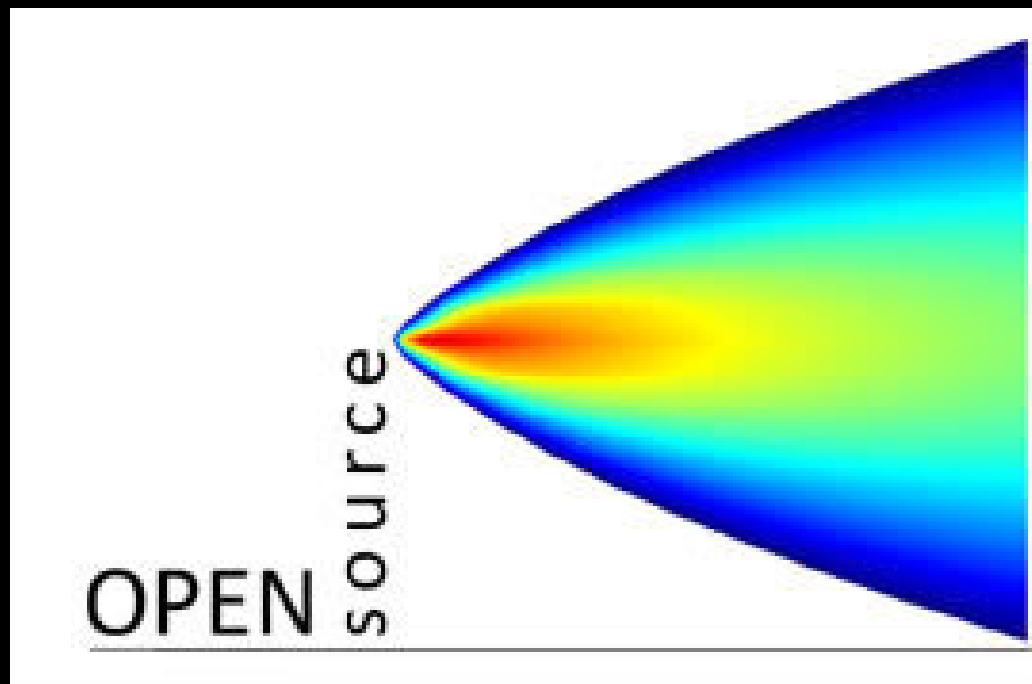# OpenAir Tools for Data Analysis

Paul Willis
SCOTTISH AIR QUALITY DATABASE AND WEBSITE ANNUAL SEMINAR
Stirling
30th March 2011

Outline: OpenAir for Air Quality in Scotland

- Introduction.

- Demonstration of Tools and Outputs.

- Questions.

NATURAL
ENVIRONMENT
RESEARCH COUNCIL

OpenAir for Air Quality in Scotland

- Open Source data analysis tools in R were developed by Dr. David Carslaw and his team at the University of Leeds (and now KCL).

- You can visit the website http://www.openair-project.org/ to find out more.

- A couple of years ago David made many presentations around the UK showing how the tools could be used to produce helpful and informative graphs of air quality data.

- AEA has developed a way of linking the tools directly to National AQ databases, with Scotland being the first made publicly available in this way.

OpenAir for Air Quality in Scotland

• http://www.scottishairquality.co.uk/openair/openair.php

Data Definitions

- http://www.scottishairquality.co.uk/openair/openair_data_definitions.php

Summarise Data

![AEA logo]

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Summarise Data
Smooth Trend
Time Variation
Trend hour weekday plots
Trend decomposition plots
MannKendall
Time Plot
Trend Level Hour

Your Openair Plot

Your 'Summarise Data' Openair output has been generated and is shown below.

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Data Summary at Aberdeen Anderson Dr for the period 2005 to 2011

Smooth Trend

ßAEA

Your Openair Plot

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Trend for Aberdeen Anderson Dr

Smooth Trend - Deseasonalised

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Your Openair Plot

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Time Variation

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Data trends at Aberdeen Anderson Dr for the period 2005 to 2011

Trend Hour Weekday Plots

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Your Openair Plot

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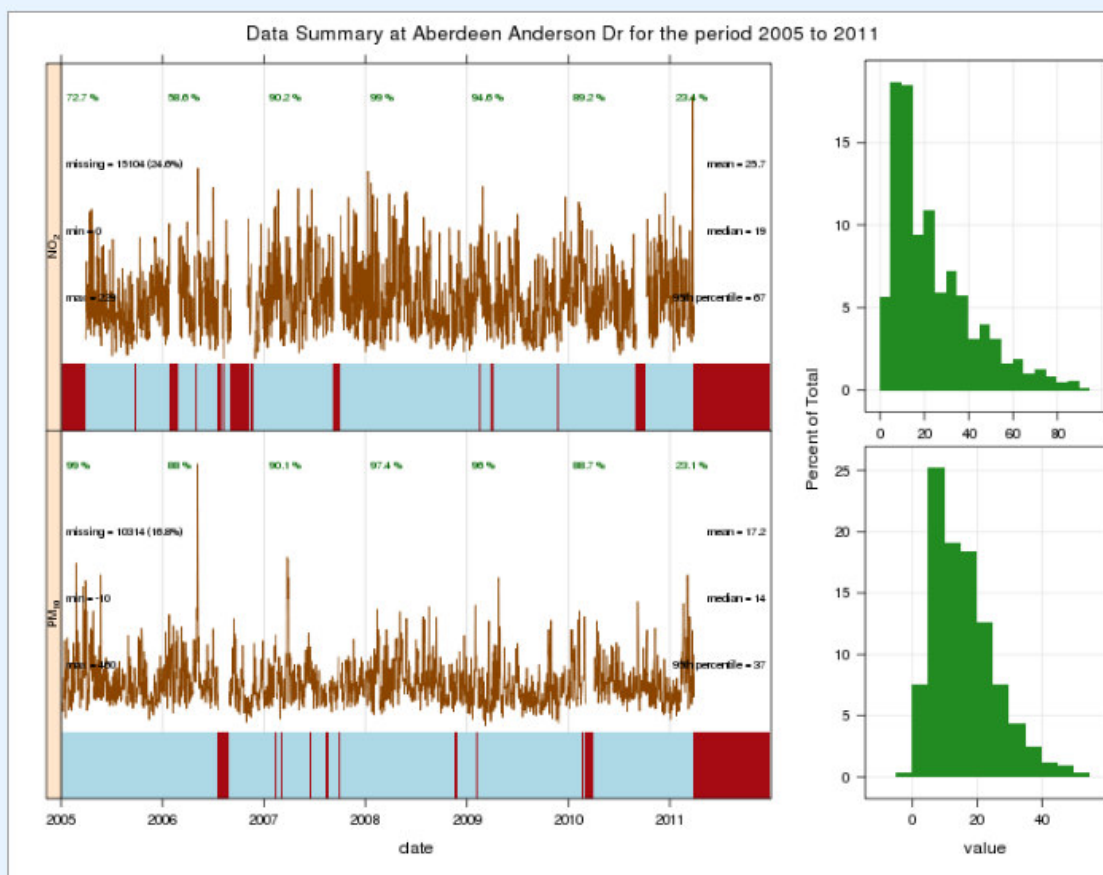
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Hour / Weekday trends at Aberdeen Anderson Dr for the period 2005 to 2011

Trend Decomposition Plots

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Your Openair Plot

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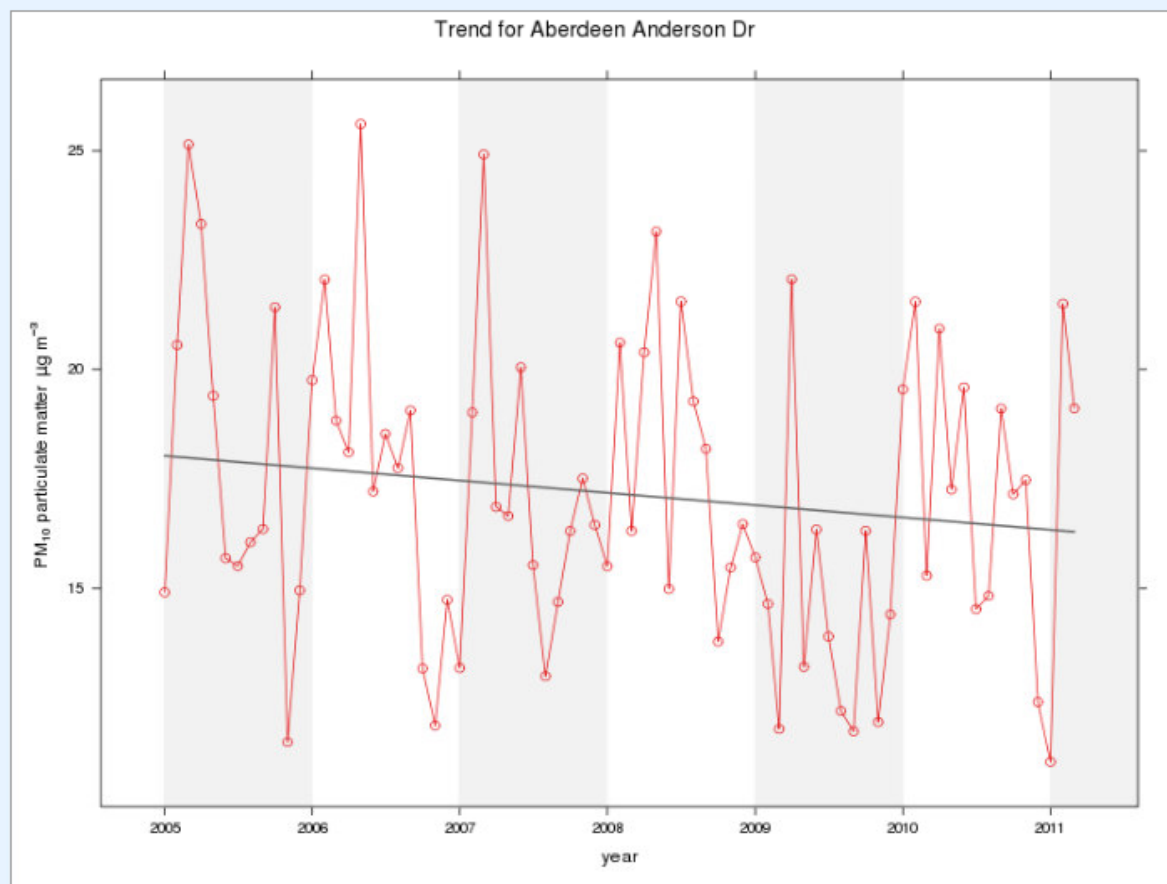
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Trends at Aberdeen Anderson Dr for the period 2005 to 2011

Mann-Kendall Trends Tool

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Your Openair Plot

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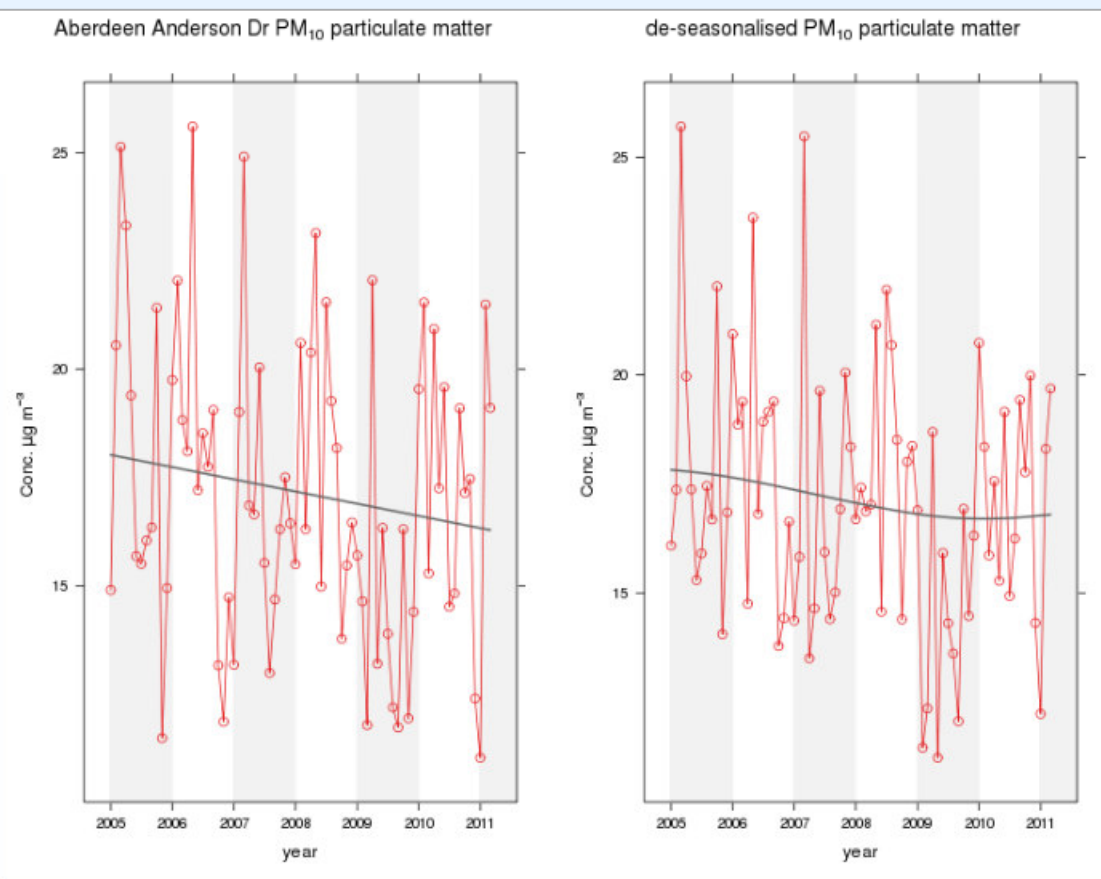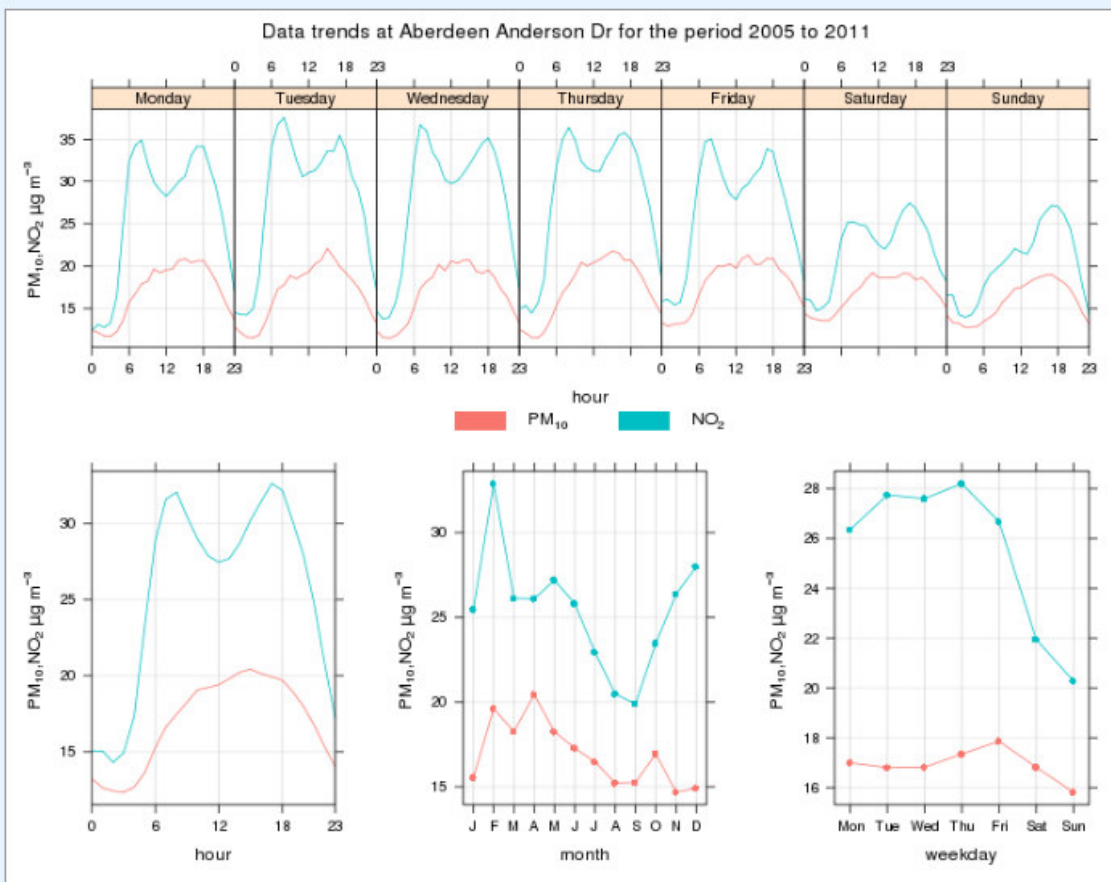
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NO₂ trends for the period 2005 to 2011

Time Plot

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Your Openair Plot

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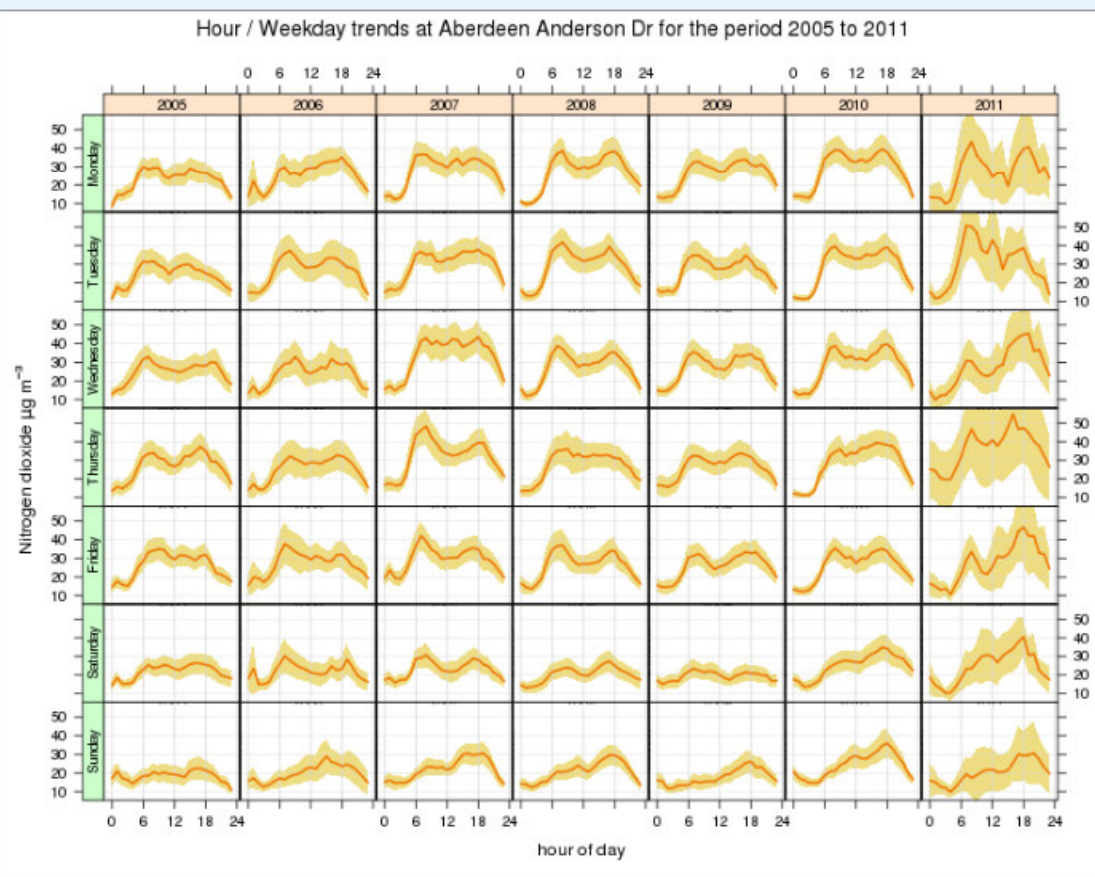
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Trend Level Hour

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Your Openair Plot

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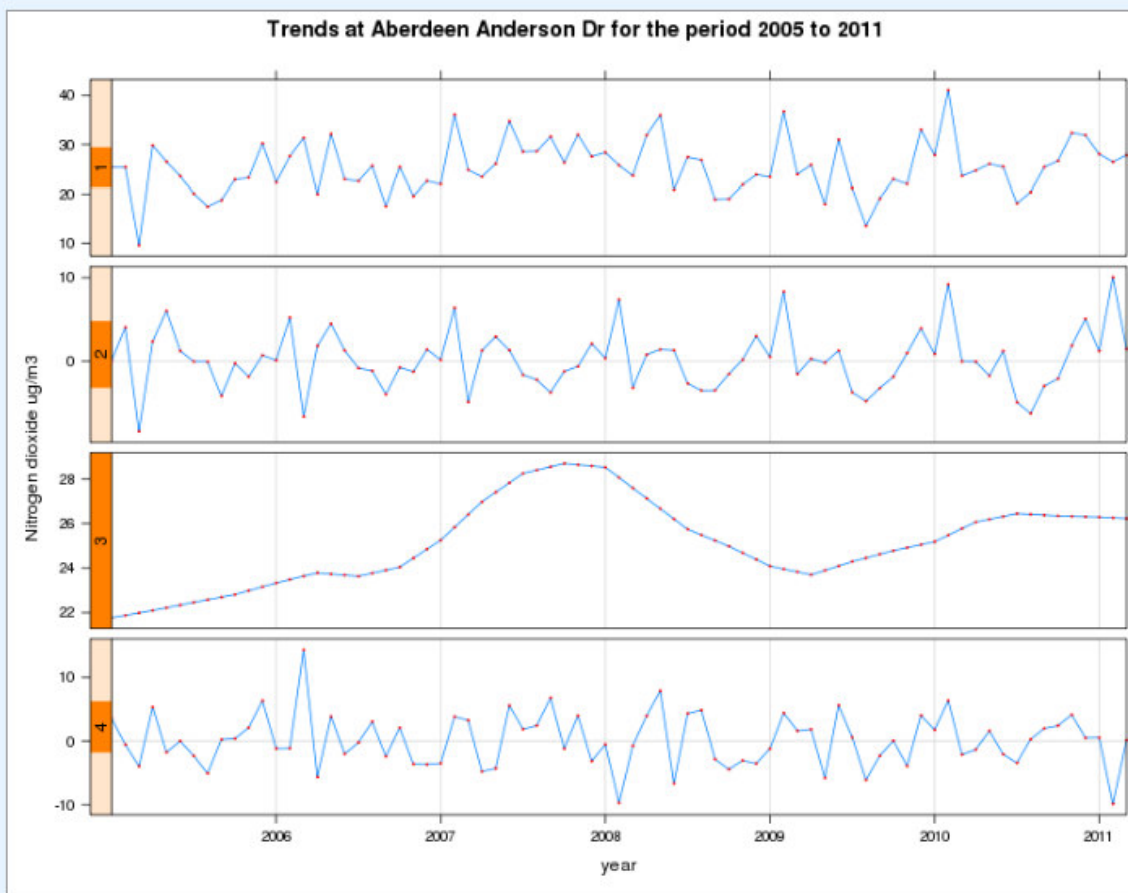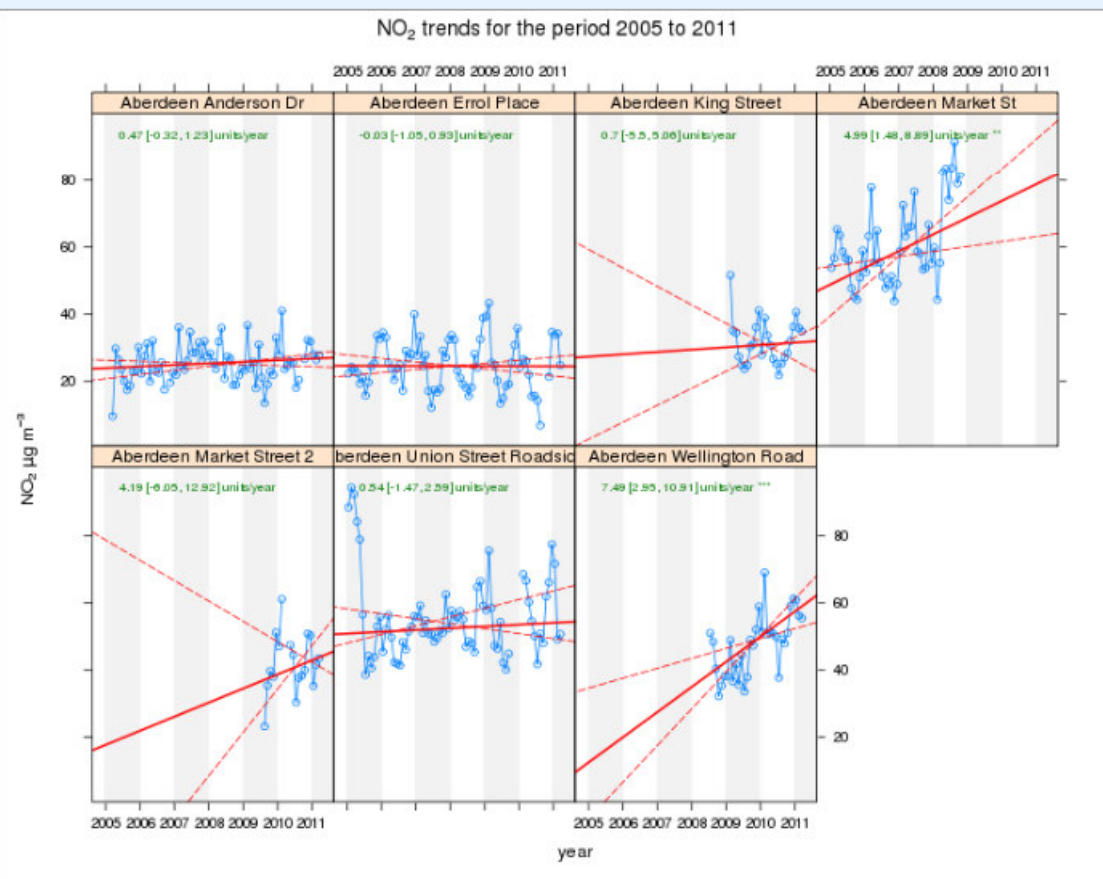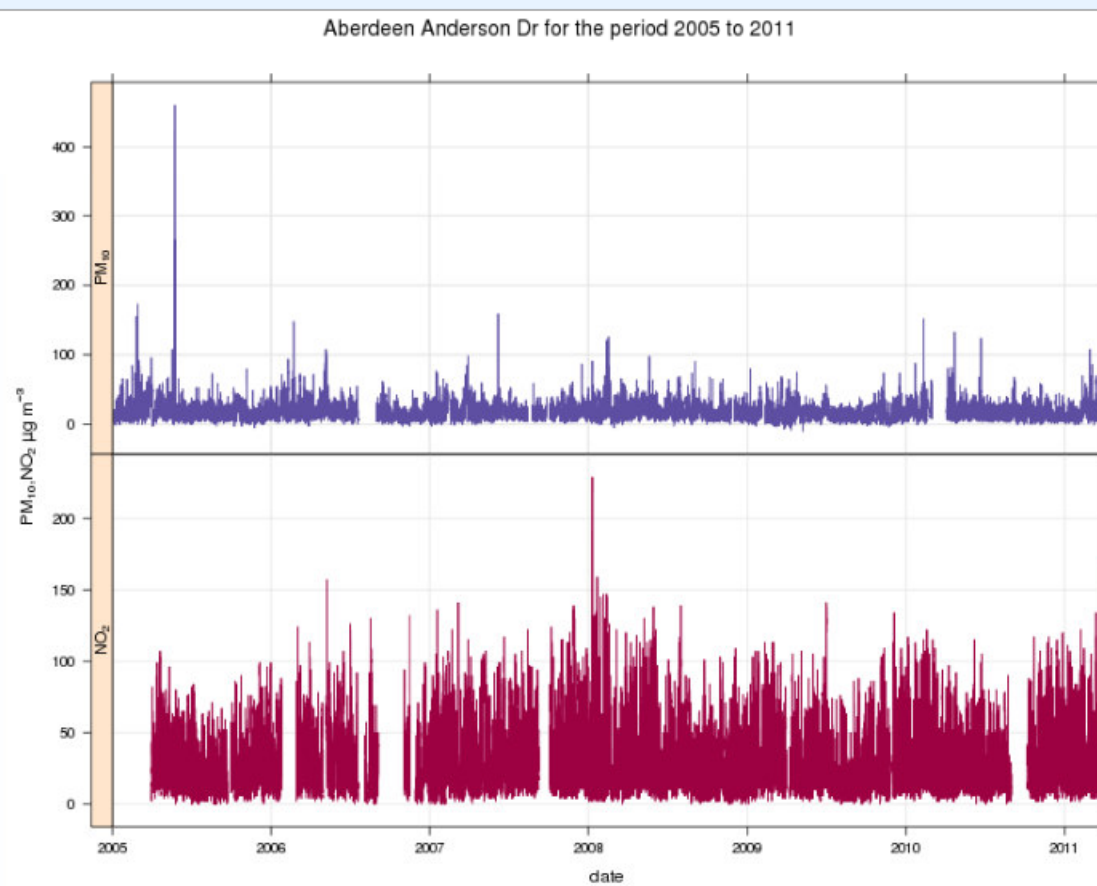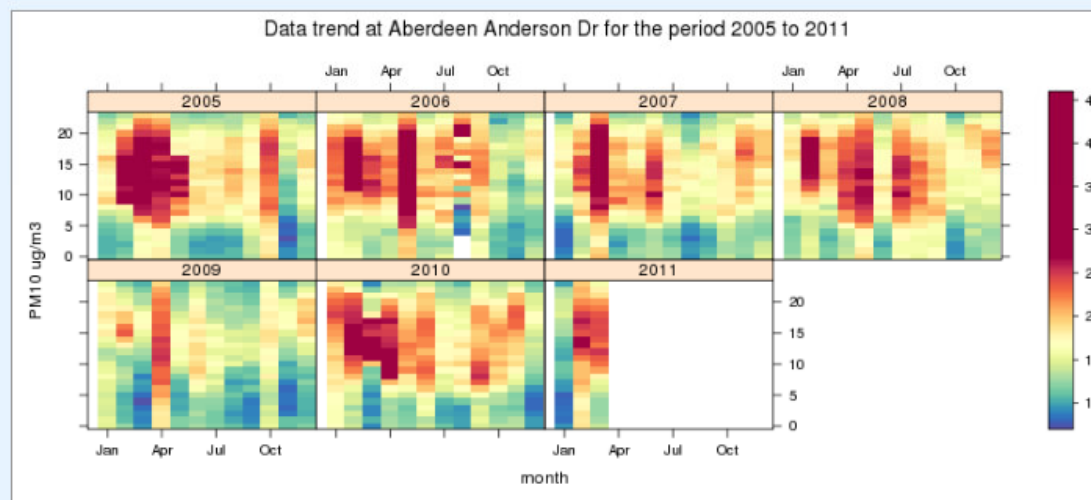
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Data trend at Aberdeen Anderson Dr for the period 2005 to 2011

Description of the Trend Level Hour tool

Trend level hour provides a way of rapidly showing a large amount of data in a condensed format. In a single plot, the variation in the concentration of a pollutant is shown by t
year. The plot therefore provides information on trends, seasonal effects and diurnal variations. Each year is presented sequentially in a separate pane. The hour of the day is
axis whereas time throughout the years is represented in the horizontal axis to show the seasonality. The concentration is represented by the colour scale on the right of the pl

View an example of this output (opens in a new window)

Summary

AEA

- OpenAir Data Analysis Tools are now available to use simply through a few clicks on "Air Quality in Scotland".

- You don't have to worry about data formatting or remembering the correct codes and commands.

- Please try it and see how much more information you can extract from your data!

- Any Questions?