

# Air Quality Data Portal

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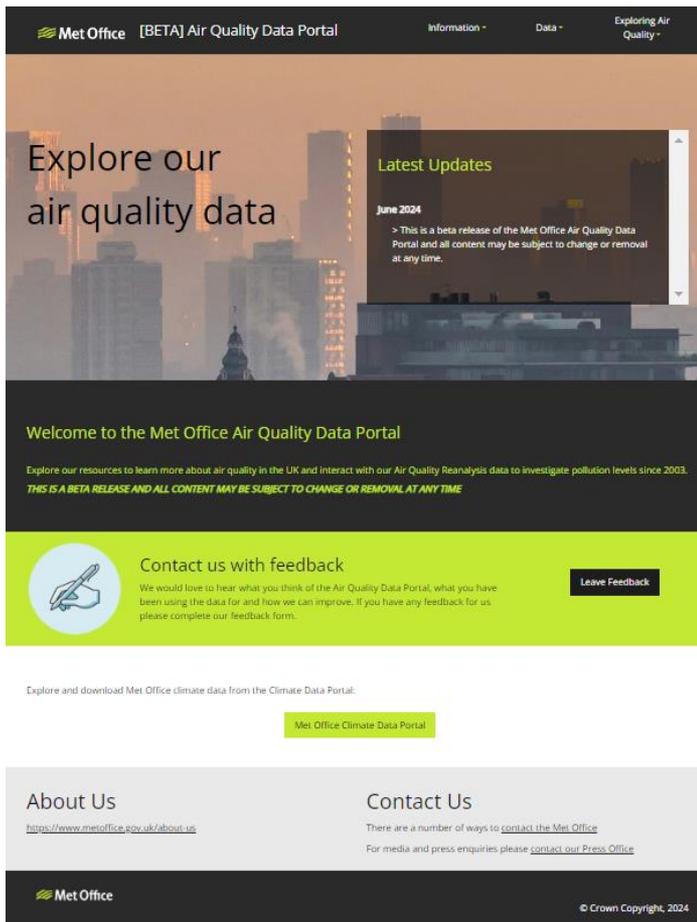


# Air Quality Data Portal

The Met Office **Air Quality Data Portal** provides an easy route to access and interact with the UK Air Quality Reanalysis data.

<https://air-quality-1-themetoffice.hub.arcgis.com/>

The portal has been constructed using Esri software and ArcGIS mapping tools



The screenshot shows the Met Office Air Quality Data Portal website. The header includes the Met Office logo, the text "[BETA] Air Quality Data Portal", and navigation links for "Information", "Data", and "Exploring Air Quality". The main content area features a large heading "Explore our air quality data" and a "Latest Updates" section dated "June 2024" with a notice: "> This is a beta release of the Met Office Air Quality Data Portal and all content may be subject to change or removal at any time." Below this is a "Welcome to the Met Office Air Quality Data Portal" section with a sub-heading "Explore our resources to learn more about air quality in the UK and interact with our Air Quality Reanalysis data to investigate pollution levels since 2003." and a warning: "THIS IS A BETA RELEASE AND ALL CONTENT MAY BE SUBJECT TO CHANGE OR REMOVAL AT ANY TIME". A "Contact us with feedback" section includes a pencil icon, a paragraph: "We would love to hear what you think of the Air Quality Data Portal; what you have been using the data for and how we can improve. If you have any feedback for us please complete our feedback form.", and a "Leave Feedback" button. Below this is a section for "Met Office Climate Data Portal" with the text "Explore and download Met Office climate data from the Climate Data Portal:". The footer contains "About Us" with a link to <https://www.metoffice.gov.uk/about-us>, "Contact Us" with text: "There are a number of ways to contact the Met Office. For media and press enquiries please contact our Press Office.", the Met Office logo, and "© Crown Copyright, 2024".

# Information resources

Built using ESRI Story Maps

There is information about different aspects of air quality, including sources and impacts of different pollutants and the Daily Air Quality Index

## About UK Air Quality



### An Overview Of Air Quality

An introduction to air pollution in the UK

## Useful Resources



### UK Air Quality Forecast

See the latest UK air quality forecast for the upcoming five days



### UK Air Quality Observations

Take a look at current and past observations of air pollutants from the UK's Automatic Urban and Rural Network (AURN)



### UK Air Pollution Emissions

Explore an interactive map of air pollution emissions from the UK National Atmospheric Emissions Inventory (NAEI)

User guide provides detailed guidance on using the website and how to download and use the data

There are also links to other useful air quality resources such as the national forecast and the latest pollutant observations

## User Guide

A step-by-step guide for interacting with data on the Air Quality Data Portal

Met Office  
18 January 2024

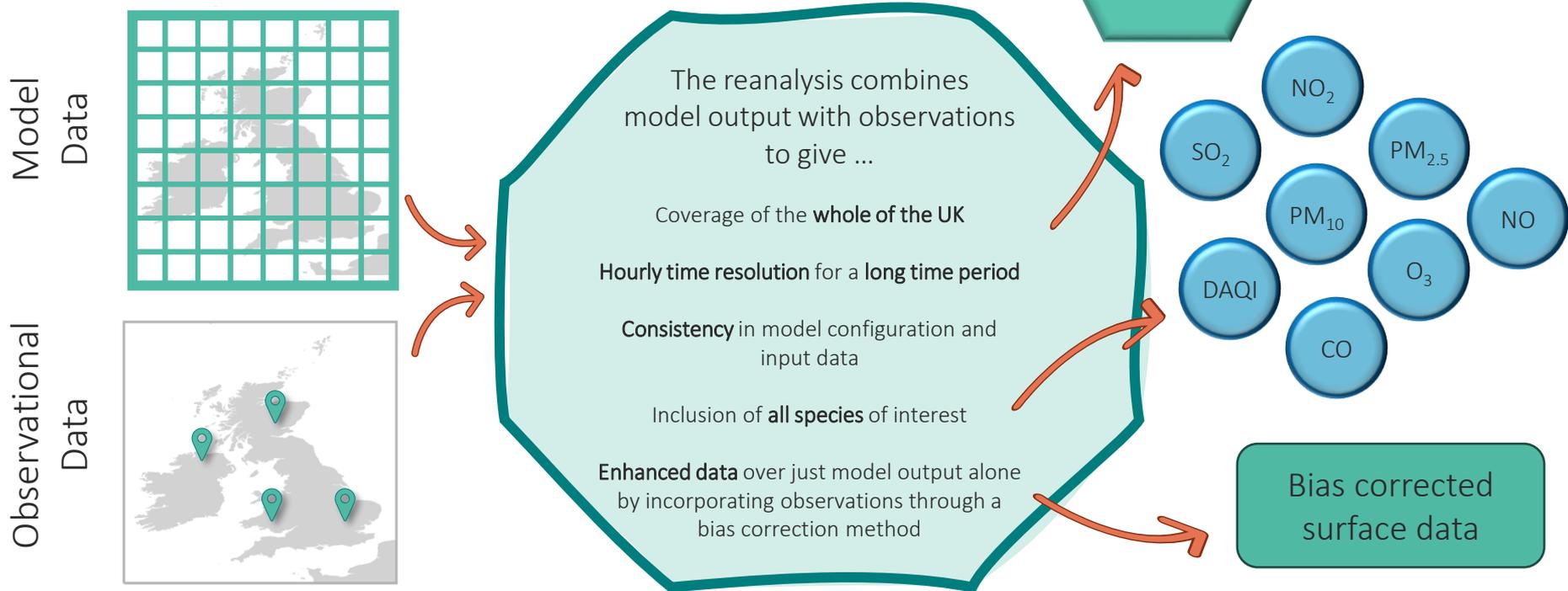
[Search For Data](#) [Visualise Data](#) [Download Data](#)

## Search For Data

The datasets on the Air Quality Data Portal can be found in the [data catalogue](#). The full catalogue can be accessed directly from the main menu, or start your search using the category buttons on the [Explore Our Data](#) page. Use the search bar, tags or update date to filter your search further.



# UK Air Quality Reanalysis



# Reanalysis datasets

## Dataset Information

The Air Quality Data Portal hosts data from the UK Air Quality Reanalysis. This data is used throughout the portal to explore different aspects of UK air quality through a range of [interactive apps](#) and in-depth [applications of the data](#).

### UK Air Quality Reanalysis

The UK Air Quality Reanalysis has been generated as part of the [SPE Clean Air Programme](#). It combines the Met Office's [air quality forecast system](#) with ground based [observations of pollutants](#) to produce a dataset that covers the whole of the UK over a long time period, with consistency in the configuration and inclusion of all key pollutants.



UK Air Quality Reanalysis

The dataset contains information about the concentrations of [air pollutants](#), calculated [daily air quality indices](#) and a selection of [meteorological variables](#).

The data covers the UK and Ireland at a horizontal resolution of [0.1 degree](#) (approximately 10 km) and [hourly time resolution](#) for a [17 year period](#) from 1st January 2003 to 31st December 2019.

*If you are interested in using the UK Air Quality Reanalysis dataset we would be grateful if you would fill in this short questionnaire. We would love to hear about which parts of the dataset are of most interest, how the data is being used, and any improvements or additions you would like to see added in future.*

[Reanalysis User Questionnaire](#)

There is detailed information about the air quality reanalysis dataset and a questionnaire to gather user information

Data is aggregated temporally and spatially due to size limitations

Gridded Yearly & Monthly Mean Concentrations



Regional Monthly Mean Concentrations



Regional Monthly Max DAQI



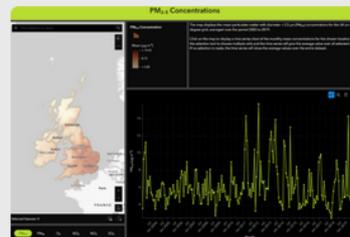
# Visualising the data

The portal hosts a selection of **visualisation tools** to allow users to easily explore the reanalysis data.

These are built using ESRI tools such as dashboards and experiences

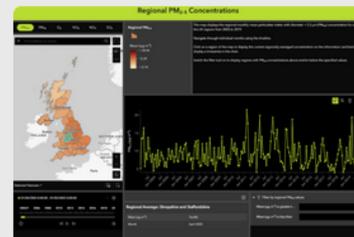
This allows quick development of useful functionality

## Pollutant Concentrations



[Gridded Pollutant Concentrations](#)

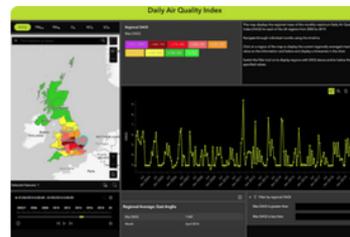
Explore maps and timeseries of pollutant concentrations across the UK on a 0.1 degree grid.



[Regional Pollutant Concentrations](#)

Explore maps and timeseries of pollutant concentrations across UK regions

## Daily Air Quality Index

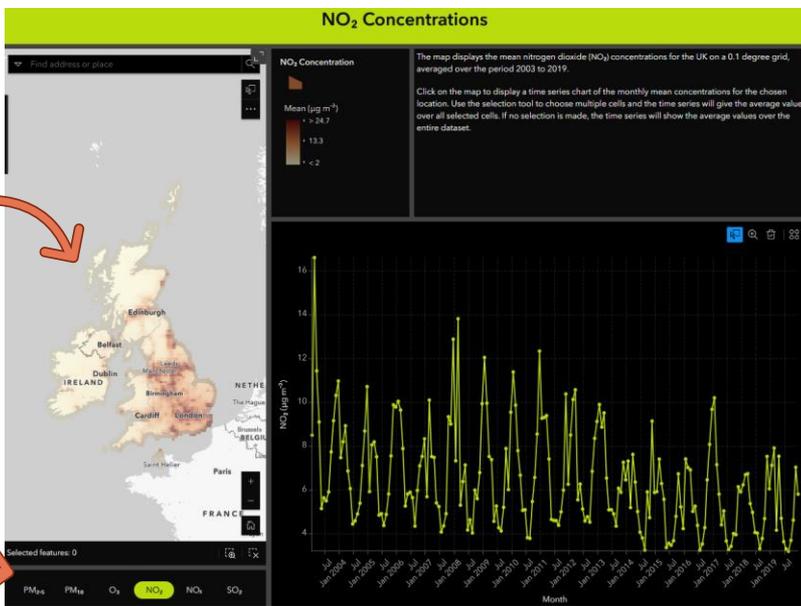


[Regional DAQI](#)

Explore maps and timeseries of the specified daily air quality index across UK regions.

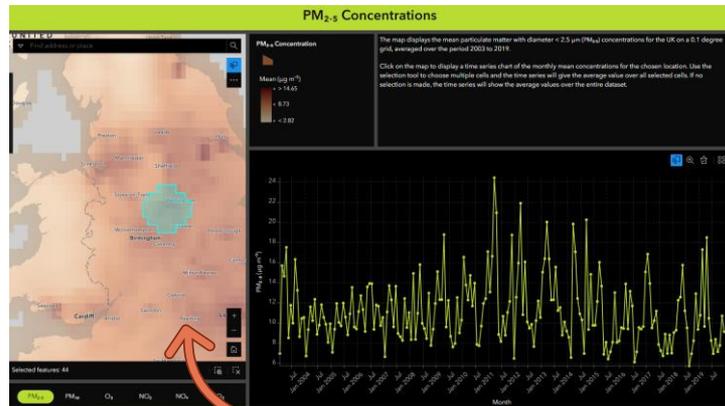
# Visualising the data – gridded concentrations

Explore maps and timeseries of pollutant concentrations across the UK on a 0.1 degree grid.



17 year mean gridded concentrations

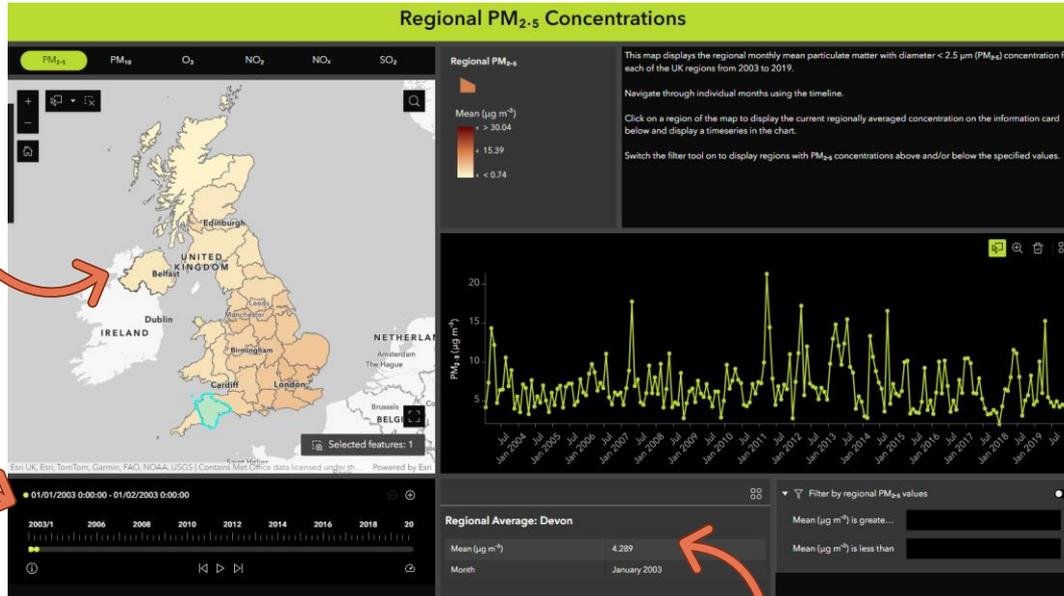
Select species



Individual locations or areas can be selected from the map to generate location-specific timeseries graphs

# Visualising the data – regional concentrations

Explore maps and timeseries of pollutant concentrations across UK regions



Data values for a chosen locations can be easily identified from information cards

# Visualising the data – regional DAQI

Explore maps and timeseries of the specialised daily air quality index across UK regions.



Time sliders can be used to move through the months and years to look at seasonal and interannual changes

Filtering tools are included to allow the user to specify the value range of interest

# Accessing the data

The **datasets** available on the portal can be explored through a data catalogue.

Each dataset is accompanied by metadata which fully describes the contents of the dataset, information about the reanalysis dataset that was used to generate it, licencing information and use guidelines

## Search For Data

Use the buttons below to begin filtering your data search.

**Gases**

**Particulates**

**Daily Air Quality Index**

**Species-Specific Daily Air Quality Index**

**Time Resolution**

**Spatial Resolution**



### Summary

Regional mean of the monthly maximum daily air quality index (DAQI) for 2003 to 2019 for UK regions, from the UK Air Quality Reanalysis dataset.

### Layer Description

This layer contains the regional mean of the monthly maximum daily air quality index (DAQI) for 2003 to 2019 for UK regions, from the UK Air Quality Reanalysis dataset.

This dataset forms part of the Met Office Air Quality Data Portal: <https://air-quality-1.themetoffice.hub.arcgis.com/>

### Temporal Resolution

This is a monthly dataset, covering the period 2003 to 2019.

### Spatial Resolution

This data is aggregated into regions. The regions correspond to the Office for National Statistics (ONS) [International Territorial Level 2 regions for the UK \(January 2021\)](#) (BUC).

Monthly maximum values have been calculated for each grid box. Regional values are then calculated as the weighted mean across all grid boxes included within the region. Weights are based on the proportion of the grid box area within the region.

### The UK Air Quality Reanalysis Dataset

The UK Air Quality Reanalysis has been generated as part of the [SFF Clean Air Programme](#). It combines an air quality forecast model system with observations of pollutants to produce an enhanced representation of past pollutant concentrations across the UK over a long time period. The data covers the UK and Ireland at 0.1 degree horizontal resolution and hourly time resolution for the period 2003 to 2019.

For further details of the dataset see: [UK Air Quality Reanalysis](#)

### Details

#### Dataset

Feature Layer

22 May 2024

Info Updated

9 May 2024

Data Updated

1 April 2024 at 00:00

Published Date

Records: 8,364

View data table

#### Organization

Anyone in your organization can see this content

#### Custom License

[View license details](#)

#### Relevant Area



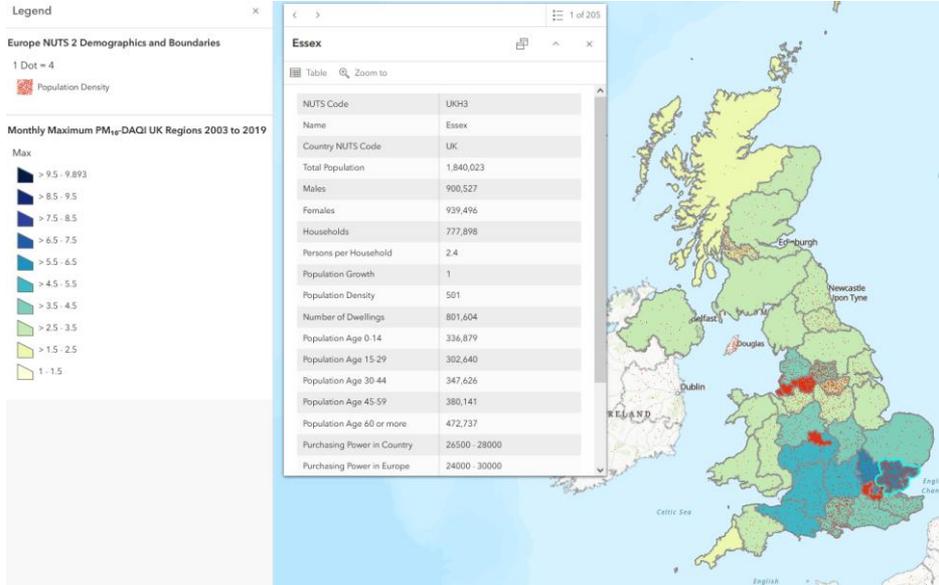
A series of search buttons have been designed to allow for quick data searches and the full catalogue can be browsed and filtered using different tags

# Accessing the data

The data can be added into your own maps or downloaded

Plan to add into Living Atlas soon!

Add additional map layers



Customise legends



Download data in a variety of formats



**Download Options** Hosted Downloads  
Monthly Maximum PM<sub>10</sub>-DAQI UK Regions 2003 to 2019

Records: 8,364  
Toggle Filters:

File Geodatabase <input type="button" value="Download"/>	Feature Collection <input type="button" value="Download"/>
CSV <input type="button" value="Download"/>	Excel <input type="button" value="Download"/>
Shapefile <input type="button" value="Download"/>	GeoJSON <input type="button" value="Download"/>
KML <input type="button" value="Download"/>	GeoPackage <input type="button" value="Download"/>
	SQLite Geodatabase <input type="button" value="Download"/>

# Story Maps

Used to explain different aspects of air quality and specific applications of the reanalysis data in more detail.

They combine text information with images and interactive maps and apps to explore the data and explain a topic.



**An Exceptional Ozone Episode in August 2003**

A large pollution event in Summer 2003



**A Complex Particulate Matter Episode in April 2014**

A spring-time pollution episode with multiple causes



**Urban vs Rural Air Quality**

Understanding the differences in air quality between urban and rural environments.



**Air Pollutant Emissions**

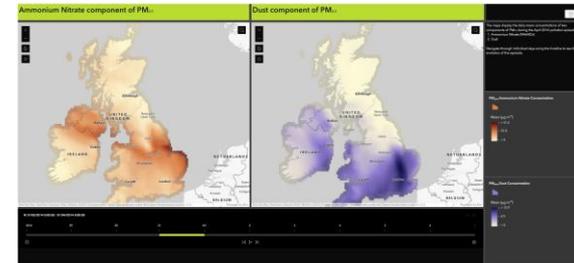
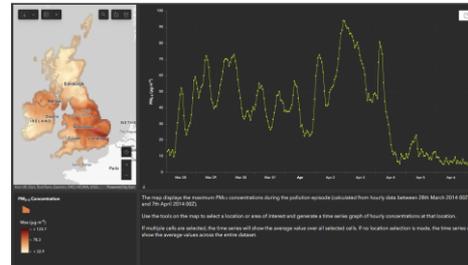
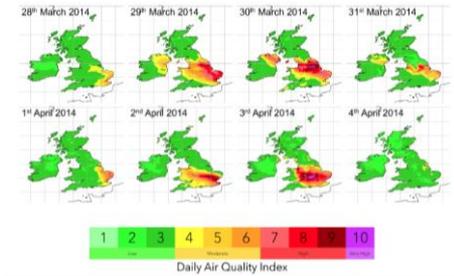
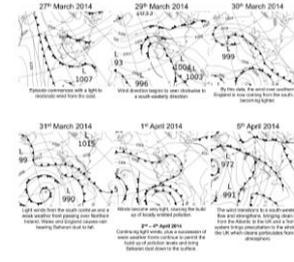
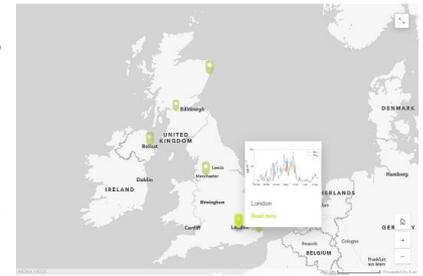
A synopsis of air pollutant emissions in the UK

## Introduction

In spring-time it is common for the UK to experience some episodes of poor air quality. There are several seasonal factors which contribute to this, including the following:

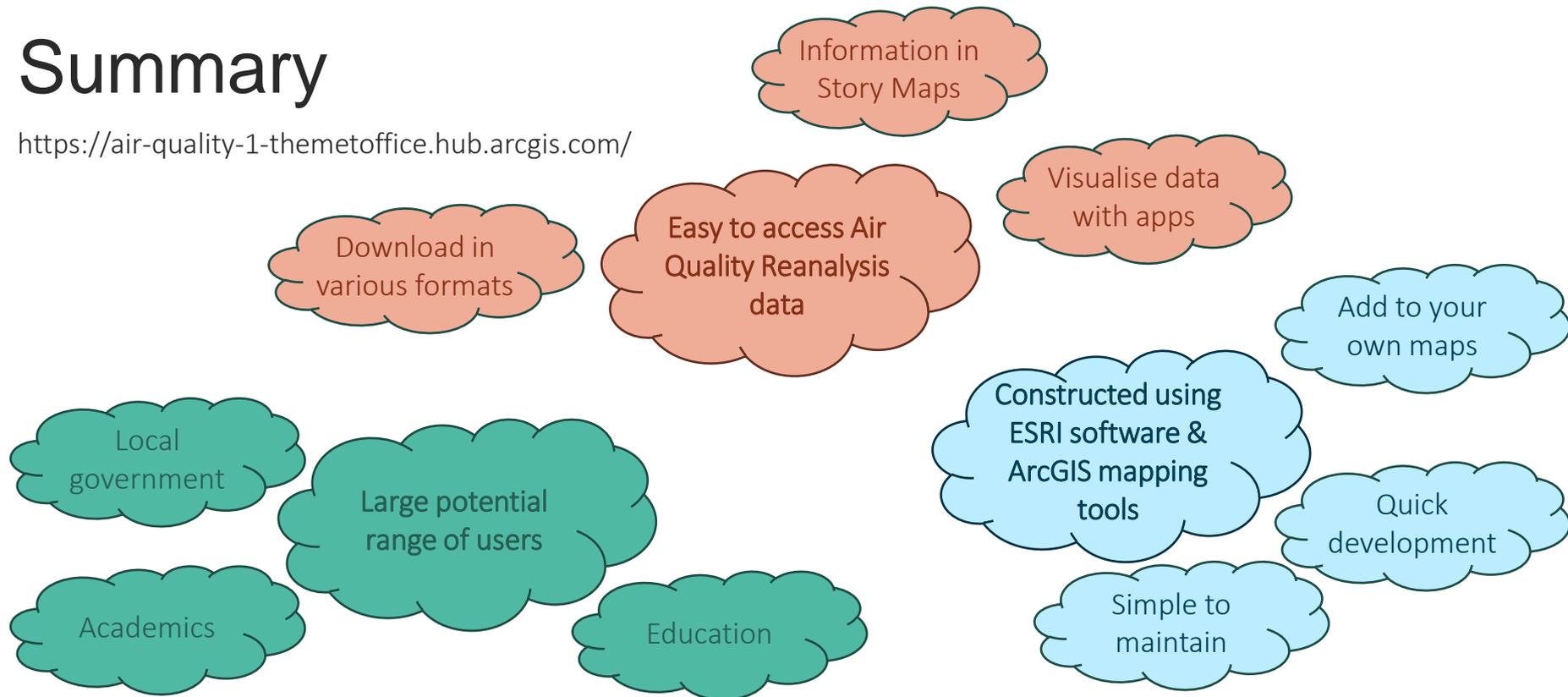
- **Agricultural practices** result in elevated levels of nitrogen- and ammonia- rich fertiliser being emitted to the air. These contribute to **secondary pollution formation**.
- Background levels of ozone in the northern hemisphere reach a maximum during the spring. Under suitable meteorological conditions the **higher background of ozone** can result in widespread elevations of ozone levels which, usually later in the spring, can reach Moderate on the Daily Air Quality Index scale. Furthermore, the elevated ozone levels promote atmospheric chemistry processes which **generate other secondary pollutants**, in particular PM<sub>2.5</sub>.
- Large-scale weather patterns can result in the transport of **Saharan Desert dust** from North Africa to Europe and the UK.

The period from around the 27th March to the 4th April 2014 saw the UK experience a complex air pollution event in which the above factors played a role.



# Summary

<https://air-quality-1-themetoffice.hub.arcgis.com/>

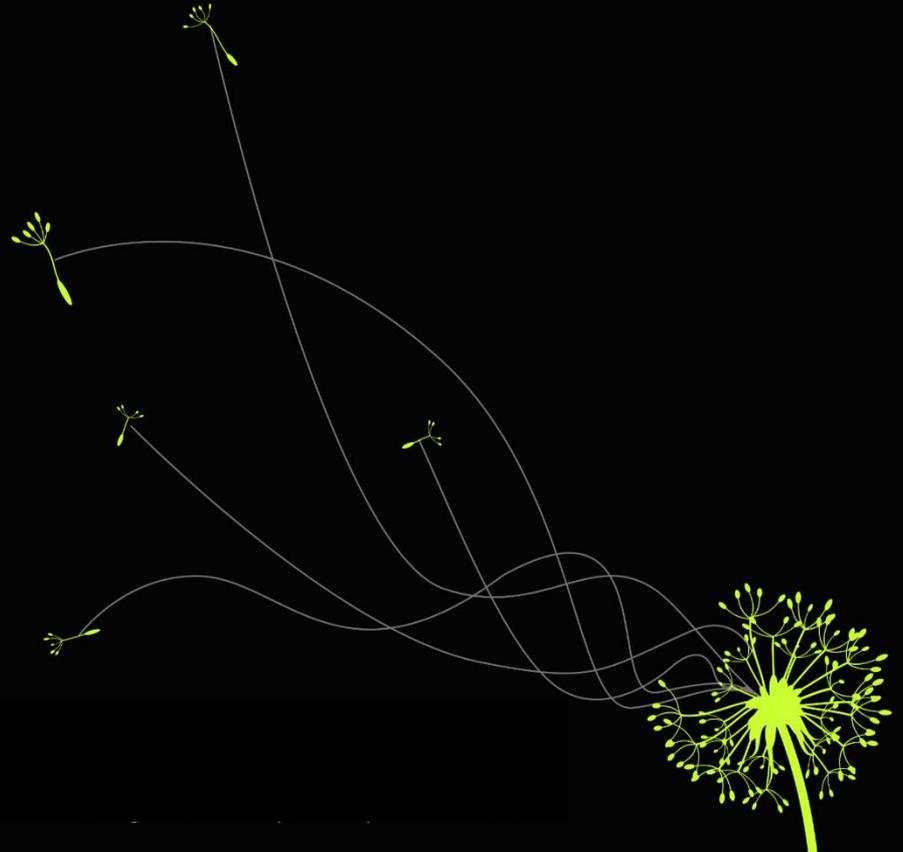


# Questions?



<https://air-quality-1-themetoffice.hub.arcgis.com/>

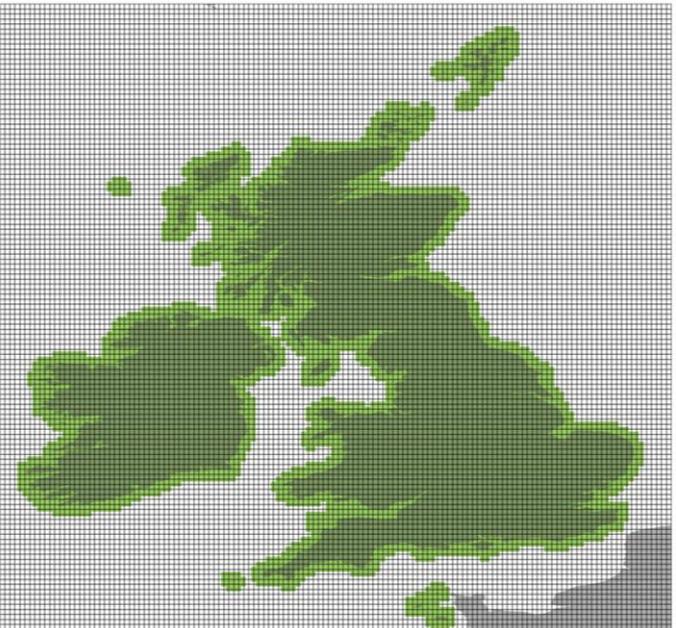
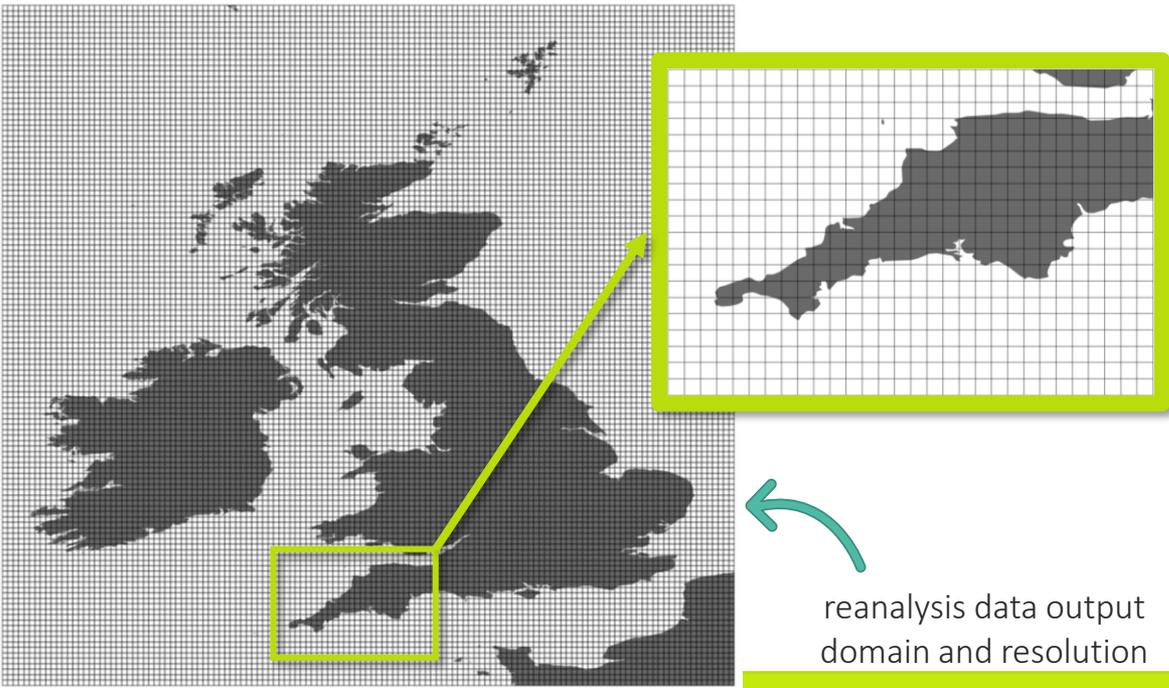
# Supplementary Slides



# UK Air Quality Reanalysis (AQREAN)

The reanalysis data is re-gridded from the native model rotated pole grid to a WGS 84 coordinate system with a horizontal resolution of 0.1 degree.

All data is saved into monthly NetCDF files containing hourly data.



As only land-based observations are used in the bias correction method, the bias corrected data is masked to remove data over the oceans.

The dataset contains the bias-corrected surface level concentrations of key gaseous and particulate pollutants along with calculated daily air quality indices.



**Raw Model Surface Level Data**  
Contains additional gaseous pollutants (ammonia, isoprene, NMVOC), speciated particulate matter and meteorology (including temperature, humidity, precipitation, cloud, wind speed and direction).

**Raw Model Vertical Data**  
Contains  $O_3$ , NO,  $NO_2$ ,  $SO_2$ , CO,  $NH_3$ ,  $PM_{2.5}$ ,  $PM_{10}$ , temperature, pressure, height above sea level.