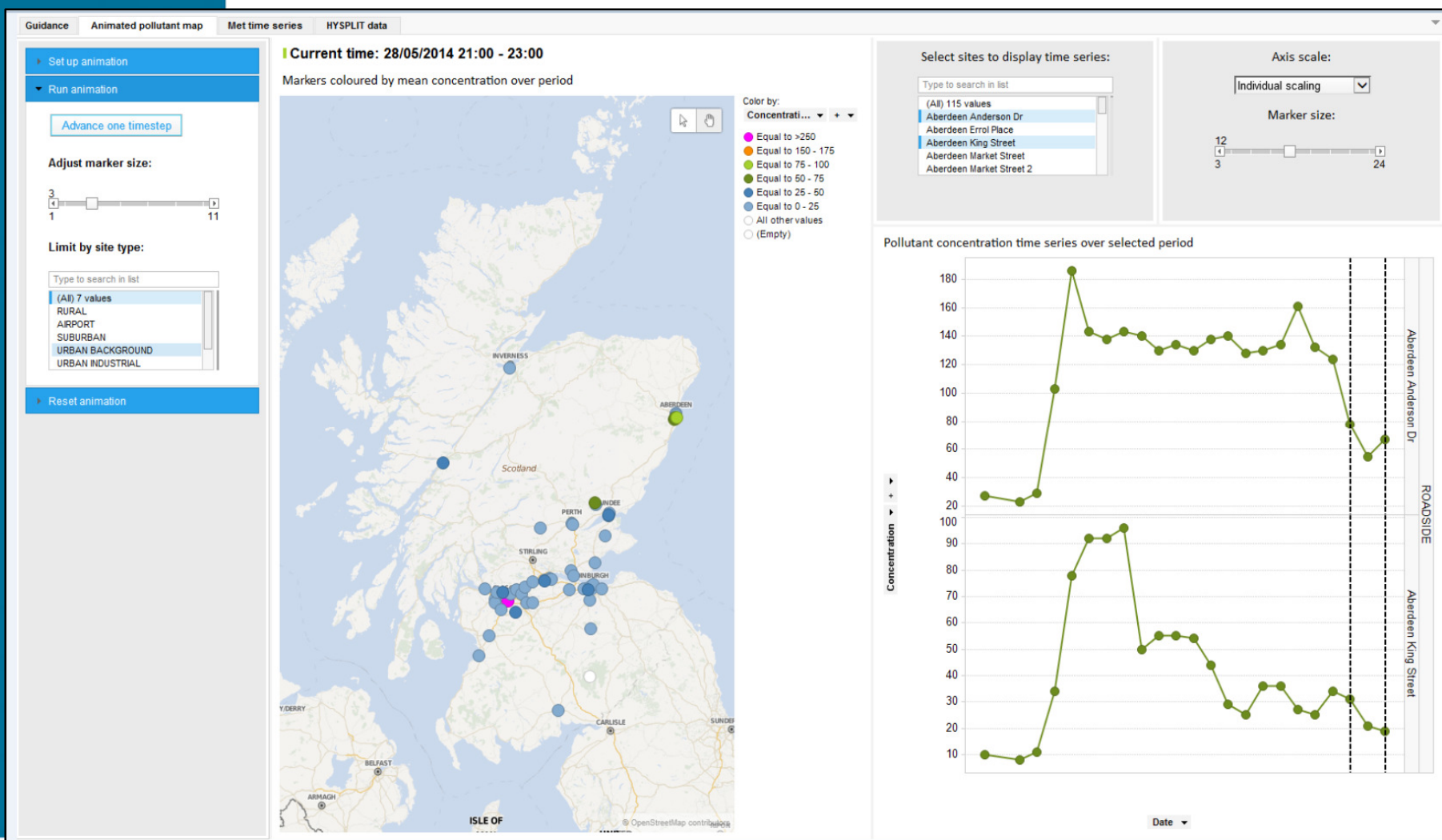
Transboundary Tool

Pollution event animation...



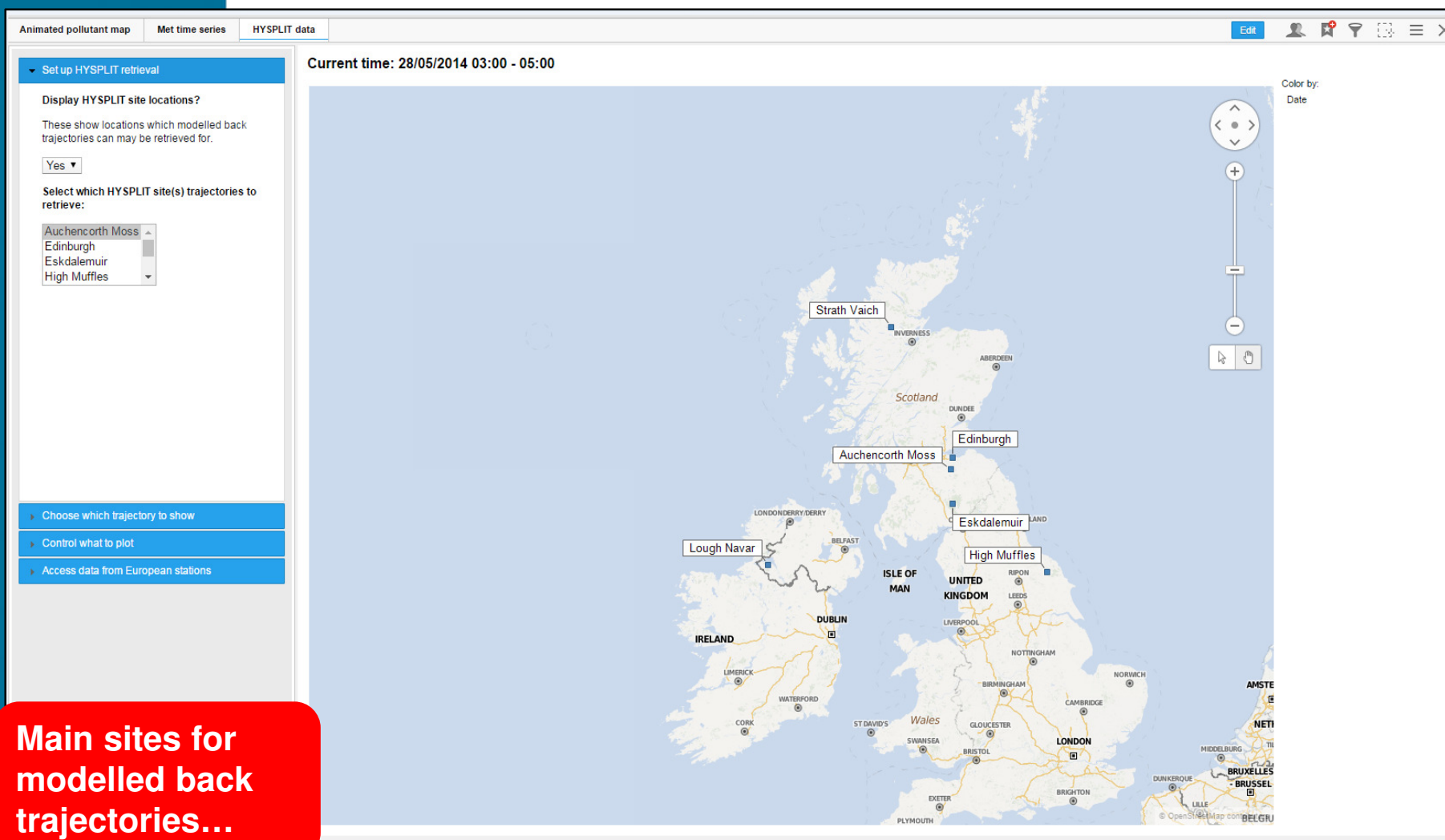
Transboundary Tool

Pollution event animation...



Transboundary Tool

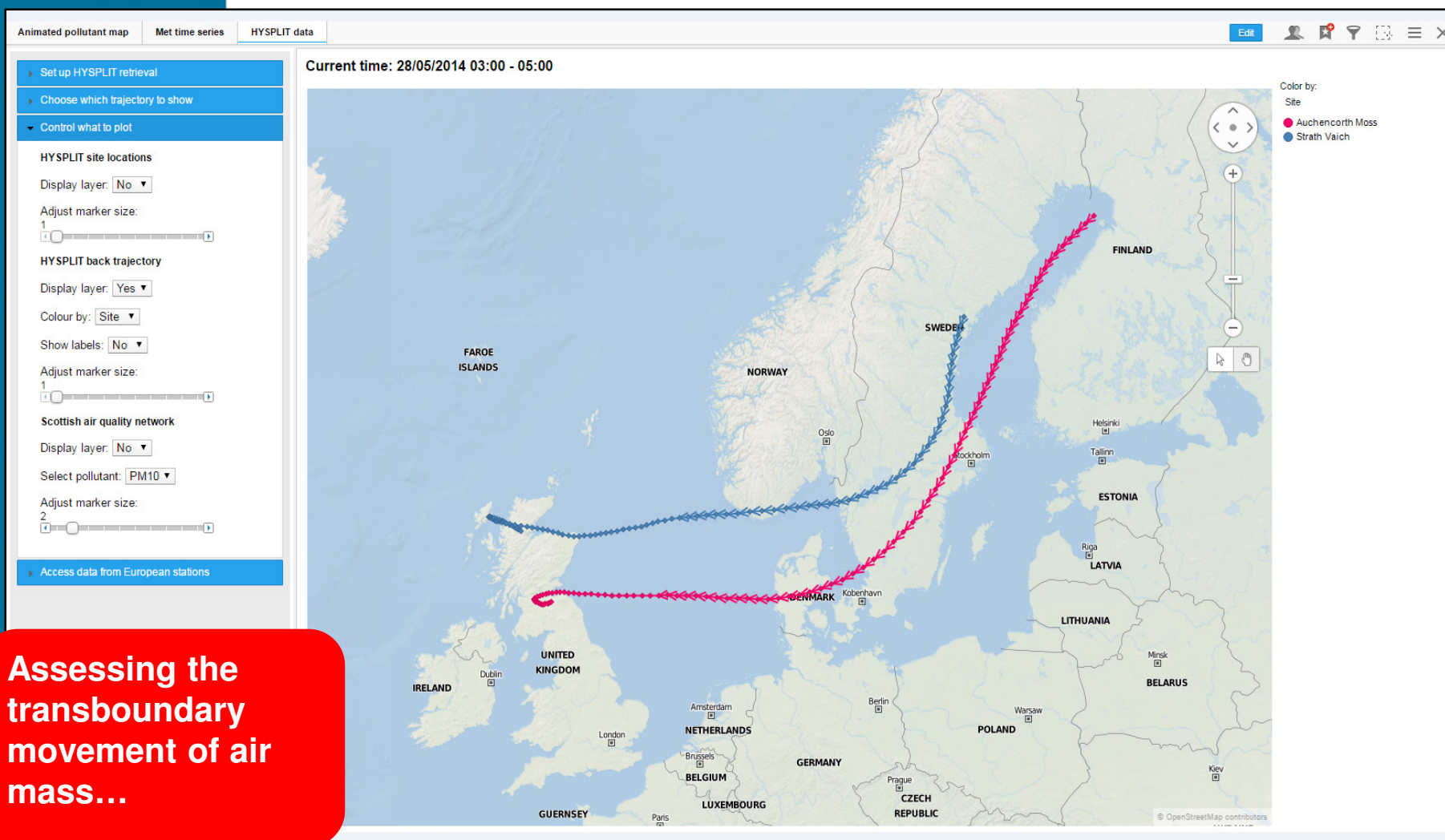
Pollution event animation...



**Main sites for
modelled back
trajectories...**

Transboundary Tool

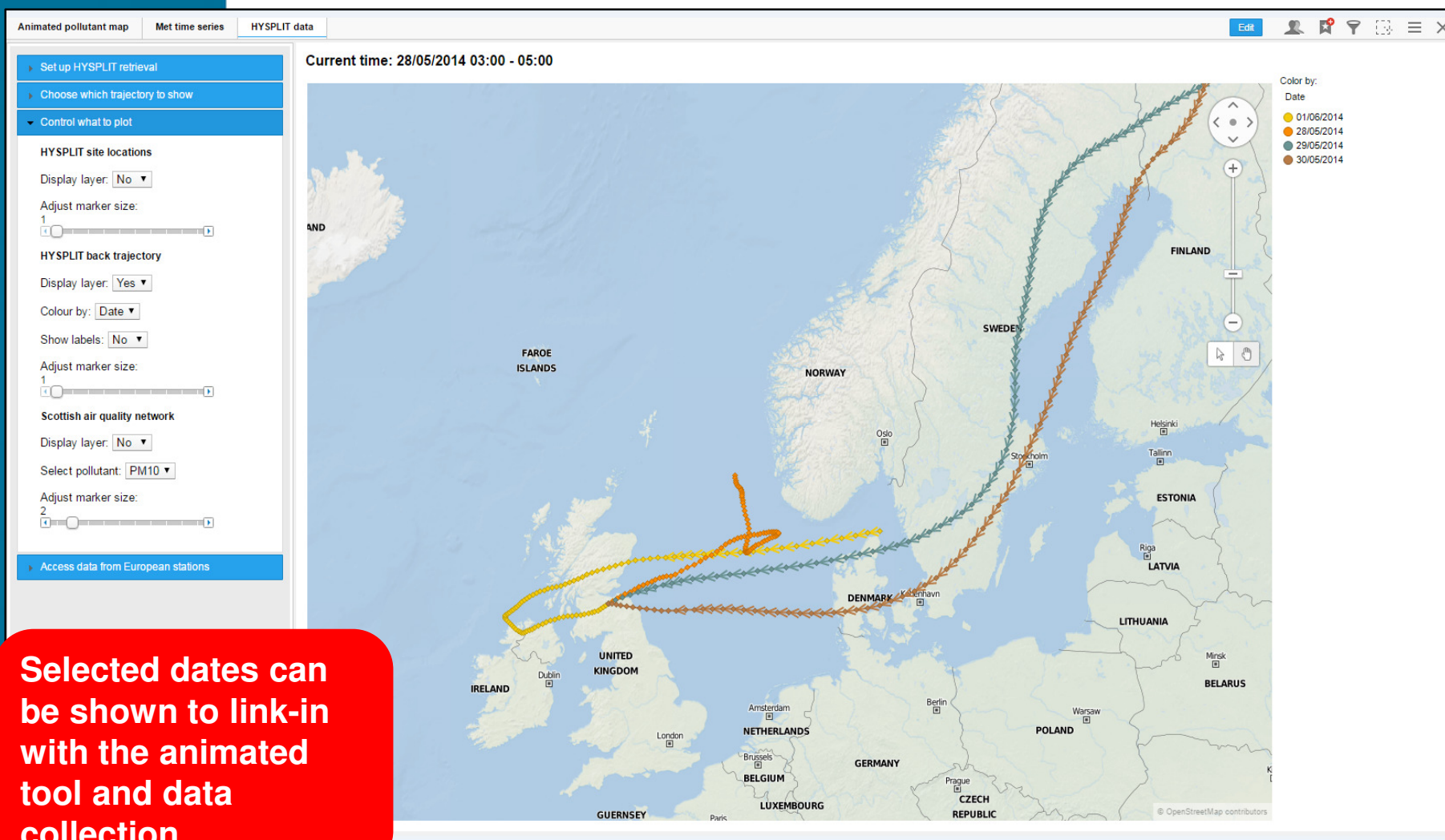
Pollution event animation...




**Assessing the
transboundary
movement of air
mass...**

Transboundary Tool

Pollution event animation...



Selected dates can be shown to link-in with the animated tool and data collection



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Analysis Tools

LAQM

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Transport Scotland - Air Quality

Scotland's Environment Web

Daily Air Quality Index & Health Advice

European Environment Commission database

Transport Scotland – NTDS

Comeap

Local Authority Modelling Tool

Local Authority	Models	Last updated

Closed site for LAs will hold the model outputs from CAFS NMF and scenario testing tools, to help inform the development of appropriate actions under CAFS as part of the NLEF




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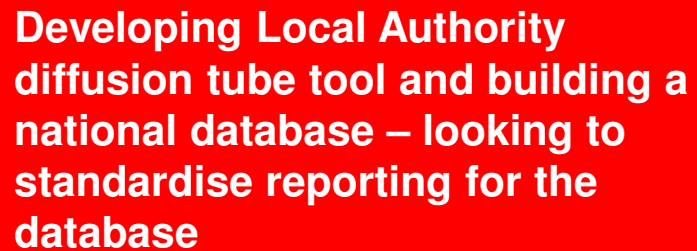
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Modelling tools are out for Peer Review

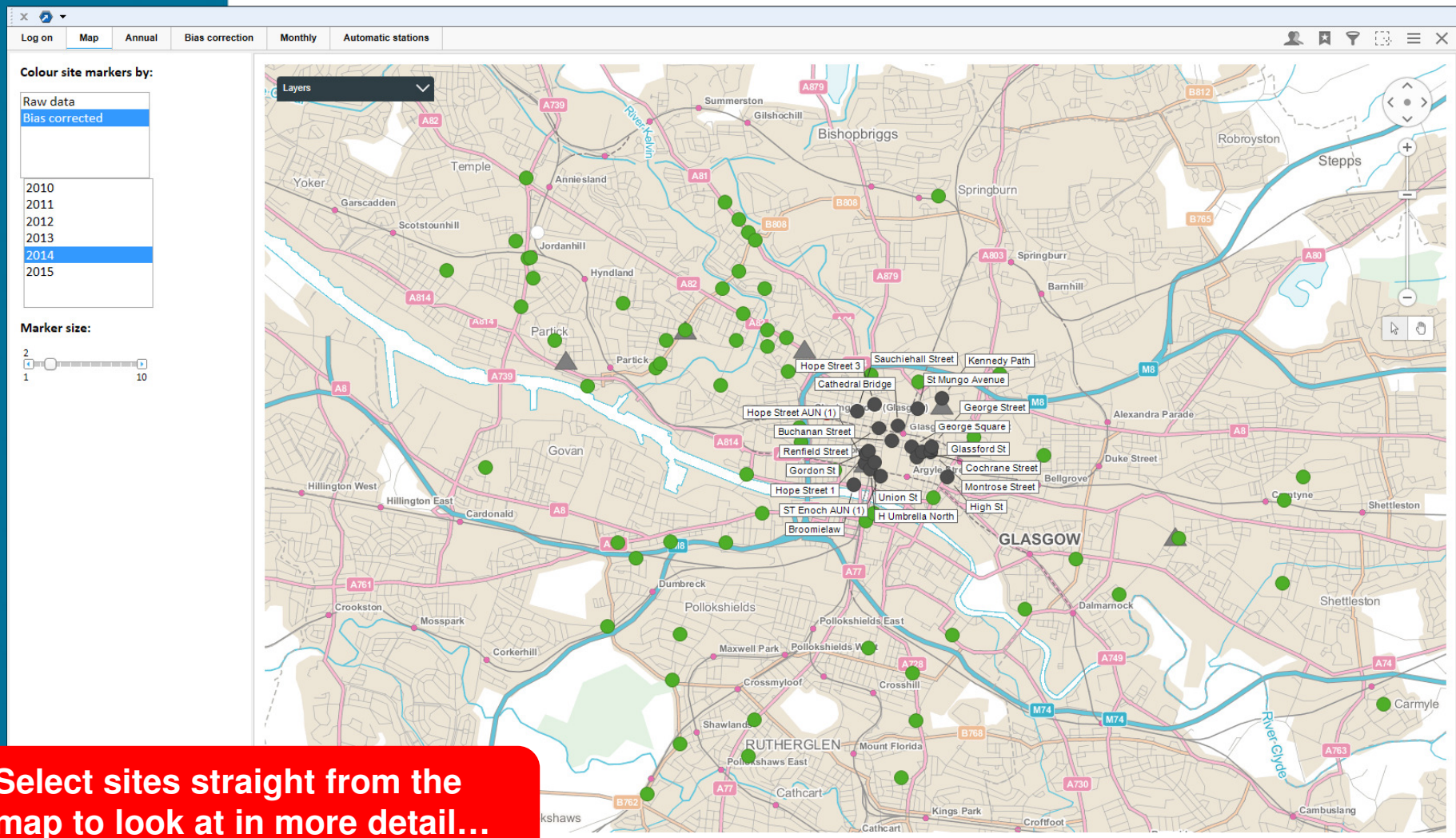
Some things to note...

- Transport Scotland data will not be visualised in the first release of the tools – due to delays in receiving this data but the method to bring in the data should be developed by launch
- The Public Interactive Tool will be released as a ‘taster’ – this is to recognise that more engagement should be undertaken with the ‘general public’ to better provide the information in these tools they are most interested in
- Diffusion Tube Data has been collated but will not be visualised in the first release of the tools – work continues to standardise the format of the data to enable annual upload of this data for use within the tools



Future Tools

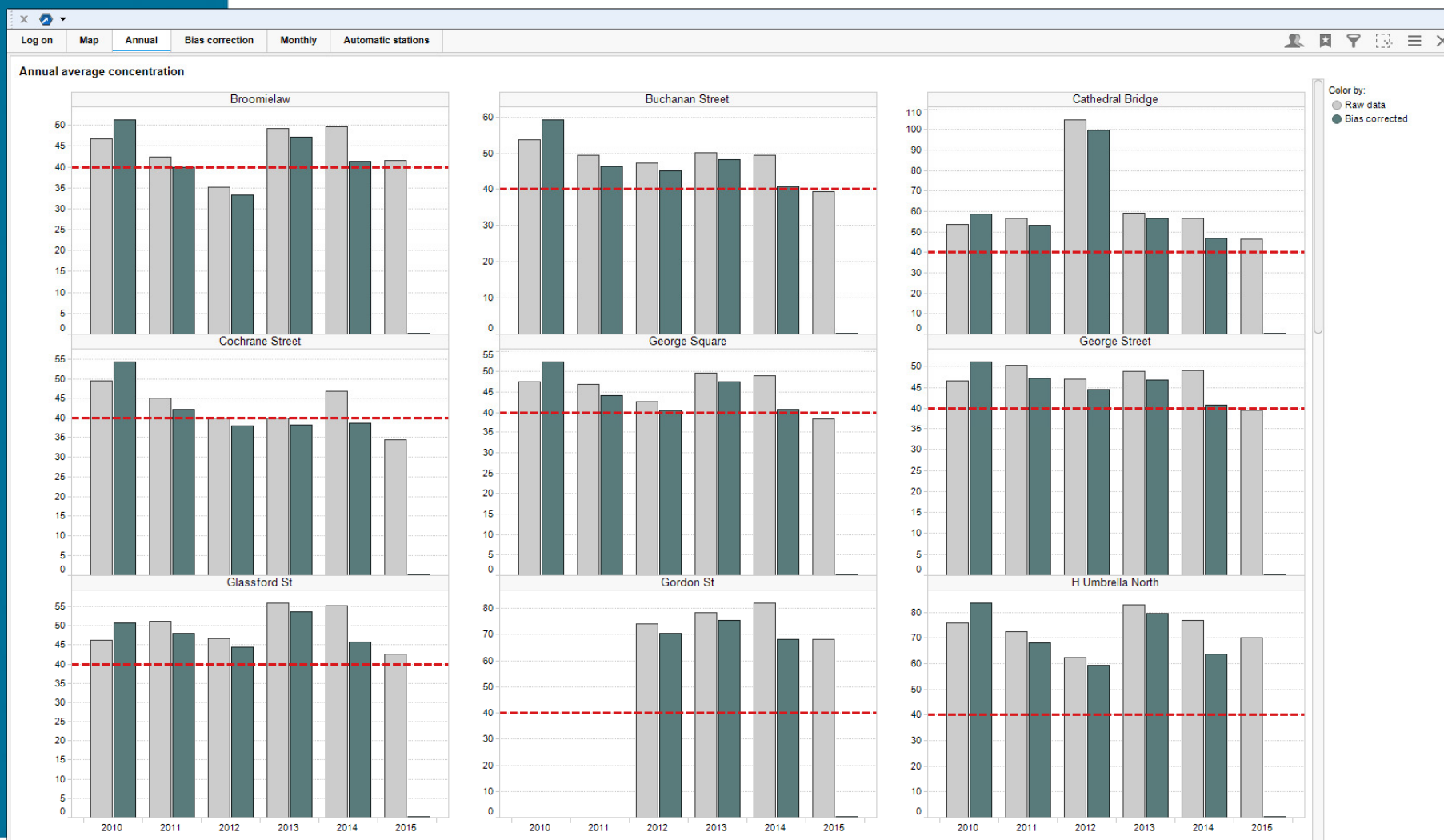
Local Authority diffusion tubes...



Select sites straight from the map to look at in more detail...

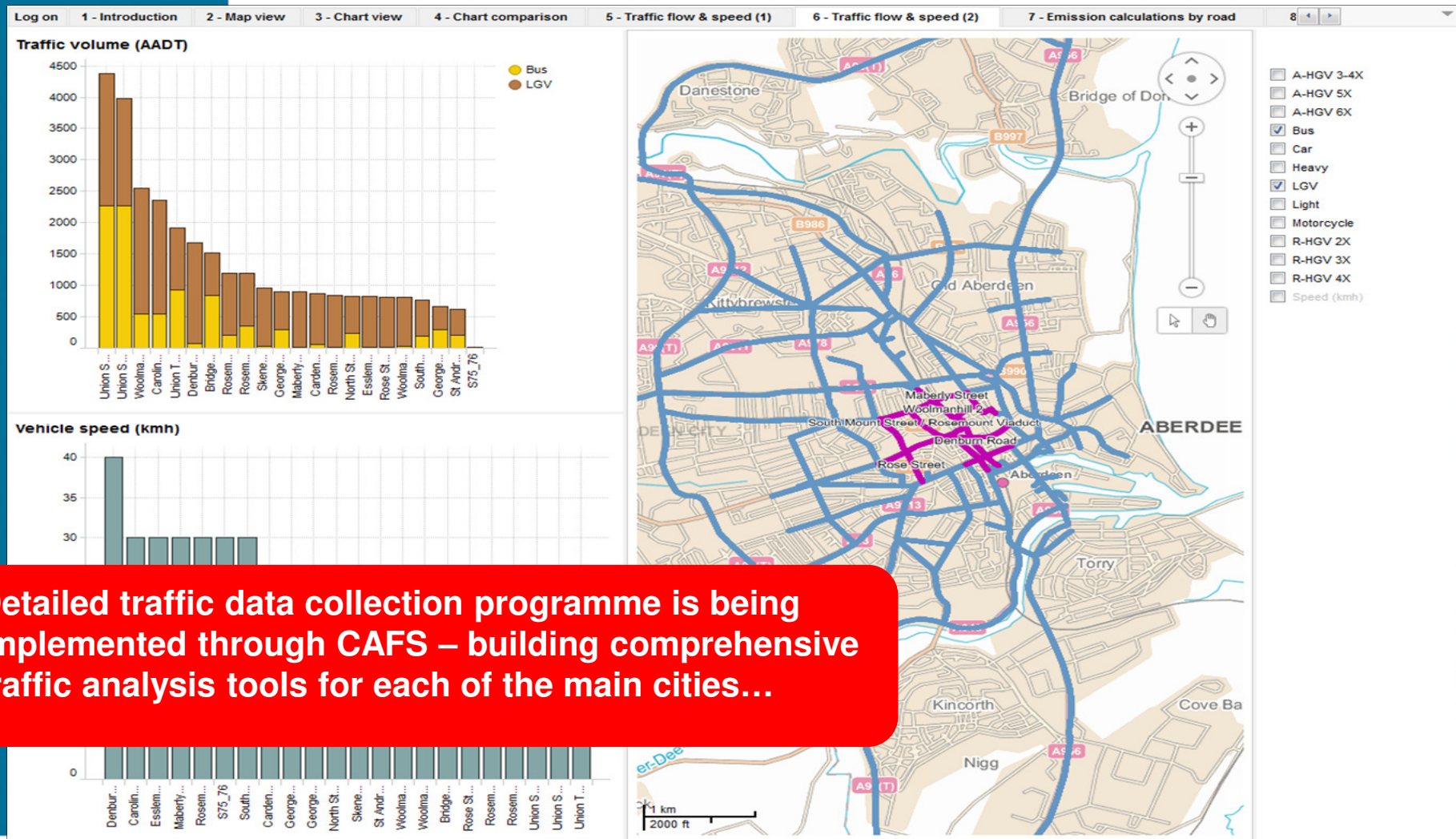
Future Tools

Local Authority diffusion tubes...



Future Tools

National/Local transport data...



Detailed traffic data collection programme is being implemented through CAFS – building comprehensive traffic analysis tools for each of the main cities...

What we still need to do...

- **Data – finalise the development of database**
datasets in database tools are going through test and will be available with 'real' data
- **Tools – finalise the Advanced Analysis Tools and Public Interactive Tool**
Advanced modelling tools have gone out to peer review, other tools are going through testing
- **Web-pages have been developed**
will go live as Beta website until new contract is awarded
- **Plan next phase of development**
after going live we will be reviewing what we have and what we need

Proposed Launch – after May elections

Thanks...