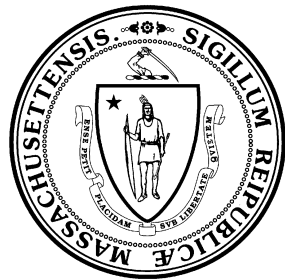


Commonwealth of Massachusetts 2007 Air Quality Report



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Bureau of Waste Prevention
Division of Planning and Evaluation

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List of Abbreviations

AAB	Air Assessment Branch
AQS	Air Quality System
AQI	Air Quality Index
BAM	Beta Attenuation Monitor
BP	Barometric Pressure
CAA	Clean Air Act
CFR	Code of Federal Regulations
CO	Carbon Monoxide
CO ₂	Carbon Dioxide
DVMT	Daily Vehicle Miles Traveled
EOEEA	Executive Office of Energy and Environmental Affairs
FEM	Federal Equivalent Method
FRM	Federal Reference Method
IMPROVE	Interagency Monitoring of Protected Visual Environments
MassDEP	Massachusetts Department of Environmental Protection
NAAQS	National Ambient Air Quality Standards (for criteria pollutants)
NADP	National Atmospheric Deposition Program
NAMS	National Air Monitoring Stations
NATTS	National Air Toxics Trends Station
NESCAUM	Northeast States for Coordinated Air Use Management
NOAA	National Oceanic and Atmospheric Administration
NO	Nitric Oxide
NO _x	Nitrogen Oxides
NO _y	Total Reactive Oxidized Nitrogen
NO ₂	Nitrogen Dioxide
NO ₃	Nitrate
NPN	NOAA Profiler Network
O ₃	Ozone
PAMS	Photochemical Assessment Monitoring Stations
Pb	Lead
PEI	Periodic Emissions Inventory
pH	Concentration of hydrogen cations (H ⁺) in solution (an indicator of acidity)
ppb	parts per billion by volume
ppm	parts per million by volume
PM _{2.5}	Particulate matter ≤ 2.5 microns aerodynamic diameter
PM ₁₀	Particulate matter ≤ 10 microns aerodynamic diameter
PQAO	Primary Quality Assurance Organization
PSI	Pollutant Standards Index
QA/QC	Quality Assurance and Quality Control
RH	Relative Humidity
SIP	State Implementation Plan
SLAMS	State and Local Air Monitoring Stations
SO ₂	Sulfur Dioxide
SO ₄	Sulfate
Solar Rad.	Solar Radiation
TSP	Total Suspended Particulates
ug/m ³	micrograms per cubic meter
USEPA	United States Environmental Protection Agency
VOCs	Volatile Organic Compounds
WS/WD	Wind Speed/Wind Direction

Section I

Ambient Air Monitoring Program

Program Overview

Introduction

The Massachusetts Department of Environmental Protection (MassDEP) is the state agency responsible for monitoring outdoor air quality in Massachusetts and developing regulatory programs to reduce emissions of pollutants that adversely affect public health, welfare, and the environment.

MassDEP's Air Assessment Branch (AAB) operates an extensive network of air monitoring stations throughout the Commonwealth. During 2007, MassDEP operated a network of 28 monitoring stations located in 20 cities and towns, and oversaw the operation of a four-station source-oriented industrial network in the Boston area which is privately funded and run by an environmental consultant. MassDEP also received data from the Wampanoag Tribe of Gay Head (Aquinnah), which began operating an ozone monitor in 2003 on Martha's Vineyard. The tribal air quality data is listed at www.epa.gov/ne/aqi/.

MassDEP submits all ambient air quality data to the national Air Quality System (AQS) database that is administered by the U.S. Environmental Protection Agency (USEPA).

Why is Air Quality Data Collected?

Ambient air quality data is used for a number of purposes, including:

- to verify compliance with National Ambient Air Quality Standards;
- to support development of policies and regulations designed to reduce ambient air pollution;
- to assess the effectiveness of existing air pollution control strategies;
- to provide information about air quality to the public;
- to support long-term trend analysis and special research; and
- to fulfill USEPA reporting requirements for ambient air quality data.

What is Monitored?

MassDEP monitors parameters in the following categories:

Criteria pollutants are subject to National Ambient Air Quality Standards (NAAQS). The criteria pollutants monitored are:

- sulfur dioxide (SO₂)
- ozone (O₃)
- carbon monoxide (CO)
- nitrogen dioxide (NO₂)
- lead (Pb)
- particulate matter ≤10 microns (PM₁₀)
- particulate matter ≤ 2.5 microns (PM_{2.5})

Non-criteria pollutants have no established National Ambient Air Quality Standards; however, some of these pollutants are subject to emissions limits in facility permits issued by MassDEP.

The non-criteria pollutants monitored are:

- nitric oxide (NO)
- total nitrogen oxides (NO_x)
- total reactive oxidized nitrogen (NO_y)
- total suspended particulates (TSP)
- volatile organic compounds (VOCs) – ozone precursors and reaction product chemicals
- black carbon
- acid deposition – measured as pH and conductivity of precipitation
- toxics – health-relevant VOCs, aldehydes and metals

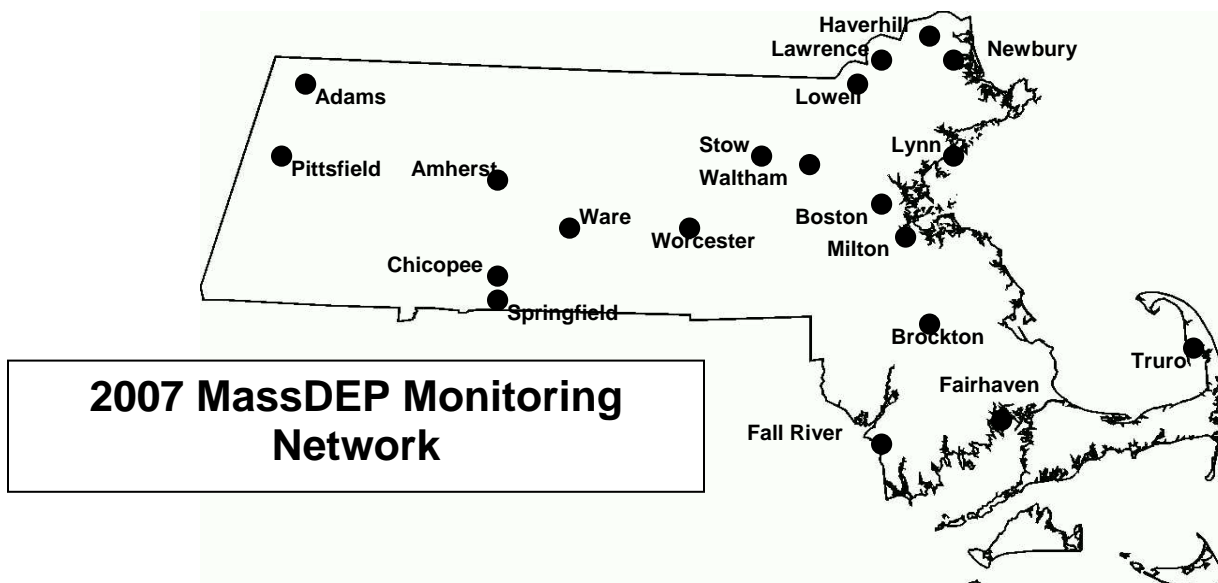
Meteorological parameters monitored are:

- wind speed/wind direction (WS/WD)
- relative humidity (RH)
- temperature (TEMP)
- barometric pressure (BP)
- solar radiation (Solar Rad)
- upper air wind and temperature (Profiler)
- total B band ultraviolet radiation (UVB)
- precipitation (PRECIP)

Monitoring Station Locations

Monitoring stations are sited to provide data for various purposes. Some are located in “hot spots” where maximum pollutant concentrations are expected, while others are located in areas that will provide data that is representative of larger geographic areas. Local topography and the location of pollutant sources are factors that determine how well a particular monitor location will represent an area.

Networks of monitors are located throughout the state. These networks are designed to reflect pollutant concentrations for all of Massachusetts. Section III contains data summaries for each pollutant measured and maps showing the monitor locations for each network. Appendix A contains a list of the monitor locations. The map below shows Massachusetts cities and towns where air monitors were located during 2007.



For Further Information

For further information about this report, please contact MassDEP’s Air Assessment Branch. For information about general air quality topics, please contact MassDEP’s Bureau of Waste Prevention or visit MassDEP’s website at www.mass.gov/dep/air. You can also contact one of MassDEP’s Regional Offices. To find out what region you are in, go to www.mass.gov/dep/about/regional.htm. To view online air quality data for Massachusetts and other states, go to USEPA’s website at www.epa.gov/air/data.

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National Ambient Air Quality Standards

Primary Standards – designed to protect public health against adverse health effects with a margin of safety.

Secondary Standards – designed to protect against damage to crops, vegetation, and buildings.

POLLUTANT	AVERAGING TIME*	PRIMARY	SECONDARY
SO ₂	Annual Arithmetic Mean	0.03 ppm (80 ug/m ³)	None
	24-Hour	0.14 ppm (365 ug/m ³)	None
	3-Hour	None	0.50 ppm (1300 ug/m ³)
CO	8-Hour	9 ppm (10 mg/m ³)	Same as Primary Standard
	1-Hour	35 ppm (40 mg/m ³)	Same as Primary Standard
O ₃ **	8-Hour	0.08 ppm (157 ug/m ³)	Same as Primary Standard
<ul style="list-style-type: none"> The 8-hour standard is met when the 3-year average of the 4th-highest daily maximum 8-hour average does not exceed 0.08 ppm at any one monitor. 			
Pb***	Calendar Quarter Arithmetic Mean	1.5 ug/m ³	Same as Primary Standard
NO ₂	Annual Arithmetic Mean	0.053 ppm (100 g/m ³)	Same as Primary Standard
PM _{2.5} Particulates up to 2.5 microns in size	Annual Arithmetic Mean	15.0 ug/m ³	Same as Primary Standard
	24-Hour	35 ug/m ³	Same as Primary Standard
<ul style="list-style-type: none"> The annual standard is met when the annual average of the quarterly mean PM_{2.5} concentrations is less than or equal to 15 ug/m³ (3-year average). If spatial averaging is used, the annual average from all monitors within the area may be averaged in the calculation of the 3-year mean. The 24-hour standard is met when the 98th percentile value is less than or equal to 35 ug/m³ (3-year average). 			
PM ₁₀ Particulates up to 10 microns in size	24-Hour	150 ug/m ³	Same as Primary Standard
<ul style="list-style-type: none"> The PM₁₀ standard is based upon estimated exceedance calculations described in 40 CFR Part 50, Appendix K. The 24-hour standard is attained if the estimated number of days per calendar year above 150 ug/m³ does not exceed one per year on average over 3 years. 			

µg/m³ = micrograms per cubic meter ppm = parts per million mg/m³ = milligrams per cubic meter

* Standards based on averaging times other than the annual arithmetic mean must not be exceeded more than once per year.

** On March 12, 2008 USEPA lowered the primary ozone standard to 0.075 ppm (from 0.08 ppm) and set the secondary standard identical to the primary standard.

*** On May 1, 2008 USEPA proposed revising the lead standard from 1.5 ug/m³ to within the range of 0.10 ug/m³ to 0.30 ug/m³, and setting the secondary standard identical to the primary standard. USEPA must issue final standards by October 15, 2008.

Pollutant Health Effects and Sources

Ozone (O₃)

- Ground-level O₃ and stratospheric O₃ are the same chemical compound but are often confused. Stratospheric O₃ at greater than 30,000 feet above the surface of the earth is beneficial because it filters out the sun's harmful ultraviolet radiation. However, ground-level O₃ is a health and environmental problem. This report pertains to ground-level O₃.
- O₃ is a respiratory irritant and can reduce lung function and cause asthma attacks, nasal congestion, and throat irritation, and reduce resistance to infection. It can inflame and damage (possibly permanently) cells that line the lungs, and aggravate chronic lung diseases. In addition, a number of studies have found a strong link between increases in ground-level O₃ and increased risk of premature death.
- O₃ is toxic to vegetation, inhibiting growth and causing leaf damage.
- O₃ deteriorates materials such as rubber and fabrics.
- Ground-level O₃ is unique in that it is formed by the reactions that occur between certain pollutants in the presence of intense, high-energy sunlight during the hot summer months. The complexity of the reactions and the amount of time needed to complete these reactions results in the buildup of ground-level ozone concentrations far downwind from the original source of the precursors.
- Sources of ground-level O₃ precursors, i.e., nitrogen oxides and hydrocarbons, include motor vehicles, power plants and other industrial sources.

Carbon Monoxide (CO)

- CO binds with hemoglobin in the blood, reducing the amount of oxygen carried to organs and tissues.
- Symptoms of high CO exposure include shortness of breath, chest pain, headaches, confusion, and loss of coordination. The health threat is most severe for those with cardiovascular disease.
- Motor vehicle emissions are the largest source of CO, which is produced from incomplete combustion of carbon in fuels.
- Industrial processes and non-transportation fuel combustion are also sources of CO.

Sulfur Dioxide (SO₂)

- SO₂ combines with water vapor to form acidic aerosols harmful to the respiratory tract, aggravating symptoms associated with lung diseases such as asthma and bronchitis.
- SO₂ is a primary contributor to acid deposition. Impacts of acid deposition include: acidification of lakes and streams, damage to vegetation, damage to materials, and diminution of visibility
- SO₂ is a product of fuel combustion (e.g., burning coal and oil). Sources include heat and power generation facilities, and petroleum refineries.

Nitrogen Dioxide (NO₂)

- NO₂ lowers resistance to respiratory infections and aggravates symptoms associated with asthma and bronchitis.
- NO₂ contributes to acid deposition (see SO₂ listing above for acid deposition effects).
- NO₂ and NO contribute to the formation of ozone.
- NO₂ is formed from the oxidation of nitric oxide (NO). Major sources of NO are fuel combustion, heating, power plants and motor vehicles.

Particulate Matter (PM₁₀ and PM_{2.5})

- Particulate matter is tiny airborne particles or aerosols, which include dust, dirt, soot, smoke, and liquid droplets. Fine particulate matter (mostly below 2.5 microns in size) are not only the result of direct emissions, but can be formed in the atmosphere by chemical reactions involving gaseous pollutants.
- The numbers 2.5 and 10 refer to the particle size, measured in microns, collected by the monitors. Several thousand PM_{2.5} particles could fit on the period at the end of this sentence.
- The small size of the particles allows entry into the human respiratory system. Long-term exposure allows the particles to accumulate in the lungs and affects breathing and produces respiratory symptoms. The small particles can migrate through the lungs and into the circulatory system and potentially produce cardio-vascular symptoms, as well as impacts from toxic components contained in the particles.
- Particulate matter causes soiling and corrosion of materials.
- Particulate matter contributes to atmospheric haze that degrades visibility.
- Sources include industrial process emissions, motor vehicles, incinerators, and power plants.

Lead (Pb)

- Lead is an elemental metal that is found in nature.
- Lead enters the atmosphere from the incineration of lead containing materials and from the manufacture and processing of lead containing products or materials like storage batteries, smelting and paint removal.
- Exposure to lead may occur by inhalation or ingestion with food, water, soil or dust particles.
- Children, infants, and fetuses are more susceptible to the effects of lead exposure.
- Lead causes mental retardation, brain damage, and liver disease. It may be a factor in high blood pressure and damages the nervous system.

Public and Industrial Network Descriptions

2007 Public Monitoring Network

MassDEP operates a public ambient air monitoring network.

Network Size

- 28 monitoring stations
- 20 cities and towns with monitoring stations

Number of Continuous Monitors

Continuous monitors measure air quality 24 hours per day. The data are reported as hourly means.

- Criteria pollutant monitors measure pollutants for which National Ambient Air Quality Standards (NAAQS) have been set.
 - 5 – CO (carbon monoxide)
 - 11 – NO₂ (nitrogen dioxide). NO (nitric oxide) and NO_x (total nitrogen oxides) also are measured by these monitors.
 - 14 – O₃ (ozone)
 - 6 – SO₂ (sulfur dioxide)
- Meteorological monitors track weather conditions.
 - 12 – BP (barometric pressure)
 - 12 – RH (relative humidity)
 - 12 – Solar Rad (solar radiation)
 - 13 – TEMP (temperature)
 - 12 – WS/WD (wind speed/wind direction)
 - 1 – Profiler (this monitor measures WS/WD and TEMP at various altitudes, which aids in the analysis of pollutant transport)
 - 2 – UVB (B Band Ultra-violet Radiation)
 - 2 – Precipitation
- Other Monitors
 - 2 – NO_y (Total Reactive Oxidized Nitrogen)
 - 6 – PAMS (Photochemical Assessment Monitoring Station). These monitors measure VOCs (volatile organic compounds).
 - 10 – PM_{2.5} BAM (particulate matter – 2.5 microns)
 - 3 – Black Carbon
 - 1 – Acid Deposition. Precipitation is collected and analyzed for conductivity and acidic compounds that are harmful to the environment. This monitor, located in Waltham, is part of the National Atmospheric Deposition Program (NADP). Two other monitors in Massachusetts are also part of the NADP. They are located in Truro and Ware and are not operated by MassDEP.

Number of Intermittent Monitors

Intermittent monitors take discrete samples for a specific time period. The samples are taken every day, every third day, or every sixth day. The data is averaged in 3-hour or 24-hour intervals.

- Criteria pollutant monitors measure pollutants that have National Ambient Air Quality Standards (NAAQS).
 - 1 – Pb (Lead)
 - 6 – PM₁₀ (particulate matter – 10 microns)
 - 15 – PM_{2.5} FRM (particulate matter – 2.5 microns)
- Non-criteria pollutant monitors measure pollutants that do not have NAAQS.
 - 6 – PAMS (photochemical assessment monitoring station). These monitors measure VOCs (volatile organic compounds).
 - 1 – TSP (total suspended particulates) used for lead analysis
 - 2 – Toxics. These monitors measure health-relevant VOCs.
 - 2 – Speciation. These monitors measure for PM_{2.5}, nitrates, and organics.
 - 1 – PM₁₀ (particles for toxic metals)

2007 Industrial Monitoring Network

Industries monitor air quality and submit data under agreement with MassDEP. The data must be collected using quality assurance requirements established by MassDEP and USEPA.

Network Size

- 4 monitoring stations
- All are located in the Boston area

Number of Continuous Monitors

Continuous monitors measure the air quality 24 hours per day. The data is averaged to provide 1-hour averages.

- Criteria pollutant monitors measure pollutants that have National Ambient Air Quality Standards (NAAQS).
 - 1 – NO₂ (nitrogen dioxide). NO (nitrogen oxide) and NO_x (total nitrogen oxides) also are measured by this monitor.
 - 4 – SO₂ (sulfur dioxide)
- Meteorological monitors
 - 4 – WS/WD (wind speed/wind direction)

Number of Intermittent Monitors

Intermittent monitors take discrete samples for a specific time period. These monitors sample every sixth day, and the data is averaged for a 24-hour interval.

- Other Monitors
 - 4 – TSP (total suspended particulates)
 - 4 – SO₄ (sulfate)

Section II

Attainment and Exceedances of Air Quality Standards

Attainment Status Summary

The Clean Air Act (CAA) established timeframes and milestones for states to meet and maintain National Ambient Air Quality Standards (NAAQS) for criteria pollutants. USEPA sets the NAAQS levels to protect public health and the environment. USEPA must review the NAAQS every five years and may update the standards based on new scientific information. Each state is required to monitor the ambient air to determine whether it meets each standard. If the air quality does not meet a standard, the state must develop and implement pollution control strategies to attain that standard. Once air quality meets a standard, a state must develop a plan to maintain that standard while accounting for future economic and emissions growth. Taken together, these plans and control strategies constitute the State Implementation Plan (SIP).

Ozone is the only pollutant for which Massachusetts monitors indicate violations of a NAAQS. Massachusetts is in attainment for the other criteria pollutants, including carbon monoxide, lead, nitrogen dioxide, sulfur dioxide, and particulate matter (including PM₁₀ and PM_{2.5}).

It should be noted that a new national strategy currently under development calls for the continued measurement of gaseous pollutants that already attain the standards, including sulfur dioxide, nitrogen dioxide and carbon monoxide. Under the new strategy, these gases will be measured in lower concentration ranges than in the past. This strategy will enable scientists to resolve trends more easily and obtain more meaningful data from monitors at rural locations.

Sulfur Dioxide, Nitrogen Dioxide, and Lead

Massachusetts has been in attainment for sulfur dioxide, nitrogen dioxide, and lead for a number of years based on decades of monitoring.

On May 1, 2008, USEPA proposed revising the lead standard from 1.5 ug/m³ to within the range of 0.10 ug/m³ to 0.30 ug/m³, and setting the secondary standard identical to the primary standard. The proposed revisions include corresponding modifications to both the method of collection and analysis. USEPA must issue final standards by October 15, 2008.

Carbon Monoxide

Prior to the mid-1980s, Massachusetts was in violation of the carbon monoxide (CO) standard. However, with the adoption of numerous control programs, CO emissions have significantly decreased. The last violation in the state of the CO NAAQS occurred in 1986. In 2000, MassDEP formally requested that the USEPA re-designate the cities of Lowell, Springfield, Waltham, and Worcester as attainment for CO since the CO monitoring data for those cities had been below the standard for many years. With the re-designation of these cities to CO attainment in April 2002, the entire state is now in attainment of the CO standard.

Particulate Matter

There are currently two sets of NAAQS particulate matter standards: PM₁₀ and PM_{2.5}. Massachusetts has been in attainment of the PM₁₀ standard for several years. PM_{2.5} standards were first established in 1997. In December 2004, USEPA designated Massachusetts “Attainment/Unclassifiable” for PM_{2.5} statewide based on monitoring data. In December 2006, USEPA revised the PM₁₀ and PM_{2.5} standards. USEPA retained the 24-hour PM₁₀ standard as is (at 150 ug/m³), and revoked the annual PM₁₀ standard. In addition, USEPA retained the annual PM_{2.5} standard as is (at 15 ug/m³) and lowered the 24-hour PM_{2.5} standard to 35 ug/m³ (from 65 ug/m³). Based on 2004-2006 monitoring data, in December 2007 Massachusetts submitted a recommendation to USEPA that the entire state be designated in attainment with the 2006 24-hour PM_{2.5} standard. USEPA will issue final designations by December 18, 2008.

Ozone

In 1997, USEPA set a new stricter ozone standard of 0.08 ppm averaged over an eight-hour period, but implementation was delayed due to legal challenges to the standard. USEPA designated Massachusetts as “moderate nonattainment” for the 8-hour standard effective June 15, 2004. The 1-hour standard was revoked on June 15, 2005. The 1-hour ozone standard (0.12 ppm averaged over one hour) had been in place for almost two decades. Massachusetts had been classified as “serious nonattainment” for the 1-hour ozone standard since the early 1990s. However, with the adoption of numerous control programs, Massachusetts has made significant progress in reducing the number and severity of 1-hour ozone exceedances. Mitigation programs that were put in place to attain the 1-hour standard will continue as part of MassDEP’s strategy to attain the new 8-hour standard. In January 2008 MassDEP submitted to USEPA an 8-hour Ozone SIP including strategies for attaining the 8-hour ozone standard by 2010.

On March 12, 2008 USEPA lowered the primary ozone standard to 0.075 ppm (from 0.08 ppm) and set the secondary standard identical to the primary standard. Massachusetts must make a recommendation to USEPA by March 2009 on whether the state is in attainment or nonattainment with the new standard.

Ozone Exceedances

What Determines an Exceedance?

An ozone exceedance occurs when monitored ozone concentrations exceed the National Ambient Air Quality Standards (NAAQS). Ozone is collected as an hourly average of continuous data and is then used to determine the 8-hour average value for the day. An exceedance of the 8-hour standard is an 8-hour averaged value that is equal to or greater than 0.085 ppm.

The Difference Between an Exceedance and a Violation

An ozone exceedance occurs when a monitor records ambient levels of ozone above a standard. A violation of an ozone standard (as opposed to an exceedance) is based on 3-year averages of data, so monitoring an exceedance does not necessarily mean that a violation of the standard has occurred.

Violations of the 8-hour standard are determined using the annual 4th-highest daily maximum 8-hour ozone value at each monitor. A violation requires a 3-year average of the annual 4th-highest daily maximum 8-hour value that is equal to or greater than 0.085 ppm. In other words, the 8-hour values for each day during a year for a specific monitor are ranked from highest to lowest. Then, the 4th-highest value for 3 consecutive years is averaged. If the 3-year average is 0.085 ppm or greater, a violation of the 8-hour standard has occurred at that specific monitoring site.

Ozone Exceedances and Violations During 2007

Exceedances

The Table below shows the 2007 ozone exceedances. There were 18 days when the 8-hour ozone standard was exceeded. There were 58 exceedances during those 18 days.

Violations

Violations of the ozone standard are based on 3-year averages. Using data from 2005–2007, three sites out of 14 violated the 8-hour standard. These sites were located in Chicopee, Ware and Milton at the Blue Hill Observatory.

2007 Ozone Exceedances (ppm)

DATE	SITE	8-HOUR MAX (ppm)	START HOUR	1-HOUR MAX (ppm) for the day
April 23, 2007	Worcester	.086	11	.090
May 25, 2007	Adams	.086	13	.089
May 25, 2007	Fairhaven	.086	16	.093
May 25, 2007	Lynn	.093	9	.099
May 25, 2007	Newbury	.086	9	.097
May 25, 2007	Stow	.086	10	.092
May 25, 2007	Truro	.093	14	.101
May 25, 2007	Worcester	.089	9	.093
May 25, 2007	Milton (Blue Hill)	.094	9	.101
May 25, 2007	Haverhill	.092	9	.100
June 2, 2007	Worcester	.086	13	.102
June 8, 2007	Adams	.093	16	.105
June 8, 2007	Chicopee	.085	11	.094
June 25, 2007	Worcester	.090	12	.113
June 26, 2007	Truro	.085	12	.094
June 26, 2007	Milton (Blue Hill)	.086	17	.102
June 27, 2007	Chicopee	.088	10	.121
June 27, 2007	Lynn	.088	10	.096
June 27, 2007	Stow	.085	13	.099
June 27, 2007	Ware	.086	11	.117
June 27, 2007	Worcester	.096	12	.119
June 27, 2007	Haverhill	.088	16	.106
July 9, 2007	Amherst	.091	14	.123
July 9, 2007	Chicopee	.112	13	.147
July 9, 2007	Ware	.109	16	.132
July 10, 2007	Amherst	.094	12	.115
July 10, 2007	Chicopee	.109	10	.134
July 10, 2007	Worcester	.088	11	.098
July 26, 2007	Chicopee	.089	11	.096
July 26, 2007	Lynn	.102	11	.117
July 26, 2007	Newbury	.094	11	.109
July 26, 2007	Milton (Blue Hill)	.095	9	.104
August 3, 2007	Chicopee	.102	11	.127
August 3, 2007	Lynn	.103	10	.116
August 3, 2007	Newbury	.097	9	.113
August 3, 2007	Stow	.091	10	.105
August 3, 2007	Ware	.102	11	.124
August 3, 2007	Worcester	.095	11	.110
August 3, 2007	Milton (Blue Hill)	.095	9	.106
August 3, 2007	Haverhill	.096	11	.107
August 15, 2007	Milton (Blue Hill)	.087	15	.094
August 16, 2007	Chicopee	.087	12	.099

(continued on next page)

2007 Ozone Exceedances (ppm) continued

DATE	SITE	8-HOUR MAX (ppm)	START HOUR	1-HOUR MAX (ppm) for the day
August 29, 2007	Ware	.087	12	.099
August 30, 2007	Haverhill	.095	10	.110
August 30, 2007	Amherst	.087	12	.094
August 30, 2007	Chicopee	.098	12	.110
August 30, 2007	Stow	.091	11	.097
August 30, 2007	Ware	.093	12	.105
August 30, 2007	Worcester	.089	11	.094
August 30, 2007	Milton (Blue Hill)	.088	10	.096
September 7, 2007	Newbury	.086	10	.094
September 7, 2007	Stow	.086	11	.097
September 7, 2007	Ware	.085	11	.101
September 7, 2007	Worcester	.089	11	.105
September 7, 2007	Haverhill	.089	12	.097
September 25, 2007	Milton (Blue Hill)	.085	12	.097
September 26, 2007	Ware	.087	11	.096
September 26, 2007	Worcester	.085	11	.098

Exceedance Days and Total Exceedance Trends

Figures 1 and 2 show the trends in number of 1-hour and 8-hour exceedance days and the total number of exceedances.

The trend for the 1-hour data in Figure 1 shows a decline in the number of exceedances and exceedance days over the period covered. Although the 1-hour standard was revoked June 15, 2005, Figure 1 reflects the total number of 1-hour exceedances for 2007. The trend in Figure 2 shows that, under the new more stringent 8-hour standard, there were a greater number of exceedances and exceedance days compared to the former 1-hour standard.

Figure 1
1-hr Ozone Exceedance Days and Total Exceedances 1987-2007
 1-hour standard = 0.125 ppm (revoked June 15, 2005)

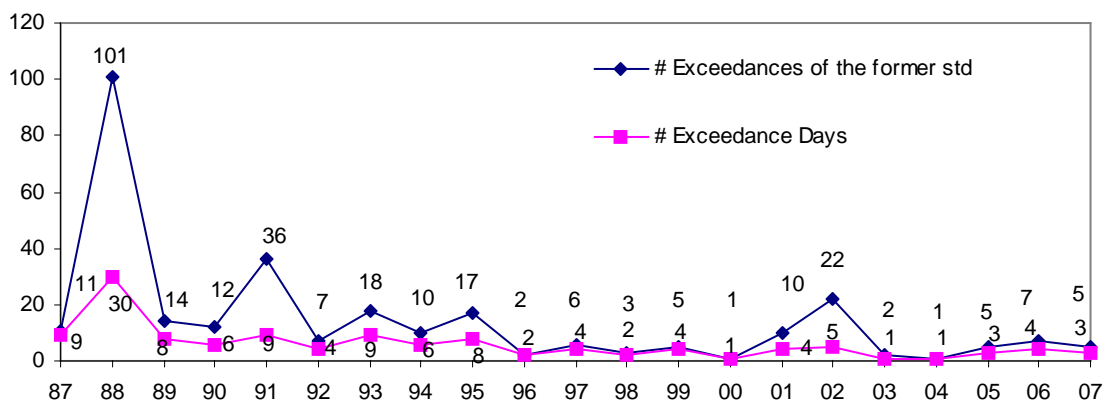
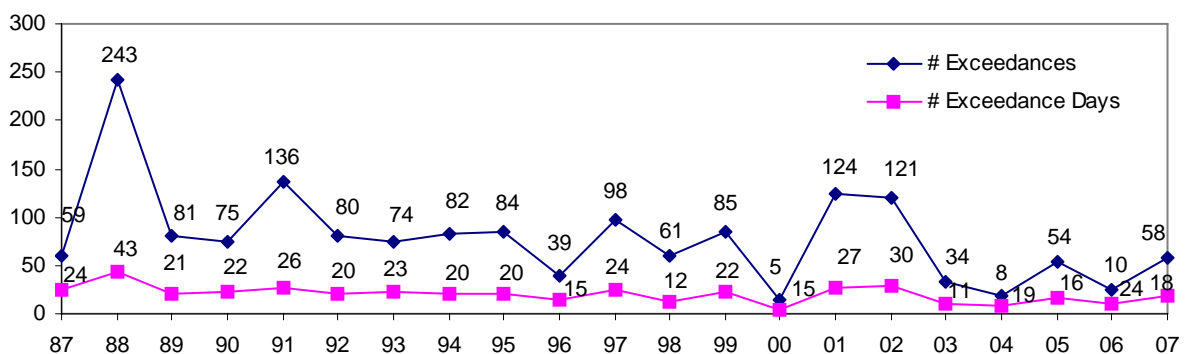


Figure 2
8-hr Ozone Exceedance Days and Total Exceedances 1987-2007
 8-hour standard = 0.085 ppm



Daily Ozone and PM Forecasts

MassDEP provides the public with daily air quality forecasts for ozone from April through September (based on the tighter ozone standard adopted by EPA in March 2008) and for fine particles all year round using weather maps and meteorological factors to predict whether or not conditions will result in elevated pollution levels. The daily air quality forecasts are available from www.mass.gov/air or by calling the Air Quality Hotline (1-800-882-1497). USEPA web sites that contain regional and national pollution forecasts using data that is provided by participating states are at www.epa.gov/region01/airquality/forecast.html and <http://airnow.gov/>. The table below describes the ratings used in the daily air quality forecasts.

<u>Air Quality Index (AQI): Ozone</u>			<u>Air Quality Index (AQI): Particle Pollution</u>		
Index Values	Levels of Health Concern	Cautionary Statements	Index Values	Levels of Health Concern	Cautionary Statements
0-50	Good	None	0-50	Good	None
51-100*	Moderate	Unusually sensitive people should consider reducing prolonged or heavy exertion outdoors.	51-100*	Moderate	Unusually sensitive people should consider reducing prolonged or heavy exertion.
101-150	Unhealthy for Sensitive Groups	Active children and adults, and people with lung disease, such as asthma, should reduce prolonged or heavy exertion outdoors.	101-150	Unhealthy for Sensitive Groups	People with heart or lung disease, older adults, and children should reduce prolonged or heavy exertion.
151-200	Unhealthy	Active children and adults, and people with lung disease, such as asthma, should avoid prolonged or heavy exertion outdoors. Everyone else, especially children, should reduce prolonged or heavy exertion outdoors.	151-200	Unhealthy	People with heart or lung disease, older adults, and children should avoid prolonged or heavy exertion. Everyone else should reduce prolonged or heavy exertion.
201-300	Very Unhealthy	Active children and adults, and people with lung disease, such as asthma, should avoid all outdoor exertion. Everyone else, especially children, should avoid prolonged or heavy exertion outdoors.	201-300	Very Unhealthy	People with heart or lung disease, older adults, and children should avoid all physical activity outdoors. Everyone else should avoid prolonged or heavy exertion.

* An AQI of 100 for ozone corresponds to an ozone level of 0.075 parts per million (averaged over 8 hours).

*An AQI of 100 for particles up to 2.5 micrometers in diameter corresponds to a level of 35 micrograms per cubic meter (averaged over 24 hours). An AQI of 100 for particles up to 10 micrometers in diameter corresponds to a level of 150 micrograms per cubic meter (averaged over 24 hours).

Section III

Massachusetts Air Quality Data Summaries

Ozone Summary

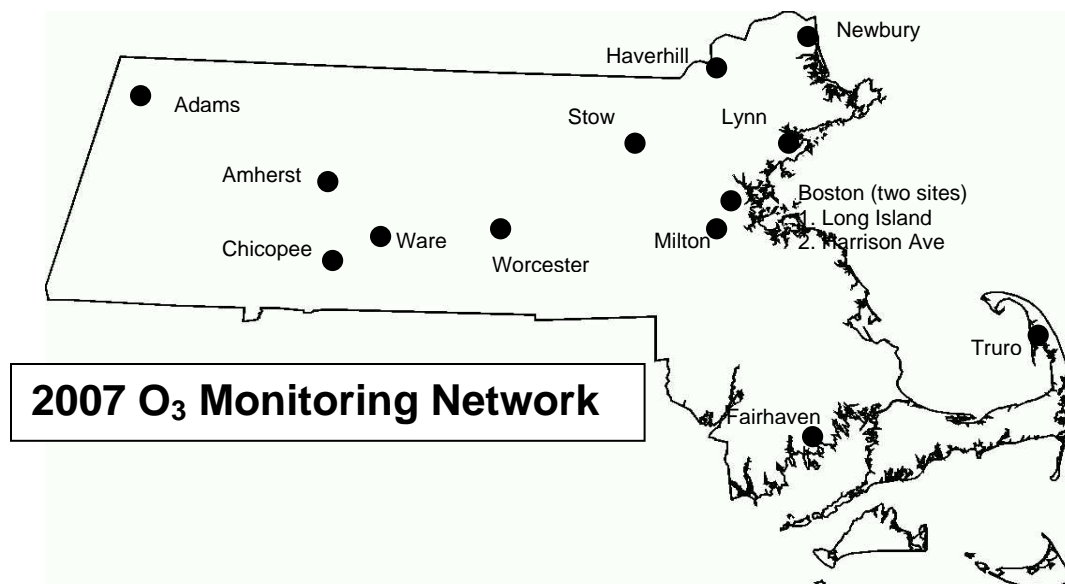
2007 Ozone Data Summary

A summary of the 2007 data collected during the ozone season (April 1 – Sept. 30) is shown below. There were 14 ozone sites in operation during 2007 in the state-operated monitoring network. All but one of the sites achieved the requirement of 75% or greater data capture for the year.

SITE ID	CITY	COUNTY	ADDRESS	% OBS	1 ST	2 ND	DAY	1 ST	2 ND	3 RD	4 TH	DAY
					MAX	MAX		MAX >=	MAX	MAX	MAX	
25-001-0002	Truro	Barnstable	FOX BOTTOM AREA	93	0.106	0.101	0	0.093	0.085	0.082	0.082	2
25-003-4002	Adams	Berkshire	MT GREYLOCK	79	0.105	0.095	0	0.093	0.086	0.083	0.080	2
25-005-1002	Fairhaven	Bristol	LEROY WOOD SCHOOL	98	0.099	0.093	0	0.086	0.083	0.082	0.075	1
25-009-2006	Lynn	Essex	390 PARKLAND	98	0.117	0.116	0	0.103	0.102	0.093	0.088	4
25-009-4004	Newbury	Essex	SUNSET BLVD	97	0.113	0.109	0	0.097	0.094	0.086	0.086	4
25-009-5005	Haverhill	Essex	CONSENTINO SCHOOL	99	0.110	0.107	0	0.096	0.095	0.092	0.089	5
25-013-0008	Chicopee	Hampden	ANDERSON RD AFB	99	0.147	0.134	3	0.112	0.109	0.102	0.098	8
25-015-0103	North Amherst	Hampshire	N PLEASANT ST	98	0.123	0.115	0	0.094	0.091	0.087	0.080	3
25-015-4002	Ware	Hampshire	QUABBIN SUMMIT	97	0.132	0.125	2	0.109	0.102	0.093	0.087	7
25-017-1102	Stow	Middlesex	US MILITARY RESERVATION	100	0.105	0.104	0	0.091	0.091	0.086	0.086	5
25-021-3003	Milton	Norfolk	BLUE HILL OBSSERVATORY	99	0.106	0.104	0	0.095	0.095	0.094	0.088	7
25-025-0041	Boston	Suffolk	LONG ISLAND	30	0.094	0.087	0	0.082	0.080	0.076	0.072	0
25-025-0042	Boston	Suffolk	HARRISON AVE	99	0.091	0.088	0	0.081	0.080	0.072	0.071	0
25-027-0015	Worcester	Worcester	WORC AIRPORT	99	0.119	0.113	0	0.096	0.095	0.090	0.089	10

ABBREVIATIONS AND SYMBOLS USED IN TABLE

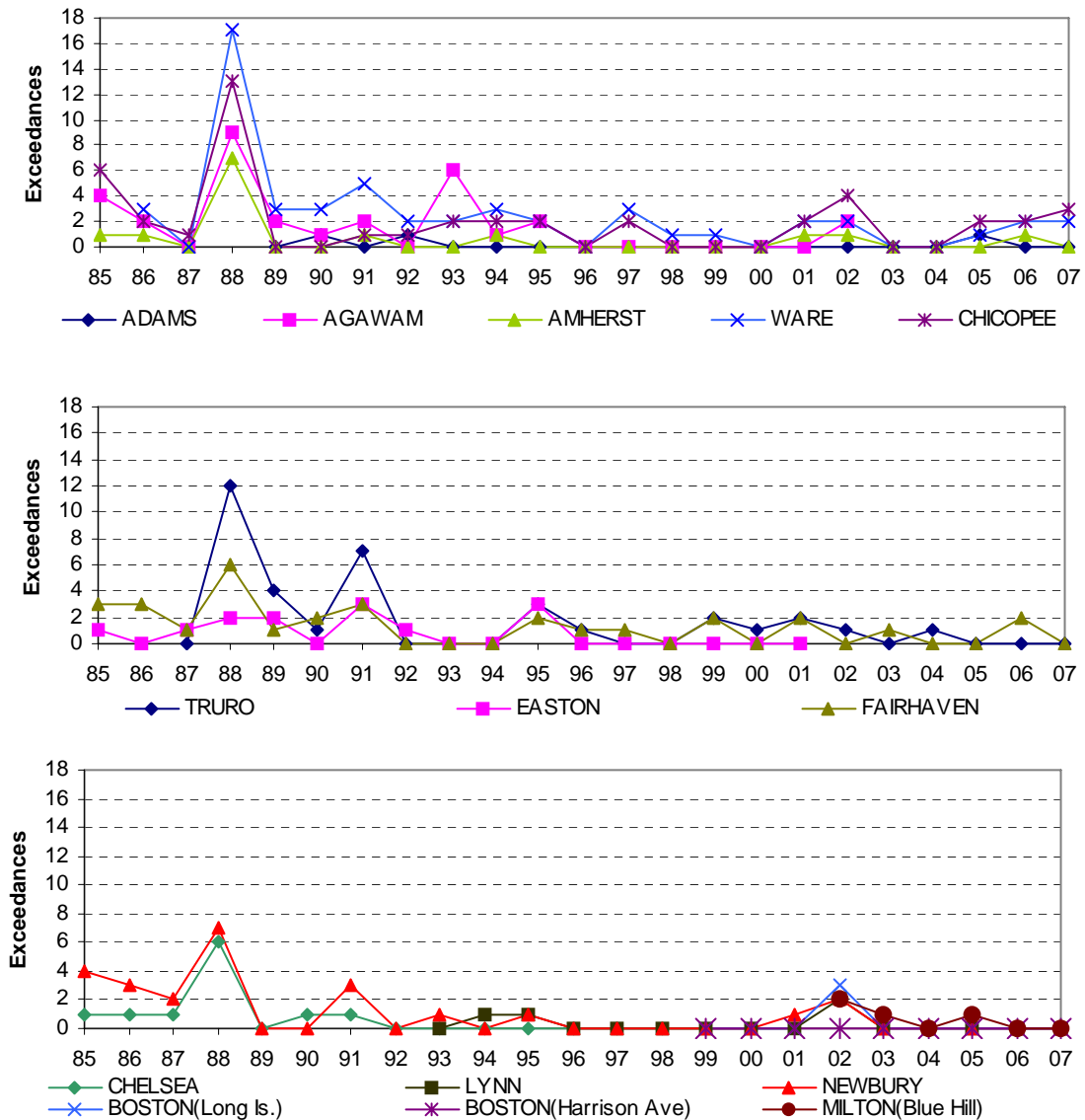
SITE ID = AIRS SITE IDENTIFICATION NUMBER **% OBS** = PERCENTAGE OF VALID DAYS MONITORED DURING O3 SEASON **1ST, 2ND MAX 1-HR** = MAXIMUM 1-HR VALUE FOR THE 1ST & 2ND HIGHEST DAY **DAY MAX ≥ 0.125** = NUMBER OF MEASURED DAILY 1-HOUR MAXIMUM VALUES GREATER THAN OR EQUAL TO 0.125 PPM (1-HR STANDARD) **1ST, 2ND, 3RD & 4TH MAX 8-HR** = MAXIMUM 8-HR VALUE FOR THE 1ST, 2ND, 3RD & 4TH HIGHEST DAY **DAY MAX ≥ 0.085** = NUMBER OF MEASURED DAILY 8-HOUR MAXIMUM VALUES GREATER THAN OR EQUAL TO 0.085 PPM (8-HR STANDARD)

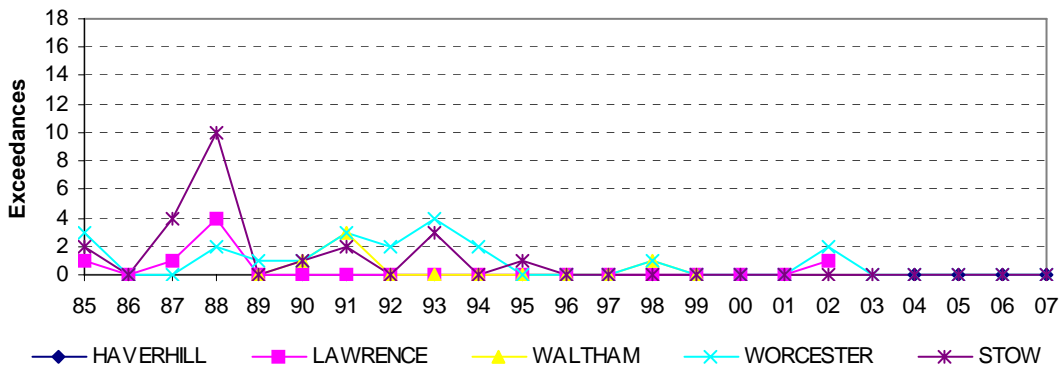


1-hour Ozone Exceedance Trends

The historical trends of the former 1-hour ozone exceedances for each site are shown below.

Figure 3
1-hour Ozone Exceedance Trends 1985 – 2007
Standard = 0.125 ppm (revoked June 15, 2005)

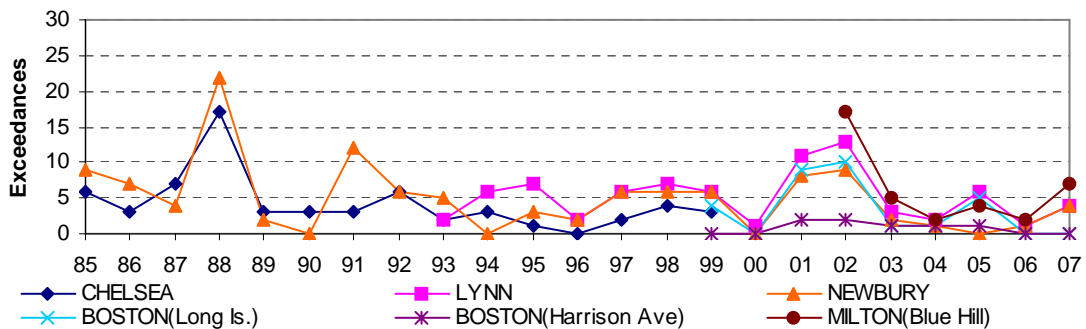
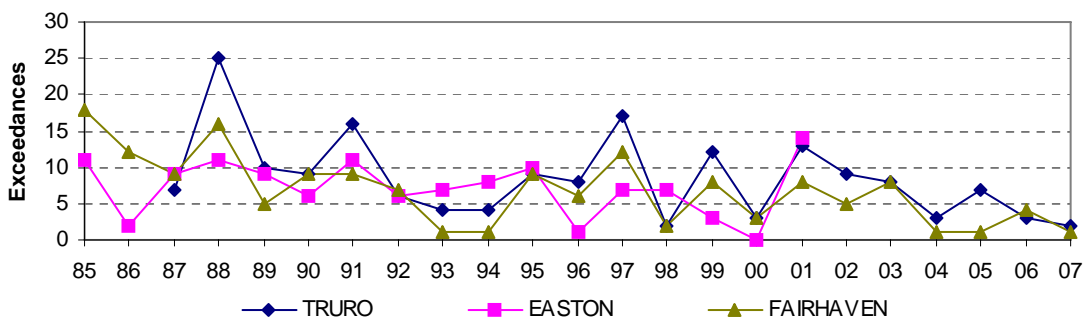
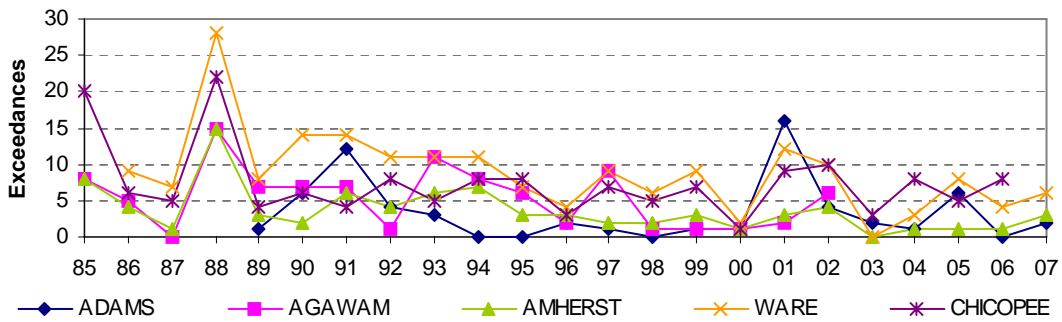


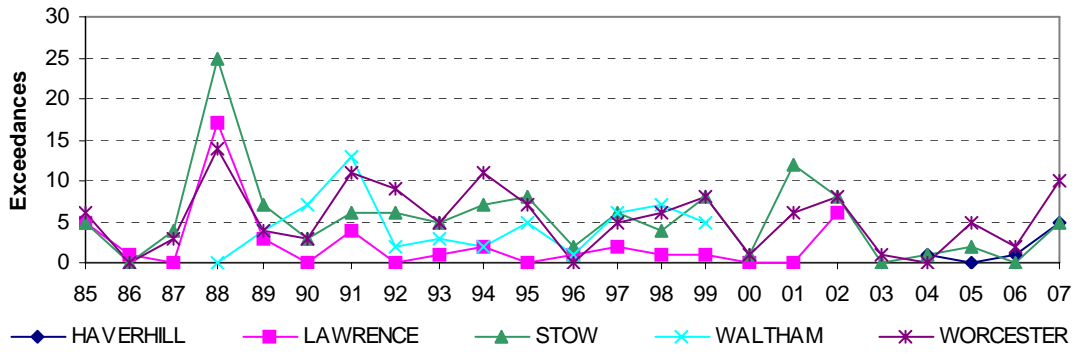


8-hour Ozone Exceedance Trends

The long-term trends of 8-hour ozone exceedances for each site are shown below. The 8-hour standard became effective in 1997.

Figure 4
8-hour Ozone Exceedance Trends 1985 – 2007
Standard = 0.085 ppm





Sulfur Dioxide (SO₂) Summary

2007 SO₂ Data Summary

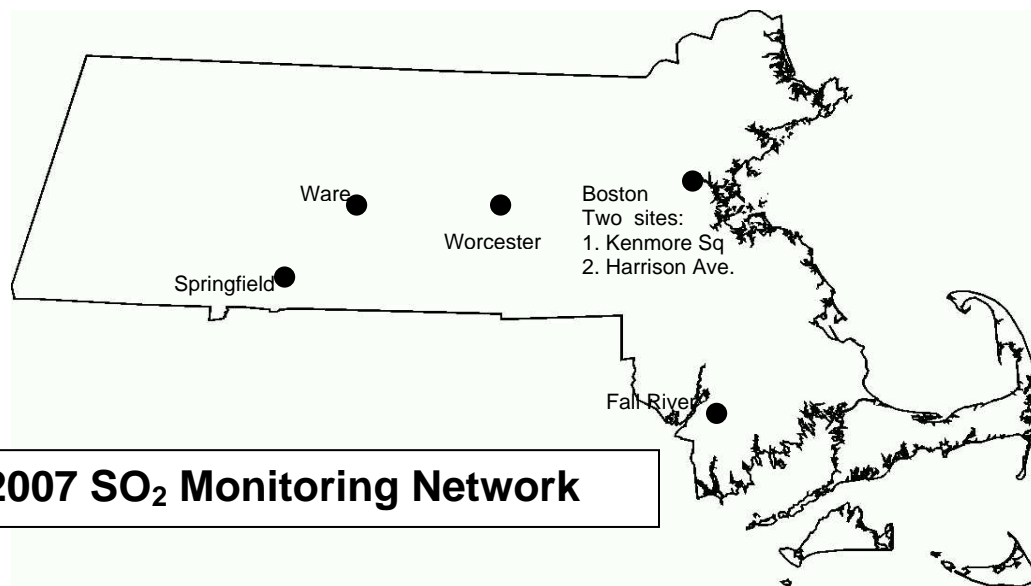
A summary of the 2007 SO₂ data is shown below. There were six SO₂ sites in operation during 2007 in the state-operated monitoring network. All of the sites achieved the requirement of 75% or greater data capture for the year.

SITE ID	CITY	COUNTY	ADDRESS	%	1 ST	2 ND	#OBS	1 ST	2 ND	#OBS	1 ST	2 ND	ARITH MEAN
				OBS	MAX 24-HR	MAX 24-HR	>0.14	MAX 3-HR	MAX 3-HR	>0.5	MAX 1-HR	MAX 1-HR	
25-025-0002	Boston	Suffolk	KENMORE SQUARE	97	0.020	0.014	0	0.034	0.031	0	0.036	0.034	0.0042
25-025-0042	Boston	Suffolk	HARRISON AVE	97	0.014	0.013	0	0.024	0.022	0	0.028	0.027	0.0032
25-005-1004	Fall River	Bristol	659 GLOBE ST	97	0.026	0.022	0	0.054	0.046	0	0.082	0.076	0.0034
25-013-0016	Springfield	Hampden	LIBERTY P—LOT	97	0.016	0.016	0	0.031	0.030	0	0.039	0.035	0.0032
25-015-4002	Ware	Hampshire	QUABBIN	93	0.011	0.011	0	0.015	0.015	0	0.019	0.017	0.0031
25-027-0023	Worcester	Worcester	SUMMER ST	95	0.014	0.012	0	0.021	0.016	0	0.031	0.026	0.0035

Standards: Annual Mean = 0.03 ppm 24-hour = 0.14 ppm 3-hour = 0.50 ppm

ABBREVIATIONS AND SYMBOLS USED IN TABLE

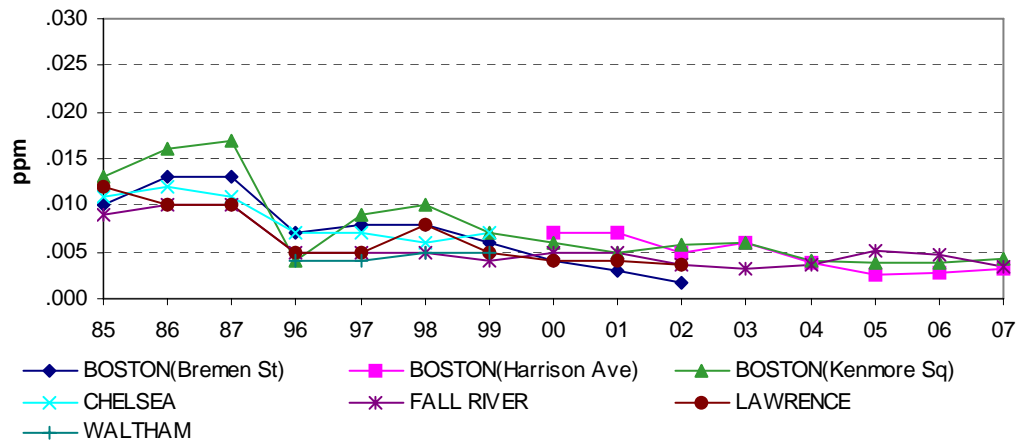
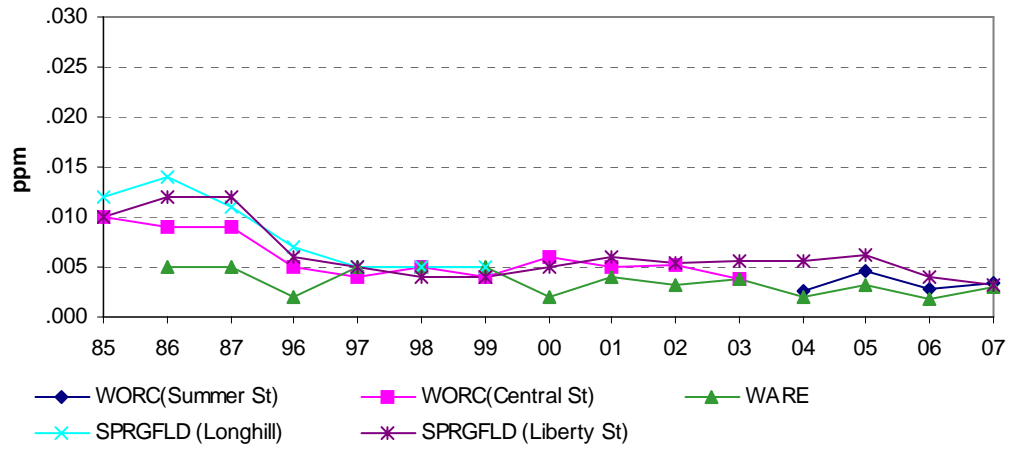
SITE ID = AIRS SITE IDENTIFICATION NUMBER **% OBS** = DATA CAPTURE PERCENTAGE **1ST, 2ND MAX 24-HR, MAX 3-HR, MAX 1-HR** = FIRST AND SECOND HIGHEST VALUE FOR TIME PERIOD INDICATED **# OBS > 0.14** = NUMBER OF OBSERVATIONS ABOVE THE 24-HOUR STANDARD OF 0.14 PPM **# OBS > 0.50** = NUMBER OF OBSERVATIONS ABOVE THE 3-HOUR STANDARD OF 0.50 PPM **ARITH MEAN** = ANNUAL ARITHMETIC MEAN (STANDARD = 0.03 PPM)



SO₂ Trends

The long-term trends of the annual arithmetic mean for each SO₂ site are shown below. The trend has been stable for the last few years and downward for the entire period. Massachusetts is well below the standard for SO₂.

Figure 5
SO₂ Trends 1985 –2007
Annual Arithmetic Means
Standard = 0.03 ppm



Nitrogen Dioxide (NO₂) Summary

2007 NO₂ Data Summary

A summary of the 2007 NO₂ data is shown below. There were 11 NO₂ sites in operation during 2007 in the state-operated monitoring network. All but one of the sites met the requirement of 75% data capture for the year.

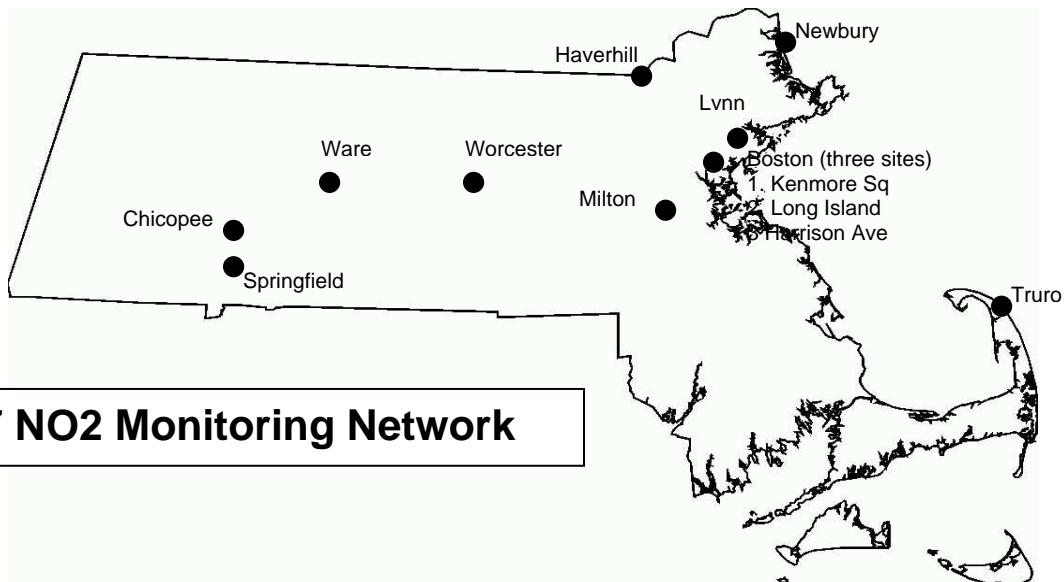
SITE ID	CITY	COUNTY	ADDRESS	% OBS	1 ST MAX 1-HR	2 ND MAX 1-HR	ARITH MEAN
25-025-0002	Boston	Suffolk	KENMORE SQUARE	94	0.067	0.067	0.0206
25-025-0041	Boston	Suffolk	LONG ISLAND	30	0.041	0.039	0.0065*
25-025-0042	Boston	Suffolk	HARRISON AVE	96	0.073	0.073	0.0196
25-013-0008	Chicopee	Hampden	ANDERSON RD AFB	94	0.050	0.048	0.0091
25-009-5005	Haverhill	Essex	CONSENTINO SCHOOL	95	0.044	0.044	0.0085
25-009-2006	Lynn	Essex	390 PARKLAND	91	0.052	0.051	0.0085
25-021-3003	Milton	Norfolk	BLUE HILL OBSERVATORY	96	0.050	0.040	0.0046
25-009-4004	Newbury	Essex	SUNSET BLVD	95	0.020	0.018	0.0034
25-013-0016	Springfield	Hampden	LIBERTY P-LOT	95	0.078	0.058	0.0152
25-015-4002	Ware	Hampshire	QUABBIN SUMMIT	94	0.036	0.034	0.0042
25-027-0023	Worcester	Worcester	SUMMER ST	95	0.056	0.056	0.0156

* indicates that the mean does not satisfy summary criteria (number of observations less than 75% for at least 1 quarter)

Standard: Annual Arithmetic Mean = 0.053 ppm

ABBREVIATIONS AND SYMBOLS USED IN TABLE

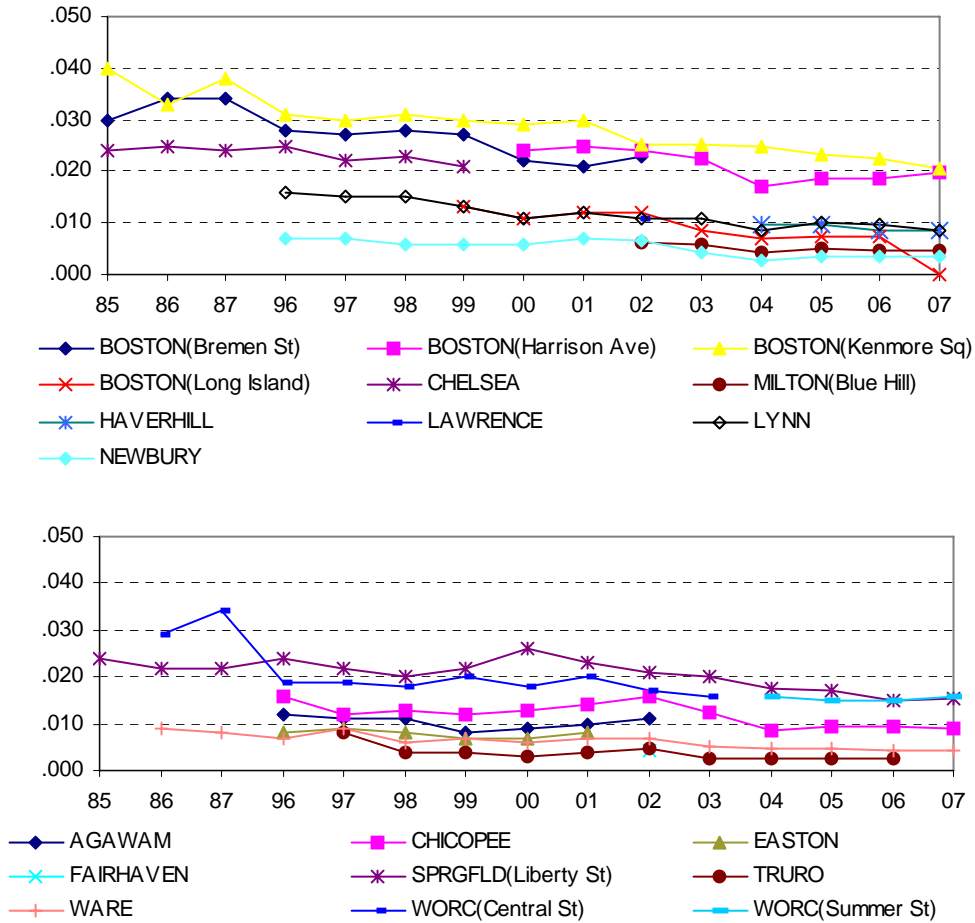
SITE ID = AIRS SITE IDENTIFICATION NUMBER % OBS = DATA CAPTURE PERCENTAGE 1ST, 2ND MAX 1-HR = FIRST AND SECOND HIGHEST VALUE FOR TIME PERIOD INDICATED ARITH MEAN = ANNUAL ARITHMETIC MEAN



NO₂ Trends

The long-term trends of the annual arithmetic means for each NO₂ site are shown below. The trend has been stable the last few years and downward for the entire period. Massachusetts is below the standard.

Figure 6
NO₂ Trends 1985 – 2007
Annual Arithmetic Means
Standard = 0.05 ppm



Carbon Monoxide (CO) Summary

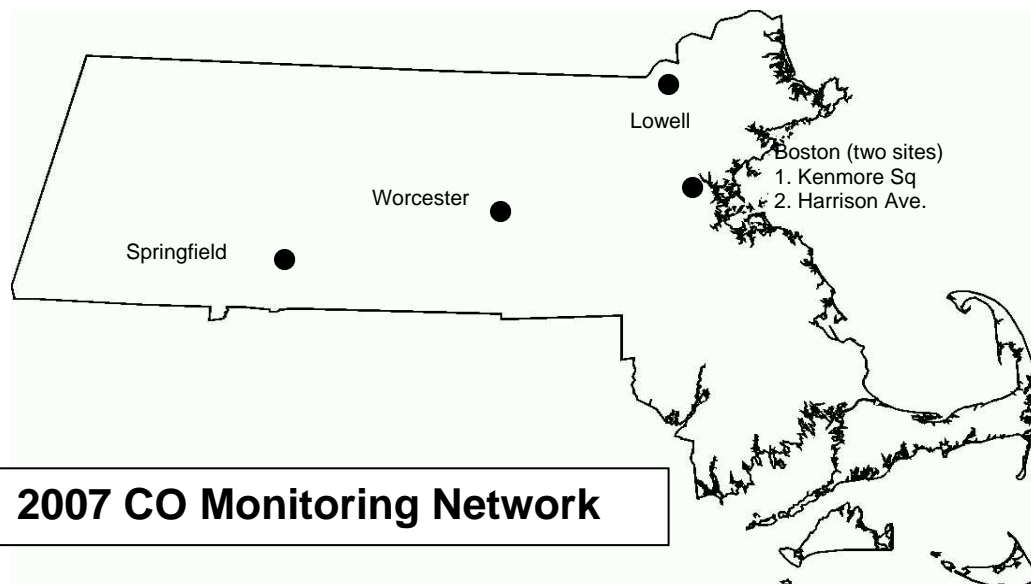
2007 CO Data Summary

A summary of the 2007 CO data is shown below. There were five CO sites in operation during 2007 in the state-operated monitoring network. All of the sites achieved the requirement of 75% or greater data capture for the year.

SITE ID	CITY	COUNTY	ADDRESS	% OBS	1 ST	2 ND	OBS >35	1 ST	2 ND	OBS >9
					MAX 1-HR	MAX 1-HR		MAX 8-HR	MAX 8-HR	
25-025-0002	Boston	Suffolk	KENMORE SQUARE	93	1.6	1.6	0	1.3	1.2	0
25-025-0042	Boston	Suffolk	HARRISON AVE	92	2	2	0	1.3	1.2	0
25-017-0007	Lowell	Middlesex	MERRIMACK ST	93	2.9	2.5	0	2.1	1.6	0
25-013-0016	Springfield	Hampden	LIBERTY P-LOT	93	2.2	2.1	0	1.8	1.3	0
25-027-0023	Worcester	Worcester	SUMMER ST	93	2.5	2.4	0	1.8	1.7	0

Standards: 1-hour = 35 ppm 8-hour = 9 ppm

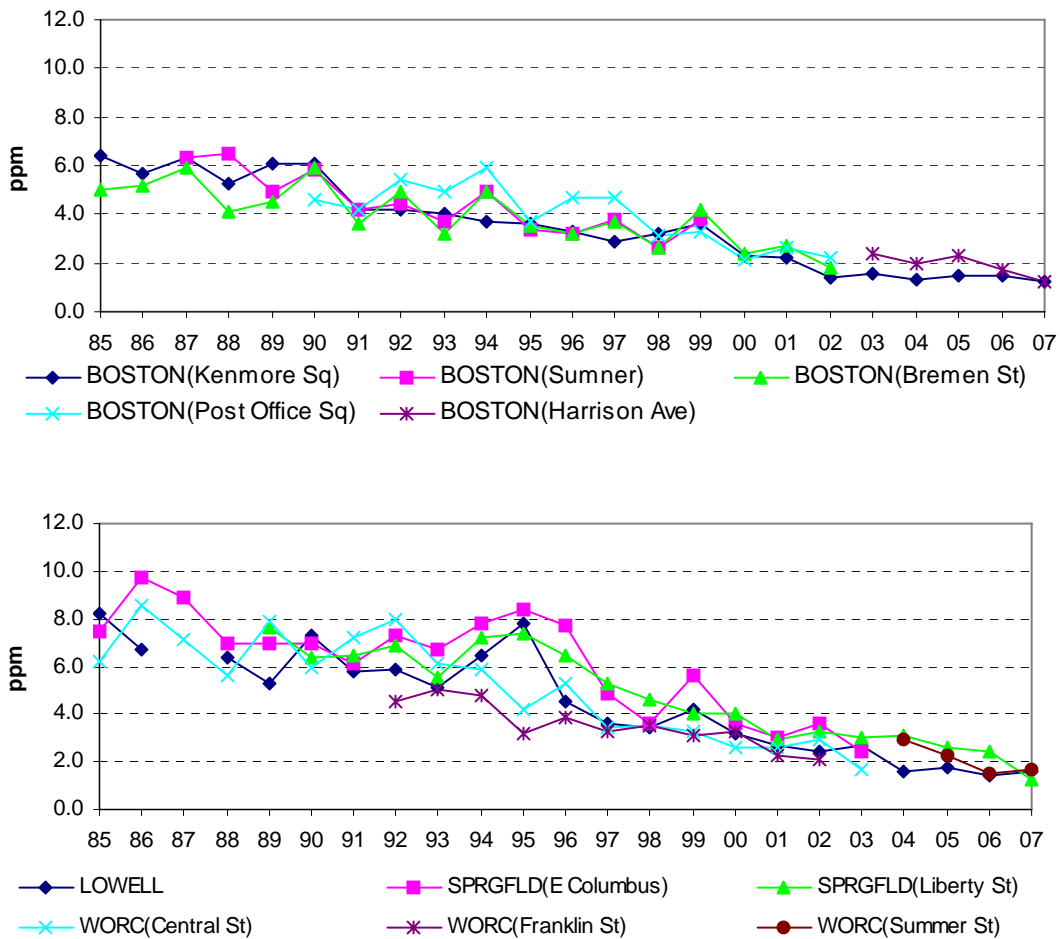
ABBREVIATIONS AND SYMBOLS USED IN TABLE
SITE ID = AIRS SITE IDENTIFICATION NUMBER **% OBS** = DATA CAPTURE PERCENTAGE **1ST, 2ND MAX 1-HR** = FIRST AND SECOND HIGHEST VALUE FOR TIME PERIOD INDICATED **OBS > 35** = NUMBER OF 1-HR AVG. GREATER THAN 35 PPM (1-HR STANDARD) **1ST, 2ND MAX 8-HR** = FIRST AND SECOND HIGHEST VALUE FOR TIME PERIOD INDICATED **OBS > 9** = NUMBER OF 8-HR AVG. GREATER THAN 9 PPM (8-HR STD)



CO Trends

The long-term trends for each CO site are shown below. The 2nd maximum value is displayed because it is the value to which the standard applies. Massachusetts is well below both the 1-hour and 8-hour standards.

Figure 7
CO Trends 1985-2007
2nd Maximum 8-hour Values
Standard = 9 ppm



Particulate Matter 10 Microns (PM₁₀) Summary

2007 PM₁₀ Data Summary

A summary of the 2007 PM₁₀ data is shown below. There were six PM₁₀ sites in operation during 2007 in the state-operated monitoring network. All of the sites achieved data capture requirements for the year.

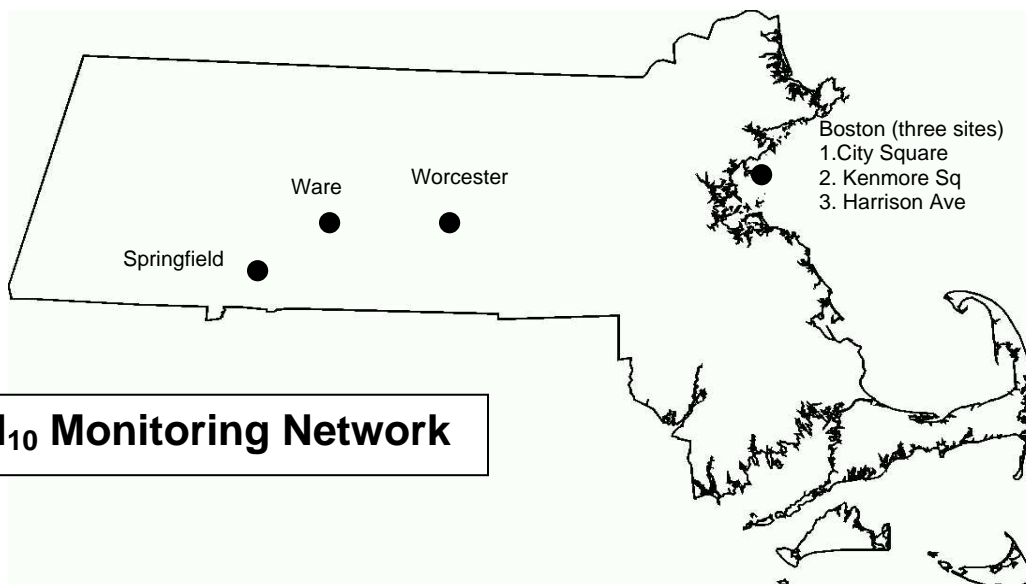
SITE ID	TYPE	CITY	COUNTY	ADDRESS	% OBS	1 ST	2 ND	3 RD	4 TH	DAY	EST	WTD
						MAX	MAX	MAX	MAX	MAX >150	DAYS >150	ARITH MEAN
25-025-0002	Lo-Vol	Boston	Suffolk	KENMORE SQUARE	93	40	38	37	37	0	0	21.6
25-025-0027	Lo-Vol	Boston	Suffolk	ONE CITY SQUARE	77	54	38	37	37	0	0	22.7*
25-025-0042	Hi-Vol	Boston	Suffolk	HARRISON AVE	97	40	24	23	22	0	0	14.2
25-025-0042	Hi-Vol Co-loc	Boston	Suffolk	HARRISON AVE	93	40	24	23	23	0	0	13.7
25-025-0042	Lo-Vol	Boston	Suffolk	HARRISON AVE	100	44	35	29	28	0	0	16.7
25-025-0042	Lo-Vol Co-loc	Boston	Suffolk	HARRISON AVE	92	42	33	29	28	0	0	16.8
25-013-2009	Lo-Vol	Springfield	Hampden	1860 MAIN ST	98	36	35	34	33	0	0	18.4
25-015-4002	Lo-Vol	Ware	Hampshire	QUABBIN SUMMIT	85	31	29	27	24	0	0	10.7*
25-027-0023	Lo-Vol	Worcester	Worcester	SUMMER ST	95	57	53	52	36	0	0	20.6

*indicates that the mean does not satisfy the summary criteria (number of observations less than 75% for at least 1 quarter)

PM₁₀ Hi Vol Standards: 24-hour = 150 µg/m³

ABBREVIATIONS AND SYMBOLS USED IN TABLE

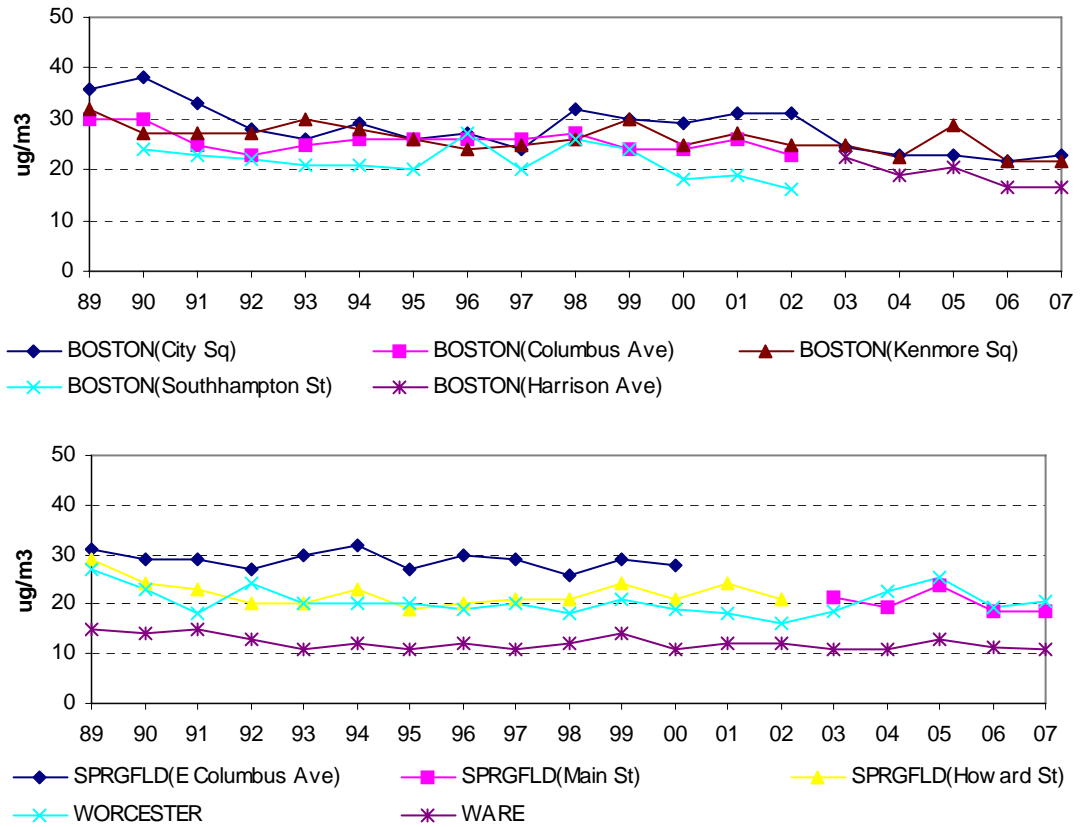
SITE ID = AIRS SITE IDENTIFICATION NUMBER **% OBS** = DATA CAPTURE PERCENTAGE **1ST, 2ND, 3RD, 4TH 24-HR MAX** = 1ST, 2ND, 3RD, AND 4TH HIGHEST 24-HOUR VALUES FOR THE YEAR **DAY MAX > 150** = DAILY MAXIMUM VALUE GREATER THAN STANDARD OF 150 µg/m³ **WTD ARITH MEAN** = WEIGHTED ANNUAL ARITHMETIC MEAN



PM₁₀ Trends

Long-term trends for each PM₁₀ site are shown below for the annual arithmetic mean. The data shows a yearly variability at most sites, with the overall trend being downward.

Figure 8
PM₁₀ Trends 1989-2007
Annual Arithmetic Mean



Particulate Matter 2.5 Microns (PM_{2.5}) Summary

2007 PM_{2.5} Operations

MassDEP operates 15 Federal Reference Method (FRM) monitors and 10 semi-continuous Beta Attenuation Monitors (BAMs) capable of measuring PM_{2.5} concentrations on an hourly basis. BAM samplers generate hourly PM_{2.5} values, thereby providing more information regarding short-term variations in fine particulate concentrations than the 24-hour FRM method. They also generate near real-time values that can be used to assess current air quality conditions, whereas FRM filter results are not available for several days due to laboratory processing. Another big advantage is the ability to immediately retrieve data from the monitoring stations remotely using a standard modem and phone line. This makes the data very useful for examining daily fluctuations in pollutant levels and providing the public with near real-time information on local air quality. In Massachusetts, FRM samples are the only measure of PM_{2.5} currently being compared to the NAAQS; however, the recent designation by USEPA of the BAM sampler as an approved Federal Equivalent Method (FEM) will permit continuous PM_{2.5} data to be used for comparison to the NAAQS and the eventual phasing out of the filter-based FRM samplers.

In 2003, USEPA began providing a website where the public can view concentration gradient maps that graphically display data coming in from the ten semi-continuous monitoring stations. Different colors on the map are used to indicate the PM concentration of the samples that were collected for each hour of the day. The website address for viewing the map is:

www.epa.gov/airnow/.

A summary of the 2007 PM_{2.5} data is shown below.

2007 PM_{2.5} FRM Data Summary

SITE ID	TYPE	CITY	COUNTY	ADDRESS	% OBS	1 ST MAX	2 ND MAX	3 RD MAX	4 TH MAX	98 TH PERCENTILE VALUE	WTD ARITH MEAN
25-025-0002	FRM	Boston	Suffolk	KENMORE SQUARE	97	39	32	31.7	28.6	31.7	11.43
25-025-0027	FRM	Boston	Suffolk	ONE CITY SQUARE	95	38	33	31.8	30.5	31.8	11.65
25-025-0042	FRM	Boston	Suffolk	HARRISON AVE	100	39	31.7	31.5	31	31.5	10.48
25-025-0043	FRM	Boston	Suffolk	174 NORTH ST	100	50.2	40.7	39.2	35.2	30.3	11.86
25-025-0043	FRM Co-loc	Boston	Suffolk	174 NORTH ST	94	49.1	40.2	38.7	35.8	31.2	11.9
25-023-0004	FRM	Brockton	Plymouth	COMMERCIAL ST	100	36.3	29.2	28.1	26.5	28.1	9.57
25-023-0004	FRM Co-loc	Brockton	Plymouth	COMMERCIAL ST	92	29.2	28.9	26.1	25.6	26.1	9.2
25-013-0008	FRM	Chicopee	Hampden	ANDERSON RD AFB	100	36.1	29.9	28.8	26.7	28.8	9.88
25-013-0008	FRM Co-loc	Chicopee	Hampden	ANDERSON RD AFB	98	35.3	31	29.6	28.5	29.6	10.39
25-005-1004	FRM	Fall River	Bristol	659 GLOBE ST	100	29.8	29.4	26	25.7	26	9.17
25-009-5005	FRM	Haverhill	Essex	CONSENTINO SCHOOL	94	31.2	27.3	25.1	23.9	25.1	9.12
25-009-6001	FRM	Lawrence	Essex	SHATTUCK ST	97	32.2	27.9	26.6	24.4	26.6	9.45
25-009-2006	FRM	Lynn	Essex	390 PARKLAND	99	32	30.4	28.2	27.8	28.2	9.36
25-003-5001	FRM	Pittsfield	Berkshire	78 CENTER ST	100	41.4	30.2	28.9	28	28.9	10.14
25-013-0016	FRM	Springfield	Hampden	LIBERTY P-LOT	97	38.1	31.1	30	29.5	30	12.32
25-013-2009	FRM	Springfield	Hampden	1860 MAIN ST	100	36.7	30.4	30	29.1	30	11.58
25-027-0016	FRM	Worcester	Worcester	WASHINGTON ST	91	35.2	31.4	31.2	30	31.2	11.12
25-027-0023	FRM	Worcester	Worcester	SUMMER ST	100	35.9	33.2	31.7	30.2	31.7	11.53

2007 PM_{2.5} BAM Data Summary

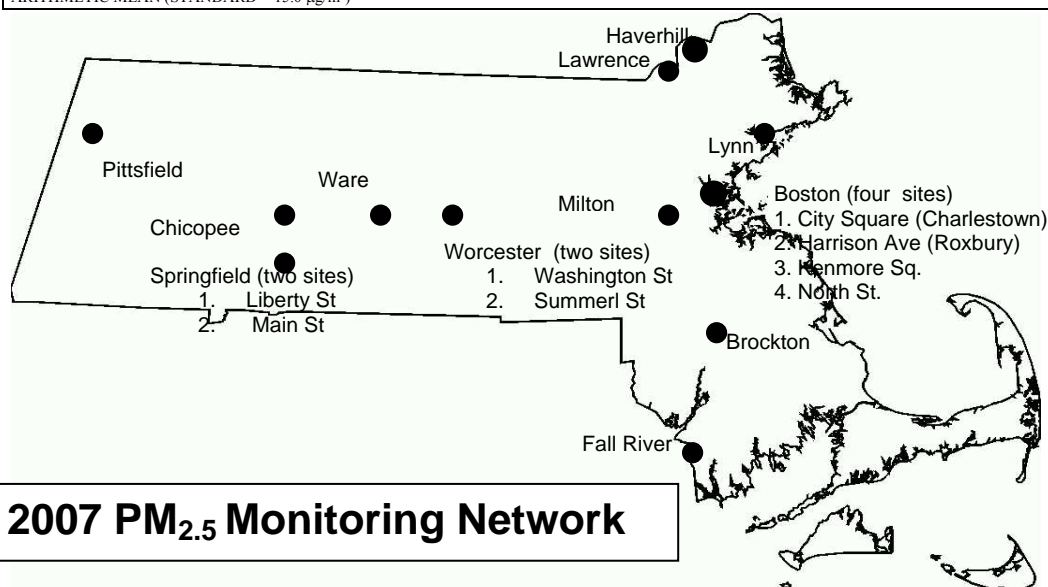
SITE ID	CITY	COUNTY	ADDRESS	% OBS	1 ST MAX	2 ND MAX	3 RD MAX	4 TH MAX	ARITH MEAN
25-025-0042	Boston	Suffolk	HARRISON AVE	99	73.4	72.4	71.0	70.4	14.4
25-025-0043	Boston	Suffolk	174 NORTH ST	99	143.1	93.9	76.9	66.3	13.6
25-013-0008	Chicopee	Hampden	ANDERSON RD	98	146.3	126.7	68.4	67.1	10.0
25-005-1004	Fall River	Bristol	659 GLOBE ST	92	275.1	115.0	64.9	61.3	10.1
25-009-5005	Haverhill	Essex	CONSENTINO SCHOOL	99	65.2	62.8	56.2	55.5	9.2
25-009-2006	Lynn	Essex	390 PARKLAND	99	76.2	75.8	69.9	66.0	11.1
25-021-3003	Milton	Norfolk	BLUE HILL OBSERVATORY	89	81.2	56.7	55.0	55.0	8.7
25-003-0006	Pittsfield	Berkshire	78 CENTER ST	94	64.7	60.1	57.2	57.1	9.1
25-015-4002	Ware	Hampshire	QUABBIN SUMMIT	98	76.6	72.3	68.9	67.7	11.9
25-027-0023	Worcester	Worcester	SUMMER ST	97	75.8	71.7	69.6	63.2	8.9

* indicates that the mean does not satisfy summary criteria (number of observations for at least 1 quarter was less than 75%) (Currently BAM data has no standard)

Standards (based on 3-year averages): 24-hours = 35 µg/m³ Annual Arithmetic Mean = 15.0 µg/m³

ABBREVIATIONS AND SYMBOLS USED IN TABLE

SITE ID = AIRS SITE IDENTIFICATION **TYPE** = TYPE OF INSTRUMENT **FRM** = FEDERAL REFERENCE METHOD; **FRM COLOC** = FED. REF. METH. COLOCATED **BAM** = BETA ATENUATION MONITOR **1ST, 2ND, 3RD, 4TH MAX** = 1ST, 2ND, 3RD, AND 4TH HIGHEST 24-HOUR VALUES FOR THE YEAR **WTD ARITH MEAN** = WEIGHTED ANNUAL ARITHMETIC MEAN (STANDARD = 15.0 µg/m³)



Speciation

MassDEP has been collecting PM_{2.5} samples for speciation at the air monitoring station in Roxbury since 2000 and in Chicopee since 2001. Speciation is the analysis of particulate matter collected on teflon, nylon and quartz filters simultaneously to determine the chemical composition of the particulate matter collected. The results are used to determine the levels of specific toxic air pollutants present in the atmosphere, and to provide clues about the nature and identity of air pollution sources that impact the monitoring station area. During each sampling event, the three separate filters are collected and shipped to an out-of-state national contract laboratory for analysis. Each different filter medium is analyzed for a different category of pollutant. These include elements (e.g., metals), sulfates, nitrates, and carbon (total and organic).

IMPROVE (Interagency Monitoring of Protected Visual Environments)

Massachusetts currently has two IMPROVE monitors at the Ware and Truro sites. The Wampanoag Indian Tribe operates a third IMPROVE sampler at its Martha's Vineyard site. These samplers acquire PM_{2.5} filter samples for speciation analysis using a different protocol than that of the speciation program described above. IMPROVE is a nationwide program designed to assess air quality at rural locations where air pollution may impact visibility over long distances (e.g., mountain ranges or scenic vistas). Data can be viewed at the IMPROVE web site at <http://vista.cira.colostate.edu/improve/Data/data.htm>.

Lead (Pb) Summary

2007 Pb Data Summary

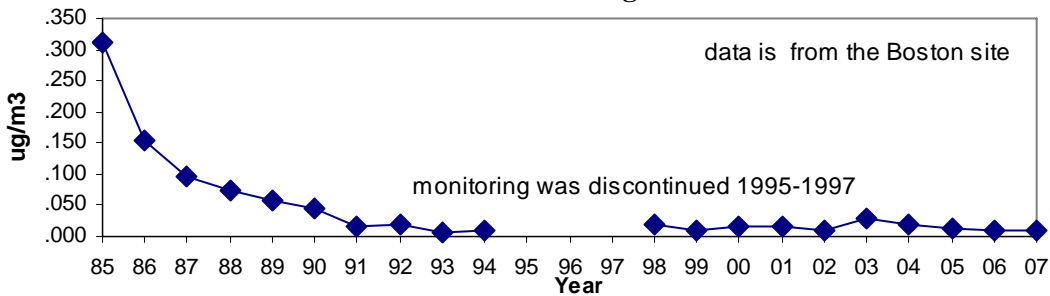
MassDEP operates a total suspended particulates (TSP) sampler at only one site to measure airborne lead levels. The concentrations monitored are low. Since 1975, the use of unleaded gasoline has greatly diminished lead emissions from automobiles, which in the past were the primary source of airborne lead in the atmosphere. A summary of the 2007 Pb data is shown below.

SITE ID	CITY	COUNTY	ADDRESS	% OBS	QTR1 ARITH MEAN	QTR2 ARITH MEAN	QTR3 ARITH MEAN	QTR4 ARITH MEAN	# MEANS > 1.5	1 ST MAX	2 ND MAX
25-025-0002	Boston	Suffolk	KENMORE SQUARE	98	0.01	0.01	0.01	0.01	0	0.03	0.02

Standard: 1.5 µg/m³ (Calendar Quarter Arithmetic Mean)

ABBREVIATIONS AND SYMBOLS USED IN TABLE
SITE ID = AIRS SITE IDENTIFICATION # **OBS** = # OBSERVATIONS **QTR1, QTR2, QTR3, QTR4 ARITH MEAN** = THE MEANS FOR THE 1ST, 2ND, 3RD AND 4TH CALENDAR QUARTERS # **MEANS > 1.5** = THE NUMBER OF CALENDAR QUARTER MEANS GREATER THAN THE STANDARD (1.5 µg/m³) **1ST, 2ND MAX** = THE 1ST AND 2ND MAXIMUM 24 HOUR VALUES

Figure 9
Pb Concentrations 1985-2007
Annual Arithmetic Mean
Standard = 1.5ug/m3



Industrial Network Summary

Introduction

The industrial ambient air quality network is comprised of monitoring stations operated by facilities that have the potential to emit large amounts of pollutants. An example would be a fossil fuel-fired power plant that has the potential to emit large quantities of SO₂.

The monitoring stations in the industrial network are sited to measure the maximum values from the specific point source. When the pollutant SO₂ value reaches certain trigger values, the power plant switches to lower-sulfur content fuel.

The data from the industrial network is submitted to MassDEP's Air Assessment Branch. AAB submits the data to the USEPA AQS database after completing the quality assurance process.

Continuous Emission Monitoring System (CEMS)

In addition to the ambient monitoring network, in-stack Continuous Emission Monitoring System (CEMS) equipment is required at certain facilities by a MassDEP-issued permit or other state and federal regulations. For example, the federal Acid Rain Program requires CEMS enabling measurement of SO₂, NO_x and CO₂ emissions from the nation's largest power generating facilities. The information on emissions collected by CEMS monitors can be found on USEPA's web site at www.epa.gov/airmarkets/arp/.

Sulfur Dioxide (SO₂) summary

There were four SO₂ sites in operation during 2007 in the industrial network. All of the sites achieved the requirement of 75% or greater data capture for the year. There were no measured violations of the SO₂ air quality standards during the year in the reported data. A summary of the 2007 SO₂ data is shown below.

SITE ID				% OBS	1 ST MAX	2 ND MAX	3 RD MAX	4 TH MAX	ARITH MEAN
25-025-0019	Boston	Suffolk	Long Island	96	0.037	0.036	0.031	0.027	0.0030
25-025-0020	Boston	Suffolk	Dewar Street	95	0.026	0.025	0.024	0.023	0.0035
25-025-0021	Boston	Suffolk	340 Bremen Street	99	0.036	0.034	0.032	0.032	0.0048
25-025-0040	Boston	Suffolk	531A East First Street	99	0.095	0.095	0.091	0.090	0.0056

PRIMARY STANDARD: ANNUAL ARITHMETIC MEAN = 0.03 PPM

ABBREVIATIONS AND SYMBOLS USED IN TABLE

SITE ID = AIRS SITE IDENTIFICATION NUMBER **%OBS** = DATA CAPTURE PERCENTAGE **1ST, 2ND MAX 24-HR, MAX 3-HR, MAX 1-HR** = FIRST AND SECOND HIGHEST 24-HOUR, 3-HOUR, AND 1-HOUR VALUES FOR TIME PERIOD INDICATED **# OBS > 0.14** = NUMBER OF OBSERVATIONS ABOVE THE 24-HOUR STANDARD OF 0.14 PPM **# OBS > 0.5** = NUMBER OF OBSERVATIONS ABOVE THE 3-HOUR STANDARD OF 0.5 PPM **ARITH MEAN** = ARITHMETIC MEAN (STANDARD = 0.03 PPM)

Nitrogen Dioxide (NO₂) summary

There was one NO₂ site that operated during 2007 in the industrial network. The site was owned by Exelon Energy in Boston (East First St.) but was operated by ENSR/AECOM. The site did not meet the requirement of 75% or greater data capture due to equipment failure requiring instrument replacement. There were no reported violations of the NO₂ air quality standard during the year.

A summary of the 2007 NO₂ data is shown below.

SITE ID				%	1 ST	2 ND	3 RD	4 TH	ARITH
				OBS	MAX	MAX	MAX	MAX	MEAN
25-025-0040	Boston	Suffolk	531A East First Street	26	0.075	0.064	0.063	0.06	0.020

PRIMARY STANDARD: ANNUAL ARITHMETIC MEAN = 0.053 PPM

ABBREVIATIONS AND SYMBOLS USED IN TABLE

SITE ID = AIRS SITE IDENTIFICATION NUMBER **%OBS** = DATA CAPTURE PERCENTAGE **MAX 1-HR 1ST, 2ND** = FIRST AND SECOND HIGHEST VALUE FOR TIME PERIOD INDICATED **ARIT MEAN** = ARITHMETIC MEAN (STANDARD = 0.053 PPM)

Total Suspended Particulates (TSP) summary

There were four TSP sites that operated during 2007 in the industrial network. The sites were owned by Exelon Energy in Boston but were operated by ENSR/AECOM. All of the sites met the requirement of 75% or greater data capture.

TSP is no longer a criteria pollutant (PM₁₀ replaced it as the coarse particulate standard in 1987), so there is no longer a standard for it. A summary of the 2007 TSP data is shown below.

SITE ID				%	1 ST	2 ND	3 RD	4 TH	ARITH
	CITY	COUNTY	ADDRESS	OBS	MAX	MAX	MAX	MAX	MEAN
25-025-0019	Boston	Suffolk	Long Island	92	65	40	40	37	21.9
25-025-0020	Boston	Suffolk	Dewar Street	97	94	82	74	72	37.9
25-025-0021	Boston	Suffolk	340 Bremen Street	97	75	74	71	67	40.5
25-025-0040	Boston	Suffolk	531A East First Street	100	160	73	72	61	35.4
25-025-0040	Co-loc	Boston	Suffolk	531A East First Street	98	253	75	69	37.0

ABBREVIATIONS AND SYMBOLS USED IN TABLE

SITE ID = AIRS SITE IDENTIFICATION NUMBER **TYPE** = TYPE OF INSTRUMENT - **NC** = NON CONTINUOUS, **NC COLOC** = NON CONTINUOUS COLOCATED. **% OBS** = DATA CAPTURE PERCENTAGE **1ST, 2ND, 3RD, 4TH** **MAX** = 1ST, 2ND, 3RD AND 4TH HIGHEST 24-HOUR VALUES FOR THE YEAR **ARITH MEAN** = ARITHMETIC MEAN **GEO MEAN** = GEOMETRIC MEAN **GEO STD** = GEOMETRIC STANDARD DEVIATION

Sulfate (SO₄) summary

There were four SO₄ sites that operated during 2007 in the industrial network. The sites were owned by Exelon Energy in Boston but were operated by ENSR/AECOM. All of the sites met the requirement of 75% or greater data capture.

SO₄ is not a criteria pollutant so there are no ambient air quality standards for SO₄. A summary of the 2007 SO₄ data is shown below.

SITE ID				% OBS	1 ST MAX	2 ND MAX	3 RD MAX	4 TH MAX	ARITH MEAN	
25-025-0019	Boston	Suffolk	Long Island	92	10	10	9	8.5	4.87	
25-025-0020	Boston	Suffolk	Dewar Street	97	14	12	12	11	6.12	
25-025-0021	Boston	Suffolk	340 Bremen Street	97	12	10	10	10	6.09	
25-025-0040	Boston	Suffolk	531A East First Street	100	11	11	10	10	5.97	
25-025-0040	Co-loc	Boston	Suffolk	531A East First Street	98	11	10	9	9	5.83

ABBREVIATIONS AND SYMBOLS USED IN TABLE

SITE ID = AIRS SITE IDENTIFICATION NUMBER **TYPE** = TYPE OF INSTRUMENT - **NC** = NON CONTINUOUS, **NC COLOC** = NON CONTINUOUS COLOCATED **% OBS** = DATA CAPTURE PERCENTAGE **1ST, 2ND, 3RD, 4TH MAX VALUE** = 1ST, 2ND, 3RD AND 4TH HIGHEST 24-HOUR VALUES FOR THE YEAR **ARITH MEAN** = ARITHMETIC MEAN

QUALITY CONTROL AND QUALITY ASSURANCE

Introduction

In order to ensure that all air quality data is of acceptable and consistent quality, MassDEP has developed standard operating procedures (SOPs) based on federal requirements that include quality control and quality assurance techniques that systematically assess the entire sample collection and data handling system on an ongoing basis. Each year MassDEP certifies that it is in compliance with the federal requirements.

In 2007, EPA changed the statistics used to evaluate precision and bias and in some cases how the measurement quality indicators are aggregated. A few of the considerations that affect data quality on the sample collection end are:

- Site Placement
- Intake Probe Material
- Intake Probe Height
- Spacing from roadways and trees

On the data processing end there are quantitative statistics and qualitative descriptors used to interpret the degree of acceptability or utility of data to the end user. Examples of these data quality indicators are:

- Representativeness
- Precision
- Bias
- Detectability
- Completeness
- Comparability

MassDEP's Air Assessment Branch in Lawrence maintains an independent Quality Assurance/Data Management Group that reviews the monitoring data for quality, ensures that samples are collected correctly and conducts performance audits throughout the air monitoring network to verify data validity. Another function of the Data Group is to process and report all of the Massachusetts air quality data to the USEPA database in a timely manner. Computer software tools, report queries and "eyes on" data reviews are all used to detect and correct problems in the data before it is submitted to USEPA.

Quality Assurance requirements for ambient air monitoring are contained in the federal regulations at 40 CFR Part 58, Appendix A thru E.

Section IV

PAMS/Air Toxics Monitoring

PAMS Monitoring

Introduction

Unlike other pollutants, ground-level ozone is unique because it is a secondary pollutant and is not discharged directly to the atmosphere from a stack or tailpipe, but rather forms in the atmosphere from the photochemical reactions of other pollutants such as volatile organic compounds (VOCs) and NO_x. Ozone formation can occur many miles downwind from the source of the original emissions. These reactions occur in the presence of strong sunlight and are most pronounced during the hottest days of the summer. The PAMS (Photochemical Assessment Monitoring Stations) program was conceived as part of the 1990 Clean Air Act Amendments as an accurate way to collect data for assessing NAAQS attainment progress independent of the meteorological variation that occurs between years and for identifying appropriate pollution control strategies.

PAMS is a special designation for enhanced monitoring stations that are designed to gather information on the ozone formation process. Instrumentation at these sites measures pollutants and meteorological parameters that are specific to the photochemical processes by which ozone is created in the atmosphere at ground level. In addition to the standard NAAQS pollutants (ozone, NO₂, etc.) that are measured at other sites, non-criteria pollutants, including VOCs, are measured at PAMS stations on either an hourly basis or at regular intervals during the hottest part of the summer in June, July and August. Meteorology is a critical component of ozone formation and each PAMS site has a full compliment of meteorological sensors including wind speed, wind direction, temperature, relative humidity, barometric pressure, solar radiation and at some sites, total ultraviolet light and precipitation. MassDEP also operates a sophisticated PAMS associated Doppler Radar atmospheric profiler at a non-PAMS site in Stow, Massachusetts. This instrument measures temperature and wind profiles at different levels of the atmosphere that provides valuable information on upper level conditions that contribute to ozone formation.

Since the PAMS project started in 1993, USEPA has required Massachusetts to conduct enhanced ozone precursor measurements in the Boston and Springfield Metropolitan Areas and to assist Rhode Island in the measurement of ozone precursors and reactants at locations down wind of Providence, RI. The PAMS monitoring network was phased in during the 1990's. Competition for attention and resources from newer monitoring initiatives (including PM_{2.5}) has halted the expansion of the program and led to a consolidation of the network over the last several years. Looking toward the future, a holistic strategy that includes PAMS measurements at fewer but more enhanced air monitoring stations is being developed by USEPA. New USEPA regulations will reduce the number of PAMS sites in each area from the originally envisioned five sites per network to two.

PAMS Monitoring Areas

Boston	Springfield	Providence
*Blue Hill (Milton)	Chicopee	*Blue Hill (Milton)
Lynn	Ware	
Newbury		
Long Island		

* Provides data for both Boston and Providence networks.

Air Toxics Monitoring

Introduction

Toxic air pollutants are distinct from criteria air pollutants such as ozone and CO. The list includes pollutants known or suspected to cause cancer or other serious health effects, and includes volatile organic compounds (VOCs) and toxic metals (e.g., mercury).

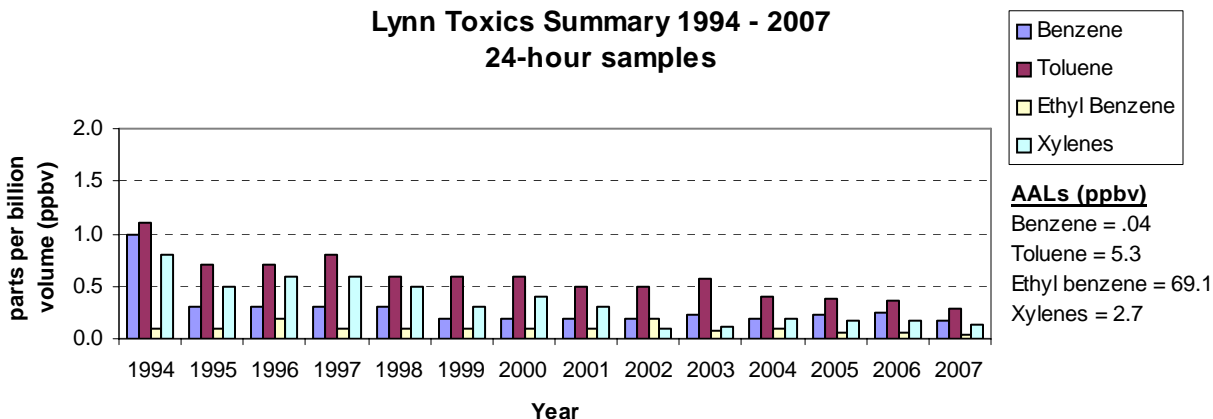
MassDEP monitors VOCs as part of the PAMS monitoring program, many of which are classified as air toxics. From June through August, VOCs are monitored at six PAMS sites. In addition, in 1999 MassDEP added two monitors to measure specific health-relevant VOCs.

A new toxics monitoring project was started at the Harrison Avenue monitoring site in Roxbury in 2003 and has been designated as a National Air Toxics Trends Station (NATTS) designed to collect and quantify a number of toxic air pollutants including VOCs, metals, aldehydes and black carbon. Data from this site will be compared with data from a network of similar sites positioned across the country to identify transport, trends and site-specific characteristics of these pollutants. VOCs and black carbon have been collected at this site since 1999.

Figure 10 summarizes concentrations of 24-hour health-relevant PAMS target compounds for samples taken at the Lynn PAMS site from 1994 to 2007. Significant mean concentration decreases seen between 1994 and 1995 are likely due to the introduction of reformulated gasoline at the beginning of 1995. Allowable Ambient Limit (AAL) values are presented next to Figure 10 for reference. AALs are health-based air toxics guidelines developed by MassDEP based on known or suspected carcinogenic and toxic health properties of individual compounds. Safety factors are incorporated into the AALs to account for exposures from pathways other than air. AALs are reviewed and updated periodically to reflect current toxicity information. AAL concentrations were developed for a 70-year lifetime exposure, but are frequently used for comparison with annual averages.

Figure 10

**Lynn Toxics Summary 1994 - 2007
24-hour samples**



Below is a table that summarizes results from the analysis of 24-hour samples for selected target VOCs from the two sites for 2007. The central city sampling location is Harrison Avenue and the area background site was Lynn.

Compound	BOSTON (Harrison Ave)		LYNN	
	Max Value ppb	Mean ppb	Max Value ppb	Mean ppb
1,3-butadiene	0.162	0.050	0.102	0.026
1,1,1-trichloroethane	0.030	0.012	0.019	0.011
trichloroethylene	0.032	0.004	0.019	0.002
tetrachloroethylene	0.147	0.030	0.063	0.019
Benzene	0.520	0.292	0.380	0.174
Toluene	8.714	0.969	0.859	0.289
Xylenes	1.399	0.404	0.403	0.138
Ethylbenzene	0.320	0.101	0.158	0.039

Samples collected at the Harrison Avenue site are analyzed for a suite of metals that are known to be toxic in the environment. The table below summarizes the 2007 metals data.

BOSTON (Harrison Ave)			
Metal	# of Samples	Max Value $\mu\text{g}/\text{m}^3$	Mean $\mu\text{g}/\text{m}^3$
Chromium	57	0.00316	0.00187
Antimony	57	0.00252	0.00096
Arsenic	57	0.00109	0.00047
Beryllium	57	0.00001	0.00001
Cadmium	57	0.00051	0.00015
Cobalt	57	0.00051	0.00015
Lead	57	0.03590	0.00402
Manganese	57	0.00793	0.00332
Nickel	57	0.00754	0.00237
Mercury	57	0.00025	0.00003
Selenium	57	0.00159	0.00041

Appendix A

2007 State Monitoring Station Locations

SITE ID	CITY	COUNTY	ADDRESS	DATE SITE	
				ESTABLISHED	MONITORED
25-003-4002	ADAMS	BERKSHIRE	MT. GREYLOCK	5/1/1989	O3
25-015-0103	AMHERST	HAMPSHIRE	NORTH PLEASANT	4/1/1988	O3
25-025-0002	BOSTON	SUFFOLK	KENMORE SQUARE	1/1/1965	SO2, NO2, CO, Lead, PM2.5 FRM, PM10, TEMP
25-025-0027	BOSTON	SUFFOLK	ONE CITY SQUARE	1/1/1985	PM2.5 FRM, PM10
25-025-0041	BOSTON	SUFFOLK	LONG ISLAND	12/1/1998	O3, NO2, VOCs, WS/WD, TEMP, Solar Rad, RH, BP O3, SO2, SO2T, NO2, CO, PM2.5 FRM & BAM (w/Speciation), PM10, Toxics, Black Carbon, WS/WD, TEMP, Solar Rad, RH, BP
25-025-0042	BOSTON	SUFFOLK	HARRISON AVENUE	12/15/1998	TEMP, Solar Rad, RH, BP
25-025-0043	BOSTON	SUFFOLK	174 NORTH ST	1/1/2000	PM2.5 FRM & BAM, Black Carbon
25-023-0004	BROCKTON	PLYMOUTH	120 COMMERCIAL ST	12/15/1998	PM2.5 FRM
25-013-0008	CHICOPEE	HAMPDEN	ANDERSON RD	1/1/1983	O3, NO2, PM2.5 FRM (w/Speciation), VOCs, Toxics, TEMP, WS/WD, Solar Rad, RH, BP
25-005-1002	FAIRHAVEN	BRISTOL	LEROY WOOD	1/1/1982	O3, WS/WD, TEMP, Solar Rad, RH, BP
25-005-1004	FALL RIVER	BRISTOL	GLOBE ST	2/1/1975	PM2.5 FRM & BAM, SO2
25-009-5005	HAVERHILL	ESSEX	WASHINGTON ST	7/19/1994	O3, NO2, PM2.5 FRM & BAM, WS/WD, TEMP, Solar Rad, RH, BP
25-009-6001	LAWRENCE	ESSEX	WALL EXP. STATION	4/3/1999	PM2.5 FRM
25-017-0007	LOWELL	MIDDLESEX	OLD CITY HALL	7/17/1981	CO
25-009-2006	LYNN	ESSEX	390 PARKLAND	1/1/1992	O3, NO2, PM2.5 FRM & BAM, VOCs, Toxics, WS/WD, TEMP, Solar Rad, RH, BP, UVB, PRECIP, COT
25-021-3003	MILTON	NORFOLK	BLUE HILL	4/2/2002	O3, NO2, NOy, PM2.5 BAM, VOCs, WS/WD, TEMP, Solar Rad, RH, BP
25-009-4004	NEWBURY	ESSEX	SUNSET BOULEVARD	8/1/1994	O3, NO2, NOy, VOCs, WS/WD, TEMP, Solar Rad, RH, BP
25-003-5001	PITTSFIELD	BERKSHIRE	78 CENTER STREET	12/15/2005	PM2.5 FRM
25-003-0006	PITTSFIELD	BERKSHIRE	BERKSHIRE COMMONS	1/1/79	PM2.5 BAM
25-013-0016	SPRINGFIELD	HAMPDEN	LIBERTY STREET	4/1/1988	SO2, NO2, CO, Black Carbon, PM2.5 FRM & BAM
25-013-2009	SPRINGFIELD	HAMPDEN	1860 MAIN STREET	1/1/2002	PM2.5 FRM, PM10
25-017-1102	STOW	MIDDLESEX	US MILITARY	4/1/1998	O3, Profiler, WS/WD, TEMP, Solar Rad, RH, BP
25-001-0002	TRURO	BARNSTABLE	FOX BOTTOM AREA	4/1/1987	O3, IMPROVE, WS/WD, TEMP, Solar Rad, RH, BP
25-017-4003	WALTHAM	MIDDLESEX	BEAVER STREET	1/1/1982	Acid Deposition
25-015-4002	WARE	HAMPSHIRE	QUABBIN SUMMIT	6/1/1985	O3, SO2, NO2, NOy, PM10, VOCs, PM2.5 BAM, IMPROVE, WS/WD, TEMP, Solar Rad, RH, BP, UVB, PRECIP
25-027-0015	WORCESTER	WORCESTER	WORC. AIRPORT	5/7/1979	O3, WS/WD, TEMP, RH, BP, Solar Rad
25-027-0016	WORCESTER	WORCESTER	2 WASHINGTON ST	12/31/2002	PM2.5 FRM
25-027-0023	WORCESTER	WORCESTER	SUMMER STREET	1/1/2004	SO2, NO2, CO, PM2.5 FRM & BAM, PM10

2007 Industrial Monitoring Station Locations

SITE ID	CITY	COUNTY	ADDRESS	DATE SITE	
				ESTABLISHED	MONITORED
25-025-0019	BOSTON	SUFFOLK	LONG ISLAND	1/1/1978	SO2, TSP, SO4, WS/WD
25-025-0020	BOSTON	SUFFOLK	DEWAR STREET	1/1/1978	SO2, TSP, SO4, WS/WD
25-025-0021	BOSTON	SUFFOLK	BREMEN STREET	1/1/1979	SO2, TSP, SO4, WS/WD
25-025-0040	BOSTON	SUFFOLK	531A EAST FIRST ST	1/1/1993	SO2, TSP, SO4, NO2, WS/WD

Appendix B

Air Quality Web Sites

Below is a listing of web sites that have air quality data or related information.

Web Address	Organization	Description
www.mass.gov/dep/	MassDEP	MassDEP Home Page. Links to MassDEP programs, regions and publications. Links to the Daily Ozone Forecast during ozone season (May 1 through September 30).
www.airbeat.org	MassDEP/EMPACT	Current AIR Quality in Roxbury – web page of MassDEP and EMPACT’s Roxbury monitor that shows current levels of ozone and particulates in the air.
www.turi.org	TURI	Toxics Use Reduction Institute – a multi-disciplinary research, education, and technical support center located at the University of Massachusetts/Lowell. Promotes reduction in the use of toxic chemicals and the generation of toxic by-products in industry and commerce in Massachusetts. The web site includes a link to TURADData, which makes information available to the public about toxics use in their communities.
www.airnow.gov	USEPA	Ozone Mapping Project – color-coded animated maps using near real-time data that show how ozone is formed and transported downwind.
www.epa.gov/ne/aqi/index.html	USEPA	AQI New England Forecast and Real Time Ozone.
www.epa.gov/ne/airquality/index.html	USEPA	EPA Smog Alert System – sign up and receive e-mail alerts whenever Massachusetts predicts unhealthy ozone levels.
www.epa.gov/air/data/	USEPA	AIRSDData - Access to air pollution data for the entire U.S.
www.epa.gov/bioindicators/	USEPA	Center for Environmental Information and Statistics – a single convenient source for information on environmental quality.
www.epa.gov/oar/oaqps	USEPA	EPA’s Office of Air and Radiation/Office of Air Quality Planning and Standards
www.epa.gov/region01/	USEPA	EPA Region 1 Home Page
www.epa.gov/ttn/	USEPA	EPA Technology Transfer Network - a collection of technical Web sites containing information about many areas of air pollution science, technology, regulation, measurement, and prevention.

Appendix B (continued)

Web Address	Organization	Description
www.epa.gov/enviro/	USEPA	EPA Envirofacts – data extracted from (4) major EPA databases: • PCS (Permit Compliance System) • RCRIS (Resource Conservation and Recovery Information System) • CERCLIS (Comprehensive Environmental Response, Compensation and Liability Information System) • TRIS (Toxic Release Inventory System)
www.epa.gov/index.html	USEPA	EnviroSenSe Network - a free, public environmental information system. Provides users with pollution prevention/cleaner production solutions, compliance and enforcement assistance information, and innovative technology options.
www.epa.gov/docs/ozone/index.html	USEPA	EPA Ozone Depletion Home Page – learn about the importance of the “good” ozone in the stratospheric ozone layer.
www.epa.gov/acidrain	USEPA	The Acid Rain Program – overall goal is to achieve significant environmental and public health benefits through reductions in emissions of sulfur dioxide (SO ₂) and nitrogen oxides (NO _x), the primary causes of acid rain. Emissions data from the nation’s largest power generating facilities is available here.
www.wampweather.org	Wampanoag Tribe	Weather monitoring information is listed under Natural Resources.
Maine www.state.me.us/dep/air/ New Hampshire www.des.state.nh.us/ New York www.dec.ny.gov/ New Jersey www.state.nj.us/dep/airmon/ Rhode Island www.dem.ri.gov/programs/benviron/air/		Ozone predictions and some real-time ozone data from neighboring states (some states report other pollutants, as well).

Appendix B (continued)

Web Address	Organization	Description
www.epa.gov/ttn/atw/	USEPA	Unified Air Toxics Website - This site is a central clearinghouse and repository for air toxics implementation information
www.epa.gov/airtrends	USEPA	AIR Trends - information on USEPA's evaluation of status and trends in the nation's outdoor air quality.
www.cleanairworld.org/	NACAA	National Association of Clean Air Agencies – site has links to state and local air quality agencies.
www.nescaum.org/	NESCAUM	Northeast States for Coordinated Air Use Management – an interstate association of air quality control divisions from the six New England states, New York and New Jersey.
www.wunderground.com/	University of Michigan	The Weather Underground -. another good source of weather information in the US and world.
http://cirrus.sprl.umich.edu/wxnet/	University of Michigan	The WeatherNet – a good source of weather information. Also has a great list of weather links.
http://www.erh.noaa.gov	NWS	The National Weather Service's Boston office provides local forecasts and climate information.
www.thebostonchannel.com	WCVB	WCVB TV Pollen Count – provides the daily pollen and mold count.
www.hazecam.net/	NESCAUM (CAMNET)	Real-time Air Pollution Visibility Camera Network - live pictures and air quality conditions for urban and rural vistas across the Northeast U.S.
www.arb.ca.gov/homepage.htm	CARB	California Air Resources Board Home Page
www.awma.org/	AWMA	The Air & Waste Management Association - a nonprofit, nonpartisan professional organization that provides training, information, and networking opportunities to 12,000 environmental professionals in 65 countries.
http://nadp.sws.uiuc.edu/	NADP	National Atmospheric Deposition Program – maps and data from the nationwide precipitation monitoring network. Site also has data from the Mercury Deposition Network.
http://profiler.noaa.gov/npn/profiler.jsp	NPN	NOAA Profiler Network provides hourly vertical wind profile data.
www.lungusa.org/	American Lung Association	American Lung Association – public health advocacy organization involved in public policy, research, and education mission is to prevent lung disease
http://nh.water.usgs.gov/projects/nawqa/hg_dep.htm	NACB	New England Coastal Basins Mercury Deposition Network – Atmospheric deposition