

# Air Quality Forecasting in the UK- *an update*



**Paul Willis**



# Introduction

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The UK Air Quality Forecasting System is operated by Netcen and the Met Office.

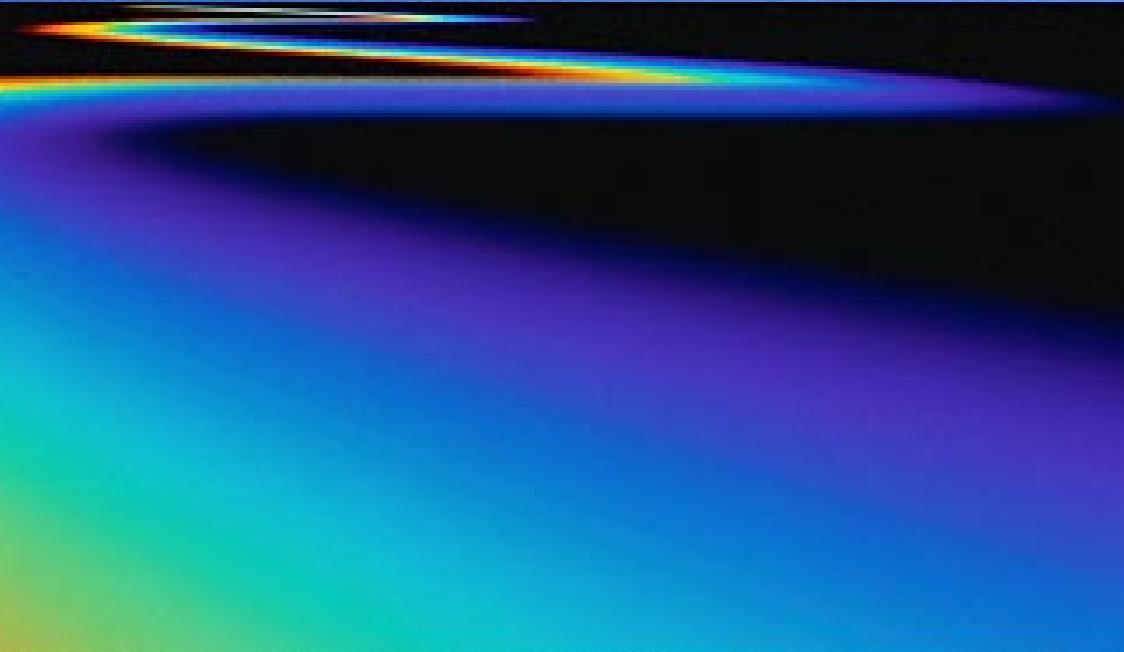
Topics in this presentation :

- Background.
- 2004 Pollution Episodes.
- Success Rates.
- New Developments.

## UK Forecasting- Primary Objectives

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- To inform the UK public about air pollution so that they can take appropriate measures.
- To meet the requirements of European Directives on Air Pollution by ozone, sulphur dioxide and nitrogen dioxide.
- To provide Government with up-to-date scientific information and policy advice.

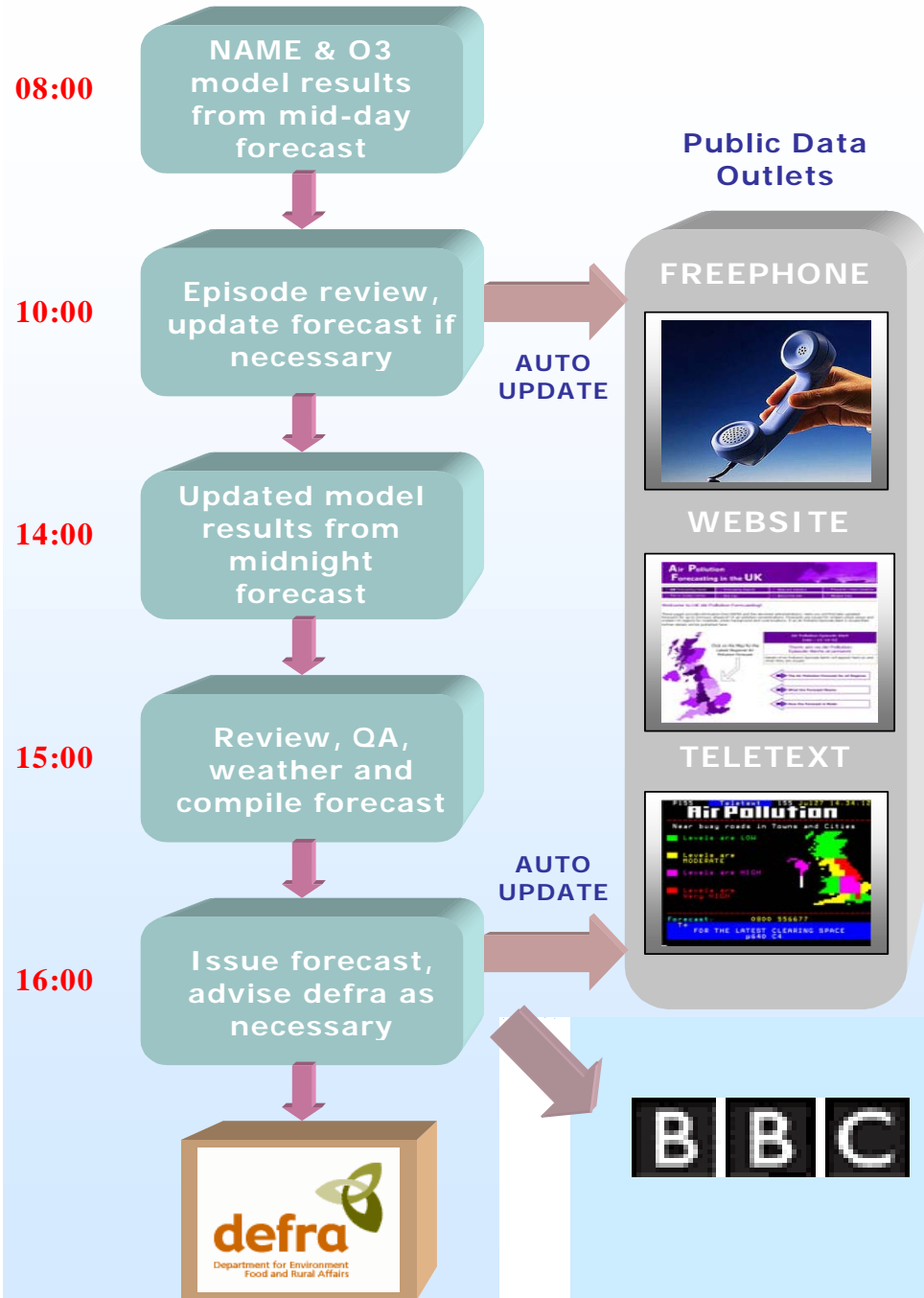


## Project Progress

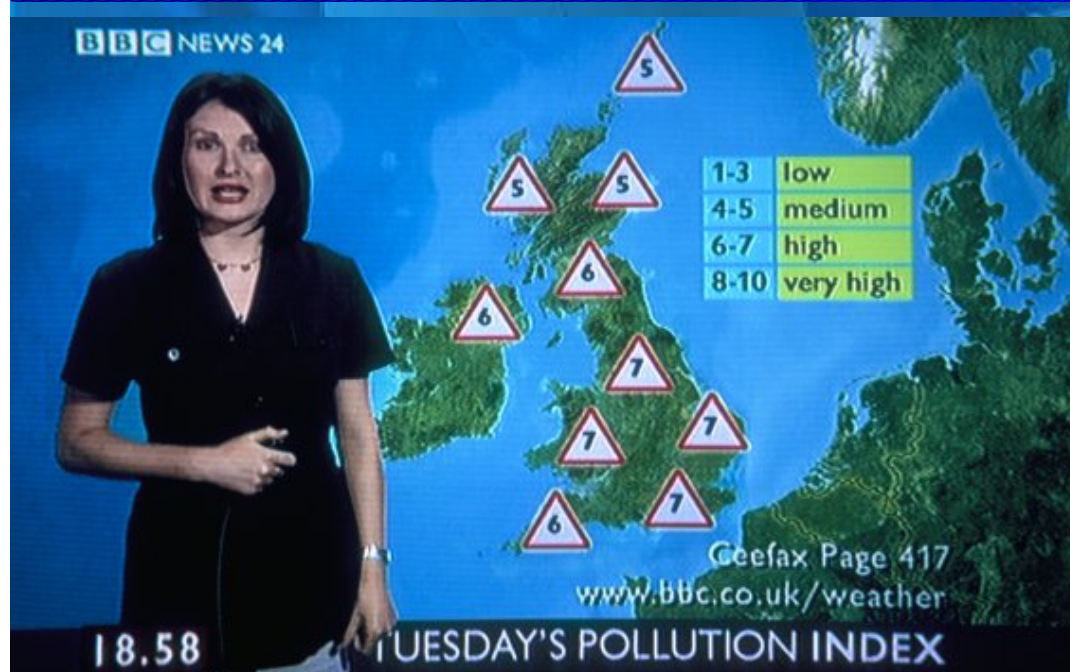
- BBC 5-day forecasts are quality assured to agree with forecasts issued on behalf of Defra and the DAs.
- Routine forecasts continue to be issued twice-daily to Teletext, Free-Phone and the Air Quality Archive.
- Bi-weekly e-mail forecasts now go to a wider circulation of recipients, including AURN stakeholders.



# Daily Forecasting Timetable



# Dissemination of UK Air Quality Forecasts



## Other Media Outlets

- [www.airquality.co.uk](http://www.airquality.co.uk)
- TELETEXT page 156
- Free-Phone  
0800 556677
- BBC and CEEFAX.

## Find out more...

Drop me a note if you would like to subscribe to free daily e-mail bulletins.  
[paul.willis@aeat.co.uk](mailto:paul.willis@aeat.co.uk).

# BBC WEATHER



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## London, United Kingdom

Current Nearest Observations:  
cloudy 7°C  
Easterly Wind (7 mph)  
Relative Humidity (%): 81,  
Pressure (mB): 1026, Falling,  
Visibility: Moderate

[View this forecast in Fahrenheit](#)

5 day forecast

	Summary	Max day	Min night	Wind	Visibility	Pressure	Relative	Sun index	Pollution
		(Celsius)	(Celsius)	(mph)		(mb)	humidity		
<b>Symbol key</b> <a href="#">(Help)</a> ? Please move your mouse over any symbol shown below to view a description of what it represents.									
<b>Thursday</b> Sunrise 7:53 (GMT) Sunset 15:51 (GMT)		7°C	4°C	← 4	poor	1026	83		
<b>Friday</b> Sunrise 7:54 (GMT) Sunset 15:51 (GMT)		5°C	2°C	↗ 3	moderate	1024	87		
<b>Saturday</b> Sunrise 7:55 (GMT) Sunset 15:51 (GMT)	FOG	2°C	1°C	↙ 2	very poor	1029	98		
<b>Sunday</b> Sunrise 7:56 (GMT) Sunset 15:51 (GMT)		5°C	3°C	← 4	very poor	1029	89		
<b>Monday</b> Sunrise 7:57 (GMT) Sunset 15:51 (GMT)		3°C	3°C	↖ 3	poor	1026	89		

Nearest weather observation station:

Latitude: 51.5172,  
Longitude: -0.1274.  
Observed: Thu 9/12/2004 at 0600 (GMT)

Search

for a new 5 day forecast

GO



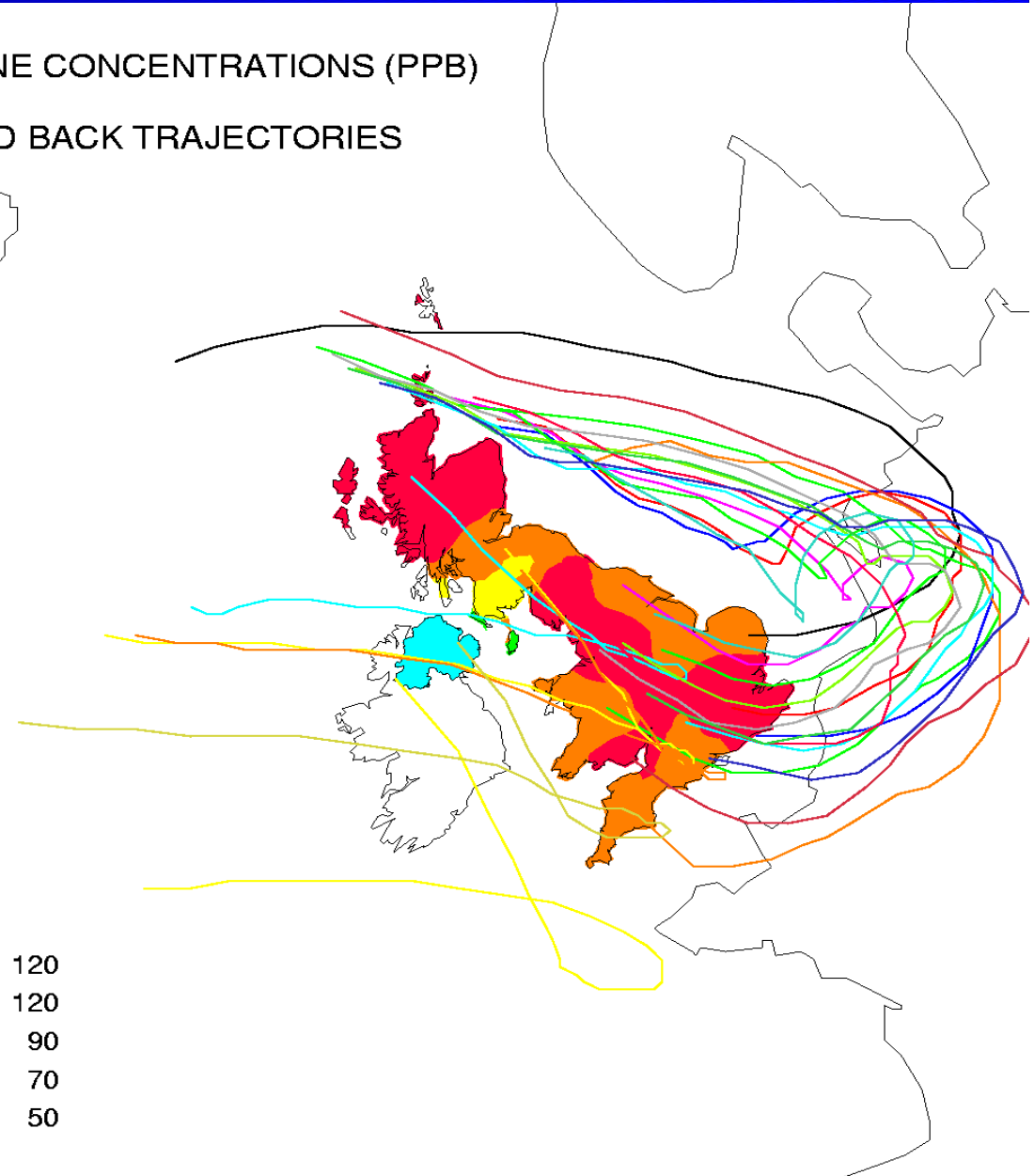
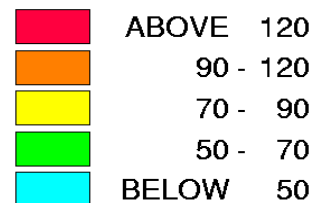
# The BBC 5-Day Forecast

# 2004 Episodes – Summer Ozone

- Summer 2004 was wet....
- There was only one extended pollution episode.
- We forecast this accurately, reported and published a summary of the event (see WWW).

FORECAST OZONE CONCENTRATIONS (PPB)  
AND ASSOCIATED BACK TRAJECTORIES

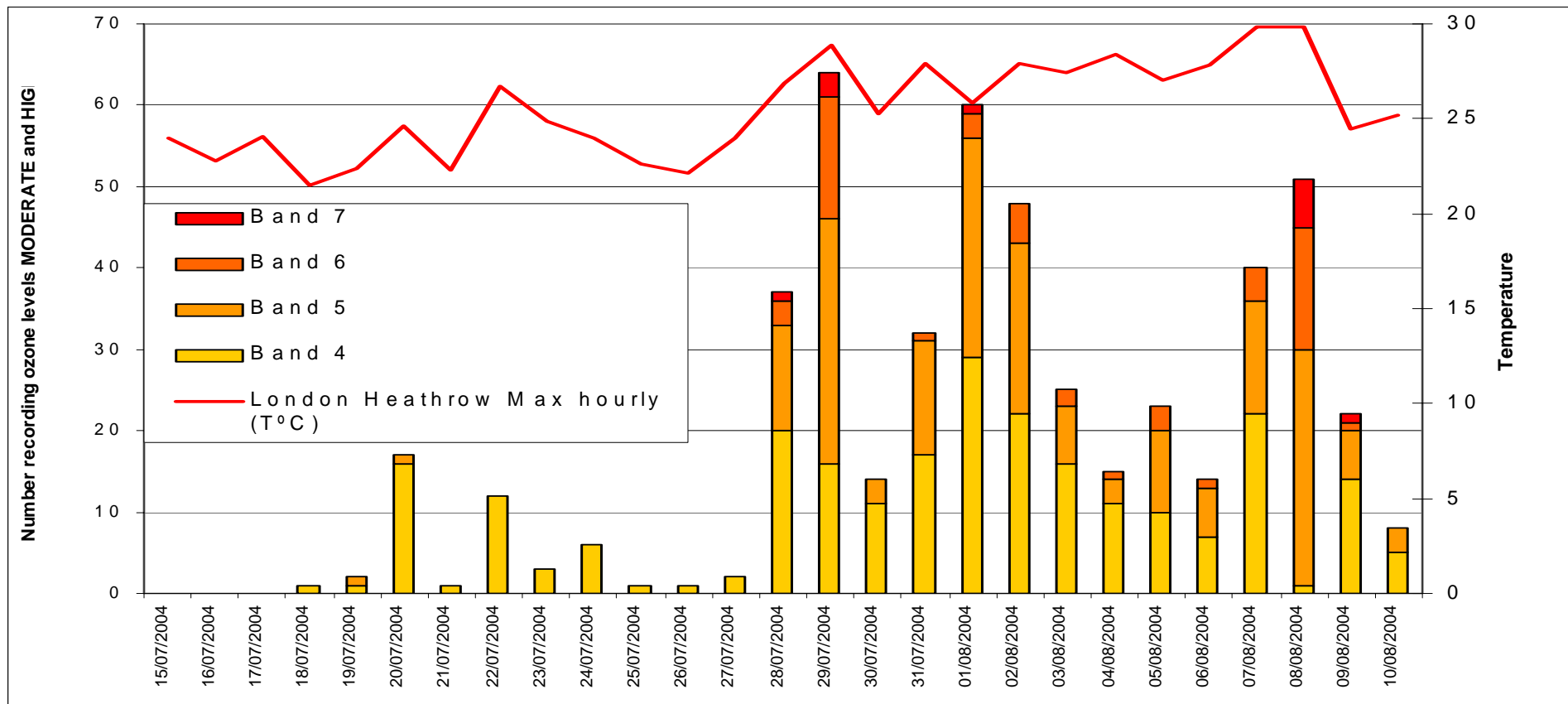
29/07/2004 1200



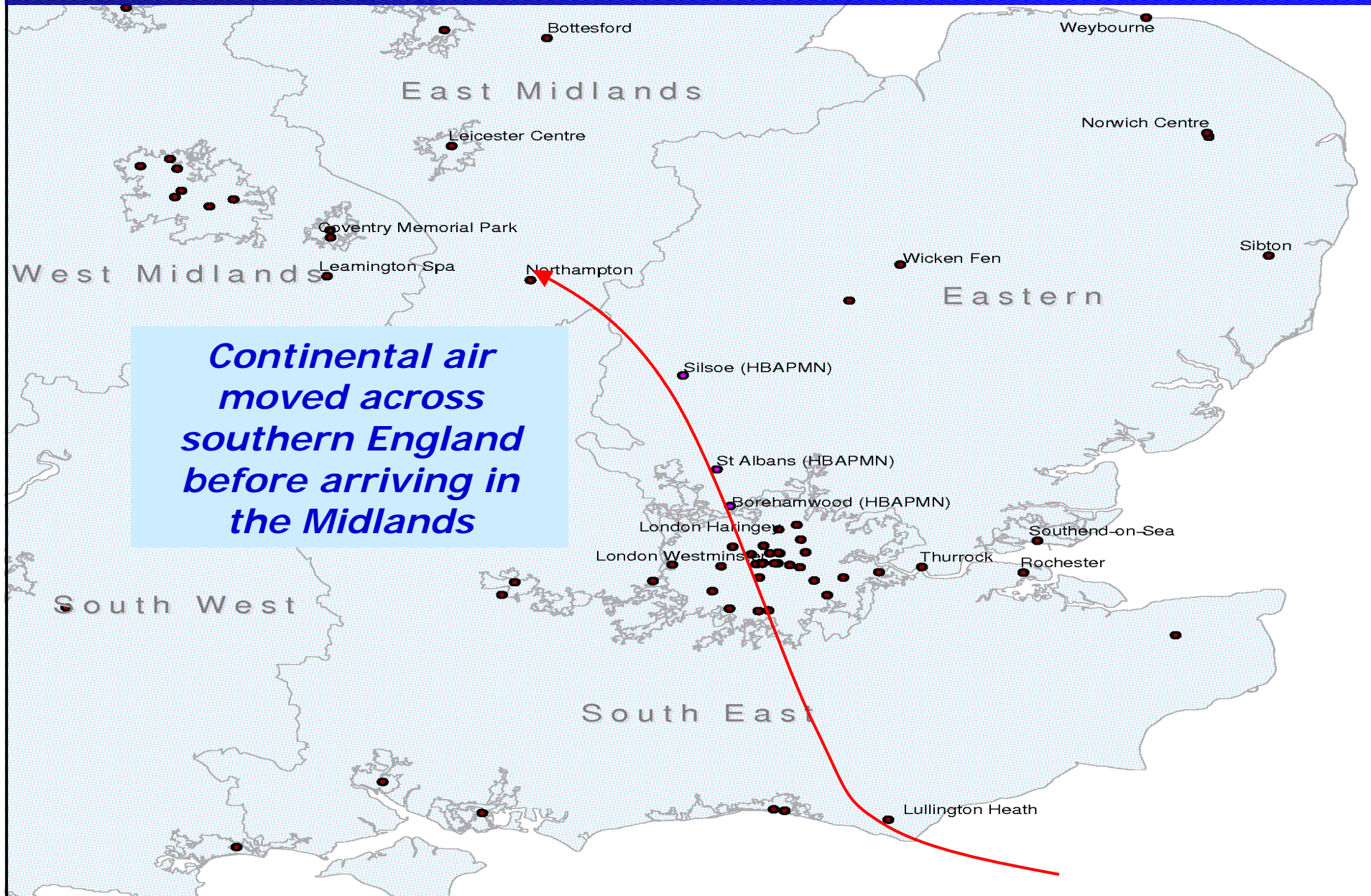


# Summer Ozone (continued)

- The episode was recorded from July 28<sup>th</sup> to August 10<sup>th</sup>.
- HIGH concentrations were reported on 5 days, maximum hour 210  $\mu\text{g}/\text{m}^3$  at Sibton on August 8<sup>th</sup>.
- The Directive Alert Threshold was not exceeded.

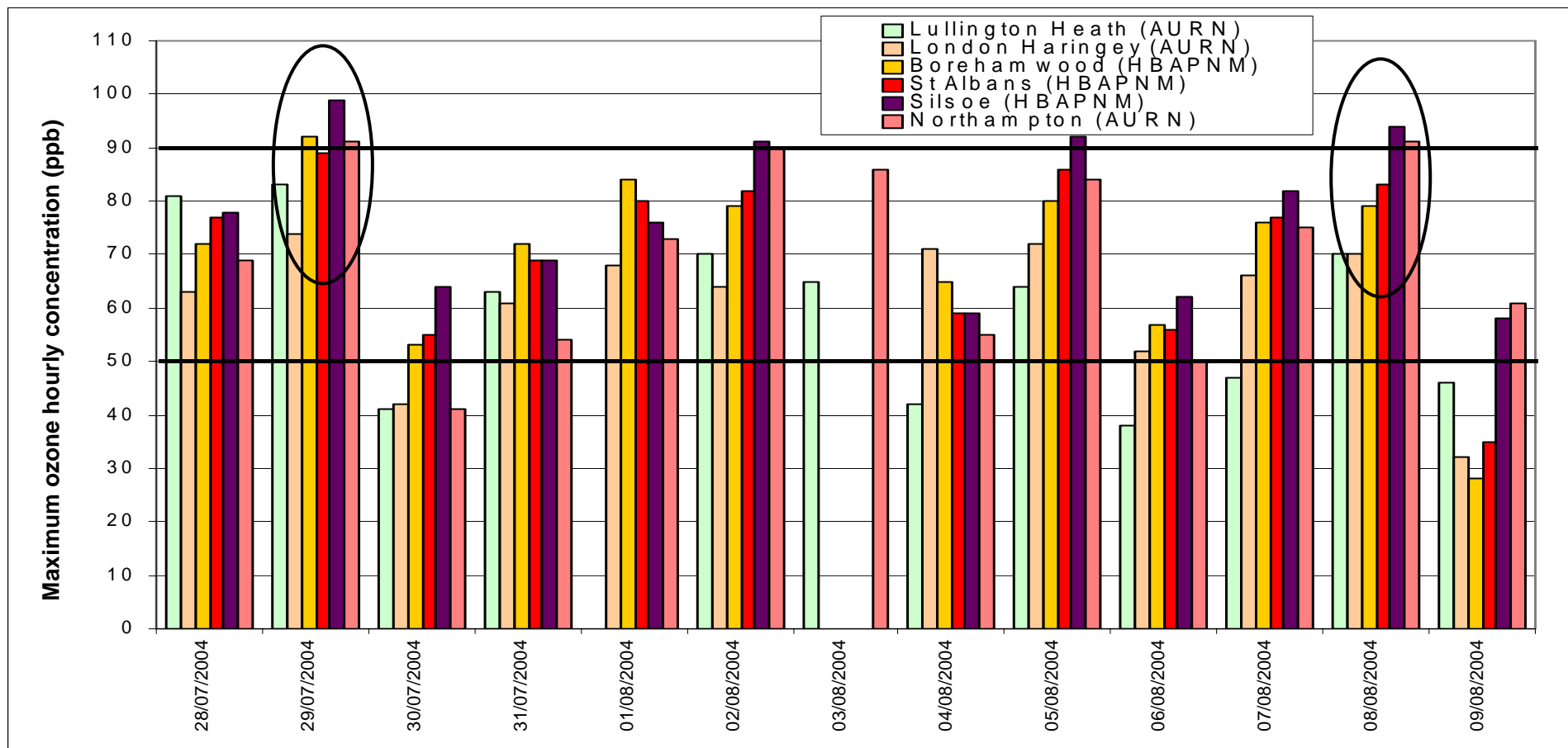


# Trajectory Analysis, July 29<sup>th</sup> and August 8<sup>th</sup>



# Daily Maximum Ozone Concentration Profile

*Concentrations fall across London and then rise again downwind of the city...*



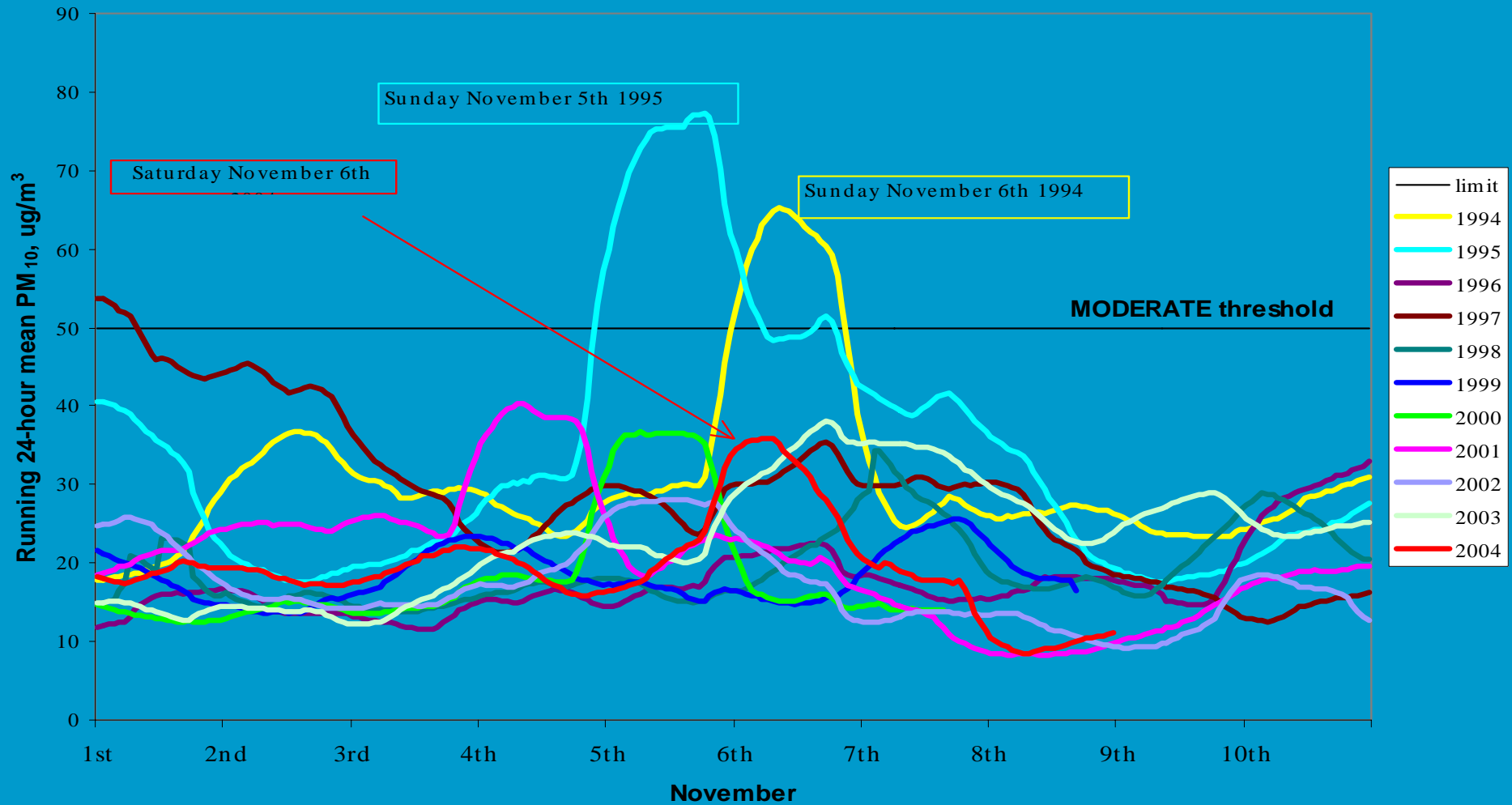


## Bonfire Night 2004 – Potentially a **HIGH** year, but not quite....

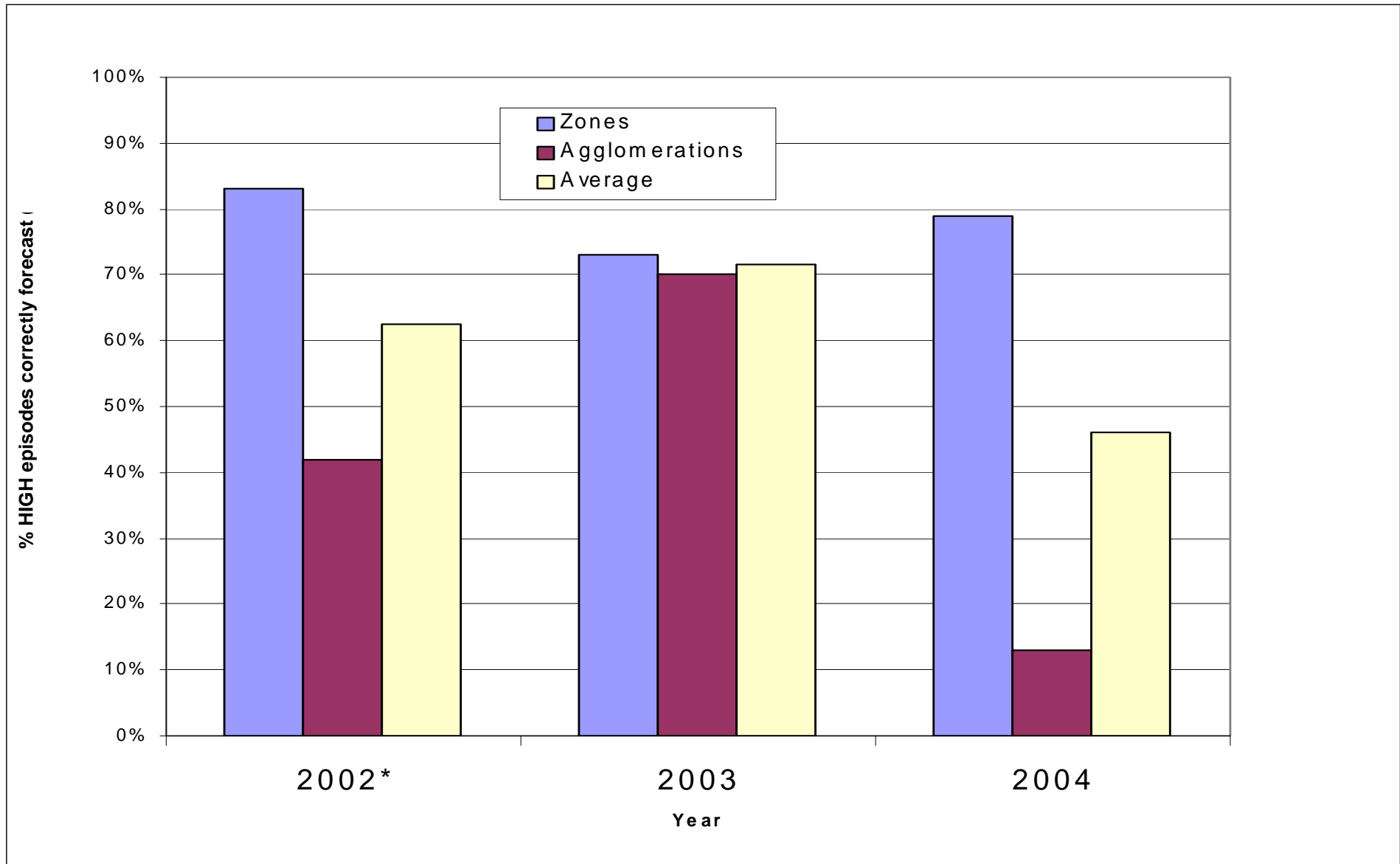
- There were some increased levels on Friday 5<sup>th</sup> and Saturday 6<sup>th</sup> November
- As predicted at the time, the high pressure system was not fully established over the UK. Mainly across southern England with Friday night most still and cold.
- Only two sites, Hillingdon and Thurrock, recorded **HIGH** pollution.
- Four other sites were **MODERATE** – Plymouth, Birmingham, Scunthorpe and Port Talbot. All apart from Birmingham had significant non-Bonfire related emissions.

# Overall UK Impact – small...

Bonfire Night PM<sub>10</sub> Air Pollution Episodes 1994 to 2004  
Running 24-Hour Mean Network Averaged TEOM Data (all sites)



# Forecasting Success Rates, 2002-4



## Forecasting Success Rates 2004 (ii)- broken down by pollutant

<i>Pollutant</i>	<i>No. of HIGH days</i>	<i>No. of MODE RATE days</i>	<i>Maximum conc.* (Index)</i>	<i>Site with max concentration</i>	<i>Zone or Agglomeration</i>	<i>Date of max conc.</i>	<i>Forecast success HIGH days (%) [no. of instances].</i>
<i>Ozone</i>	3	200	212 $\mu\text{gm}^{-3}$ (index 7)	Sibton	Eastern	08/08/04	77 % [13]
<i>PM<sub>10</sub></i>	9	133	143 gravimetric $\mu\text{gm}^{-3}$ (index 8)	Scunthorpe Town	Yorkshire and Humbersid e	09/08/04	8 % [24]
<i>NO<sub>2</sub></i>	0	14	436 $\mu\text{gm}^{-3}$ (index 5)	London A3 Roadside	Greater London UA	30/03/04	[0]
<i>SO<sub>2</sub></i>	5	24	830 $\mu\text{gm}^{-3}$ (index 8)	Salford Eccles	Greater Manchester UA	01/03/04	0 % [5]
<i>CO</i>	0	0	6.3 $\text{mgm}^{-3}$ (index 2)	Manchester Picadilly	Greater Manchester UA	23/12/04	[0]

# New Developments

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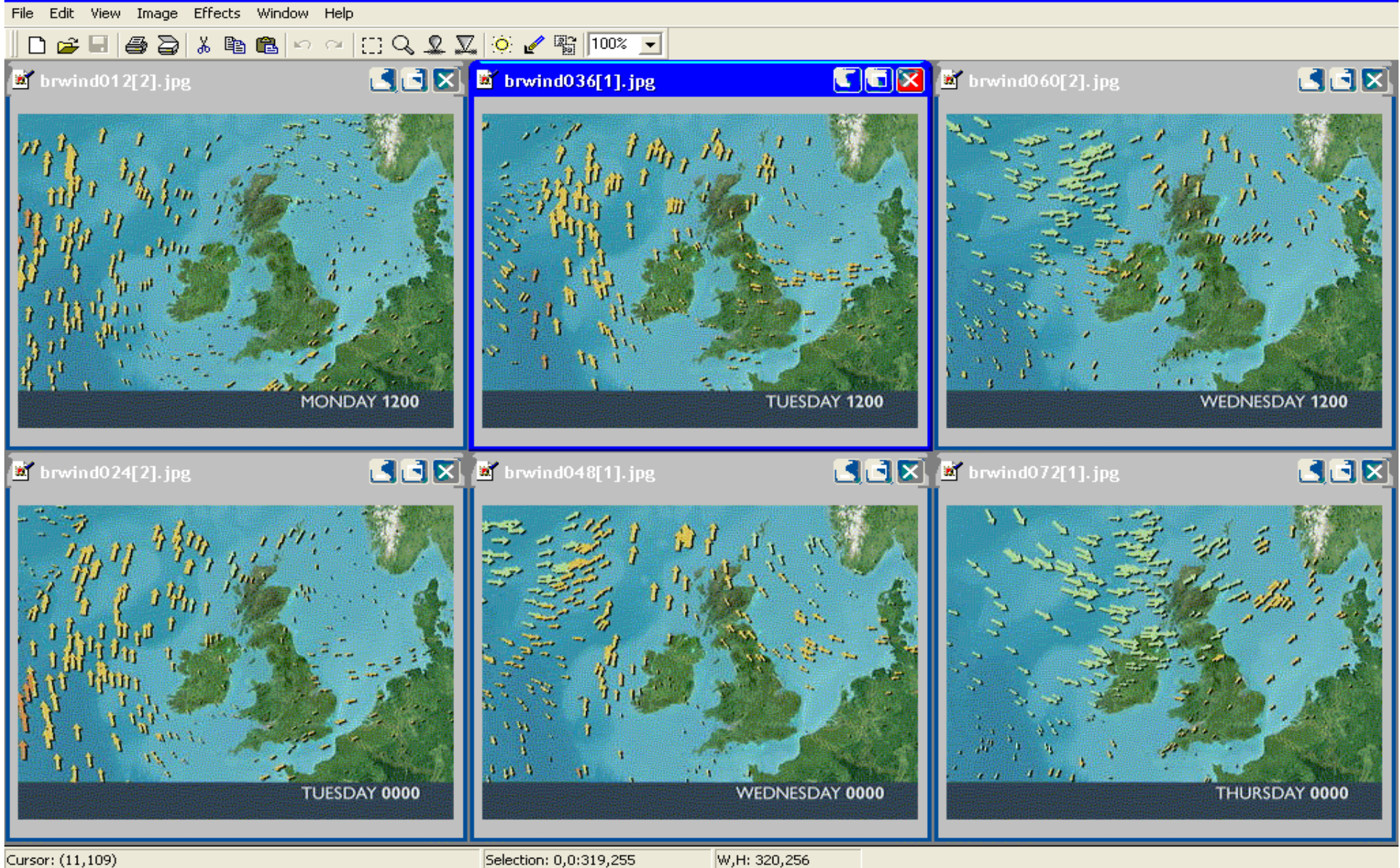
1. Netcen Air Quality Forecasting Toolkit
2. Improved Operational Resilience
3. Ozone Web





# 1) AQ Forecasting Toolkit...

*an Excel macro which automatically searches the web and downloads all the relevant images needed for forecasting. e.g. weather and forecasting model runs*

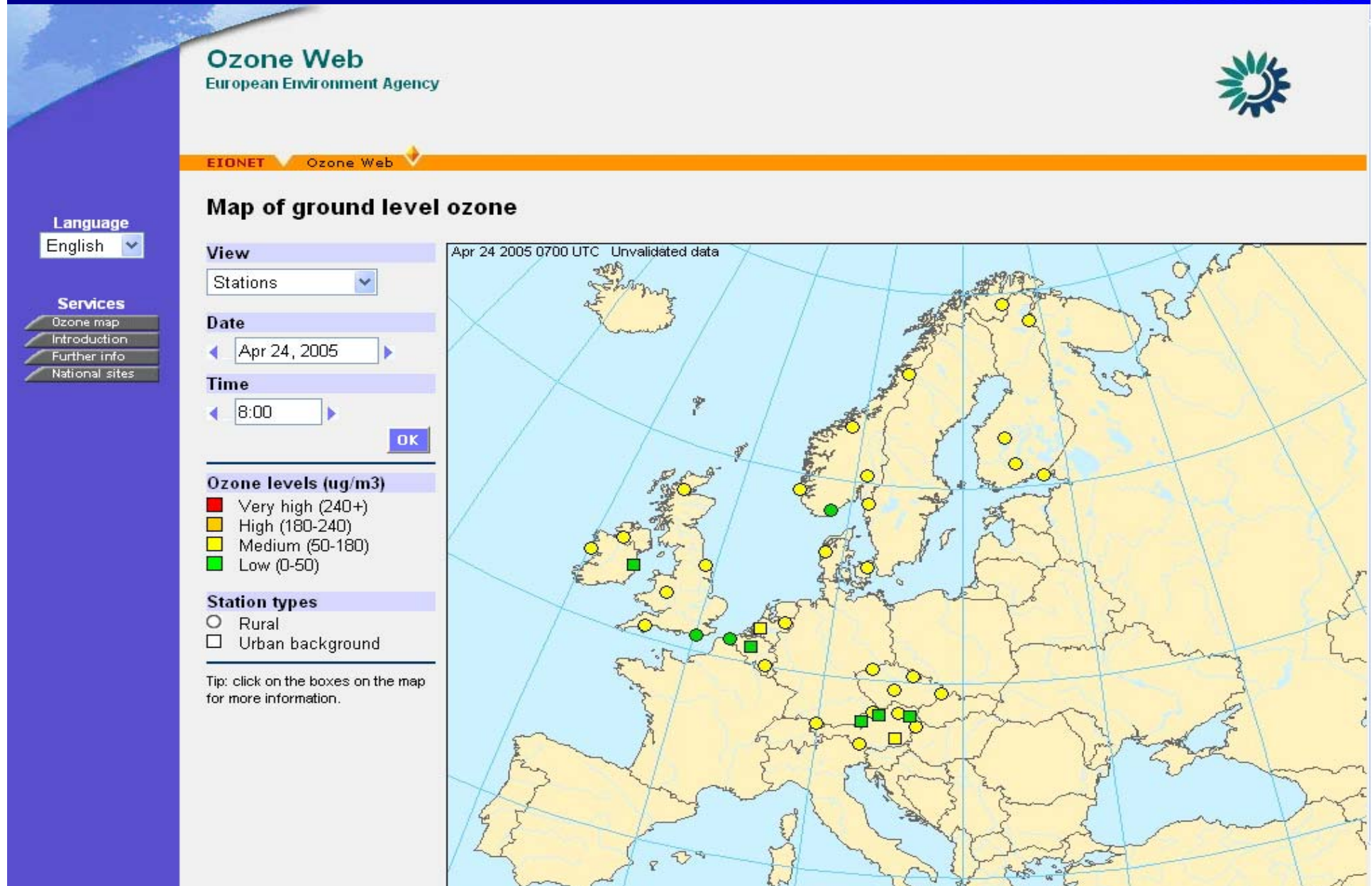


## 2) Improved Operational Resilience...

*Support of Met Office AQ Forecasting model runs has now been passed from specialist staff to the Met Office Production and IT Operation Teams.*



### 3) Ozone Web- the UK (through *Netcen*) now contributes to this pan-European near real-time ozone data exchange



**Thank you-  
any questions?**

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