

Air Pollution in Northern Ireland

2008



A report for DoE
Northern Ireland

1 Introduction



This brochure is the seventh in a series of annual reports on air quality in Northern Ireland. Produced by AEA on behalf of the Department of Environment in Northern Ireland, it is intended to provide a summary of air quality monitoring carried out on behalf of Government and by District Councils during 2008.

Section 2 of this report reviews the continuing developments in air quality legislation and policy affecting Northern Ireland. Section 3 summarises the main national air quality monitoring programmes, together with locations of Northern Ireland's monitoring sites. In Section 4, we review long-term trends in air quality, followed by spatial patterns of pollution in Section 5. In Section 6, we take a closer look at levels of one particular group of pollutants: polycyclic aromatic hydrocarbons (PAH). Finally, for readers wanting to find out more, additional web-based and published sources of information on Northern Ireland's air quality issues are summarised in Section 7.

Air quality in Northern Ireland has improved substantially in recent years. In particular, levels of air pollutants associated with coal and oil combustion have declined significantly over the past decade. However, some pollutants in some parts of Northern Ireland continue to exceed air quality objectives. The 2007 review of the Air Quality Strategy reports that current average levels of man-made particulate pollution in the UK are estimated to reduce life expectancy by up to eight months. Continued effort to reduce air pollution is therefore important, together with monitoring to assess progress and to provide sound, science-based input to policy development.

2 Legislation and policy



The management of air quality is based on a series of statutory measures and policy programmes originating from Europe, the UK and Northern Ireland. Together, these form the basis of a strong framework for managing air quality in Northern Ireland over the coming years.

2.1 The European Union Process

Much of the foundation for managing air quality in Northern Ireland can be traced back to the objectives and provisions contained within a series of Air Quality Directives adopted by all Member States of the European Union. June 2008 saw the adoption of a new European Air Quality Directive (Directive 2008/50/EC) on ambient air quality and cleaner air for Europe. This has:

- ▶ Combined and streamlined several pre-existing Directives and Decisions.
- ▶ Confirmed many of the existing Directives' obligations, but introduced some flexibility in meeting those obligations under some circumstances.
- ▶ Introduced provision for identifying and discounting the contribution to air pollution from natural sources – for example natural wind-blown dusts – when determining compliance with Limit Values.
- ▶ Clarified guidance on where to assess air quality, so that the focus is on areas where members of the public could be exposed.
- ▶ Introduced controls on fine particulate, measured as PM_{2.5}, in the light of clear scientific evidence that fine particles are hazardous to health.
- ▶ Introduced an "exposure reduction" approach, aimed at improving air quality in areas where the greatest numbers of people are exposed, not just in areas that exceed a Limit Value.

Member States must transpose the new Directive's requirements into their own legislation by June 2010.

2.2 The Air Quality Strategy for England, Scotland, Wales and Northern Ireland

The Air Quality Strategy for England, Scotland, Wales and Northern Ireland, first published in 1997, establishes a strong framework for tackling air pollution. It was established on the basis of strong scientific evidence and a science-based understanding of the effects of air pollutants on health and the environment (Figure 1).

The Strategy sets objectives for a series of pollutants to be met within the UK. The scientific basis, the objectives set and provisions contained within the Strategy are closely associated with the corresponding standards set within European Air Quality Directives, as described above. However, provisions and corresponding objectives for some pollutants differ from those in the Air Quality Directives; these differences relate to scientific evidence and expert opinion that is specific to the UK situation.

A major revision of the Strategy was published in July 2007, which includes new objectives for PM_{2.5} to protect human health, and for ozone to protect ecosystems. The full revised Air Quality Strategy and associated technical annexes can be accessed at <http://www.defra.gov.uk/environment/airquality/strategy/index.htm>. The Department of the Environment in Northern Ireland has also now published its own Air Quality Standards Regulations (Northern Ireland) 2007, which came into operation on 28th May 2007.

2.3 Local Air Quality Management

Local Air Quality Management (LAQM) provides the strong framework within which air quality is managed by District Councils in Northern Ireland. LAQM requires District Councils to review and assess a range of air pollutants against the objectives set out within the Air Quality Strategy, using a range of monitoring, modelling, observations and corresponding analyses. For locations where objectives are not expected to be met by the relevant target date, District Councils are required to declare an Air Quality Management Area (AQMA), and develop an Action Plan to address the problem.

At the time of writing, eleven of Northern Ireland's 26 District Councils have Air Quality Management Areas in place. Of these, three declared AQMAs for PM₁₀ alone, two declared AQMAs for NO₂ and PM₁₀ together, six declared AQMAs for NO₂ only, and one for SO₂. Table 1 shows the locations of these AQMAs, and what pollutants they address.

Table 1: Current Air Quality Managements Areas in Northern Ireland

Council	Pollutant	Source	Date Declared	Number of AQMAs
Antrim	SO ₂	Domestic	31/10/04	1
Armagh	NO ₂	Roads	24/11/08	1
Ballymena	PM ₁₀	Domestic	1/11/04	2
Ballymoney	PM ₁₀	Domestic	1/08/05	1
Belfast	NO ₂ & PM ₁₀	Roads & Domestic	31/08/04	1
	NO ₂ only	Roads		3
Derry	NO ₂	Roads	21/02/05	1
Dungannon	NO ₂	Roads	14/01/08	1
Limavady	NO ₂	Roads	01/03/06	1
Newry & Mourne	NO ₂ & PM ₁₀	Roads	11/04/06	5
Newtownabbey	NO ₂	Roads	29/01/08	3
Strabane	PM ₁₀	Domestic	30/06/04	3

At the time of writing, eight Councils - Antrim, Ballymena, Ballymoney, Belfast, Derry, Limavady, Newry and Mourne and Strabane - have submitted Air Quality Action Plans to the Department, and a further three (Armagh, Dungannon and Newtownabbey) are in the process of preparing them.

Two Councils – Belfast City Council and Derry City Council - have had their Action Plans highlighted as examples of good practice, and these are available via the Air Quality Archive at www.airquality.co.uk/laqm/ap_goodpractice.php.

Derry's Action Plan is aimed at reducing NO₂ concentrations around the busy Creggan Road/Infirmary Road junction. The Action Plan sets out a number of traffic measures aimed at cutting emissions of nitrogen oxides, including –

- ▶ Restrictions on heavy duty vehicles on the road.
- ▶ Development of an Alternative Travel Plan aimed at residents in and around the AQMA.
- ▶ Establishing a Travelwise car-share scheme.

Traffic flow and air quality will be monitored in and around the AQMA, and the results used to evaluate the effectiveness of the measures.

Belfast's Action Plan contains a wide range of policy and other measures aimed at tackling NO₂ and PM₁₀ from traffic emissions, domestic fuel use and the burning of domestic and industrial waste. Their Action Plan is highlighted on the above web page as "A good example of quantifying the air quality benefits of actions and projecting when the national air quality objective is likely to be met".



Figure 1 The goal of all our legislation and policy - clean air for all

3 Networks and data



A wide range of air quality monitoring activities is carried out in Northern Ireland. Some monitoring sites are run as part of UK-wide monitoring networks; others are operated by District Councils in order to meet local objectives. The following pollutants were monitored in Northern Ireland during 2008:

- ▶ Carbon Monoxide (CO)
- ▶ Oxides of Nitrogen (NO_x) and Nitrogen Dioxide (NO₂)
- ▶ Sulphur Dioxide (SO₂)
- ▶ Particles (as PM₁₀ and PM_{2.5}, also using the older Black Smoke technique)
- ▶ Ozone
- ▶ Benzene
- ▶ Polycyclic Aromatic Hydrocarbons (PAH)

During 2008, there were 32 air quality monitoring stations in Northern Ireland, each equipped with continuous monitoring equipment for some or all of the above pollutants. The locations of the automatic monitoring sites are shown in Figure 2; they provide high-resolution hourly information on a wide range of pollutants. In the case of sites comprising the national network, this can be communicated rapidly to the public, together with warnings when levels approach or exceed the 'high' pollution band. A recently established roadside automatic monitoring site- Newtownabbey Antrim Road – is shown in Figure 3.

Northern Ireland's automatic sites are supplemented by a large number of non-automatic monitoring sites, which use less expensive techniques to provide additional information on air quality. The majority of these are diffusion tubes: low cost single-use samplers that absorb the pollutant directly from the air and need no power supply. These measure average concentrations over a specified sampling period (typically one month) instead of instantaneous concentrations, but still provide invaluable data for screening purposes, 'hot-spot' identification, local impact assessment and mapping overall levels of pollution across the country as a whole. The pollutants measured, site numbers and areas covered are summarised in Table 2.

Northern Ireland's first PM_{2.5} monitoring site became operational in October 2006, when Belfast Centre began monitoring PM_{2.5} particulate matter in addition to the PM₁₀ fraction.

3.1 Automatic Monitoring - key results for 2008

Here we summarise some of the results of Northern Ireland's air quality monitoring in 2008, including compliance with Air Quality Strategy Objectives. Further information is provided on the Northern Ireland Air Quality website at www.airqualityni.gov.uk.

Carbon monoxide was monitored using automatic techniques at one site - Belfast Centre. This site achieved the Air Quality Strategy (AQS) Objective for this pollutant.

Nitrogen dioxide was monitored using automatic techniques at 17 sites during 2008. Four roadside automatic sites failed to meet the AQS Objective for annual mean NO₂ concentration (40 µg m⁻³). These were Belfast Newtownards Road, Belfast Stockman's Lane, Newry Trevor Hill and Newtownabbey Antrim Road - all of which are close to busy roads. Of these four sites, two also recorded more than the 18 permitted exceedences of the AQS Objective for the hourly mean (200 µg m⁻³), and have therefore also failed to meet the 1-hour mean objective. These two sites were Belfast Stockman's Lane and Newtownabbey Antrim Road.

Sulphur dioxide was monitored at 14 automatic sites. All the AQS Objectives for SO₂ (15-minute, 1-hour and 24-hour mean) were met at all 14 sites. Year 2008 was the fifth consecutive year in which all the SO₂ objectives have been met - an indication of the progress that has been made in reducing ambient levels of this once highly problematical pollutant in Northern Ireland.



Figure 2 Automatic monitoring stations in Northern Ireland



Figure 3 Newtownabbey Antrim Road automatic monitoring station

Table 2 Summary of measurements made for the most important air pollutants

Pollutant	Major sources	Site numbers	Areas covered
Nitrogen Dioxide (NO ₂)	Road transport and industry	17 (Auto)	Mostly urban
Ozone (O ₃)	Produced when sunlight acts on transport & industrial emissions; also transboundary	3 (Auto)	Urban & rural
Particles (PM ₁₀ , 2.5)	Road transport, industry, construction, soil and natural sources	25 (Auto) 3 (Non-auto: black smoke)	Mostly urban and industrial
Sulphur dioxide (SO ₂)	Industry and fuel combustion	14 (Auto)	Mostly urban
Carbon Monoxide	Road transport	1 (Auto)	Urban
Benzene	Road transport, industry	2 pumped tubes	Urban
Polycyclic Aromatic Hydrocarbons (PAH)	Domestic fuels, industry, transport,	3 PAH	Urban, residential
Acid Deposition	Fuel burning, agricultural and other emissions	2 (Non-auto)	Rural

Particulate matter – PM₁₀ Particulate matter as PM₁₀ was monitored automatically at 25 locations in 2008. All sites met both the AQS Objective of 40 µg m⁻³ for the annual mean PM₁₀, and the AQS Objective of 50 µg m⁻³ for the 24-hour mean - which may be exceeded on up to 35 occasions per year. (Note: where Tapered Element Oscillating Microbalance analysers were used, data have been converted to gravimetric equivalent by applying the King's College London's Volatile Correction Model to correct for loss of volatile components, see www.volatile-correction-model.info/Default.aspx).

Particulate matter – PM_{2.5} Fine particulate matter as PM_{2.5} has been monitored at Belfast Centre since 2006: in February 2008, two further sites (Derry and Lisburn Dunmurry) began measuring this parameter. All three sites measured annual mean PM_{2.5} concentrations in the range 13–14 µg m⁻³: these are well within the objective of 25 µg m⁻³ to be achieved by 2020. However, the sites must also meet an exposure reduction target of 20%, between 2010 and 2020.

Ozone was monitored using automatic analysers at Belfast Centre, Derry and Lough Navar (rural). One site (Derry) recorded 16 days on which the maximum daily 8-hour running mean exceeded the AQS Objective of 100 µg m⁻³. This site therefore exceeded the AQS objective on more than the permitted 10 days. Ozone (O₃) is a secondary pollutant that is formed by reactions involving other pollutant gases, in the presence of sunlight, and over several hours. Once formed, it may persist for several days and be transported over long distances. This means that District Councils have little control over levels in their area.

Unlike some other pollutants, levels of ozone in Northern Ireland do not appear to be decreasing, but remain variable from year to year, depending substantially on weather conditions. Ozone exceedences – such as that which occurred in 2008 - therefore remain a possibility in future.

3.2 Non-Automatic Monitoring in 2008

Sampler-based pollution monitoring can provide a cost-effective way of determining overall pollution levels over large areas. The most widely used of these techniques is passive sampling, using diffusion tubes. The main programmes of sampler-based monitoring in Northern Ireland are as follows:

1) Diffusion tubes

These typically measure monthly concentrations of nitrogen dioxide (NO₂). Diffusion tubes are easy to use and relatively inexpensive, so they can be deployed in large numbers over a wide area, giving good spatial coverage. They may also be used to complement detailed measurements made at automatic monitoring sites, or in circumstances where hourly measurements from automatic analysers are not required.

NO₂ diffusion tubes are widely used by the District Councils for the purpose of Local Air Quality Management (LAQM). Although the majority of Northern Ireland's diffusion tube sites (over 200 of them) monitor NO₂, a smaller number also provide indicative monitoring of ozone, sulphur dioxide and benzene. These supplement the automatic monitoring.

2) Black smoke monitoring

In the years before automatic PM₁₀ monitoring became widespread, particulate pollution was often measured as "black smoke". This parameter is still measured by a small network of 21 sites (operated by the National Physical Laboratory) of which three are in Northern Ireland – at Belfast Centre, Strabane and Lisburn Dunmurry. The old-style samplers in this network are being replaced by automatic Black Carbon analysers; all three Northern Ireland sites were replaced in October 2008. The third annual report¹ for this new UK Black Smoke Network, covering 2008, is available on the UK Air Quality Archive at: www.airquality.co.uk/reports/cat05/0909161044_AS37_Black_Smoke_2008_Annual_Report.pdf

This report highlights a significant downward trend in black smoke between 2003 and 2008 at Strabane: this is attributed to the installation of oil fired central heating in the surrounding housing estate, from 2003 onwards, replacing domestic coal use.

The new automatic Black Carbon analysers in use from October 2008 allow hourly monitoring, and thus permit analysis of diurnal patterns. Both Strabane and Dunmurry (though not Belfast) showed peaks in Black Carbon from 1500 – 2300 hours: this is attributed to fuels used for domestic heating.

3) Hydrocarbons

Benzene was monitored at one site: Belfast Centre – which met the AQS Objective in 2008.

1,3-Butadiene is no longer measured, as long-term monitoring at Belfast Centre and Belfast Newtownards Road had established that levels were well below the AQS Objective.

Polycyclic aromatic hydrocarbons (PAH) were monitored at three sites in 2008: Ballymena Ballykeel, Derry Brandywell and Lisburn Dunmurry. None of these three sites met the 2010 AQS Objective for the PAH species benzo[a]pyrene – this is discussed in more detail in Section 6.

3.3 Summary

Northern Ireland's air quality continues to improve. Results from Northern Ireland's network of air quality monitoring stations show that the Air Quality Strategy Objectives for the following pollutants have been met by the due dates –

- ▶ Carbon monoxide
- ▶ PM₁₀
- ▶ Benzene
- ▶ 1,3-Butadiene
- ▶ Sulphur dioxide

Non-automatic monitoring in previous years also established that ambient concentrations of lead were well within the AQS Objective.

However, there remain a small number of sites close to busy roads in the Belfast conurbation and in Newry that do not meet AQS Objectives for nitrogen dioxide. Benzo[a]pyrene concentrations at Lisburn Dunmurry, Derry Brandywell and Ballymena Ballykeel were also above the AQS Objective for 2010. Occasional ozone exceedences (such as that which occurred at Derry in 2008) remain a possibility.

¹ D Butterfield, S Beccaceci, P Hughey, D Green, J Alexander "2008 Annual Report for the UK Black Smoke Network" NPL Report AS 37, National Physical Laboratory Queens Road, Teddington, Middlesex TW11 0LW, ISSN 1754-2928. Available on the Air Quality Archive at http://www.airquality.co.uk/reports/cat05/0909161044_AS37_Black_Smoke_2008_Annual_Report.pdf
Accessed 6th Nov 2009.

4 Air quality trends



Recent years have seen a marked improvement in Northern Ireland's overall air quality. In particular, levels of pollutants such as SO₂, associated with coal and oil combustion, have declined significantly over the past decade. Here we examine how overall air pollution levels in Northern Ireland have changed over the last 20 years.

In 1999, a first air quality 'headline' indicator was introduced in support of the UK Sustainable Development Strategy. This original 'headline' indicator included the average number of days at which air pollution reached the 'moderate' level or higher. However, this indicator has proved to be of limited use when analysing trends in Northern Ireland, as it is affected by changes in monitoring site numbers and there have been substantial increases in the number of sites in recent years.

In 2005, a new indicator was introduced, as graphed in Figure 4: trends for annual exposure to particles and ozone. These trends are important, because there is considerable evidence suggesting long-term exposure to even low levels of particles may have a significant effect on public health. Figure 4 shows annual mean concentrations of PM₁₀ (for all roadside and urban background sites) and ozone (for all sites, rural and urban locations) in Northern Ireland during the period 1990 to 2008.

This figure demonstrates that there has been a general reduction in urban background PM₁₀ concentrations since 1987. For roadside sites, this parameter can only be calculated from 2001 onwards, due to the lack of roadside PM₁₀ sites before that year. This indicator appears to show an overall decreasing trend from 2001 to 2008. By contrast, mean ozone concentrations in Northern Ireland do not appear to show any clear overall trend over the same period, although there is distinct year-to-year fluctuation. This is consistent with UK-wide observations, together with our understanding that this metric is markedly dependent on summer temperatures and weather conditions.

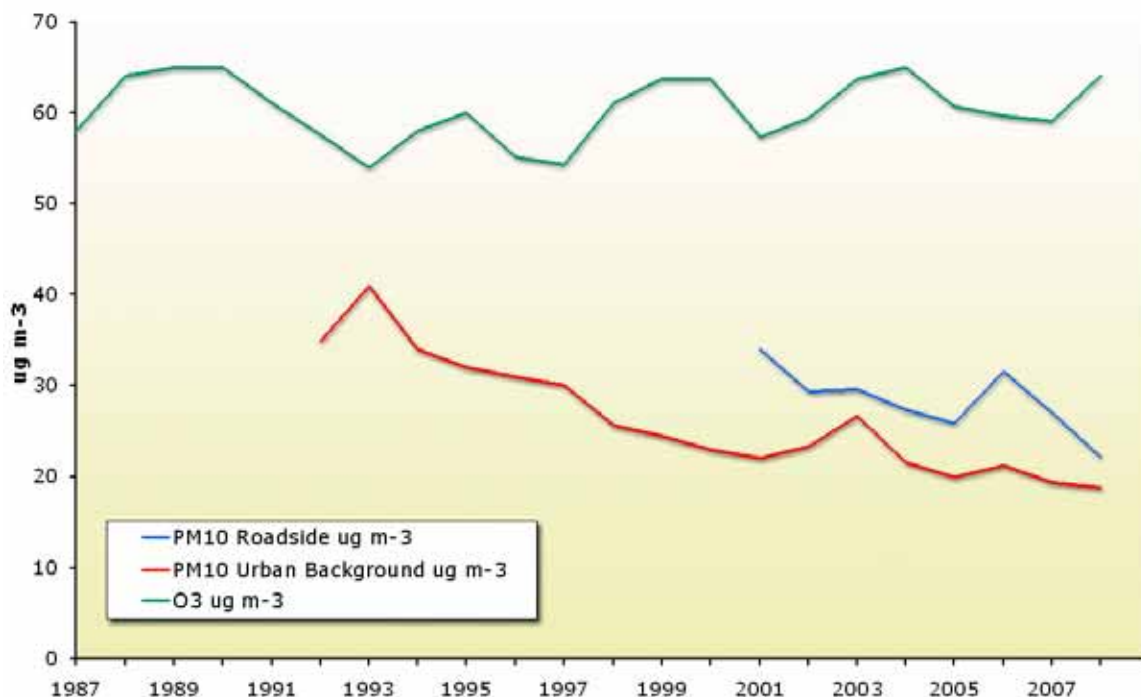


Figure 4 New Headline Air Quality Indicator: gravimetric PM₁₀ annual means at urban background and roadside sites, plus ozone mean maximum 8-hr running means at all sites: 1987 - 2008.

Figure 5 shows annual mean concentrations of nitrogen dioxide (NO₂) concentrations at roadside and urban background sites. This graph shows a long-term decline in

concentrations of this pollutant in urban areas of Northern Ireland. Please note, however, that data prior to 1998 should be treated with caution due to the small number of monitoring locations.

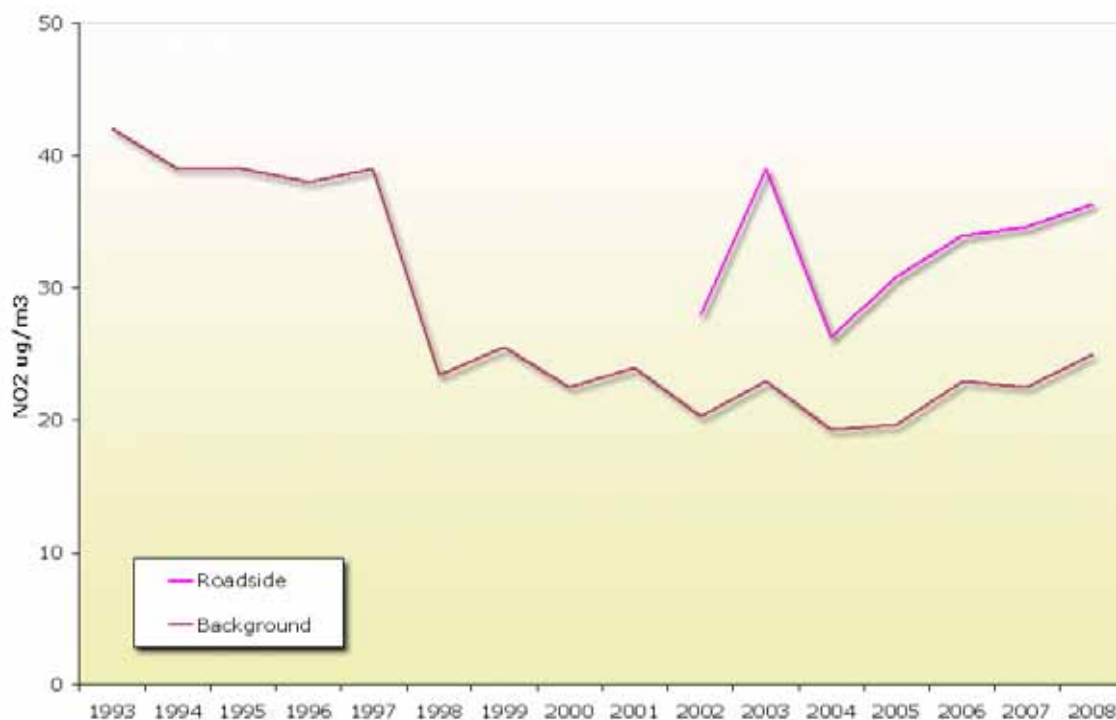


Figure 5 Annual mean NO₂ concentration, urban background and roadside sites in Northern Ireland, 1993 - 2008.

5 Maps of Air Quality



Measurements from air quality monitoring sites in Northern Ireland have been combined with pollutant emissions data from the UK's National Atmospheric Emissions Inventory (NAEI) to produce detailed maps - at 1km resolution - of average or peak background pollutant concentrations across the country for 2008.

Figure 6.1 shows peak (99.9th percentile) 15-minute average concentrations of sulphur dioxide (SO₂). The main sources of this pollutant are industrial and domestic fuel burning - particularly coal and oil. While peak concentrations are very low over most of Northern Ireland, there are 'clusters' of elevated peak SO₂ concentration around Belfast, Derry and the Craigavon and Portadown area south of Lough Neagh. There are also isolated hot spots of higher concentration throughout the rest of the region, possibly due to small pockets of high domestic coal or oil use in small towns.

Figure 6.2 shows corresponding annual mean PM₁₀ concentration. Highest concentrations occur in the Belfast valley, in the area around Belfast and Dunmurry. However, annual mean background concentrations throughout most of the region are well below the Air Quality Strategy Objective.

Like the other pollutants represented in these maps, estimated background NO₂ concentrations modelled for Northern Ireland in 2008 (Figure 6.3) are low. The highest concentrations are limited to Belfast, although Derry and Newry can also be seen as areas of marginally elevated concentrations. Also visible are the major roads connecting Northern Ireland's cities. Figure 6.4 examines in greater spatial resolution NO₂ concentrations in and around Belfast: this clearly shows the impacts of road vehicle emissions on modeled NO₂ concentrations.

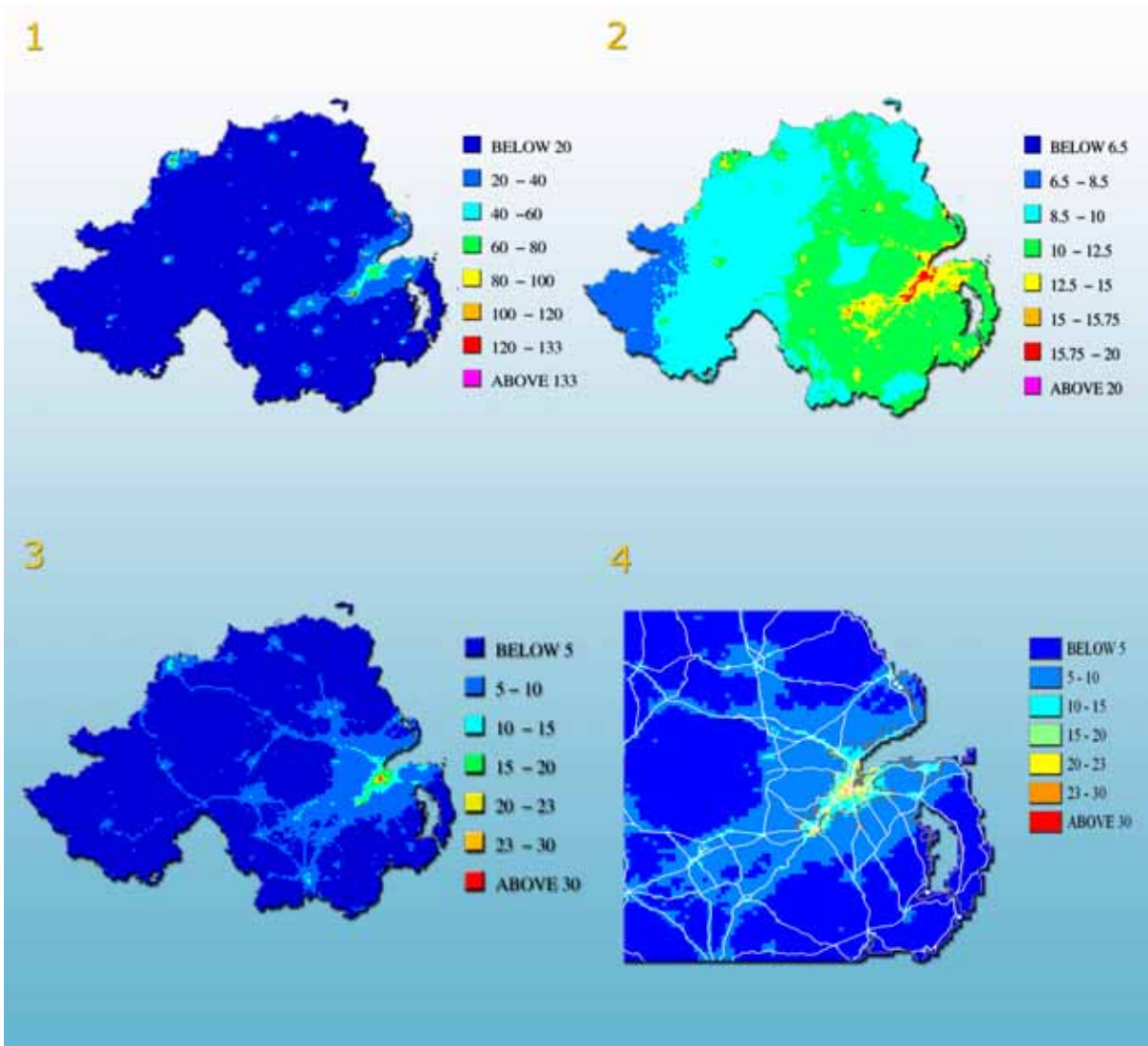


Figure 6.1 Estimated 99.9th percentile of 15-minute mean SO₂ $\mu\text{g m}^{-3}$
 Figure 6.2 Estimated annual mean PM₁₀ $\mu\text{g m}^{-3}$
 Figure 6.3 Estimated annual mean NO₂ $\mu\text{g m}^{-3}$
 Figure 6.4 Estimated annual mean NO₂ $\mu\text{g m}^{-3}$ in the Belfast area

6 Polycyclic Aromatic Hydrocarbons



Northern Ireland's air quality monitoring also covers polycyclic aromatic hydrocarbons (PAH). These are organic compounds containing carbon and hydrogen only, composed of two or more fused benzene rings in linear, cluster or angular arrangements. One such compound, benzo[a]pyrene - B[a]P - is often used as a marker for the carcinogenic risk of PAH in ambient air.

Major sources of PAH include vehicle emissions, industrial combustion processes and domestic solid fuel combustion. The latter is of particular significance in parts of Northern Ireland where domestic solid fuel heating is still common.

Health effects are thought to result from cumulative long-term exposure, so the averaging period for assessing inhalation exposure is the calendar year annual mean. An EC Target Value of 1 ng m^{-3} for the annual mean has been set for B[a]P, to be achieved from 2012. There is also a more stringent UK AQS Objective of 0.25 ng m^{-3} (again, measured as a calendar year annual mean) to be achieved by 2010.

A suite of PAH compounds has been monitored at Lisburn Dunmurry from 1999 onwards. In late 2006, PAH monitoring commenced at Derry Brandywell, followed at the end of 2007 by a further PAH monitoring site at Ballymena Ballykeel (Figure 7). These sites were installed as part of the expansion of the PAH Monitoring Network. The sampling method was also changed; the existing samplers were replaced with new Digitel DHA-80 samplers, which measure the PM_{10} particulate fraction. The averaging period was also changed from quarterly to monthly at the beginning of 2008.

Annual mean B[a]P concentrations for 2008 at Ballymena Ballykeel, Derry Brandywell and Lisburn Dunmurry were 2.5 ng m^{-3} , 1.3 ng m^{-3} and 0.75 ng m^{-3} respectively. All three sites therefore exceeded the AQS Objective of 0.25 ng m^{-3} ; Ballymena Ballykeel and Derry Brandywell also exceeded the less stringent EC Target Value of 1 ng m^{-3} .

Figure 8 shows annual mean B[a]P concentrations for these three sites, and compares these with selected examples of other site types, in the PAH Network; not all sites are shown, however, for reasons of space.

The three Northern Ireland sites, although located in primarily residential areas, measured annual mean B[a]P concentrations comparable to those at sites in industrial areas such as Scunthorpe, Middlesbrough and Port Talbot. B[a]P concentrations at the three Northern Ireland sites were higher than those in urban centres such as Birmingham and Newcastle.

The relatively high B[a]P concentrations at these three Northern Ireland sites are thought to be due to widespread domestic combustion of coal, other solid fuels and oil in their immediate vicinity. It should be noted that high B[a]P concentrations do not occur throughout all of Northern Ireland: PAH was measured at Belfast Clara Street from 2001 to 2006: this site was located in a Smoke Control area, where there was less solid fuel burning. By 2006, Belfast Clara Street was recording similar B[a]P concentrations to sites in other large cities, hence the decision to relocate the monitoring site to Derry Brandywell.

Figure 9 shows monthly mean B[a]P concentrations measured at the three sites in Northern Ireland over the year. This clearly illustrates the strong seasonal pattern in PAH concentrations, with high winter concentrations likely to be resulting from the increased use of domestic solid fuels during winter.



Figure 7 PAH monitoring site at Ballymena Ballykeel

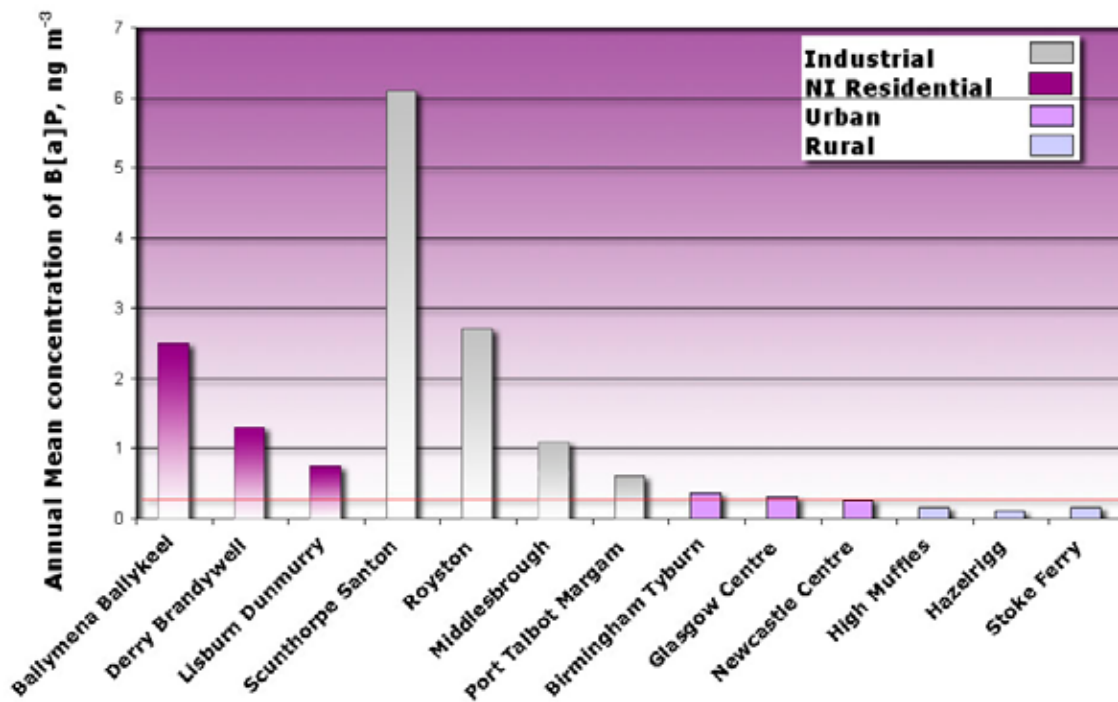


Figure 8 2008 Annual Mean benzo[a]pyrene concentrations at sites in Northern Ireland and selected sites elsewhere (dotted red line shows AQS Objective of 0.25 ng m⁻³; the darker bars show Northern Ireland sites)

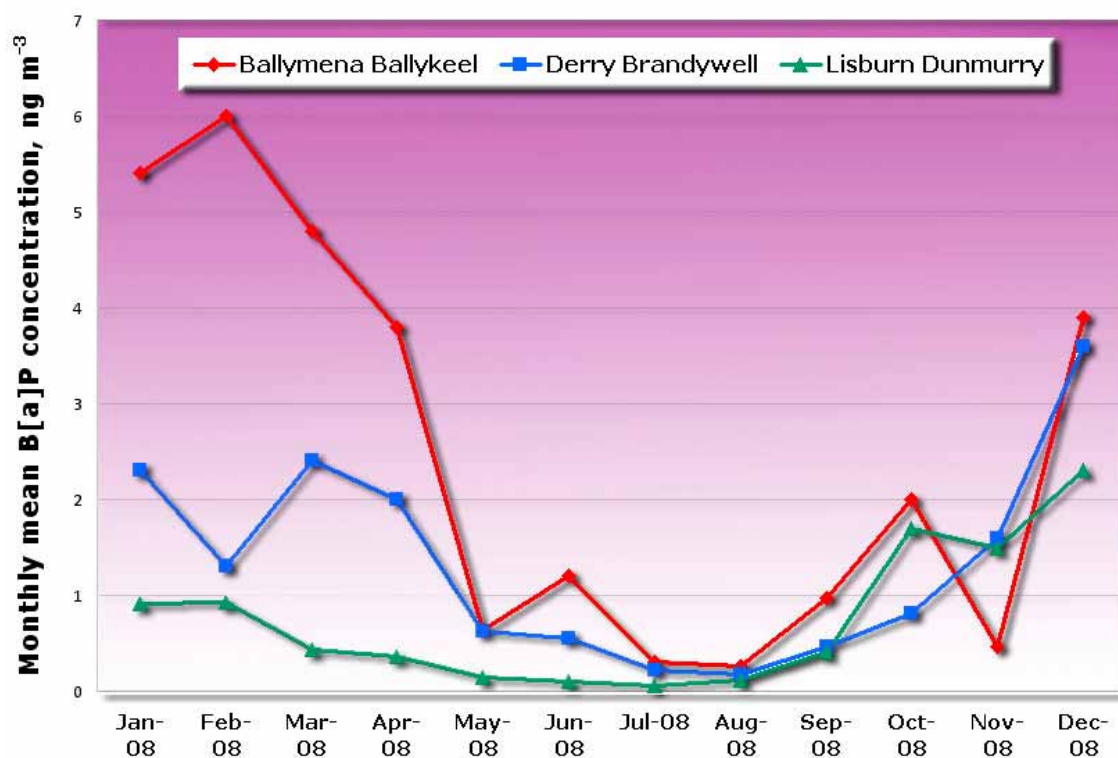


Figure 9 Monthly Mean benzo[a]pyrene concentrations at Ballymena Ballykeel, Derry Brandywell and Lisburn Dunmurry.

7 More information



1) The Northern Ireland Air Quality Website

The air quality website, 'Northern Ireland Air' at www.airqualityni.co.uk provides a 'one stop shop' resource for information covering all aspects of air pollution in Northern Ireland. The site, funded by the Department of Environment in Northern Ireland, provides information on:

- ▶ Latest up-to-date air quality levels across Northern Ireland
- ▶ Reports and analysis of trends and historical data
- ▶ Information on both national air quality policy and the work of Northern Ireland's District Councils
- ▶ Descriptions of what causes air pollution, how it is measured, and relevant health, amenity and ecosystem impacts

Recently upgraded, a new feature of the site is an interactive map showing where Northern Ireland's automatic monitoring stations are located. By clicking on the map, users can view details of each monitoring site and current levels of the pollutants monitored. An 'Air Pollution Index' is used to provide a simple indication of current pollution levels (Figure 10).



Figure 10 The Northern Ireland Air Quality website – showing the interactive map on its home page

The newly upgraded website also incorporates an advanced Google Earth™ mapping feature, which allows users to "zoom in" on a site location, using both satellite photos or maps. Figure 11 shows the location of the Carrickfergus Rosebrook Avenue site displayed using this advanced functionality.

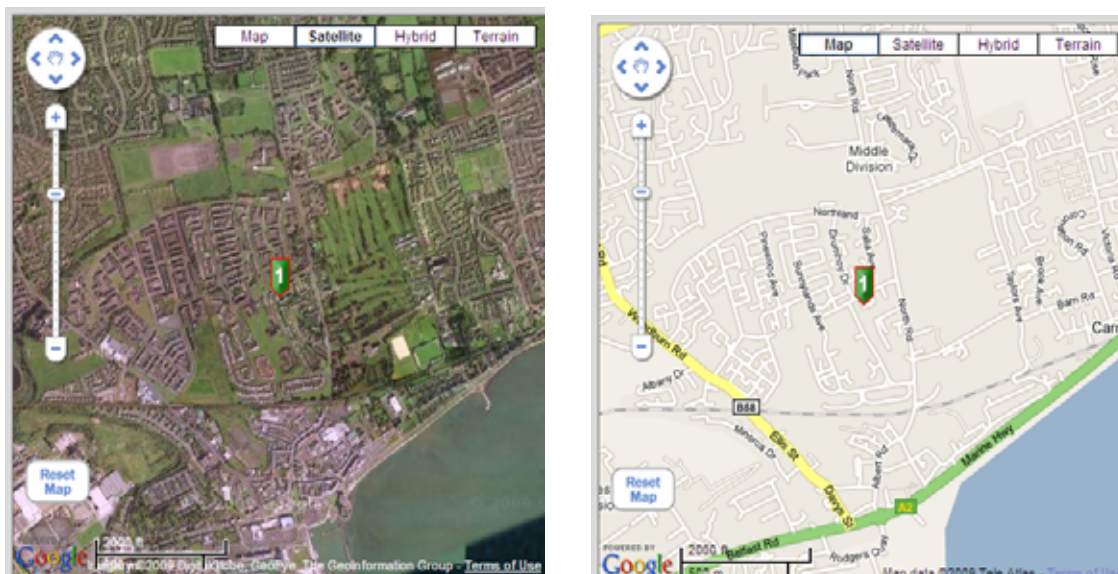


Figure 11 Advanced Google Earth mapping facility on Northern Ireland's upgraded Air Quality website.

2) Current and forecast air quality (national and local)

In addition to the Northern Ireland Air Quality website, this information is also readily available from:

- ▶ Teletext page 156
- ▶ The Air Pollution Information Service on freephone 0800 556677
- ▶ The UK Air Quality Archive on www.airquality.co.uk

3) General information on Air Quality

- ▶ The DoENI website at <http://www.doeni.gov.uk/>
- ▶ The Northern Ireland Environment Agency website at <http://www.ni-environment.gov.uk/>
- ▶ The UK Air Quality Information Archive on www.airquality.co.uk
- ▶ The National Atmospheric Emissions Inventory on www.naei.org.uk
- ▶ The Defra air quality information web resource on <http://www.defra.gov.uk/environment/index.htm>
- ▶ The Northern Ireland Air Quality website at: www.airqualityni.co.uk

4) Local Air Quality Issues

For further information on air quality issues in your area, please contact the Environmental Health Department at your local District Council office. Further information on Local Air Quality Management may also be found at:

<http://www.defra.gov.uk/environment/index.htm>
www.airquality.co.uk/archive/laqm/laqm.php and the Local Authority support site at:
<http://www.laqmsupport.org.uk>.

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