

REPORT

UK Air Quality Forecasting: Operational Report for April to June 2004

A report produced for the Department for Environment, Food and Rural Affairs, the Scottish Executive, the Welsh Assembly Government and the Department of the Environment in Northern Ireland



AEAT/ENV/R/1785 Issue 1
August 2004

UK Air Quality Forecasting: Operational Report for April to June 2004

A report produced for the Department for Environment, Food and Rural Affairs, the Scottish Executive, the Welsh Assembly Government and the Department of the Environment in Northern Ireland

AEAT/ENV/R/1785 Issue 1
August 2004

Title	UK Air Quality Forecasting: Operational Report for April to June 2004
Customer	Department for Environment Food and Rural Affairs, the Scottish Executive, the Welsh Assembly Government and the Department of the Environment in Northern Ireland
Customer reference	EPG 1/3/179
Confidentiality, copyright and reproduction	Copyright AEA Technology plc. All rights reserved. Enquiries about copyright and reproduction should be addressed to the Commercial Manager, AEA Technology plc.
File reference	ED45099
Report number	AEAT/ENV/R/1785 Issue 1
Report status	Issue 1

AEA Technology plc
netcen
 E4
 Culham
 Abingdon
 OX14 3ED
 Telephone 0870 190 6499
 Facsimile 0870 190 6607
netcen is an operating division of AEA Technology plc
 AEA Technology is certificated to BS EN ISO9001: (1994)

	Name	Signature	Date
Author	Jaume Targa		13 Aug 2004
Reviewed by	Paul Willis		
Approved by	Jon Bower		

Executive Summary

This report covers the operational activities carried out by NETCEN and the Met Office on the UK Air Quality Forecasting Contract from April to June 2004. The work is funded by the Department for Environment Food and Rural Affairs, the Scottish Executive, Welsh Assembly Government and the Department of the Environment in Northern Ireland.

During the second period there were a total of 11 days on which HIGH air pollution was recorded. These HIGH periods get recorded within the forecasting success calculations. The forecasting success and accuracy for this quarter for HIGH and MODERATE episodes is summarised in Table 1 below. The success and accuracy of these HIGH days in agglomerations has improved slightly compared to the first quarter but still poor due to their SO₂ /PM₁₀ nature which has been unpredictable and occurred in very localised events. Only one of the high levels measured was forecast.

Success figures for MODERATE level days show that all measured days were successfully forecast (percentage above 100%). An average accuracy figure of circa 80% represents that only 20% of the forecasts were not measured with levels remaining LOW. This is due to the precautionary approach that NETCEN takes when issuing the daily forecasts.

Table 1 – Forecast success/accuracy for incidents¹ above 'HIGH' and above 'MODERATE', April 1st to June 30st 2004

Region/Area	HIGH		MODERATE	
	% success	% accuracy	% success	% accuracy
Zones	0	0	147	89
Agglomerations	13	13	172	71

We continue to research ways of improving the air pollution forecasting system by:

1. Investigate ways of using automatic software systems to streamline the activities within the forecasting process, thus allowing forecasters to spend their time more efficiently considering the most accurate forecasts.
2. Research the chemistry used in our models, in particular the NO_x->NO₂ conversion used in NAME, and the chemical schemes for secondary PM₁₀ and ozone.
3. Improve the NAME model runs which can be used for ad-hoc analysis runs. In particular with regard to investigating the possible long-range transport of PM₁₀ pollution from forest fires in Russia and the long-range transport of particles from Saharan Dust Storms.
4. Improve and update the emissions inventories used in our models.

There were no reported breakdowns between April and June and all bulletins were delivered to the Air Quality Communications contractor on time.

During this period there were not any new ad-hoc reports presented to Defra and the Devolved Administrations.

¹ Note that the calculations of accuracy and success rates are based on a success being ± 1 of the measured index and that it is possible to record rates in excess of 100% rather than 'true' percentages.

Contents

Executive Summary	ii
1 Introduction	1
2 New developments during this period	2
3 Analysis of forecasting success rate	2
3.1 FORECAST ANALYSIS FOR APRIL 1 ST TO JUNE 30 TH 2004	4
4 Breakdowns in the service	12
5 Additional or enhanced forecasts	12
6 Ad-hoc services	12
7 Ongoing research	13
8 Forward work plan for July to September 2004	13
9 Hardware and software inventory	14
Appendix 1 - Air Pollution Index	15
Appendix 2 - Forecasting Zones and Agglomerations	17
Appendix 3 – Metropolis Workshop - Abstract	20

1 Introduction

A forecast of the following day's air pollution is prepared every day by NETCEN in collaboration with the Met Office. The forecast consists of a prediction of the air pollution descriptor for the worst-case situation in 16 zones and 16 agglomerations over the following 24-hours. Forecasts can be updated and disseminated through Teletext, the World Wide Web and a Freephone telephone number at any time of day, but the most important forecast of the day is the "daily media forecast". This is prepared at 3.00 p.m. for uploading to the internet and Air Quality Communications contractor before 4.00 p.m. each day, and is then included in subsequent air quality bulletins for the BBC, newspapers and many other interested organisations. This report covers the media forecasts issued between 1st April and 30th June 2004. Results from forecasting models are available each day and are used in constructing the forecast. The forecasters issue predictions for rural, urban background and roadside environments, but for the purposes of this report these have been combined into a single "worst-case" category.

Twice per week, on Tuesdays and Fridays, we also provide a long-range pollution outlook. This takes the form of a short piece of text which is emailed to around twenty recipients in Defra and other government Departments, plus the BBC weather forecasters. The outlook is compiled by looking at the output from our pollution models, which currently run out to 3 days ahead and by assessing the long-term weather situation.

We continue to provide a quality control system to ensure that the 5-day forecasts provided by the Met. Office to the BBC are consistent with the "daily media forecasts" and long-range pollution outlook provided by NETCEN for Defra and the DAs. The BBC requires 5-day air pollution index forecasts for 230 UK towns and cities on their BBC Online service. The quality control work is carried out at around 3.00 p.m. daily with the forecast updating onto the BBC Online Web site at 4.00 a.m. the following morning.

2 New developments during this period

During the second quarter in 2004, there has not been any new development.

3 Analysis of forecasting success rate

Analysis of the forecasting performance is performed for each of the 16 zones and 16 agglomerations used in the daily forecasting service. Further details of these zones and agglomerations are presented in Appendix 2. Forecasting performance is analysed for a single, general pollutant category rather than for each individual pollutant and has been aligned to the forecasting day (a forecasting day runs from the issue time, generally 3 pm). This analysis of forecasting performance is based on provisional data before ratification as used in the daily forecasting process. Any obviously faulty data have been removed.

The analysis treats situations where the forecast index was within ± 1 of the measured index as a successful prediction as this is the accuracy we hope to obtain in the forecast. Because the calculations of accuracy and success rates are based on a success being ± 1 of the measured index, it is possible to record rates in excess of 100% rather than 'true' percentages. Further details of the text descriptions and index code used for the forecasting are given in Appendix 1.

The forecasting success rates for each zone and agglomeration for April – June 2004 are presented in Tables 3.1 (forecasting performance in zones) and 3.2 (forecasting performance in agglomerations) for 'HIGH' days. Table 3.5 provides a summary for each pollutant of the number of days on which HIGH and above pollution was measured, the maximum exceedence concentration and the day and site at which it was recorded. The forecasting performance Tables 3.1 and 3.2 give:

- The number of 'HIGH' days measured in the PROVISIONAL data aligned to the forecasting day.
- The number of 'HIGH' days forecast
- The number of days with a correct forecast of 'HIGH' air pollution, within an agreement of ± 1 index value. A HIGH forecast is recorded as correct if air pollution is measured HIGH and the forecast is within ± 1 index value, or it is forecast HIGH and the measurement is within ± 1 index value. For example measured index 7 with forecast index 6 counts as correct, as does measured index 6 with forecast index 7.
- The number of days when 'HIGH' air pollution was forecast ('f' in the tables) but not measured ('m') on the following day to within an agreement of 1 index value.
- The number of days when 'HIGH' air pollution was measured ('m') but had not been forecast ('f') to within an agreement of 1 index value.

The two measures of forecasting performance used in this report are the 'success rate' and the 'forecasting accuracy'.

The forecast success rate (%) is calculated as:

- $(\text{Number of episodes successfully forecast} / \text{total number of episodes measured}) \times 100$

The forecast accuracy (%) is calculated as:

- $(\text{Number of episodes successfully forecast} / [\text{Number of successful forecasts} + \text{number of wrong forecasts}]) \times 100$

The forecasting success rates for 'MODERATE' days or above for each zone and agglomeration are presented in tables 3.3 (zones) and table 3.4 (agglomerations). Table 3.3 and 3.4 give the same information as table 3.1 and 3.2 but for 'MODERATE' days and above.

3.1 FORECAST ANALYSIS FOR APRIL 1ST TO JUNE 30TH 2004

Table 3.1 - Forecast Analysis for UK Zones 'HIGH' band and above*

ZONES	Central Scotland	East Mids	Eastern	Greater London	Highland	North East	North East Scotland	North Wales	North West & Merseyside	Northern Ireland	Scottish Borders	South East	South Wales	South West	West Midlands	Yorkshire & Humberside	Overall
Measured days	3	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	4
forecasted days	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ok (f and m)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
wrong (f not m)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
wrong (m not f)	3	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	4
success %	0	100	100	100	100	100	100	100	100	100	100	0	100	100	100	100	0
Accuracy %	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Table 3.2 - Forecast Analysis for UK Agglomerations 'HIGH' band and above*

AGGLOMERATIONS	Belfast UA	Brighton/Worthing/Littlehampton	Bristol UA	Cardiff UA	Edinburgh UA	Glasgow UA	Greater Manchester UA	Leicester UA	Liverpool UA
measured days	0	0	0	0	0	0	0	0	6
forecasted days	0	0	0	0	0	0	0	0	1
ok (f and m)	0	0	0	0	0	0	0	0	1
wrong (f not m)	0	0	0	0	0	0	0	0	0
wrong (m not f)	0	0	0	0	0	0	0	0	5
success %	100	100	100	100	100	100	100	100	17
accuracy %	0	0	0	0	0	0	0	0	17

AGGLOMERATIONS	Nottingham UA	Portsmouth UA	Sheffield UA	Swansea UA	Tyneside	West Midlands UA	West Yorkshire UA	Overall
Measured days	0	0	0	2	0	0	0	8
forecasted days	0	0	0	0	0	0	0	1
ok (f and m)	0	0	0	0	0	0	0	1
wrong (f not m)	0	0	0	0	0	0	0	0
wrong (m not f)	0	0	0	2	0	0	0	7
success %	100	100	100	0	100	100	100	13
accuracy %	0	0	0	0	0	0	0	13

* All performance statistics are based on provisional data. Obviously incorrect data due to instrumentation faults have been removed from the analyses.

Please refer to the start of section 3 for an explanation of the derivation of the various statistics, figures >100 % may occur.

Table 3.3 - Forecast Analysis for UK Zones 'MODERATE' band and above*

ZONES	Central Scotland	East Mids	Eastern	Greater London	Highland	North East	North East Scotland	North Wales	North West & Merseyside	Northern Ireland	Scottish Borders	South East	South Wales	South West	West Midlands	Yorkshire & Humberside	Overall
measured days	15	38	61	37	30	30	21	14	35	10	13	52	9	47	14	41	467
forecasted days	13	55	60	57	31	48	19	25	34	10	15	62	32	55	51	43	610
ok (f and m)	13	61	66	59	44	55	23	26	49	15	18	63	27	63	46	58	686
wrong (f not m)	5	2	3	4	1	3	3	5	2	2	4	4	5	2	7	3	55
wrong (m not f)	7	1	2	1	1	2	5	1	0	0	0	2	0	3	0	4	29
success %	87	161	108	159	147	183	110	186	140	150	138	121	300	134	329	141	147
accuracy %	52	95	93	92	96	92	74	81	96	88	82	91	84	93	87	89	89

Table 3.4 - Forecast Analysis for UK Agglomerations 'MODERATE' band and above*

AGGLOMERATIONS	Belfast UA	Brighton/Worthing/Littlehampton	Bristol UA	Cardiff UA	Edinburgh UA	Glasgow UA	Greater Manchester UA	Leicester UA	Liverpool UA
measured days	8	0	6	15	14	5	19	7	18
forecasted days	5	30	22	21	8	10	24	22	23
ok (f and m)	9	0	21	22	16	9	31	21	25
wrong (f not m)	3	30	6	3	4	5	4	7	6
wrong (m not f)	1	0	0	2	1	0	0	0	7
success %	113	100	350	147	114	180	163	300	139
accuracy %	69	0	78	81	76	64	89	75	66

AGGLOMERATIONS	Nottingham UA	Portsmouth UA	Sheffield UA	Swansea UA	Tyneside	West Midlands UA	West Yorkshire UA	Overall
measured days	6	12	13	23	5	26	12	189
forecasted days	16	35	17	33	14	32	20	332
ok (f and m)	12	34	21	33	12	41	19	326
wrong (f not m)	8	4	4	7	7	4	6	108
wrong (m not f)	1	0	1	6	0	1	3	23
success %	200	283	162	143	240	158	158	172
accuracy %	57	89	81	72	63	89	68	71

* All performance statistics are based on provisional data. Obviously incorrect data due to instrumentation faults have been removed from the analyses.

Please refer to the start of section 3 for an explanation of the derivation of the various statistics, figures > 100 % may occur.

Table 3.5 – Summary of episodes April to June 2004

Pollutant	High days	Moderate days	Max. conc. ($\mu\text{g}/\text{m}^3$) *	Site with max. conc.	Zones or Agglomeration	Date of max conc.	Forecast success HIGH days (%) [no. incidents]
Ozone	-	76	176 $\mu\text{g}\text{m}^{-3}$	Wicken Fen	Eastern	08/06/04	N/A
PM ₁₀ (teom)	8	27	98 $\mu\text{g}\text{m}^{-3}$	Liverpool Speke	Liverpool UA	15/06/04	13 % [8]
NO ₂	-	1	302 $\mu\text{g}\text{m}^{-3}$	London Marylebone Road	Greater London UA	24/06/04	N/A
SO ₂	3	7	788 $\mu\text{g}\text{m}^{-3}$	Grangemouth	Central Scotland	08/06/04	0 % [3]
CO	-	-	-	-	-	-	N/A

* Maximum concentration relate to 8 hourly running mean or hourly mean for ozone, 24 hour running mean for PM₁₀, hourly mean for NO₂, 15 minute mean for SO₂ and 8 hour running mean for CO.

General Trends

The second quarter has been characterised by some localised events with more persistent regional MODERATE levels due to ozone. There have been eight HIGH days due to PM₁₀ and three due to SO₂. MODERATE levels of PM₁₀ have been scattered throughout this period and MODERATE levels of ozone have been more persistent throughout the quarter (80% of the days). Figures 3.1 – 3.3 show the trends of pollutants in graphical form. A site-by-site breakdown is given in Figures 3.4a and 3.4b.

O₃

Ozone levels have not reached HIGH levels during this period. The highest recorded level was at Wicken Fen on the 8th June. Seventy six days out of ninety one have been characterised with levels of MODERATE pollution due to ozone. Stations showing the highest number of MODERATE days were, after data finalisation, Weybourne (44 days), Wicken Fen (37), Yarner Wood (36), Bournemouth (31), Rochester (31) and Southend-on-Sea (30). Figure 3.1 shows the trends in ozone levels over this period.

PM₁₀

PM₁₀ levels of HIGH were recorded at two stations over this period: 6 days in Liverpool Speke and 2 days in Port Talbot. These levels were due to localised events: construction works nearby the monitoring station and industrial processes, respectively. The maximum peak was recorded at Liverpool Speke at 98 $\mu\text{g}\text{m}^{-3}$ (band 9) on the 15th June. During the second quarter, 27 events were recorded at MODERATE levels.

During the three month period covered by this report, PM₁₀ reached HIGH in localised areas. For PM₁₀ related HIGH episodes, which tend to dominate in agglomerations where road traffic pollution, industry and construction are abundant, the success rate is normally very low due to its unpredictability (only one of the eight incidents was successfully forecast). Figure 3.2 shows the trends in PM₁₀ levels over this period.

NO₂

Nitrogen dioxide levels have remained below HIGH levels. London Marylebone Road was the only site to measure one day of MODERATE levels across the UK, with a maximum of 302 $\mu\text{g}\text{m}^{-3}$ on the 24th June.

SO₂

Sulphur dioxide reached HIGH levels on three occasions: twice in Grangemouth and one measured at Harwell. MODERATE levels were measured on 7 occasions at Grangemouth. The highest level was measured at Grangemouth at 788 $\mu\text{g}\text{m}^{-3}$ (band 8) on the 8th June. None of the HIGH incidents were successfully forecast due to their associated unpredictability.

Figure 3.3 shows the trends in SO₂ levels over this period with NO₂ also included.

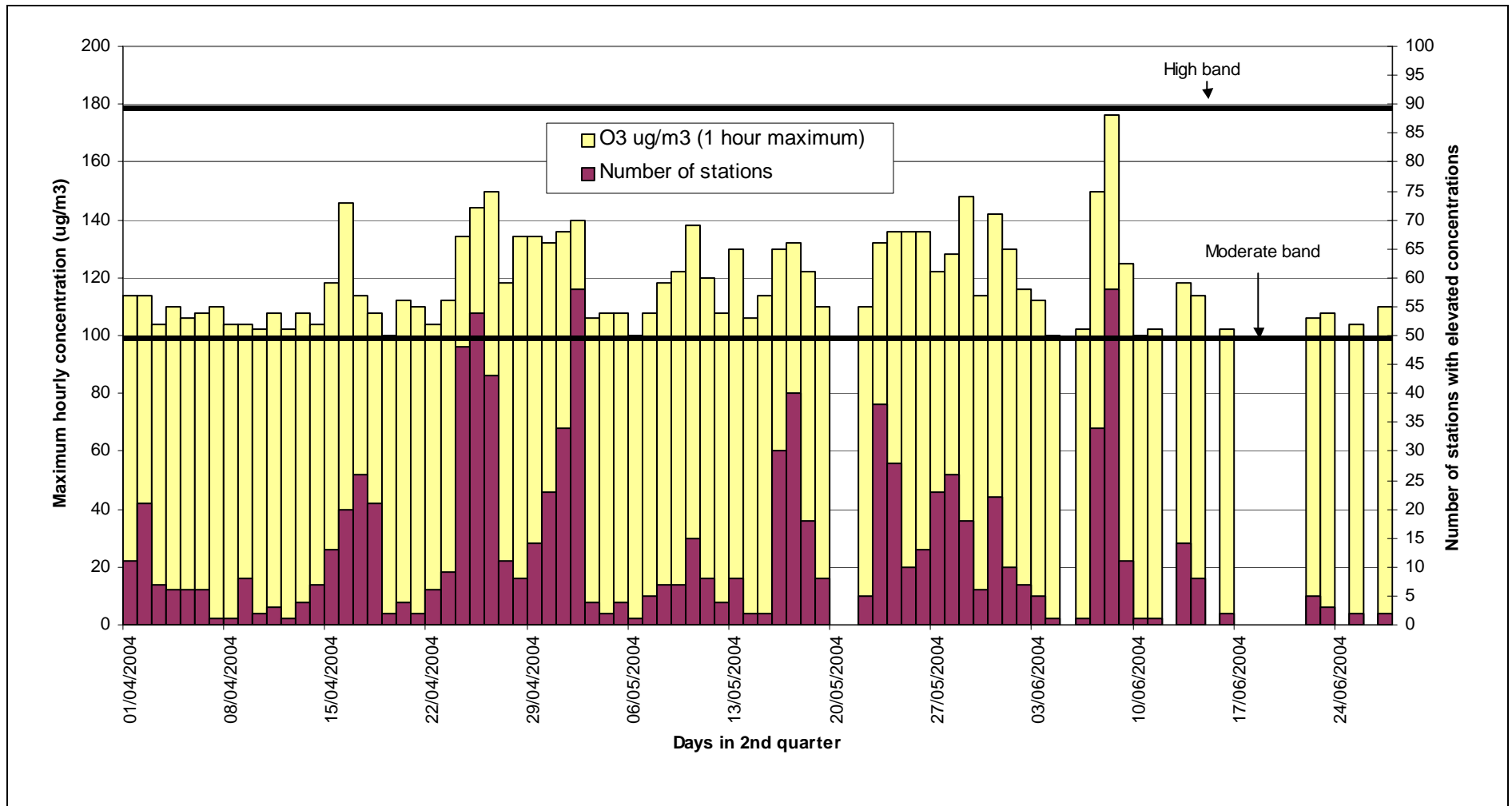
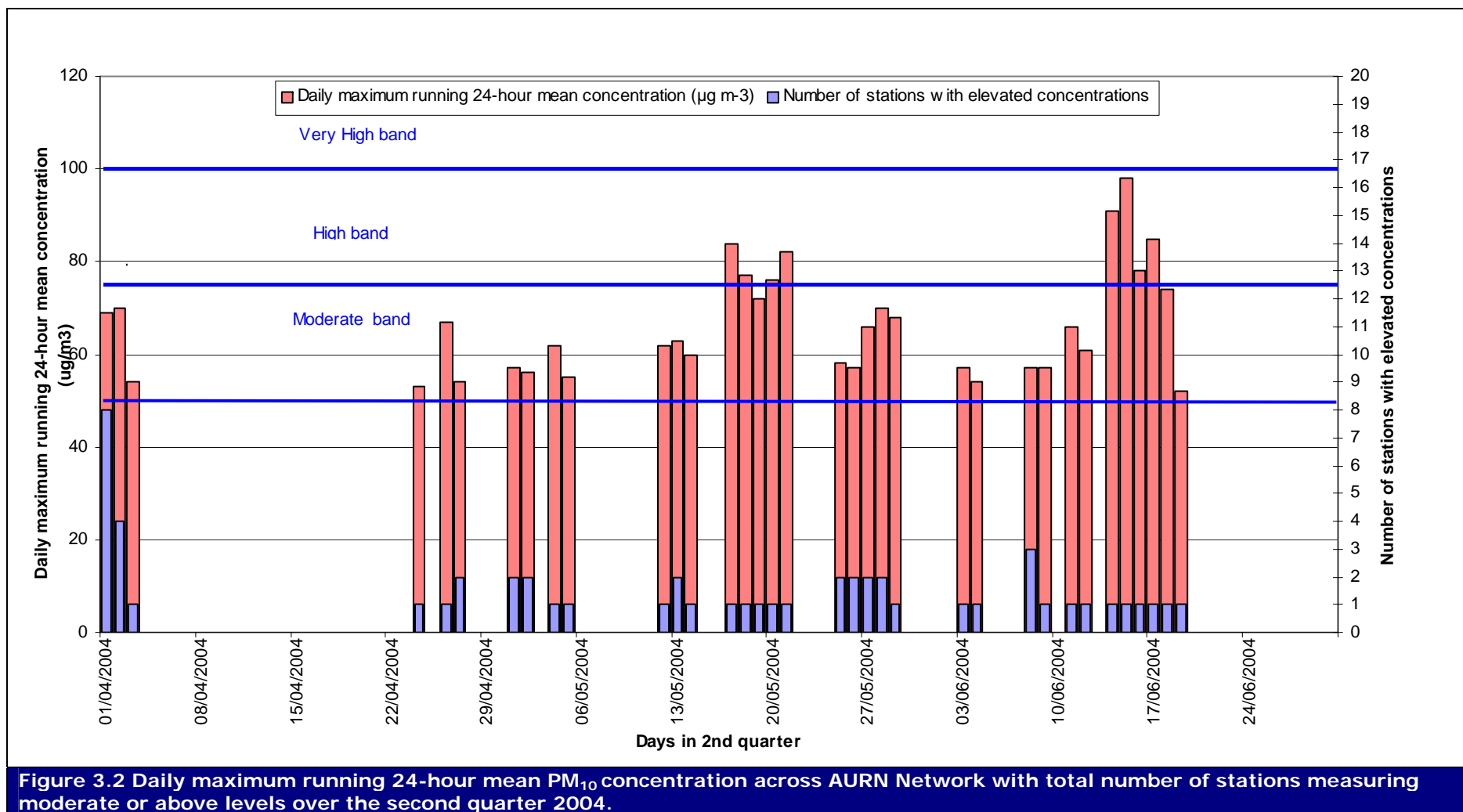


Figure 3.1 Daily maximum hourly ozone concentrations across AURN Network with total number of stations measuring moderate or above levels of ozone over second quarter 2004



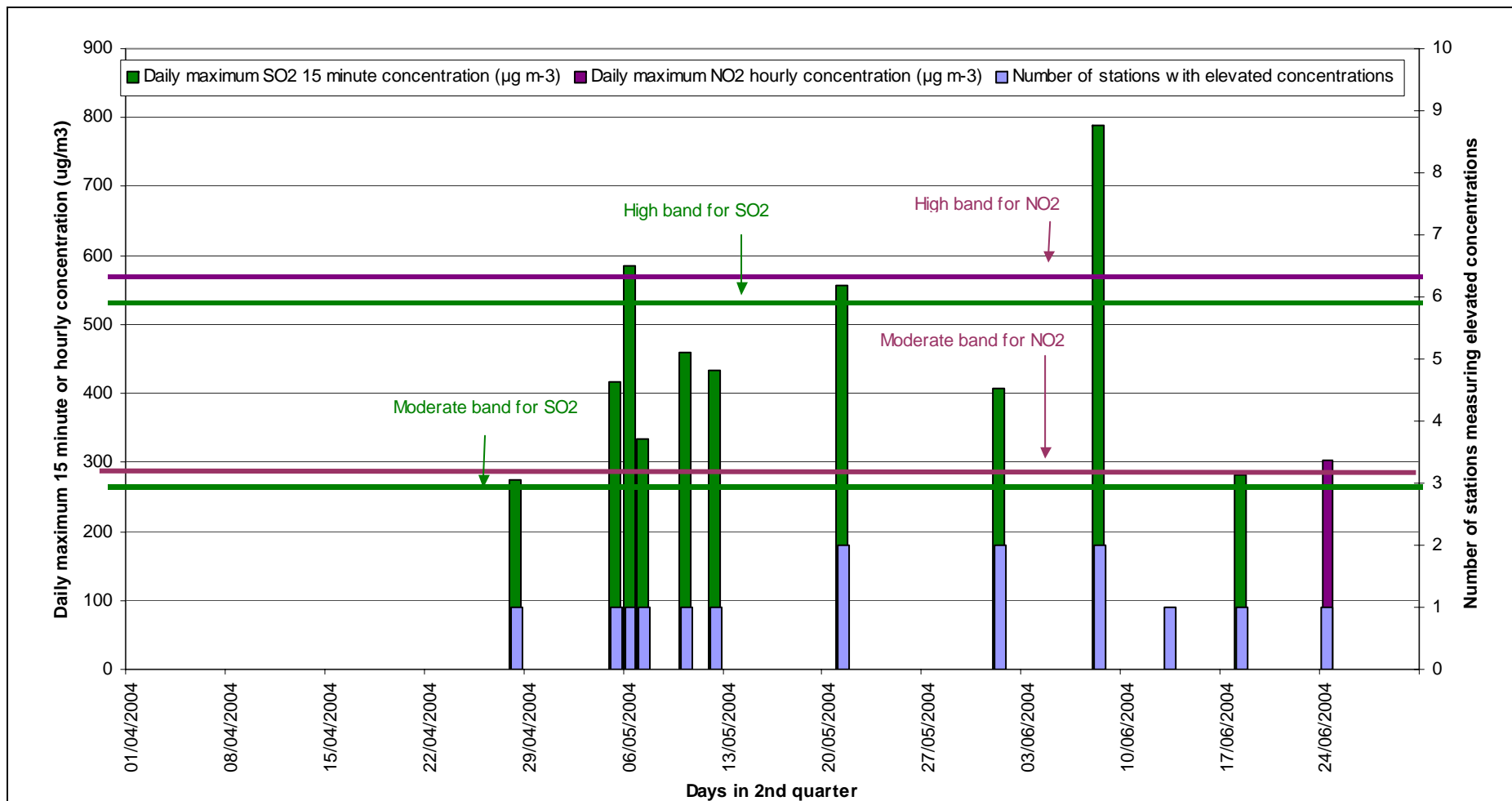
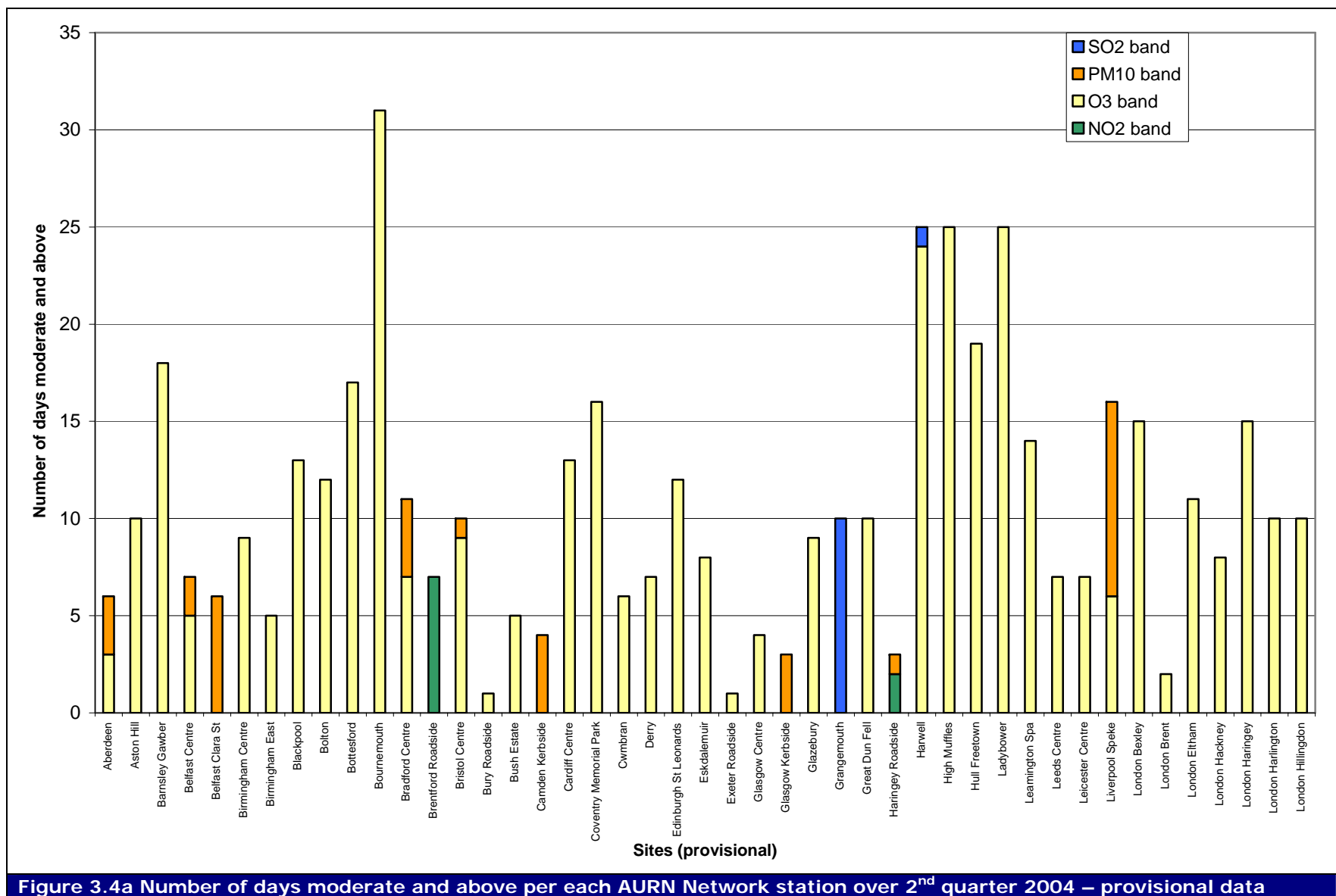
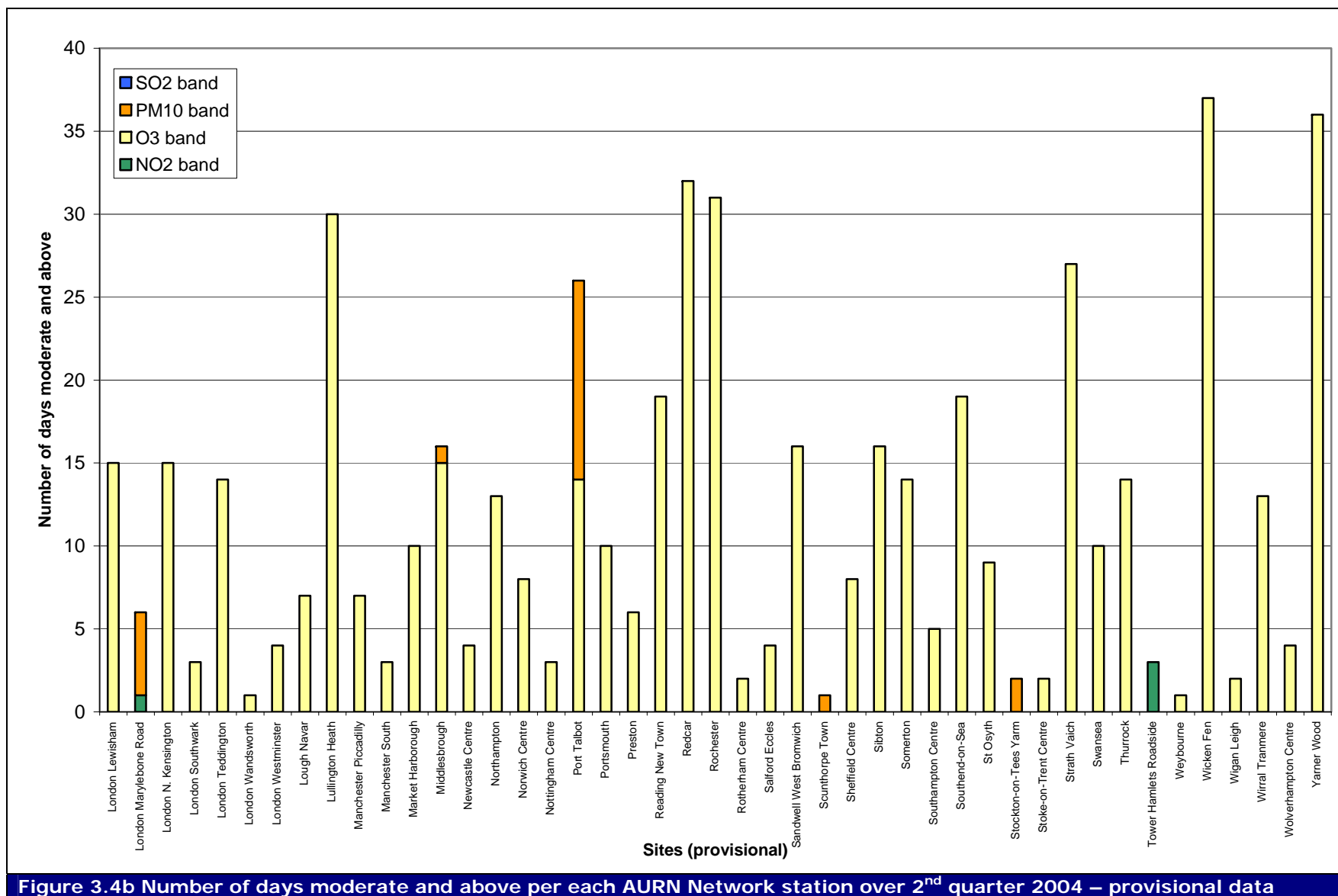


Figure 3.3 Maximum 15 minute average concentrations of SO₂ and hourly average of NO₂ across AURN Network with total number of stations measuring moderate or above levels over the second quarter 2004





4 Breakdowns in the service

All bulletins were successfully delivered to the Air Quality Communications contractor on time and there were no reported breakdowns in the service over this three month period.

5 Additional or enhanced forecasts

No formal enhanced forecasts can be issued until the format of the enhanced service has been agreed with Defra and the Devolved Administrations.

The air pollution forecast is always re-issued to Teletext, Web and Freephone services at 10.00 a.m local time each day, but will only be updated when the pollution situation is changing.

The bi-weekly air pollution outlooks have continued to be delivered successfully to Defra and other government departments by email on Tuesdays and Fridays.

6 Ad-hoc services

In June 2004, Jaume Targa from NETCEN attended the Metropolis Workshop: "Information – Communication – Awareness – Education". METROPOLIS project and JRC organised a two day seminar on experiences with local abatement strategies involving citizens, the development of air pollution and health information systems and awareness raising projects.

During this workshop, Jaume Targa gave a presentation on the 'UK National Air Quality Information Service' that NETCEN has established for DEFRA and the Devolved Administrations. The abstract of this presentation is in appendix 3. In this presentation the following was covered:

- UK Government commitment to easy public access of air quality data
- Objectives of the Information Services
- Current data available (on-line data, 24 hours daily forecast, reports and contracts, Local Authorities on-line tools, historic data and statistics...)
- Different media used to broadcast air quality information (Internet, teletext, e-mail bulletins weather centres, TV, Newspapers; free-phone, BBC forecast...)

Alongside to NETCEN's presentation, other interesting topics were also covered. These were:

- The use of 'new' dissemination techniques like Internet, WAP, SMS E-mail and MMS (NILU in Norway).
- Implementation of SMS services in Marseille under APNEE project
- Practical dissemination solution for city authorities (NILU in Norway)
- On-road Optical Remote Sensing for Driver Information and Awareness Raising (IVL in Sweden)
- Raising awareness through PEOPLE project
- Science based hands on education systems for schools (NILU in Norway)
- Ozone assessment in the Varese Area in collaboration with European School (JRC in Ispra)

7 Ongoing research

NETCEN and the Met office will continue to:

1. Investigate ways of using automatic software systems to streamline the activities within the forecasting process, thus allowing forecasters to spend their time more efficiently considering the most accurate forecasts.
2. Research the chemistry used in our models, in particular the $\text{NO}_x \rightarrow \text{NO}_2$ conversion used in NAME, and the chemical schemes for secondary PM_{10} and ozone.
3. Improve the NAME model runs which can be used for ad-hoc analysis runs. In particular with regard to investigating the possible long-range transport of PM_{10} pollution from forest fires in Russia, and the long-range transport of particles from Saharan Dust Storms.
4. Improve and update the emissions inventories used in our models.

8 Forward work plan for July to September 2004

- Ongoing daily air pollution forecasting activities.
- Ongoing improvements to NAME model including improved modelling over steep topographical gradients, higher resolution model runs with reduced statistical noise, update of emissions inventory used in the model.
- Publication of the January to March 2004 report on the Air Quality Archive Web Site.
- Improve the accessibility of the website by use of meta tags to improve its rating in search engines. Also refine some of the buttons so that they are easier to select.

9 Hardware and software inventory

Defra and the Devolved Administrations own the code for the ozone and secondary PM₁₀ models, but not the graphical interface for these.

Defra and the Devolved Administrations own the software for delivering the air pollution forecast to the Air Quality Communications system.

Defra and the Devolved Administrations also own the web pages used to display the forecasts.

No computer hardware being used on this project is currently owned by Defra and the Devolved Administrations.

Appendix 1 - Air Pollution Index

CONTENTS

1	Table showing the Air Pollution index
---	---------------------------------------

Old Banding	Index	Ozone 8-hourly/ Hourly mean		Nitrogen Dioxide Hourly Mean		Sulphur Dioxide 15-Minute Mean		Carbon Monoxide 8-Hour Mean		PM ₁₀ Particles 24-Hour Mean
		µgm ⁻³	ppb	µgm ⁻³	ppb	µgm ⁻³	ppb	mgm ⁻³	ppm	µgm ⁻³
LOW										
	1	0-32	0-16	0-95	0-49	0-88	0-32	0-3.8	0.0-3.2	0-16
	2	33-66	17-32	96-190	50-99	89-176	33-66	3.9-7.6	3.3-6.6	17-32
	3	67-99	33-49	191-286	100-149	177-265	67-99	7.7-11.5	6.7-9.9	33-49
MODERATE										
	4	100-126	50-62	287-381	150-199	266-354	100-132	11.6-13.4	10.0-11.5	50-57
	5	127-152	63-76	382-477	200-249	355-442	133-166	13.5-15.4	11.6-13.2	58-66
	6	153-179	77-89	478-572	250-299	443-531	167-199	15.5-17.3	13.3-14.9	67-74
HIGH										
	7	180-239	90-119	573-635	300-332	532-708	200-266	17.4-19.2	15.0-16.5	75-82
	8	240-299	120-149	636-700	333-366	709-886	267-332	19.3-21.2	16.6-18.2	83-91
	9	300-359	150-179	701-763	367-399	887-1063	333-399	21.3-23.1	18.3-19.9	92-99
VERY HIGH										
	10	≥ 360 µgm ⁻³	≥ 180 ppb	≥ 764 µgm ⁻³	≥ 400 ppb	≥1064 µgm ⁻³	≥ 400 ppb	≥ 23.2 mgm ⁻³	≥ 20 ppm	≥ 100 µgm ⁻³

Old Banding	New Index	Health Descriptor
LOW		
	1	Effects are unlikely to be noticed even by individuals who know they are sensitive to air pollutants
	2	
	3	
MODERATE		
	4	Mild effects unlikely to require action may be noticed amongst sensitive individuals
	5	
	6	
HIGH		
	7	Significant effects may be noticed by sensitive individuals and action to avoid or reduce these effects may be needed (e.g. reducing exposure by spending less time in polluted areas outdoors). Asthmatics will find that their "reliever inhaler is likely to reverse the effects on the lung.
	8	
	9	
VERY HIGH		
	10	The effects on sensitive individuals described for "HIGH" levels of pollution may worsen.

Appendix 2 - Forecasting Zones and Agglomerations

CONTENTS

- 1 Table showing the Air Pollution Forecasting Zones and Agglomerations, together with populations (based on 1991 Census).
- 2 Map of Forecasting Zones and Agglomerations.

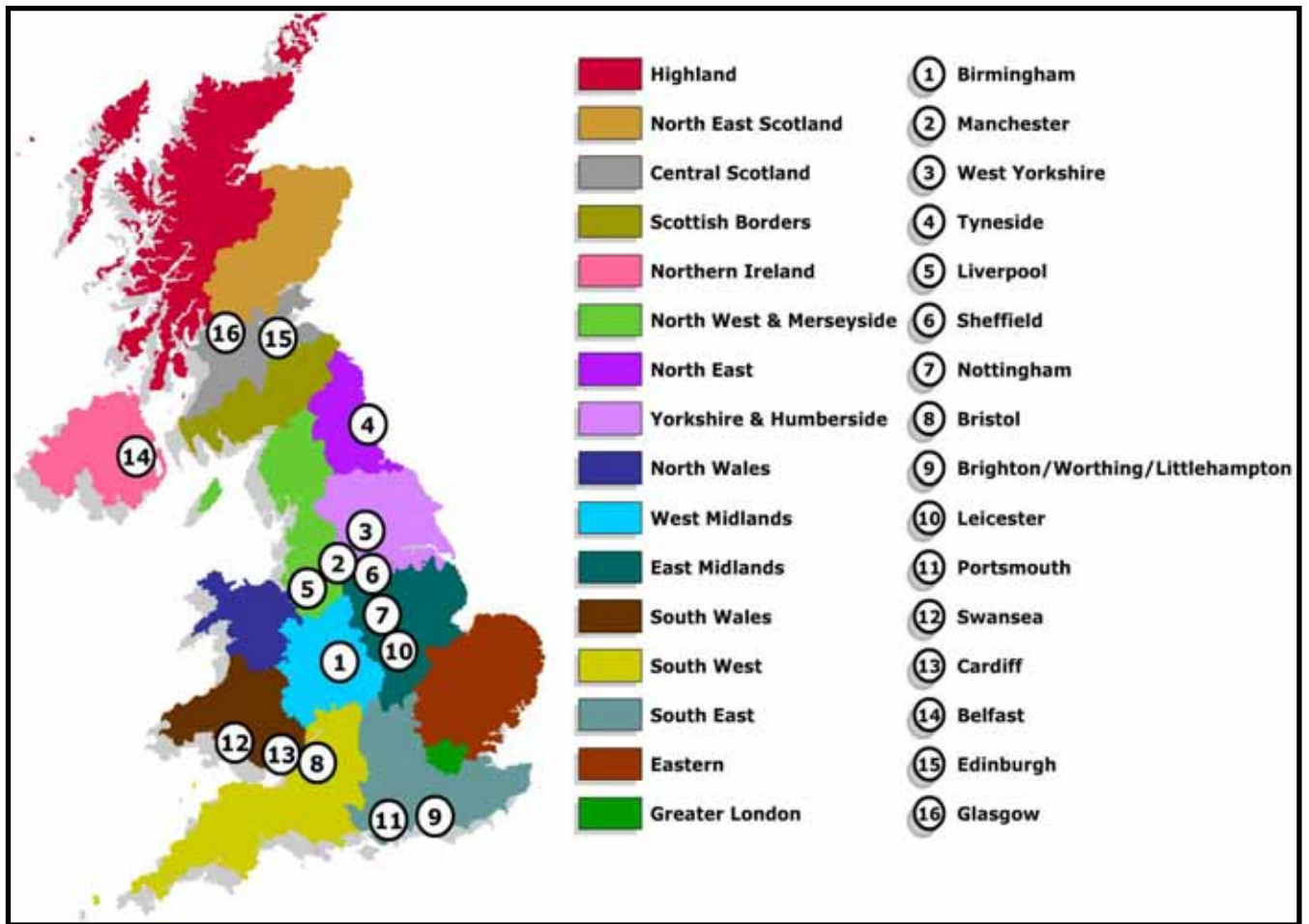
Forecasting Zones

Zone	Population
East Midlands	2923045
Eastern	4788766
Greater London	7650944
North East	1287979
North West and Merseyside	2823559
South East	3702634
South West	3728319
West Midlands	2154783
Yorkshire and Humberside	2446545
South Wales	1544120
North Wales	582488
Central Scotland	1628460
Highland	364639
North East Scotland	933485
Scottish Borders	246659
Northern Ireland	1101868

Forecasting Agglomerations

Agglomeration	Population
Brighton/Worthing/Littlehampton	437592
Bristol Urban Area	522784
Greater Manchester Urban Area	2277330
Leicester	416601
Liverpool Urban Area	837998
Nottingham Urban Area	613726
Portsmouth	409341
Sheffield Urban Area	633362
Tyneside	885981
West Midlands Urban Area	2296180
West Yorkshire Urban Area	1445981
Cardiff	306904
Swansea/Neath/Port Talbot	272456
Edinburgh Urban Area	416232
Glasgow Urban Area	1315544
Belfast	475987

Map of forecasting zones and agglomerations



Appendix 3 – Metropolis Workshop - Abstract

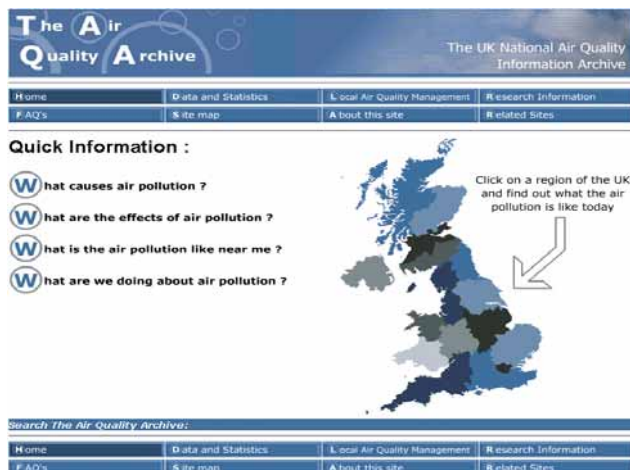
CONTENTS

- | | |
|---|--|
| 1 | Abstract of NETCEN's presentation in Metropolis Workshop – Ispra (3 rd and 4 th June 2004) |
|---|--|

Abstract

air quality e-information

UK NATIONAL AIR QUALITY INFORMATION SERVICE



The UK Government is committed to providing easy public access to advice on current and forecast levels of air pollution, information on the sources and effects of air pollution, and detailed past and current air quality data from national monitoring networks.

NETCEN, an operating division of AEA Technology plc, has established for the government an integrated information service comprising:

- bulletins for current air monitoring data and air quality forecasts, automatically generated every hour and distributed through TELETEXT, Freephone and e-mails;

Jaume Targa

AEA Technology plc
netcen
Culham Science Centre
Culham
Abingdon
OX14 3ED
UK
+44 (0) 870 190 6669 tel.
+44 (0) 870 190 6377 fax.

Jaume.targa@aeat.co.uk

- an internet site designed to provide information on air pollution relevant to different types of user, www.airquality.co.uk;
- a queryable on-line database containing historic and current air quality monitoring.

In providing this service, we are fully meeting the needs of a diverse range of users for air quality data and information. We have developed an innovative internet design and created automated IT systems with proven reliability, ensuring the UK's air quality information services are World-class.

