United States Environmental Protection Agency

2009 Annual Report on Air Quality in New England

United States Environmental Protection Agency, Region 1
New England Regional Laboratory
North Chelmsford, MA 01863

October 2010
Ecosystems Assessment Unit
http://www.epa.gov/region01/lab/reportsdocuments.html

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with
Map Data Source: USGS Earth Resources Observation Systems (EROS) Data Center, for elevation data.

The photo on the cover is from the Moosehorn, Maine site of the Hazecam network

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2009 ANNUAL REPORT ON AIR QUALITY

IN NEW ENGLAND

This report provides a summary of 2009 annual air quality information for all states in New England. The majority of the data included in this report were submitted to EPA by the states from their ambient monitoring networks in accordance with 40 CFR 58. The only data from industrial monitors which have been included are from the Massachusetts Industrial Network. These industrial sites supplement the state network.

This report reflects the status of the Air Quality System (AQS) database as of April 2010. The majority of data used have been evaluated and verified by EPA. However, for those monitors that appear to be violating an applicable ambient air quality standard, the data may require further evaluation by both EPA and the states. EPA has designated areas in New England as nonattainment for the 1997 8-hour ozone standard as reflected in the map of ozone nonattainment areas on page 81. Nonattainment area designations for the annual and 24-hour particulate matter less than 2.5 microns ($PM_{2.5}$) standards are also shown on page 81.

A table of the National Ambient Air Quality Standards (NAAQS) follows this introduction.

There is a list of potential health effects of the criteria pollutants after the NAAQS.

A summary of New England air quality follows. The bulk of the report, beginning on page 5, lists by state, a summary of criteria pollutant data from sites in each state in New England, and from industrial sites in Massachusetts. The information presented compares the measured values to each NAAQS; it includes the number of violations, the maximum and second high values, and the annual means [arithmetic mean or average for sulfur dioxide (SO_2), particulate matter less than 10 microns (PM_{10}), and nitrogen dioxide (NO_2)]. An annual mean is not valid for intermittent data unless there are four valid quarters. For PM_{10} and $PM_{2.5}$, 75% of the scheduled samples must be available for a quarter to be considered valid. However, years with at least 11 samples in each quarter shall be considered valid, notwithstanding quarters with less than complete data, if the resulting annual mean is greater that the level of the standard. (For continuous data, 75% of the year must be available to calculate a valid annual average.)

Included with this data summary table are graphs of selected air quality monitoring sites that show a multi-year span of data for PM_{10}, carbon monoxide (CO), $PM_{2.5}$, SO_2, ozone (O_3), and NO_2.

The state maps display the location of the monitoring sites (when measuring particulates, each state has at least one location where duplicate, or collocated, monitors run side by side for quality assurance purposes).

Additional maps are provided to show the current areas in New England designated non-attainment by EPA. This is followed by a summary of information from the $PM_{2.5}$ Performance Evaluation Program Audits (PEP) which are meant to assure the quality of particulate matter data, and the Through the Probe (TTP) audit data which is meant to assure the quality of other criteria pollutant data.

A discussion of regional atmospheric deposition of sulfates and nitrates follows this section. The last substantive section includes a discussion of Photochemical Assessment Monitoring Stations (PAMS).

The last section provides a list of AQS state and regional Air Quality Contacts, their addresses and phone numbers.

National Ambient Air Quality Standards

The Clean Air Act, which was last amended in 1990, requires EPA to set **National Ambient Air Quality Standards** (40 CFR part 50) for pollutants considered harmful to public health and the environment. The Clean Air Act established two types of national air quality standards. ***Primary standards*** set limits to protect public health, including the health of "sensitive" populations such as asthmatics, children, and the elderly. ***Secondary standards*** set limits to protect public welfare, including protection against decreased visibility, damage to animals, crops, vegetation, and buildings.

The EPA Office of Air Quality Planning and Standards (OAQPS) has set National Ambient Air Quality Standards for six principal pollutants, which are called "criteria" pollutants. They are listed below. Units of measure for the standards are parts per million (ppm) by volume, milligrams per cubic meter of air (mg/m^3), and micrograms per cubic meter of air ($\mu g/m^3$).

	Primary Standards		Secondary Standards	
Pollutant	**Level**	**Averaging Time**	**Level**	**Averaging Time**
Carbon Monoxide	9 ppm (10 mg/m^3)	8-hour (1)	None	
	35 ppm (40 mg/m^3)	1-hour (1)		
Lead	0.15 $\mu g/m^3$ (2)	Rolling 3-Month Average	Same as Primary	
	1.5 $\mu g/m^3$	Quarterly Average	Same as Primary	
Nitrogen Dioxide	53 ppb (3)	Annual (Arithmetic Ave.)	Same as Primary	
	100 ppb	1-hour (4)	None	
Particulate Matter (PM_{10})	150 $\mu g/m^3$	24-hour (5)	Same as Primary	
Particulate Matter ($PM_{2.5}$)	15.0 $\mu g/m^3$	Annual (6) (Arithmetic Average)	Same as Primary	
	35 $\mu g/m^3$	24-hour (7)	Same as Primary	
Ozone	0.075 ppm (2008 std)	8-hour (8)	Same as Primary	
	0.08 ppm (1997 std)	8-hour (9)	Same as Primary	
	0.12 ppm	1-hour (10)	Same as Primary	
Sulfur Dioxide	0.03 ppm	Annual (Arithmetic Ave.)	0.5 ppm	3-hour (1)
	0.14 ppm	24-hour (1)		
	75 ppb (11)	1-hour	None	

(1) Not to be exceeded more than once per year.
(2) Final rule signed October 15, 2008.
(3) The official level of the annual NO_2 standard is 0.053 ppm, equal to 53 ppb, which is shown here for the purpose of clearer comparison to the 1-hour standard
(4) To attain this standard, the 3-year average of the 98th percentile of the daily maximum 1-hour average at each monitor within an area must not exceed 100 ppb (effective January 22, 2010).
(5) Not to be exceeded more than once per year on average over 3 years.
(6) To attain this standard, the 3-year average of the weighted annual mean $PM_{2.5}$ concentrations from single or multiple community-oriented monitors must not exceed 15.0 $\mu g/m^3$.
(7) To attain this standard, the 3-year average of the 98th percentile of 24-hour concentrations at each population-oriented monitor within an area must not exceed 35 $\mu g/m^3$ (effective December 17, 2006).
(8) To attain this standard, the 3-year average of the fourth-highest daily maximum 8-hour average ozone concentrations measured at each monitor within an area over each year must not exceed 0.075 ppm. (effective May 27, 2008)
(9) (a) To attain this standard, the 3-year average of the fourth-highest daily maximum 8-hour average ozone concentrations measured at each monitor within an area over each year must not exceed 0.08 ppm.
(b) The 1997 standard—and the implementation rules for that standard—will remain in place for implementation purposes as EPA undertakes rulemaking to address the transition from the 1997 ozone standard to the 2008 ozone standard.
(c) EPA is in the process of reconsidering these standards (set in March 2008).
(10) (a) EPA revoked the 1-hour ozone standard in all areas, although some areas have continuing obligations under that standard ("anti-backsliding").
(b) The standard is attained when the expected number of days per calendar year with maximum hourly average concentrations above 0.12 ppm is ≤ 1.
(11) (a) Final rule signed June 2, 2010. To attain this standard, the 3-year average of the 99th percentile of the daily maximum 1-hour average at each monitor within an area must not exceed 75 ppb.

Health Effects of Criteria Pollutants

Lead (Pb)

Children are particularly sensitive to the chronic effects of lead and can suffer from damage to the brain and nervous system: behavior and learning problems, such as hyperactivity: slowed growth: hearing problems: and chronic headaches. Adults can suffer from reproductive problems (in both men and women), high blood pressure and hypertension, nerve disorder, memory and concentration problems, and muscle and joint pain. The major sources of lead air pollution are lead smelters, lead-acid battery manufacturers, utilities, airports and waste incinerators.

Ozone (O_3)

Ozone can irritate the respiratory system, causing coughing, throat irritation, and/or an uncomfortable sensation in the chest. Ozone can reduce lung function and make it more difficult to breathe deeply and vigorously. Ozone can aggravate asthma and increase susceptibility to respiratory infections. It injures vegetation, and has adverse effects on materials. Ozone is generally highest on sultry summer afternoons. Ozone is formed in the atmosphere by the reaction of nitrogen oxides, and hydrocarbons in the presence of sunlight.

Sulfur Dioxide (SO_2)

Children and adults with asthma who are active outdoors are most vulnerable to the health effects of sulfur dioxide. The primary effect they experience, even with brief exposure, is a narrowing of the airways, which may cause symptoms such as wheezing, chest tightness, and shortness of breath. Long-term exposure to both sulfur dioxide and fine particles can cause respiratory illness, alter the lung's defense mechanisms, and aggravate existing cardiovascular disease. It combines with water to form acid aerosols and sulfuric acid mist which falls to earth as acid rain, causing plant and structural damage, and acidifying watershed and freshwater ecosystems. Sulfate aerosols are also a component of $PM_{2.5}$. Major sources include power plants and industrial boilers.

Nitrogen Dioxide (NO_2)

In children and adults with respiratory disease, nitrogen dioxide can cause respiratory symptoms such as coughing, wheezing, and shortness of breath, and affect lung function. In children, short-term exposure can increase the risk of respiratory illness. Studies suggest that long-term exposure may cause permanent structural changes in the lungs. It also combines with water in the atmosphere to form acid aerosols and contributes to acid rain causing watershed acidification and damage to material structures. Nitrate aerosols contribute to ozone formation and are a component of $PM_{2.5}$. The sources of nitrogen dioxide are motor-vehicle exhaust, and fuel combustion sources such as electric power generating facilities.

Carbon Monoxide (CO)

People with cardiovascular disease, such as angina, may experience chest pain and more cardiovascular symptoms if they are exposed to carbon monoxide, particularly while exercising. In healthy individuals, exposure to higher levels of carbon monoxide can affect mental alertness and vision. Carbon monoxide forms when carbon and hydrocarbon in fuels do not completely burn. Motor vehicles are the most significant source of CO to ambient air.

Particulate Matter ($PM_{2.5}$ and PM_{10})

Both fine ($PM_{2.5}$) and coarse (PM_{10}) particles can accumulate in the respiratory system. When exposed to particulate matter (PM), people with existing heart or lung problems are at increased risk of premature death or admission to hospitals or emergency rooms. Children and people with existing lung disease may not be able to breathe as deeply or vigorously as they would normally, and they may experience coughing and shortness of breath. PM can increase susceptibility to respiratory infections and can aggravate existing respiratory diseases, causing more use of medication and more doctor visits. PM includes both solid particles and liquid droplets found in air. Many sources, both manmade and natural, emit PM directly or emit other pollutants that react in the atmosphere to form PM. Sources of fine particles include all types of combustion (motor vehicles, power plants, wood burning, etc.) and some industrial processes. Sources of coarse particles include crushing or grinding operations, and dust from paved or unpaved roads.

Site Maps, Narratives, Summary Data, and Charts for the Criteria Pollutants in the Six New England States

Abbreviations and Symbols used in the Ambient Air Quality Data Section

SITE ID Site Identification number

POC Parameter Occurrence Code - differentiates between monitors for a given pollutant

MT Monitor type:
1=NAMS National Air Monitoring Station,
2=SLAMS State/Local Air Monitoring Station,
3=Other,
4=Industrial, Industrially owned Air Monitoring Station,
6,7,8=PAMS Photochemical Assessment Air Monitoring Station
0=Unknown,
C=Non EPA Federal

YR Year

REP ORG Reporting Organization

#OBS Number of Observations

MAX 24-HR:
- 1st Highest 24-hour value recorded in the year
- 2nd Second highest 24-hour value for the year
- 3rd Third highest 24-hour value for the year.
- 4th Fourth highest 24-hour value for the year.

ARITH MEAN Arithmetic mean

WTD ARITH MEAN Weighted arithmetic mean

GEO MEAN Geometric mean

GEO STD Geometric standard deviation

QUARTERLY ARITH MEANS:
- 1ST First quarter arithmetic mean
- 2ND Second quarter arithmetic mean
- 3RD Third quarter arithmetic mean
- 4TH Fourth quarter arithmetic mean

MAX VALUES:
- 1st Highest 24-hour value recorded for the year
- 2nd Second highest 24-hour value in the year.

METHOD Method

MAX 1-HR:
- 1st Highest 1-hour value recorded in the year
- 2nd Second highest 1-hour value recorded in the year

OBS > 35 Number of observations greater than 35 ppm for CO

MAX 8-HR:
- 1st Highest 8-hour value recorded in the year
- 2nd Second highest 8-hour value recorded in the year

OBS > 9 Number of 8-hour ave. greater than 9 ppm for CO

OBS > 365 Number of 24-hour ave. greater than 365 ug/m^3 for SO_2

MAX 3-HR:
- 1st Highest 3-hour value recorded in the year
- 2nd Second highest 3-hour value recorded in the year

Obs > 1300 Number of 3-hour ave. greater than 1300 µg/m^3 for SO_2

NUM MEAS The valid number of days measured

NUM REQ The valid number of days in the ozone season

NUM OBS Number of Observations

SCHEDULED NUM OBS Number of observations scheduled

% OBS Percent completed of number of observations scheduled

MISS DAYS ASSUMED < STANDARD
Number of missing days assumed to be less than the standard

"METHOD" REPORTED = Details can be found at:
http://www.epa.gov/ttn/airs/airsaqs/manuals/ A "code "0" is included if Multiple Methods codes are input for the same year.

PPM: Parts Per Million

PPB: Parts Per Billion

µg/m^3: micrograms per cubic meter

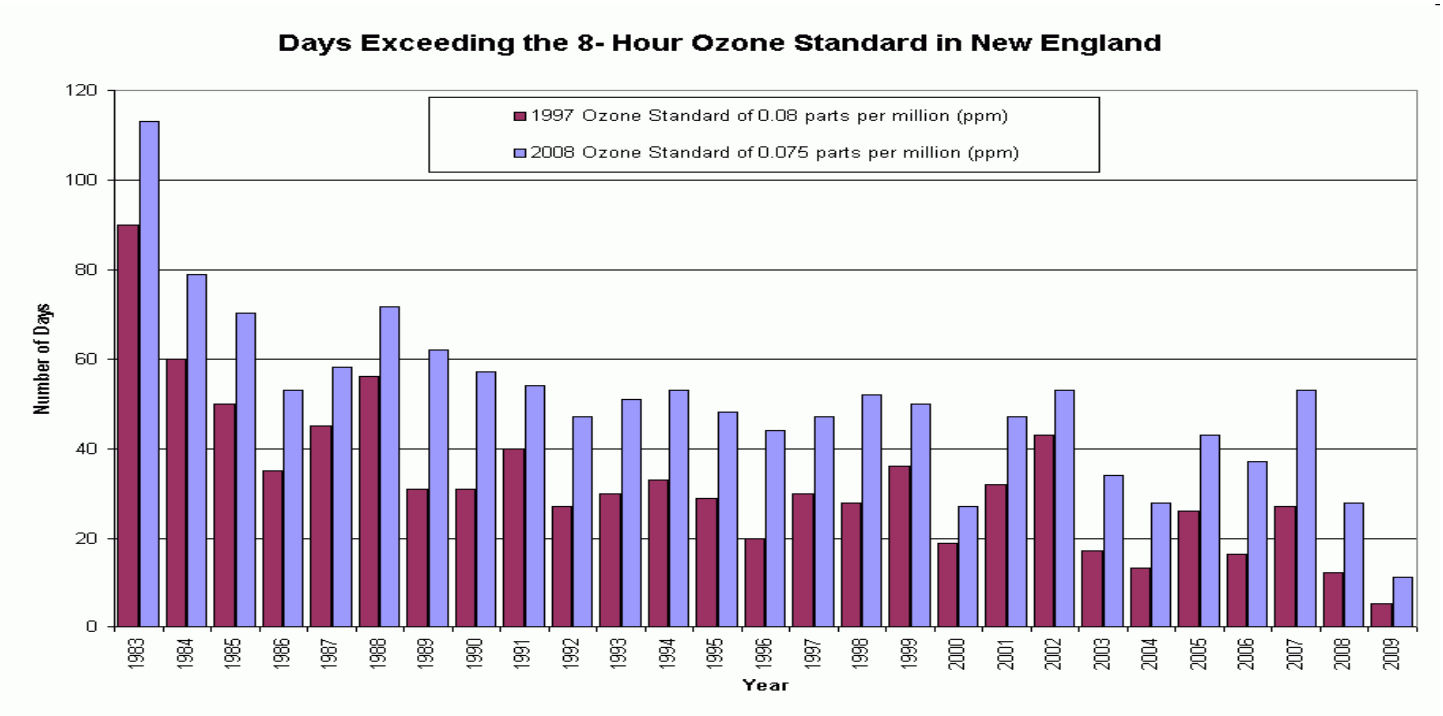
2009 Summary of New England Ambient Air Quality

2009 Summary of Ambient Air Quality in New England

The New England states operate more than 110 criteria pollutant monitoring sites, with more than 250 ambient air quality monitors. These monitors measure the criteria pollutants: CO, SO_2, NO_2, O_3, Pb, PM_{10} and $PM_{2.5}$. Levels of these pollutants are compared to the NAAQS, limits set by EPA to protect public health and welfare. In addition, more than a dozen sites measure precursor pollutants for ozone (PAMS sites) and toxic compounds.

In general, air quality measurements are strongly influenced by seasonal weather patterns. This is especially true for ozone and haze (principally composed of fine particulate matter - $PM_{2.5}$) which can be influenced by photochemical and transport mechanisms. For these pollutants, higher ambient air concentrations are generally recorded during warm and dry summers and lower concentrations during cool and/or wet summers. In addition, high $PM_{2.5}$ concentrations can be recorded during strong temperature inversions in the winter months. Both of these pollutants are tracked real-time by the EPA AIRNow Air Quality Index (AQI) program, which maps the relative health impacts of ozone and fine particulate concentrations throughout the U.S. (http://www.airnow.gov/).

During 2009, weather conditions during the summer were generally cooler and wetter than normal, with eleven days above 90°F at Bradley Airport near Hartford, CT, leading to fewer high ozone days. Using the number of days when at least one ozone monitoring site exceeded the 2008 8-hour ozone standard (0.075 ppm), 2009 had 11 days which exceeded the NAAQS. 2008 had 28 days which exceeded that NAAQS. In contrast, relative to the less stringent 1997 8-hour ozone standard (0.08 ppm), there were only 5 days which exceeded this standard. This chart shows the trend in the number of days above both the newer 0.075 ppm standard and the previous 0.08 ppm standard. At the time of this writing, EPA is reconsidering the 2008 NAAQS and has proposed to strengthen the 8-hr primary ozone standard to a level within the range of 0.060 – 0.070 ppm.



More information can be found at www.epa.gov/region1/aqi. In 2009, Worcester Airport in Massachusetts recorded a fourth highest maximum 8-hour ozone concentration of 0.077 ppm, the highest in New England. The other New England states measured fourth highest maximum 8-hour concentrations ranging from 0.074 ppm (CT) to 0.068 ppm (VT). Only three (3) monitoring sites in New England exceeded the fourth highest 8-hour ozone threshold (> 0.075 ppm). Nevertheless based on 2007 – 2009 data all ozone sites in New England meet the 1997 8-hour ozone standard of 0.08 ppm.

Since 1993, the New England states (except Vermont) have operated Photochemical Assessment Monitoring Stations (PAMS), which measure ozone precursors (oxides of nitrogen and organic compounds). Near the end of this report we include an analysis of Total Non-Methane Organic Compounds (TNMOC) reductions that have occurred as a result of efforts to reduce these pollutants.

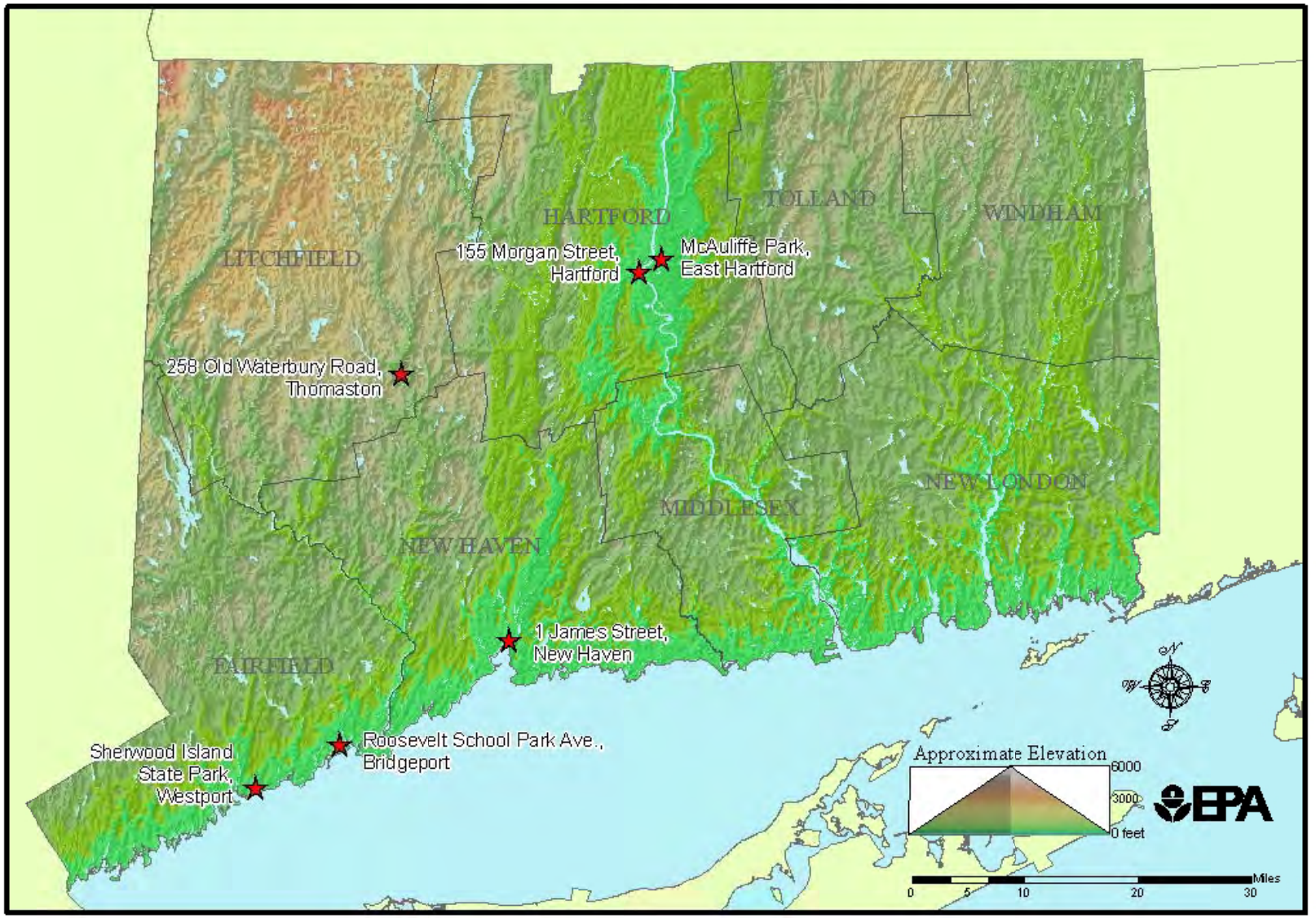
During 2009, the highest daily concentrations of fine particulate matter $PM_{2.5}$ occurred in northern Maine at 41.5 µg/m^3. Other than that, the highest concentrations were in the order of 30-35 µg/m^3 and were measured at a number of sites throughout New England. That said, however, based on 2007-2009 data, all sites in New England met the 24-hour and the annual $PM_{2.5}$ NAAQS. The highest annual average concentration for fine particulate matter was measured at New Haven (CT), at 10.75 µg/m^3. The lowest annual average concentrations of fine particulate matter were measured at the Bar Harbor, Presque Isle, and Greenville, Maine sites and the Underhill, VT site (<6.0 µg/m^3). For coarse particulate matter (PM_{10}), the highest daily concentration was measured at the Portland (ME) site (138 µg/m^3). None of the PM_{10} sites in New England exceeded either the primary or the secondary NAAQS for PM_{10}. In New England, $PM_{2.5}$ concentrations are collected using both the typical 24- hour, or daily, sampling techniques, and some monitors collect data on a continuous basis. This real time data collection is useful for AIRNow reporting purposes even while some states evaluate the continuous monitors for NAAQS compliance purposes.

In general, the concentrations for most of the other criteria pollutants (NO_2, CO, and Pb) measured at monitoring sites throughout New England either declined or remained at historically low levels. Ambient air concentrations of SO_2, NO_2, CO, and Pb measured at sites in New England were well below the NAAQS in effect in 2009.

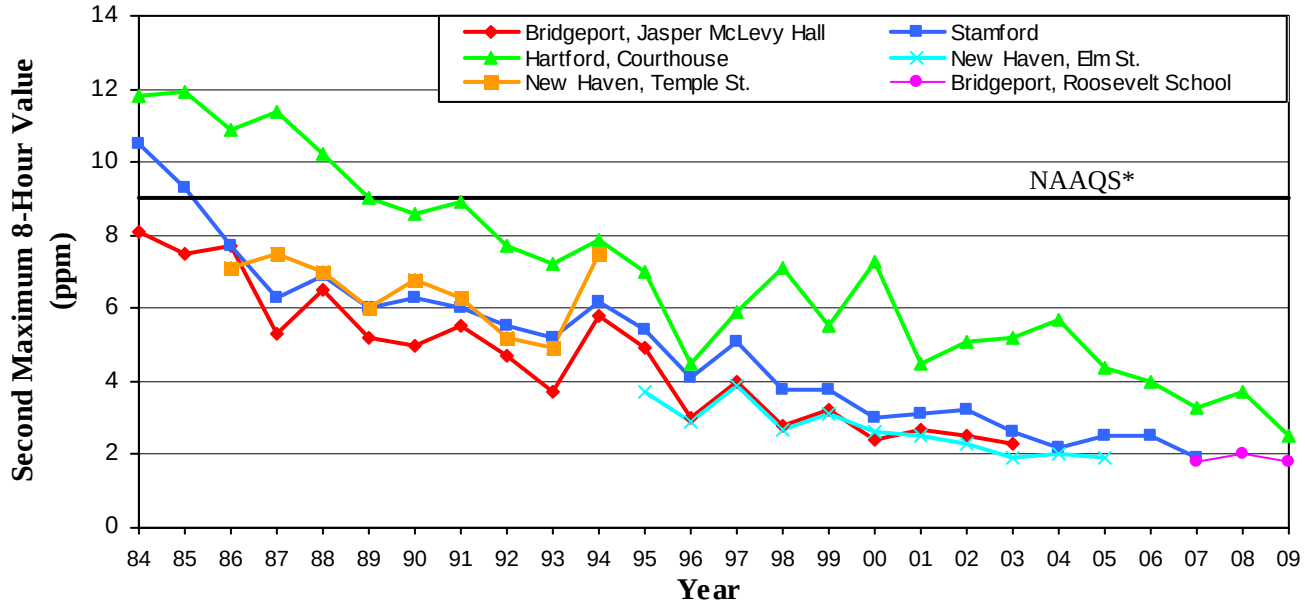
In the coming year, with the substantially strengthened NAAQS for lead, EPA expects that additional monitors will be placed to better characterize lead concentrations in New England. In addition, in 2010, EPA promulgated substantially strengthened NAAQS for SO_2 and NO_2. In the coming years, new monitors will be placed throughout New England to characterize pollutant concentrations relative to these pollutants. Based on the 2007-2009 data, the Pembroke, New Hampshire monitor measures sulfur dioxide concentrations that violate this new NAAQS.

As a further resource, detailed information about air monitors and a variety of mapping and data plotting information for the entire United States can be found at www.epa.gov/airexplorer.

Connecticut Sites - 2009 - Carbon Monoxide



Connecticut Carbon Monoxide Data

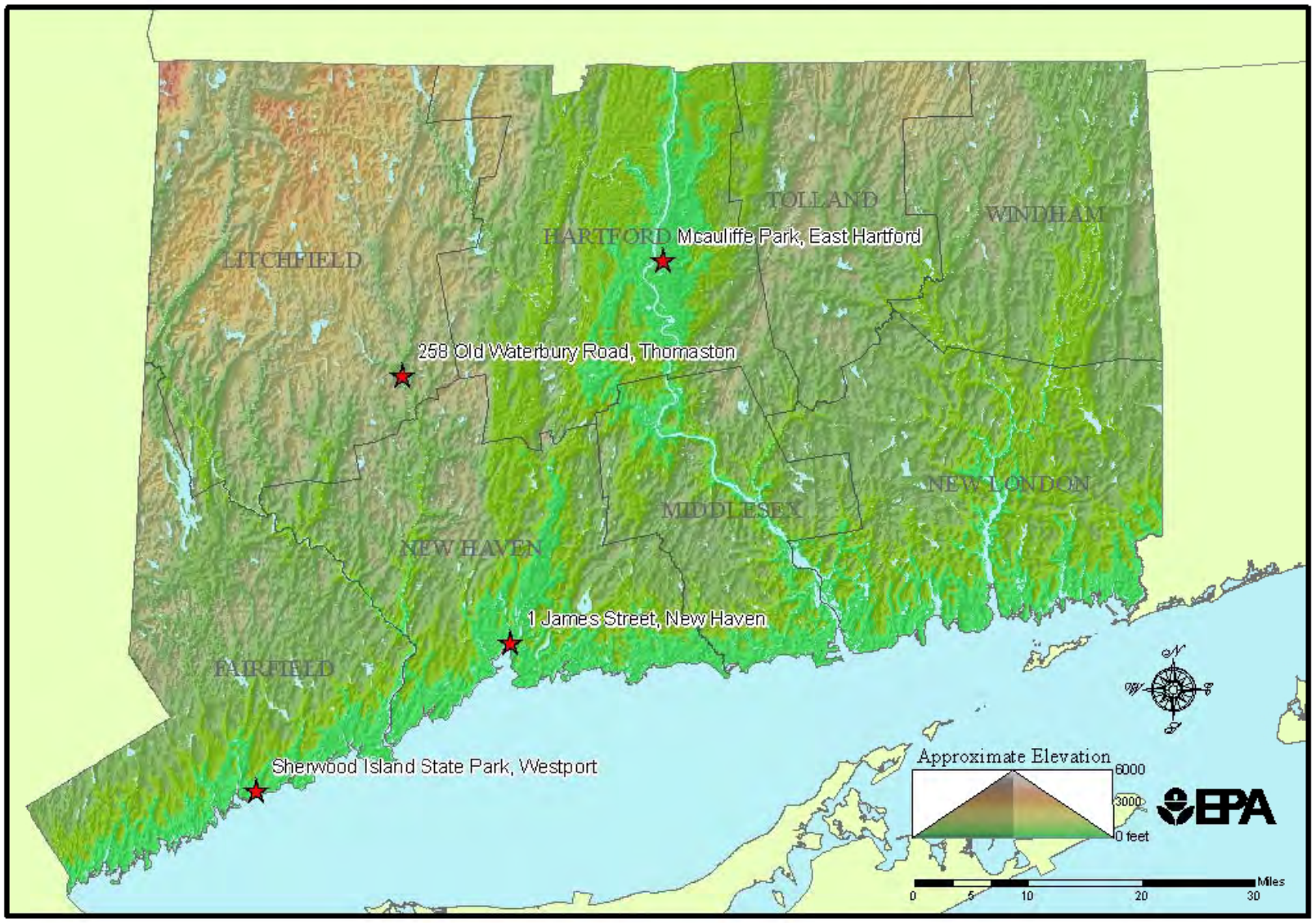


*NAAQS for Carbon Monoxide:
8-hour – 9 ppm, not to be exceeded more than one per year
1-hour – 35 ppm, not to be exceeded more than once per year

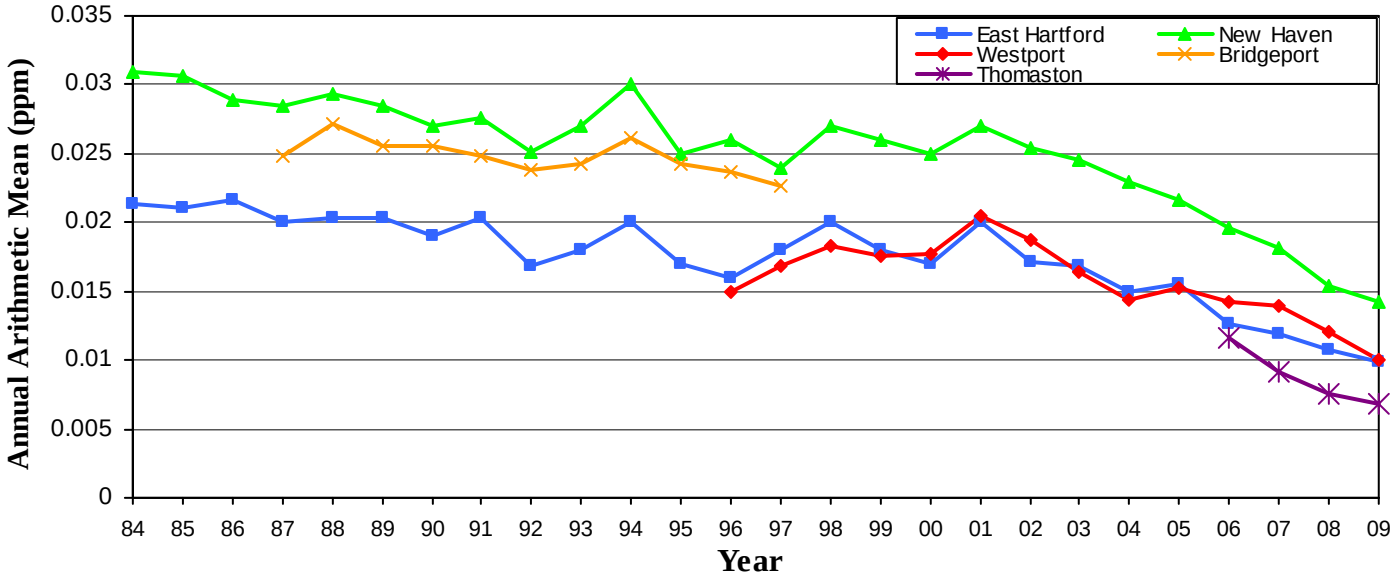
2009													
Connecticut													
Carbon Monoxide													
All Values are in Units of Parts Per Million (ppm)													
								1-hour	1-hour		8-hour	8-hour	
	P								2nd			2nd	
	O					Methods	#	Highest	Highest		Highest	Highest	
Site ID	C	PQAO	City	County	Address	Used	Obs	Value	Value	OBS > 35	Value	Value	OBS > 9
09-001-0010	1	251	Bridgeport	Fairfield	ROOSEVELT SCHOOL PARK AVE.	54	8656	2.9	2.7	0	1.9	1.8	0
09-001-9003	1	251	Westport	Fairfield	SHERWOOD ISLAND STATE PARK	554	8666	1.0	1.0	0	0.9	0.9	0
09-003-0017	1	251	Hartford	Hartford	COURTHOUSE, 155 MORGAN ST.	54	8513	4.9	4.5	0	2.6	2.5	0
09-003-1003	1	251	East Hartford	Hartford	MCAULIFFE PARK	54	8623	2.1	2.0	0	1.3	1.3	0
09-005-0004	1	251	Thomaston	Litchfield	258 OLD WATERBURY ST.	554	8410	1.1	0.9	0	0.8	0.7	0
09-009-0027	1	251	New Haven	New Haven	1 JAMES STREET	554	7760	2.0	1.9	0	1.5	1.4	0

Six CO ambient monitoring sites operated in 2009, three of which are trace CO ambient monitoring sites. No exceedance or violation of the 1-hour or 8-hour CO NAAQS were recorded in Connecticut during 2009. The second highest recorded maximum 8-hour concentration of 2.5 ppm was recorded at the Hartford Courthouse site, and shows a fairly steady and substantial downward trend.

Connecticut Sites - 2009 - Nitrogen Dioxide



Connecticut Nitrogen Dioxide Data



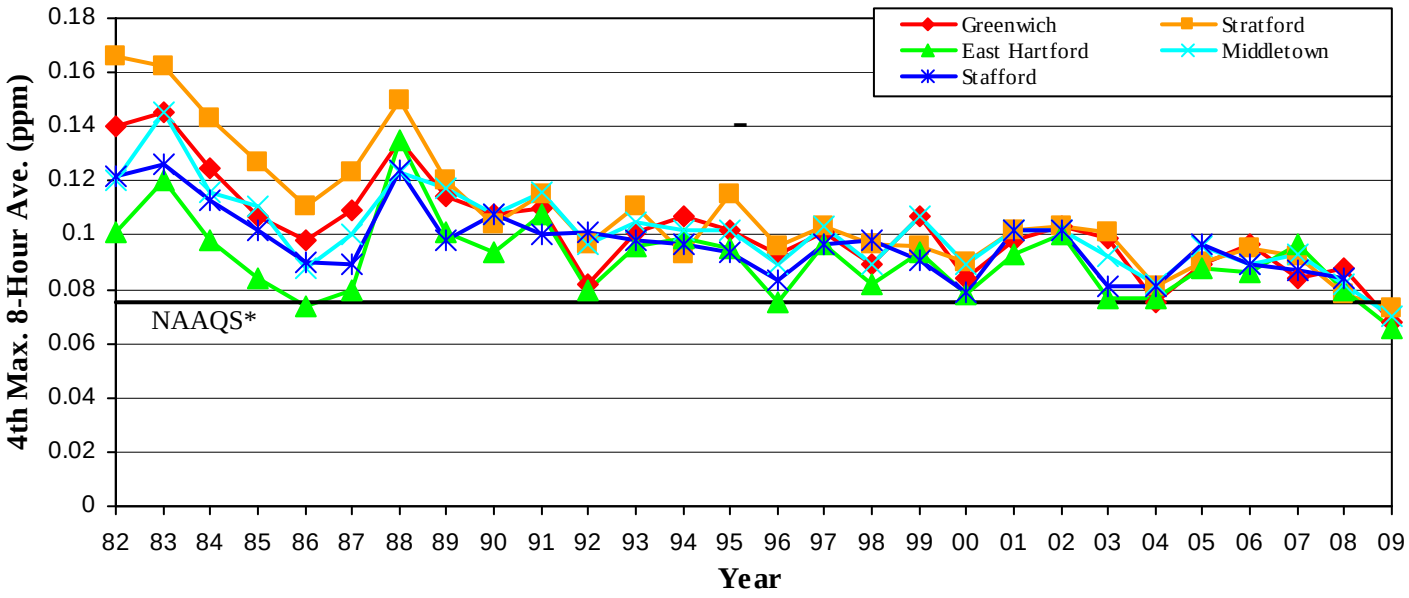
NAAQS for Nitrogen Dioxide:
Annual Arithmetic Mean 0.053 ppm (100 µg/m^3)
1-hour – 100 ppb (or 0.100 ppm)(as of January 22, 2010) 98th percentile

2009										
Connecticut										
Nitrogen Dioxide										
All Values are in Units of Parts Per Million (ppm)										
								1-hour	1-hour	
	P								2nd	Annual
	O						#	Highest	Highest	Arith.
Site ID	C	PQAO	City	County	Address	Method	Obs	Value	Value	Mean
09-001-9003	1	251	Westport	Fairfield	SHERWOOD ISLAND STATE PARK	74	8253	0.052	0.052	0.01
09-003-1003	1	251	East Hartford	Hartford	MCAULIFFE PARK	74	8557	0.054	0.054	0.0099
09-005-0004	1	251	Thomaston	Litchfield	258 OLD WATERBURY ROAD	74	8485	0.052	0.046	0.0068
09-009-0027	1	251	New Haven	New Haven	1 JAMES STREET	74	8099	0.076	0.066	0.0143

The four NO_2 ambient air monitoring sites that operated during 2009, did not measure any violation of the annual NAAQS. The New Haven site reported the highest annual arithmetic mean NO_2 concentration of 0.0143 ppm, which is 27% of the NAAQS. The PAMS located in East Hartford and Westport both reported concentrations of NO_2 well below the NAAQS. For the past twenty four years annual concentrations of NO_2 have been relatively constant with a downward trend since 2001.

Connecticut Sites - 2009 - Ozone

Connecticut Ozone 8-Hour Data



*NAAQS for Ozone:

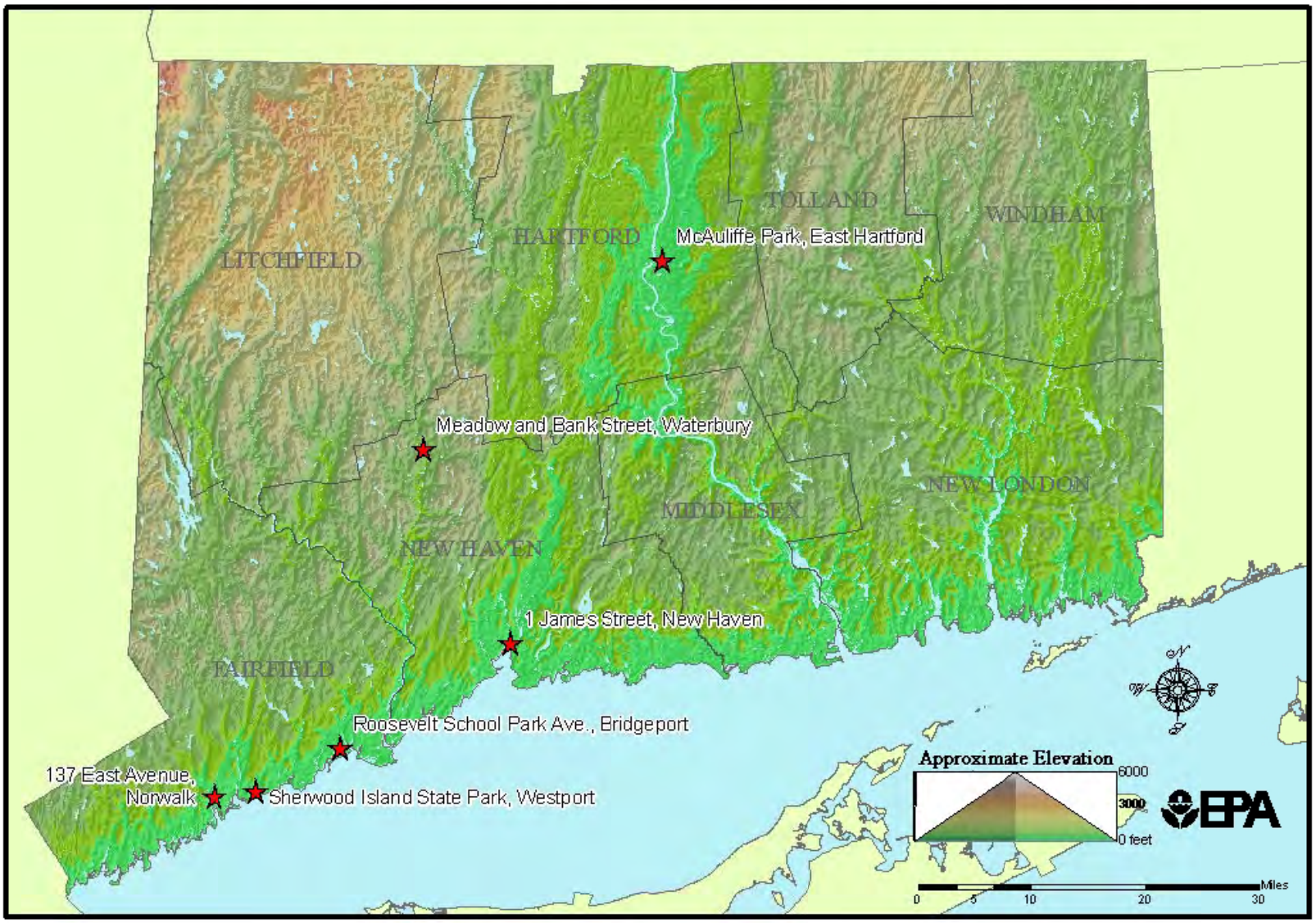
8-hour – 0.075 ppm (2008 std)

(To attain this 0.075 ppm standard, the 3-year average of the fourth-highest daily maximum 8-hour average ozone concentrations measured at each monitor within an area over each year must not exceed 0.075 ppm. This graph represents the 4th highest value for each year for each monitor depicted. Thus, being above or below this NAAQS line does not indicate whether or not a monitor exceeds the NAAQS.)

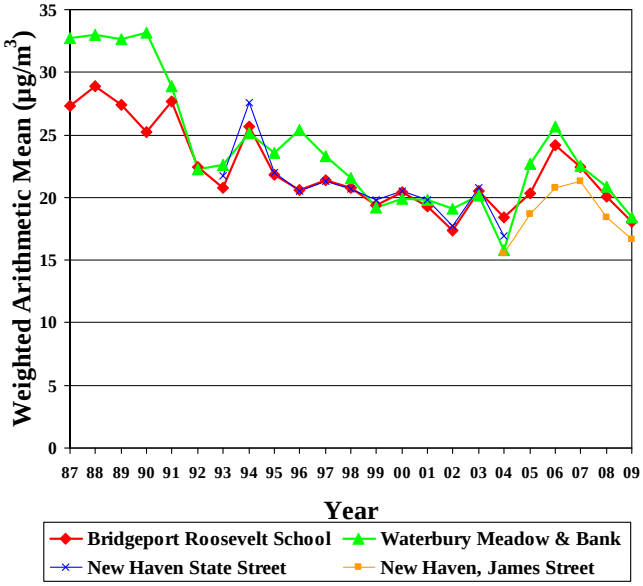
2009														
Connecticut														
Ozone (8-hour)														
All Values are in Units of Parts Per Million (ppm)														
	P							Valid	Num		2nd	3rd	4th	Days
	O					Meth	%	Days	Req	Highest	Highest	Highest	Highest	Max >
Site ID	C	PQAO	City	County	Address	Rept	Obs	Meas.	Days	8-Hr Val	8-Hr Val	8-Hr Val	8-Hr Val	0.075
09-001-0017	1	251	Greenwich	Fairfield	GREENWICH POINT PARK	47	89	162	183	0.079	0.073	0.072	0.068	1
09-001-1123	1	251	Danbury	Fairfield	W. CONNECTICUT STATE U.	47	99	181	183	0.083	0.080	0.076	0.074	3
09-001-3007	1	251	Stratford	Fairfield	USCG LIGHTHOUSE , PROSPECT ST.	47	98	180	183	0.084	0.081	0.073	0.073	2
09-001-9003	1	251	Westport	Fairfield	SHERWOOD ISLAND STATE PARK	47	98	179	183	0.085	0.082	0.073	0.073	2
09-003-1003	1	251	E. Hartford	Hartford	MCAULIFFE PARK	47	91	166	183	0.076	0.073	0.071	0.066	1
09-005-0005	1	251	Cornwall	Litchfield	MOHAWK MTN MICROWAVE TWR.	47	86	158	183	0.074	0.074	0.072	0.070	0
09-007-0007	1	251	Middletown	Middlesex	CONN. VALLEY HOSP	47	99	181	183	0.081	0.075	0.071	0.070	1
09-009-0027	1	251	New Haven	New Haven	1 JAMES STREET	47	90	165	183	0.071	0.063	0.061	0.061	0
09-009-3002	1	251	Madison	New Haven	HAMMONASSET STATE PARK	47	96	176	183	0.079	0.075	0.074	0.073	1
09-011-0124	1	251	Groton	New London	141 SMITH STREET	47	91	166	183	0.083	0.075	0.074	0.073	1
09-013-1001	1	251	Not in a city	Tolland	ROUTE 190, SHENIPSIT ST. FOREST	47	99	181	183	0.082	0.081	0.079	0.074	3

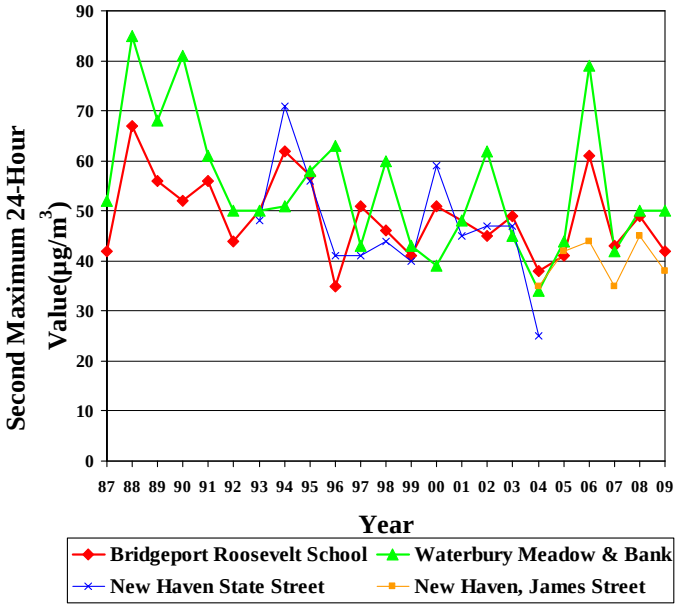
During 2009, none of the eleven ozone monitoring sites reported a fourth-highest daily 8-hour average ozone concentration above the level of the 8-hour NAAQS for the year. In 2009, the highest value of 0.085 ppm was recorded at Westport. This was a substantial decrease from 2008 during which the highest values of 0.105 ppm over 8-hours were recorded in Greenwich and Madison. In 2007, the highest 8-hour ozone concentration of 0.123 ppm was measured at the Cornwall site.

Connecticut Sites - 2009 - Particulate Matter < 10 Microns



Connecticut Particulate Matter < 10 Microns (PM_{10}) Data



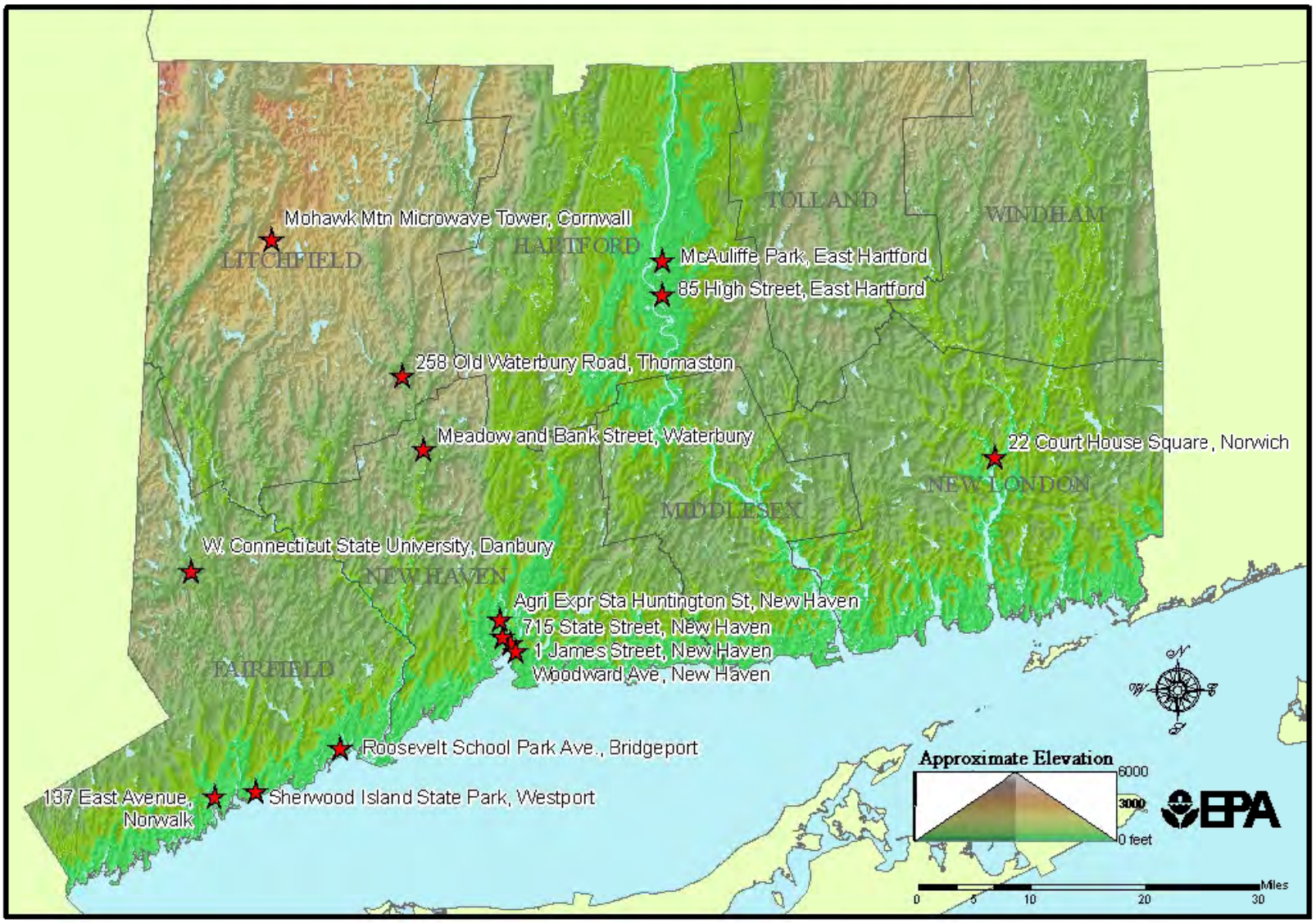


NAAQS for Particulate Matter less than 10 Microns:
24-hour 150 µg/m^3

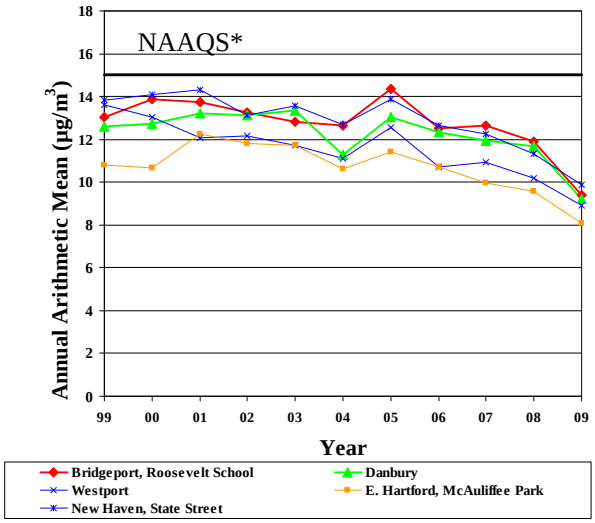
2009																		
Connecticut																		
Particulate Matter < 10 Microns																		
All Values are in Units of µg/m^3																		
												2nd	3rd	4th	Days	st. Day	Wtd.	
							Methods			Number	Valid	Highest	Highest	Highest	Highest	Max	Max	Arith.	
SITE ID	POC	PQAO	City	County	Address	Used	# Obs	# Req.	Days	% Obs	Value	Value	Value	Value	>150	>150	Mean	
09-001-0010	1	251	Bridgeport	Fairfield	ROOSEVELT SCHOOL PARK AVE.	0	56	61	56	92	45	42	40	38	0	0	18.1	
09-001-3005	1	251	Norwalk	Fairfield	NORWALK HEALTH DEPT 137 E. AVE.	126	54	61	54	89	36	36	34	33	0	0	15.4	
09-001-9003	1	251	Westport	Fairfield	SHERWOOD ISLAND STATE PARK	127	57	61	57	93	36	25	24	24	0	0	11.7	
09-003-1003	1	251	East Hartford	Hartford	MCAULIFFE PARK	126	59	61	59	97	32	28	27	26	0	0	12.5	
09-009-0027	1	251	New Haven	New Haven	1 JAMES STREET	127	60	61	60	98	38	38	38	34	0	0	16.7	
09-009-0027	2	251	New Haven	New Haven	1 JAMES STREET	127	58	61	58	95	37	37	37	33	0	0	16.4	
09-009-2123	1	251	Waterbury	New Haven	MEADOW AND BANK STREET	127	61	61	61	100	60	50	43	43	0	0	18.4	
09-009-2123	2	251	Waterbury	New Haven	MEADOW AND BANK STREET	126	58	61	58	95	61	50	43	42	0	0	18.4	

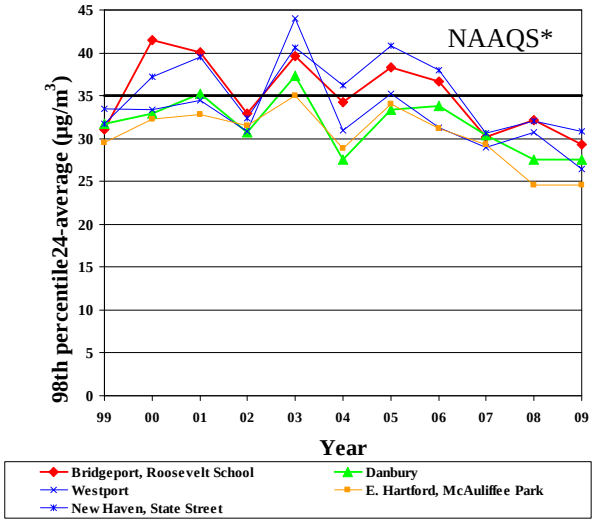
The six Connecticut sites (there are two co-located monitors in New Haven) measuring PM_{10} did not record an exceedance or violation of the 24-hour NAAQS during 2009. The New Haven site at Meadow and Bank streets reported the highest 24-hour second maximum value of 50 µg/m^3 during 2009, which is 40% of the NAAQS.

Connecticut Sites - 2009 - Particulate Matter < 2.5 Microns



Connecticut Particulate Matter < 2.5 Microns ($PM_{2.5}$) Data



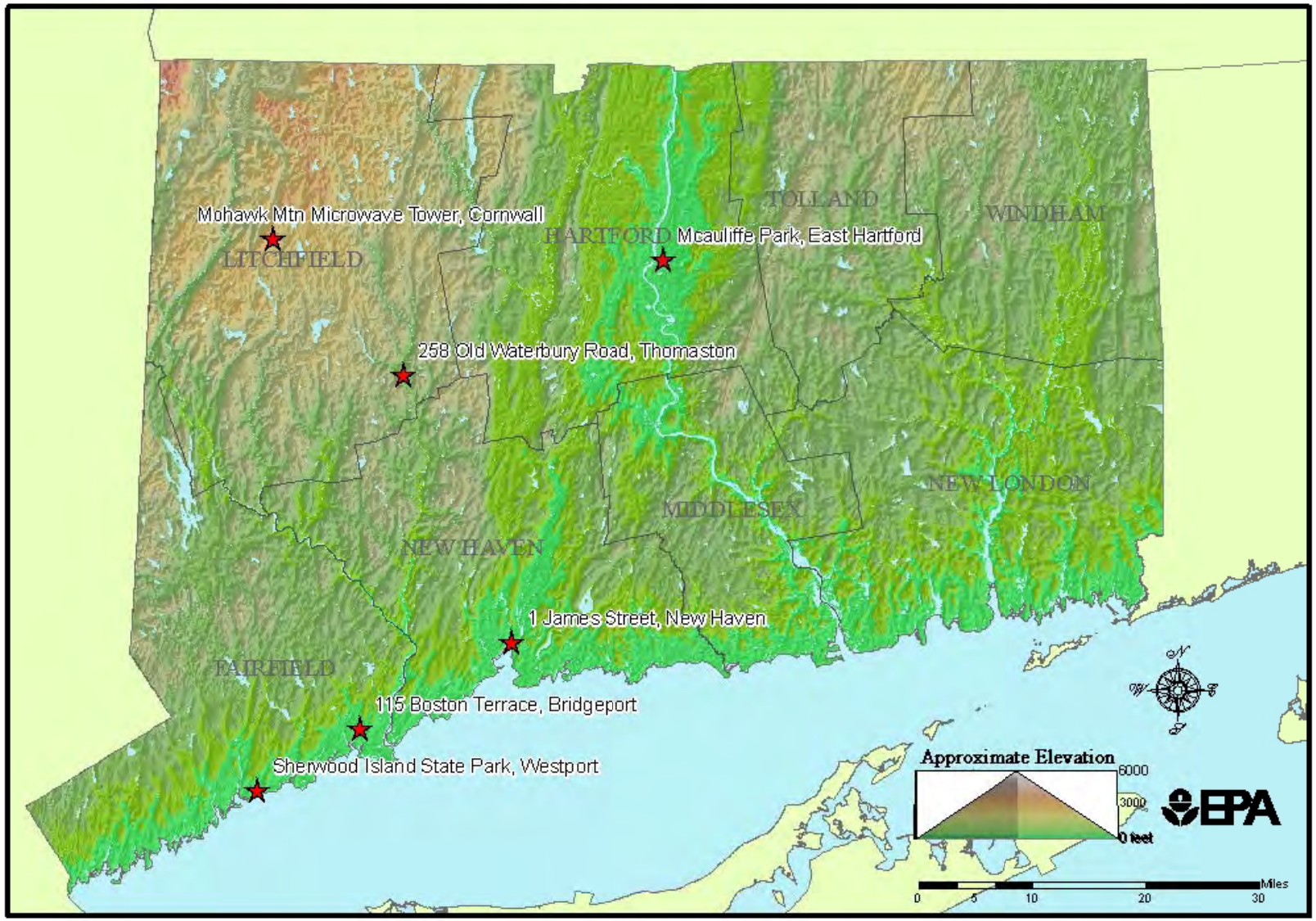


*NAAQS for Particulate Matter less than 2.5 Microns:
Annual: the 3-year average of the Annual Arithmetic Mean - 15.0 µg/m^3
24-Hour: the 3-year average of the 98th percentile of 24-hour average concentrations - 35 µg/m^3

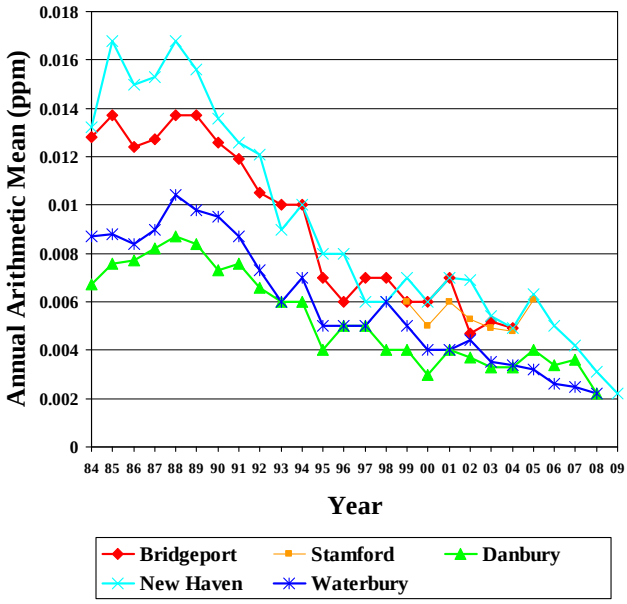
2009													
Connecticut													
Particulate Matter < 2.5 Microns													
All Values are in µg/m^3 Meters Local Conditions													
	P								2nd	3rd	4th	98th	Wtd.
	O							#	Highest	Highest	Highest	Highest	Percentile	Arith.
Site ID	C	PQAO	City	County	Address	Method	Obs	Value	Value	Value	Value	Value	Mean
09-001-0010	1	251	Bridgeport	Fairfield	ROOSEVELT SCH. PARK AVE.	145	112	31.1	30.7	29.3	24.0	29.3	9.41
09-001-1123	1	251	Danbury	Fairfield	W.CONNECTICUT STATE U.	145	117	32.4	29.5	27.6	26.6	27.6	9.22
09-001-3005	1	251	Norwalk	Fairfield	HEALTH DEP. 137 EAST AVE.	145	113	30.9	29.4	29.3	24.8	29.3	9.47
09-001-9003	1	251	Westport	Fairfield	SHERWOOD ISLAND STATE PARK	145	331	33.7	29.1	29.1	27.5	26.4	8.91
09-003-1003	1	251	East Hartford	Hartford	MCAULIFFE PARK	145	335	29.4	28.9	26.9	26.8	24.6	8.08
09-003-2006	1	251	East Hartford	Hartford	85 HIGH STREET	145	120	28.2	27.2	26.1	21.2	26.1	8.97
09-005-0004	1	251	Thomaston	Litchfield	258 OLD WATERBURY ROAD	145	115	26.1	22.7	18.0	17.3	18.0	7.34
09-005-0005	1	251	Cornwall	Litchfield	MOHAWK MTN MICROWAVE TWR	145	118	24.3	16.0	15.8	15.6	15.8	5.36
09-009-0026	1	251	New Haven	New Haven	WOODWARD AVENUE	145	122	33.6	33.2	28.5	23.7	28.5	9.24
09-009-0027	1	251	New Haven	New Haven	1 JAMES STREET	145	357	34.5	34.2	33.5	32.6	30.2	9.73
09-009-0027	2	251	New Haven	New Haven	1 JAMES STREET	145	60	33.8	32.3	31.4	25.1	32.3	10.75
09-009-1123	1	251	New Haven	New Haven	715 STATE STREET	145	120	34.6	32.3	30.8	27.2	30.8	9.86
09-009-2008	1	251	New Haven	New Haven	AGRI EXPR STA, HUTINGTON ST.	145	118	28.7	28.7	27.3	22.9	27.3	8.45
09-009-2123	1	251	Waterbury	New Haven	MEADOW AND BANK ST.	145	118	33.7	29.8	28.1	25.0	28.1	9.38
09-009-2123	2	251	Waterbury	New Haven	MEADOW AND BANK ST.	145	58	33.6	29.0	28.5	27.5	29.0	10.13
09-011-3002	1	251	Norwich	New London	22 COURT HOUSE	145	356	36.0	28.9	28.7	27.3	24.2	8.62

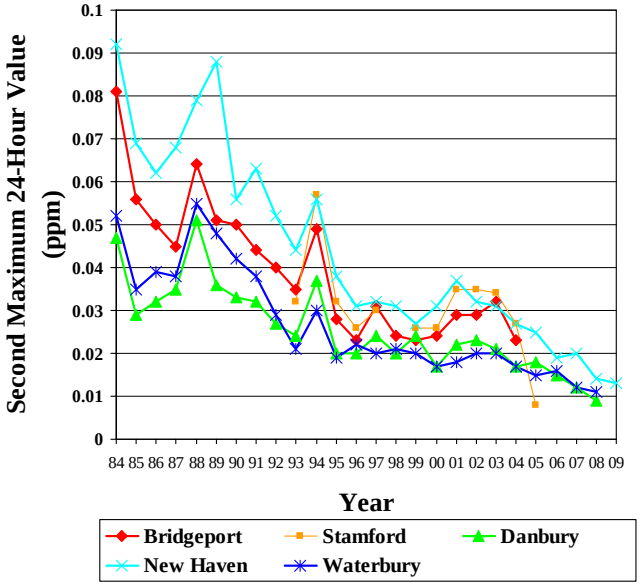
In 2009, Connecticut operated a network of fourteen $PM_{2.5}$ sites, with two co-located monitors. During 2009, the annual arithmetic mean concentration of $PM_{2.5}$ was the highest at the James Street site in New Haven with a value of 10.75 µg/m^3. The highest 98th percentile 24-hour value was 32.3 µg/m^3 recorded at the James Street site in New Haven. The nine year annual arithmetic mean concentration trend graph shown for the Bridgeport, Westport, New Haven State Street, Danbury and East Hartford McAuliffe Park sites have declined, except for a slight increase during 2005.

Connecticut Sites - 2009 - Sulfur Dioxide



Connecticut Sulfur Dioxide Data





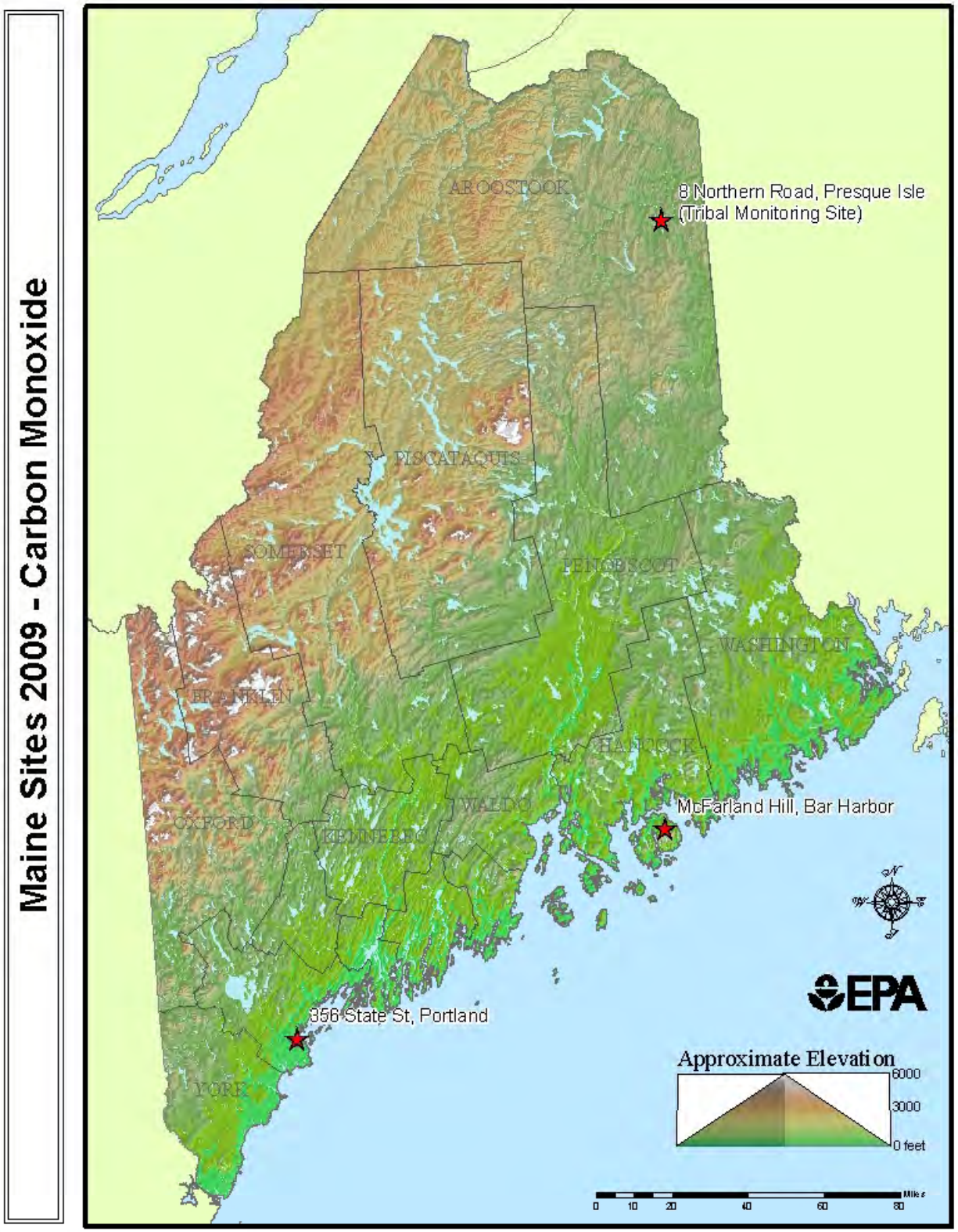
NAAQS for Sulfur Dioxide:

Primary: Annual Arithmetic Mean - 0.03 ppm
24-hour 0.14 ppm
1-hour 75 ppb (0.075 ppm) (Signed June 2, 2010) 99th percentile

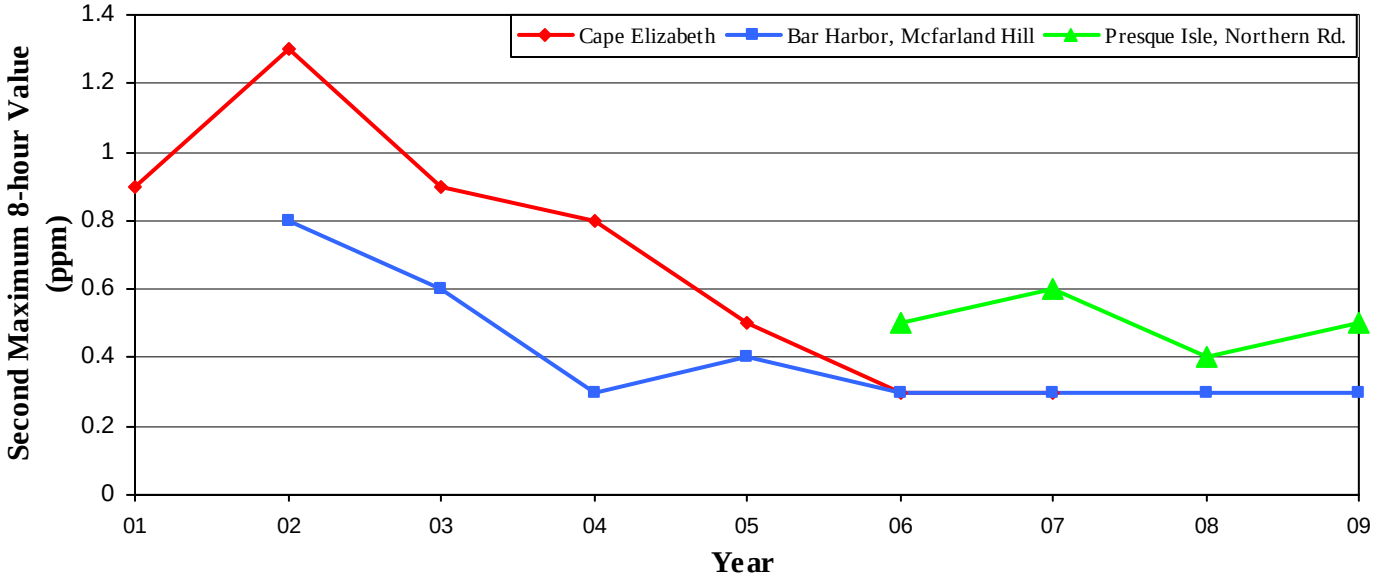
Secondary: 3-hour 0.5 ppm

2009																	
Connecticut																	
Sulfur Dioxide																	
All Values are in Units of Parts Per Million (ppm)																	
									24-	24-		3-hour	3-hour		1-hour	1-hour	
	P								hour	hour			2nd			2nd	
	O						Method	#		2nd	Obs	Highest	Highest	Obs	Highest	Highest	Arith.
Site ID	C	PQAO	City	County	Address	Used	Obs	Highest	Highest	> 0.14	Value	Value	> 0.5	Value	Value	Mean	
09-001-0012	1	251	Bridgeport	Fairfield	115 BOSTON TERRACE	0	8688	0.016	0.015	0	0.025	0.024	0	0.027	0.026	0.0024	
09-001-9003	1	251	Westport	Fairfield	SHERWOOD ISLAND STATE PARK	0	8466	0.016	0.015	0	0.027	0.026	0	0.03	0.028	0.0022	
09-003-1003	1	251	East Hartford	Hartford	MCAULIFFE PARK	0	8489	0.012	0.012	0	0.021	0.018	0	0.023	0.021	0.0019	
09-005-0004	1	251	Thomaston	Litchfield	258 OLD WATERBURY ROAD	560	8497	0.009	0.008	0	0.016	0.015	0	0.0246	0.0202	0.00097	
09-005-0005	1	251	Cornwall	Litchfield	MOHAWK MTN MICROWAVE TWR.	560	7931	0.012	0.011	0	0.023	0.022	0	0.0283	0.0273	0.00102	
09-009-0027	1	251	New Haven	New Haven	1 JAMES STREET	560	8130	0.014	0.013	0	0.034	0.034	0	0.0458	0.0434	0.0022	

Six air quality monitoring sites measured SO_2 in Connecticut during 2009, three of which are trace SO_2 ambient monitoring sites. There were no exceedances or violations at any of the Connecticut ambient monitoring sites. The Bridgeport site reported the highest arithmetic mean concentration of SO_2 at 0.0024 ppm, which is 8% of the previous annual NAAQS. The highest 24-hour second maximum concentration of 0.015 ppm at the Bridgeport and Westport sites. The long range trend for SO_2 concentrations in Connecticut continually shows a downward trend.


Maine Sites 2009 - Carbon Monoxide
AROOSTOOK
8 Northern Road, Presque Isle
(Tribal Monitoring Site)
PISCATAQUIS
SOMERSET
PENOBSCOT
WASHINGTON
FRANKLIN
HANCOCK
WALDO
McFarland Hill, Bar Harbor
OXFORD
KENNEBEC
356 State St, Portland
YORK
EPA
Approximate Elevation
6000
3000
0 feet
0
10
20
40
60
80
Miles

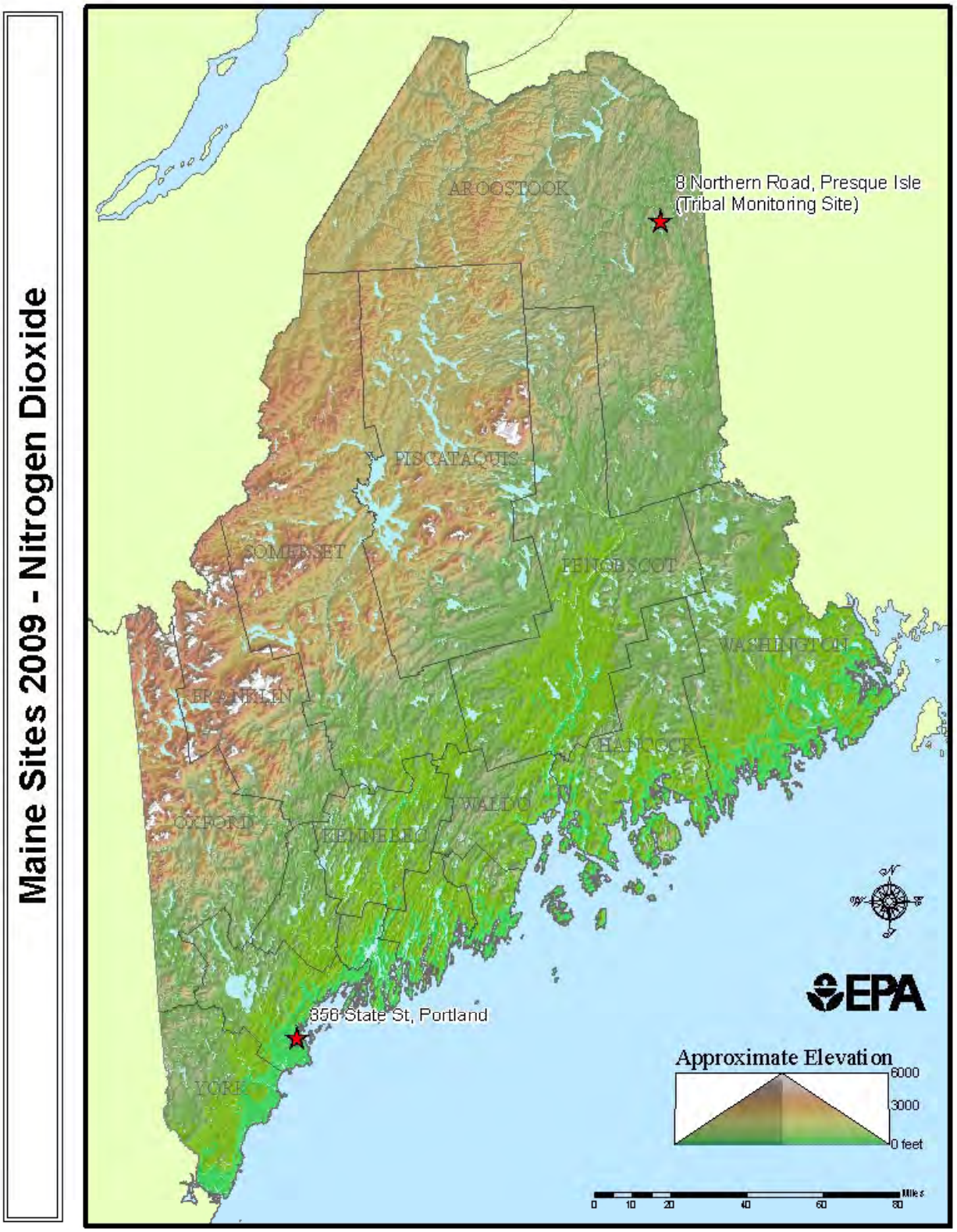
Maine Carbon Monoxide Data



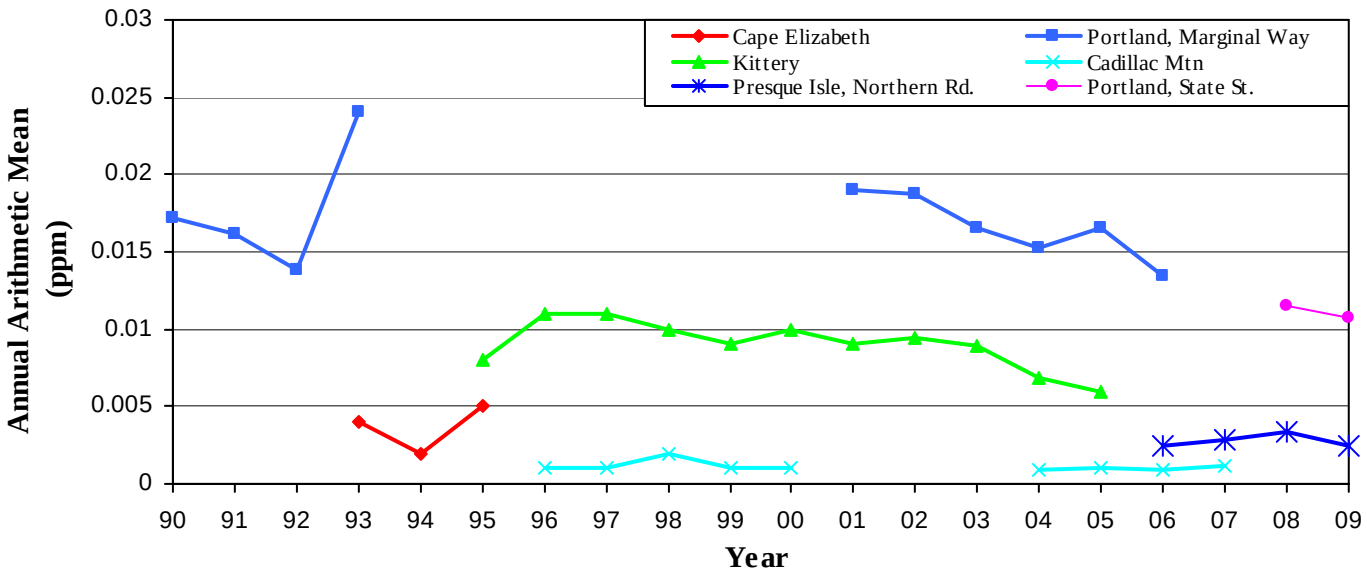
NAAQS for Carbon Monoxide:
8-hour – 9 ppm, not to be exceeded more than one per year
1-hour – 35 ppm, not to be exceeded more than once per year

2009													
Maine													
Carbon Monoxide													
All Values are in Units of Parts Per Million (ppm)													
								1-hour	1-hour		8-hour	8-hour	
	P								2nd			2nd	
	O					Methods	#	Highest	Highest		Highest	Highest	
Site ID	C	PQAO	City	County	Address	Used	Obs	Value	Value	OBS > 35	Value	Value	OBS > 9
23-003-1100	1	635	Presque Isle	Aroostook	NORTHERN ROAD	554	7265	0.9	0.8	0	0.5	0.5	0
23-005-0029	1	635	Portland	Cumberland	356 STATE STREET	54	8600	2.4	2.1	0	1.8	1.5	0
23-009-0103	1	635	Bar Harbor	Hancock	MCFARLAND HILL	554	8535	0.3	0.3	0	0.3	0.3	0

In 2009, the State of Maine operated two low-level trace CO monitors – one at the Bar Harbor - McFarland Hill Acadia National Park site and the other at the Portland – Deering Oaks site. CO measurements were recorded at these sites to help understand ozone formation, summer photochemistry, and pollution transport along the Maine coast. The Aroostook Band of Micmac Indians operated a low-level trace CO monitor at the Northern Road site in Presque Isle. CO concentrations were well below the NAAQS.


Maine Sites 2009 - Nitrogen Dioxide
8 Northern Road, Presque Isle
(Tribal Monitoring Site)
AROOSTOOK
PISCATAQUIS
SOMERSET
PENOBSCOT
WASHINGTON
FRANKLIN
HANCOCK
WALDO
OXFORD
KENNEBEC
YORK
356 State St, Portland
EPA
Approximate Elevation
6000
3000
0 feet
0
10
20
40
60
80
Miles

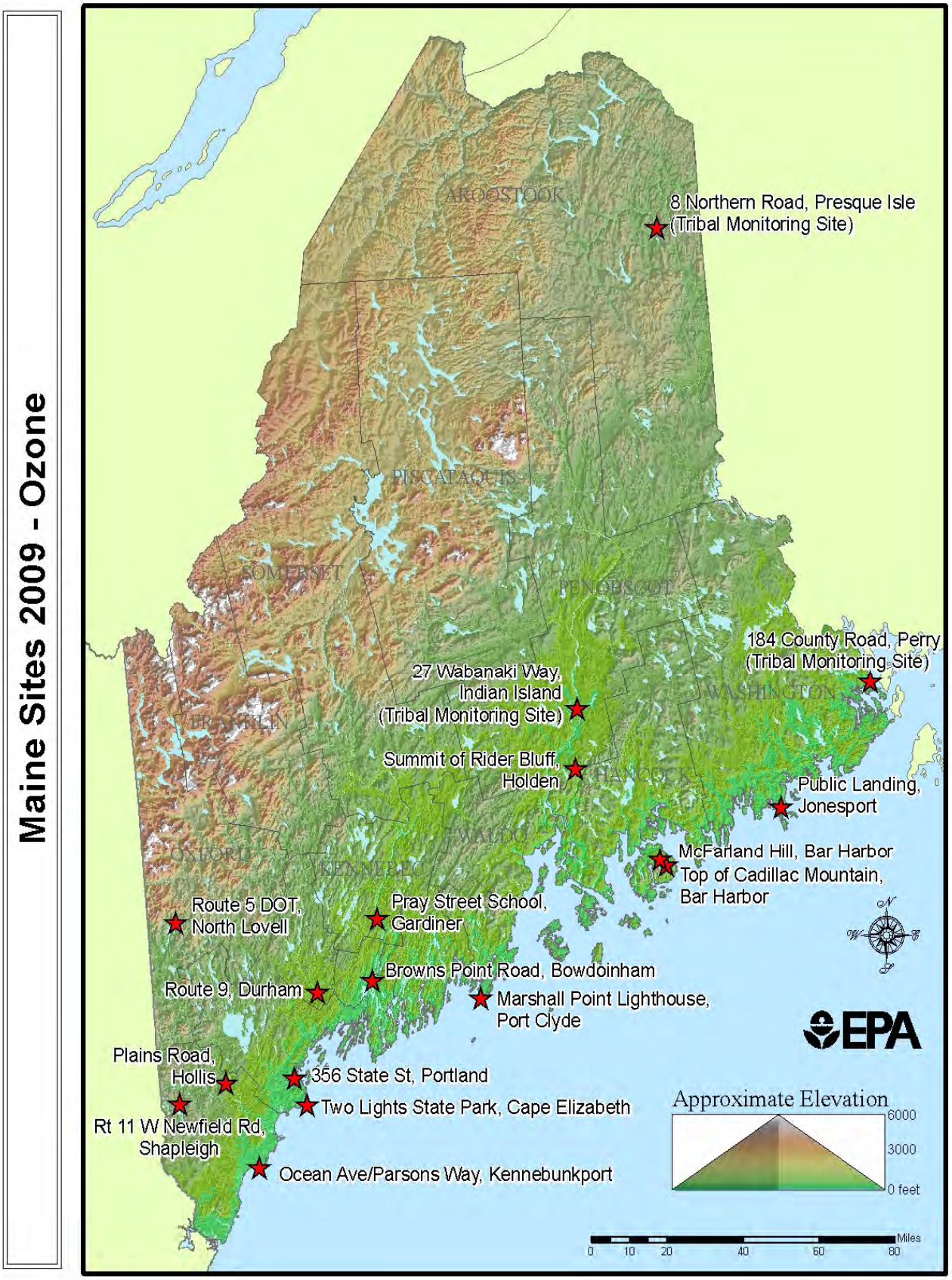
Maine Nitrogen Dioxide Data



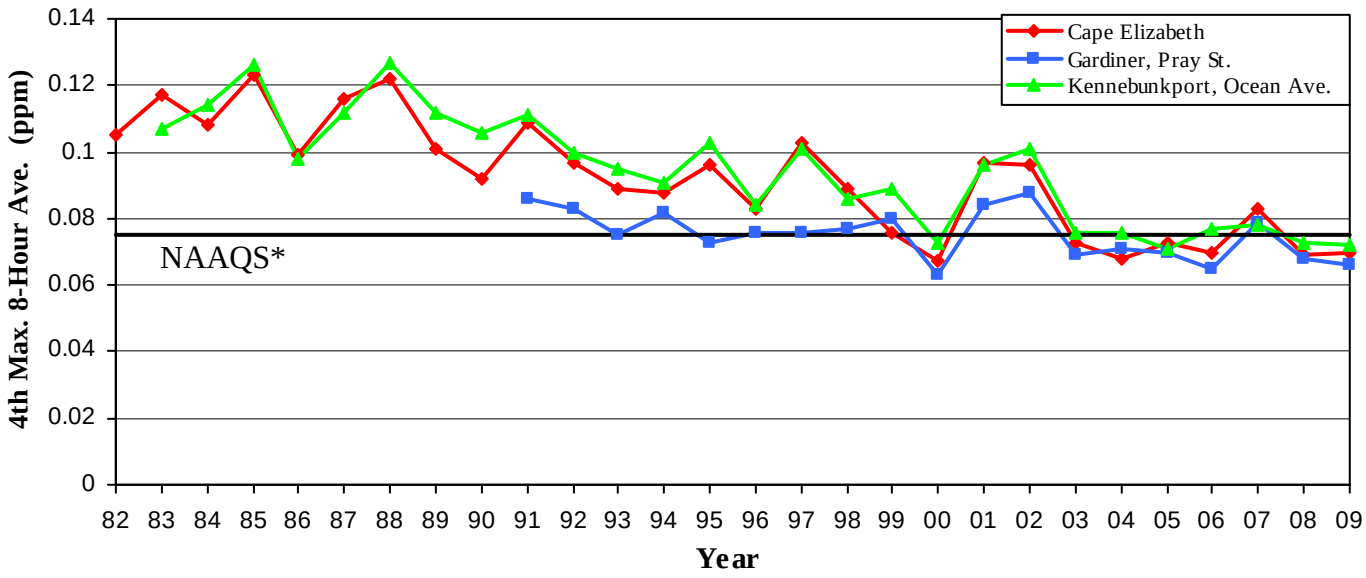
NAAQS for Nitrogen Dioxide:
Annual Arithmetic Mean 0.053 ppm (100 µg/m^3)
1-hour – 100 ppb (or 0.100 ppm) (as of January 22, 2010) 98th percentile

2009										
Maine										
Nitrogen Dioxide										
All Values are in Units of Parts Per Million (ppm)										
								1-hour	1-hour	
	P								2nd	Annual
	O						#	Highest	Highest	Arith.
Site ID	C	PQAO	City	County	Address	Method	Obs	Value	Value	Mean
23-003-1100	1	635	Presque Isle	Aroostook	8 NORTHERN ROAD	74	7309	0.034	0.033	0.0025
23-005-0029	1	635	Portland	Cumberland	356 STATE STREET	75	8064	0.064	0.058	0.0107

There were two NO_2 monitoring sites that operated during 2009, the Portland – Deering Oaks site (operated by ME DEP) and the Presque Isle – Northern Road site (operated by the Aroostook Band of Micmac Indians). There were no exceedances or violations of the NAAQS measured, and concentrations were well below the NAAQS.


Maine Sites 2009 - Ozone
AROOSTOOK
PISCATAQUIS
SOMERSET
PENOBSCOT
WASHINGTON
HANCOCK
WALDO
OXFORD
KENNEBEC
8 Northern Road, Presque Isle
(Tribal Monitoring Site)
184 County Road, Perry
(Tribal Monitoring Site)
27 Wabanaki Way,
Indian Island
(Tribal Monitoring Site)
Summit of Rider Bluff,
Holden
Public Landing,
Jonesport
McFarland Hill, Bar Harbor
Top of Cadillac Mountain,
Bar Harbor
Route 5 DOT,
North Lovell
Pray Street School,
Gardiner
Browns Point Road, Bowdoinham
Route 9, Durham
Marshall Point Lighthouse,
Port Clyde
Plains Road,
Hollis
356 State St, Portland
Two Lights State Park, Cape Elizabeth
Rt 11 W Newfield Rd,
Shapleigh
Ocean Ave/Parsons Way, Kennebunkport
EPA
Approximate Elevation
6000
3000
0 feet
0 10 20 40 60 80
Miles

Maine Ozone 8-Hour Data



*NAAQS for Ozone:

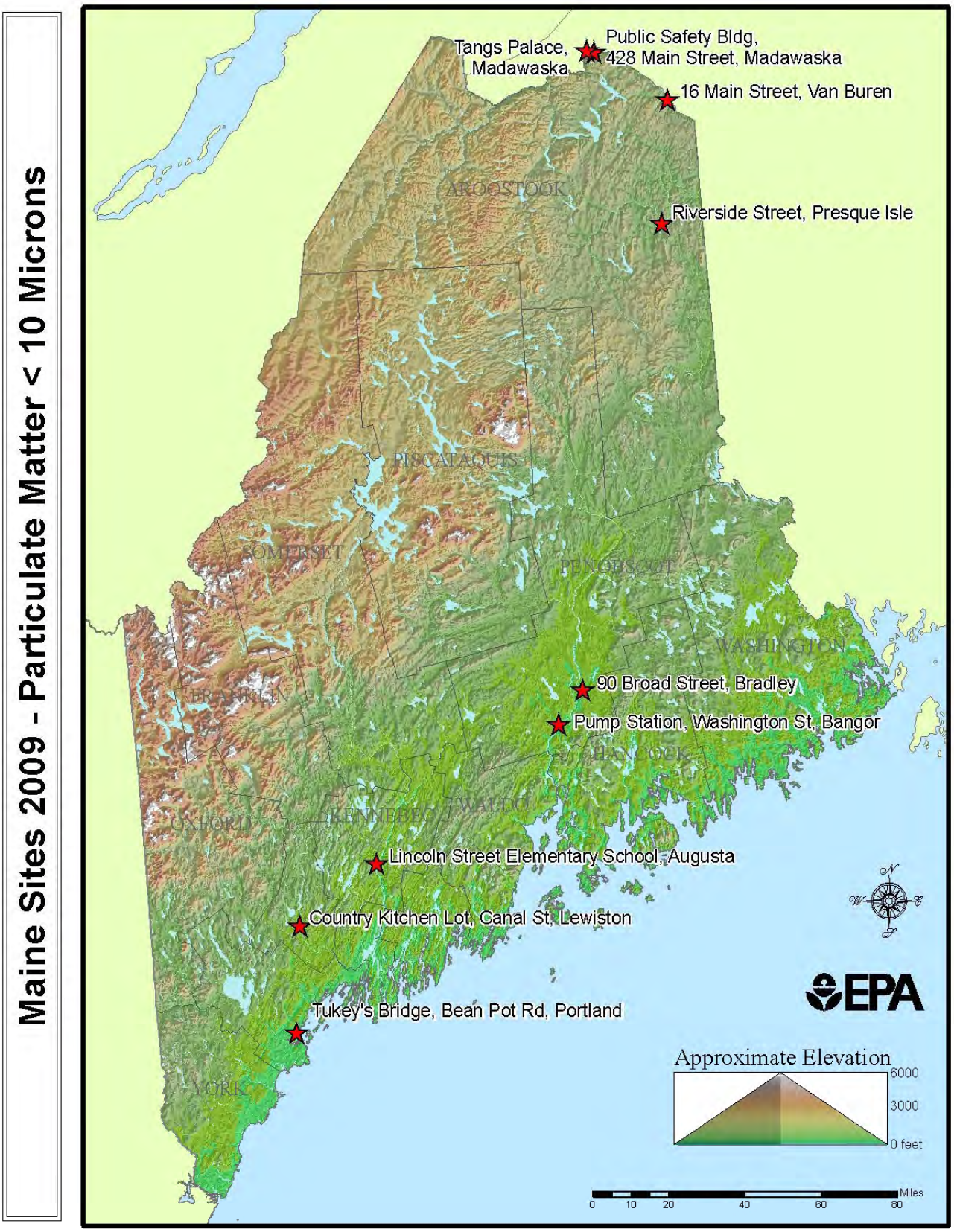
8-hour – 0.075 ppm (2008 std)

(To attain this 0.075 ppm standard, the 3-year average of the fourth-highest daily maximum 8-hour average ozone concentrations measured at each monitor within an area over each year must not exceed 0.075 ppm. This graph represents the 4th highest value for each year for each monitor depicted. Thus, being above or below this NAAQS line does not indicate whether or not a monitor exceeds the NAAQS.)

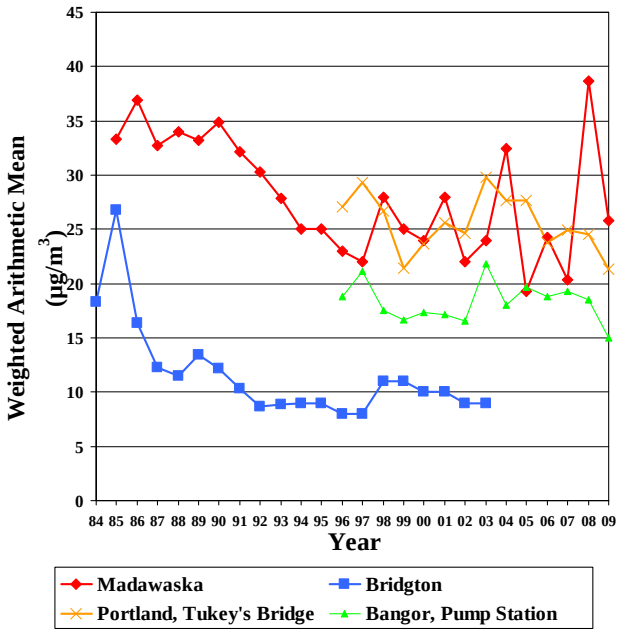
2009
Maine
Ozone (8-Hour)
All Values are in Units of Parts Per Million (ppm)

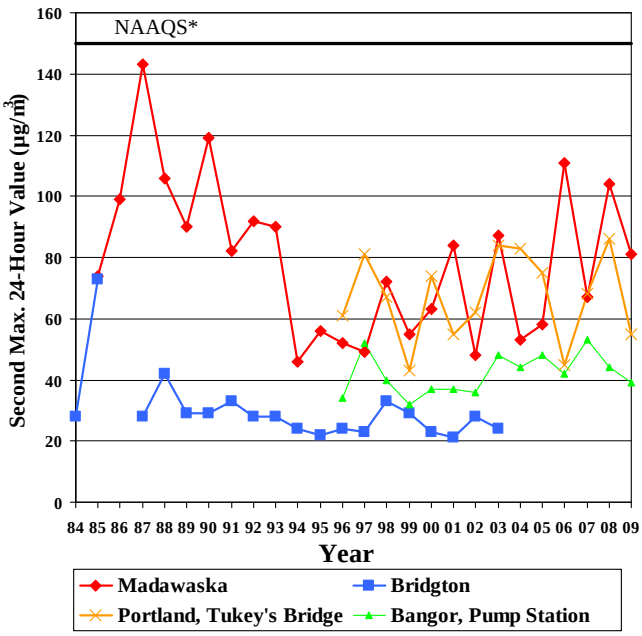
Site ID	P O C	PQAO	City	County	Address	Meth Rept	% Obs	Valid Days Meas.	Num Req Days	Highest 8-Hr Val	2nd Highest 8-Hr Val	3rd Highest 8-Hr Val	4th Highest 8-Hr Val	Days Max > 0.075
23-001-0014	2	635	Durham	Androscoggin	ROUTE 9, DURHAM	47	100	183	183	0.068	0.068	0.068	0.067	0
23-003-1100	1	635	Presque Isle	Aroostook	8 NORTHERN ROAD	47	95	174	183	0.068	0.065	0.060	0.054	0
23-005-0029	1	635	Portland	Cumberland	356 STATE STREET	47	98	179	183	0.069	0.062	0.062	0.059	0
23-005-2003	1	635	Cape Elizabeth	Cumberland	TWO LIGHTS STATE PARK	47	99	182	183	0.085	0.081	0.070	0.070	2
23-009-0102	1	635	Bar Harbor	Hancock	TOP OF CADILLAC MOUNTAIN	47	98	179	183	0.085	0.077	0.075	0.074	2
23-009-0103	1	635	Bar Harbor	Hancock	MCFARLAND HILL	47	98	180	183	0.086	0.077	0.073	0.073	2
23-011-2005	1	635	Gardiner	Kennebec	PRAY STREET SCHOOL	47	99	181	183	0.072	0.068	0.067	0.066	0
23-013-0004	2	635	Port Clyde	Knox	MARSHALL POINT LIGHTHOUSE	47	100	183	183	0.085	0.085	0.072	0.069	2
23-017-3001	1	635	Lovell	Oxford	ROUTE 5, NORTH LOVELL DOT	47	99	181	183	0.060	0.060	0.059	0.057	0
23-019-1100	1	635	Indian Island	Penobscot	27 WABANAKI WAY	47	81	148	183	0.064	0.059	0.057	0.055	0
23-019-4008	1	635	Holden	Penobscot	SUMMIT OF RIDER BLUFF	47	99	181	183	0.077	0.064	0.064	0.057	1
23-023-0006	1	635	Bowdoinham	Sagadahoc	BROWN'S POINT ROAD	47	100	183	183	0.069	0.068	0.064	0.063	0
23-029-0019	1	635	Jonesport	Washington	JONESPORT - PUBLIC LANDING	47	97	177	183	0.084	0.074	0.066	0.061	1
23-029-0032	1	635	Perry	Washington	184 COUNTY ROAD	47	82	150	183	0.075	0.063	0.061	0.057	0
23-031-0038	1	635	Hollis	York	PLAINS ROAD	47	100	183	183	0.070	0.069	0.068	0.062	0
23-031-0040	1	635	Shapleigh	York	Rt. 11, SHAPLEIGH BALL PARK	47	99	181	183	0.070	0.066	0.065	0.063	0
23-031-2002	1	635	Kennebunkport	York	OCEAN AVE/PARSONS WAY	47	95	174	183	0.087	0.077	0.075	0.072	2

During 2009, none of Maine's 17 ozone monitoring sites recorded a fourth highest 8-hr average ozone concentration above the level of the 8-hr NAAQS. The Bar Harbor - Cadillac Mountain site recorded a fourth highest value of 0.074 ppm and the McFarland Hill site recorded a fourth highest value of 0.073 ppm. The Kennebunkport site recorded the highest 8–hour ozone concentration at 0.087 ppm. O_3 levels in 2009 were similar to those recorded over the past several years.


Maine Sites 2009 - Particulate Matter < 10 Microns
Tangs Palace, Madawaska
Public Safety Bldg, 428 Main Street, Madawaska
16 Main Street, Van Buren
Riverside Street, Presque Isle
AROOSTOOK
PISCATAQUIS
SOMERSET
PENOBSCOT
WASHINGTON
FRANKLIN
90 Broad Street, Bradley
Pump Station, Washington St, Bangor
HANCOCK
OXFORD
KENNEBEC
WALDO
Lincoln Street Elementary School, Augusta
Country Kitchen Lot, Canal St, Lewiston
Tukey's Bridge, Bean Pot Rd, Portland
YORK
EPA
Approximate Elevation
6000
3000
0 feet
0 10 20 40 60 80 Miles

Maine Particulate Matter < 10 Microns (PM_{10}) Data





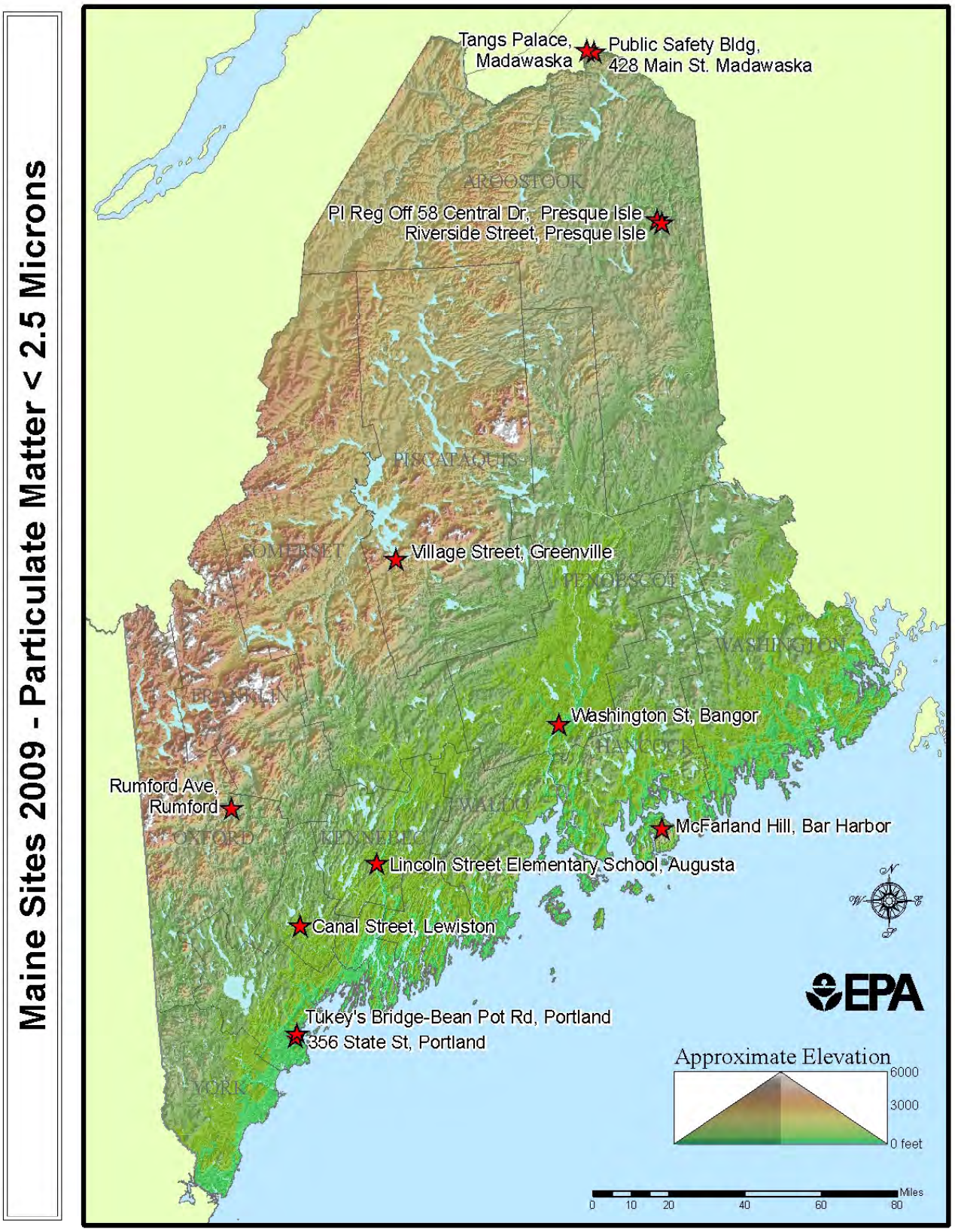
*NAAQS for Particulate Matter less than 10 Microns:
24-hour 150 µg/m^3

2009
Maine
Particulate Matter < 10 Microns
All Values are in Units of µg/m^3

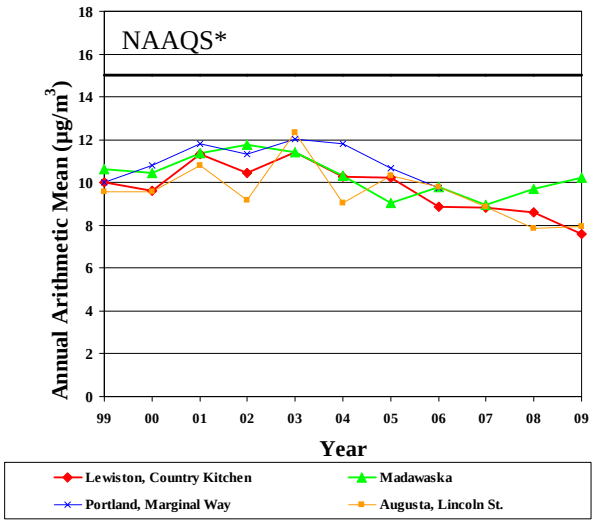
SITE ID	POC	PQAO	City	County	Address	Methods Used	# Obs	# Req.	Number Days	Valid % Obs	Highest Value	2nd High Value	3rd High Value	4th High Value	Days >150	Est. Days >150	Wtd. Arith. Mean	
23-001-0011	2	635	Lewiston	Androscoggin	COUNTRY KITCHEN, CANAL ST.	126	59	61	58	95	44	34	26	26	0	0	13.4	
23-003-0013	3	635	Madawaska	Aroostook	MADAWASKA TANG'S PALACE	127	168	365	168	46	111	81	80	78	0	0	25.8	*
23-003-0014	1	635	Madawaska	Aroostook	PUBLIC SAFETY BLDG. 428 MAIN	127	36	122	34	28	47	46	29	27	0	0	13.8	*
23-003-1011	2	635	Presque Isle	Aroostook	RIVERSIDE STREET	79	8712	365	363	99	89	87	78	70	0	0	15.8	
23-003-1019	1	635	Van Buren	Aroostook	16 MAIN STREET	127	110	122	110	90	63	54	49	45	0	0	16.7	
23-005-0015	2	635	Portland	Cumberland	TUKEY'S BRIDGE, BEAN POT RD	126	56	61	56	92	122	55	45	44	0	0	21.3	
23-005-0015	3	635	Portland	Cumberland	TUKEY'S BRIDGE, BEAN POT RD	126	31	31	31	100	138	54	45	43	0	0	24.8	
23-011-0016	2	635	Augusta	Kennebec	LINCOLN STREET ELEMENTARY	126	61	61	61	100	64	35	34	29	0	0	13.2	
23-019-0002	3	635	Bangor	Penobscot	PUMP STATION- WASHINGTON	0	56	61	56	92	50	39	38	30	0	0	15	
23-019-0016	1	635	Bradley	Penobscot	90 BROAD STREET	127	267	61	51	84	54	40	39	34	0	0	9.3	*

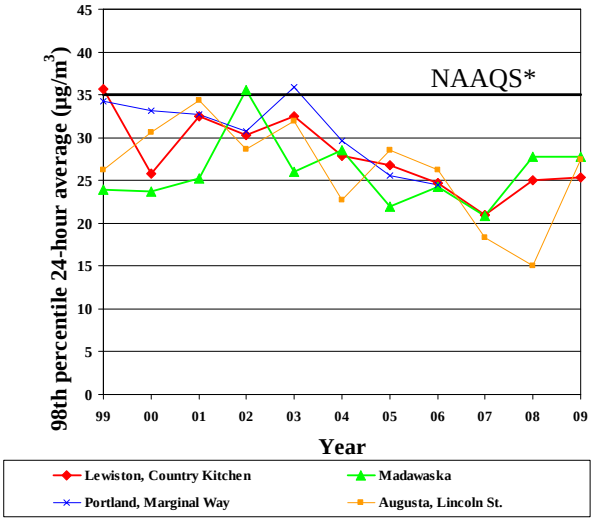
*Indicates that the mean does not satisfy summary criteria

None of Maine's nine particulate matter sites (with a collocated monitor in Portland) which measured PM_{10} reported any exceedances of the 24-hour NAAQS during 2009. The second highest 24-hour PM_{10} concentration was recorded at the Presque Isle – Riverside St. monitoring site at 87 ug/m^3. In Madawaska, the monitor was moved from Tang's Palace to the Public Safety building across the street. The long range graphs for PM_{10} show values varied up and down from year-to-year.


Maine Sites 2009 - Particulate Matter < 2.5 Microns
Tangs Palace, Madawaska
Public Safety Bldg, 428 Main St. Madawaska
AROOSTOOK
PI Reg Off 58 Central Dr, Presque Isle
Riverside Street, Presque Isle
PISCATAQUIS
SOMERSET
Village Street, Greenville
PENOBSCOT
WASHINGTON
FRANKLIN
Washington St, Bangor
HANCOCK
Rumford Ave, Rumford
WALDO
OXFORD
KENNEBEC
McFarland Hill, Bar Harbor
Lincoln Street Elementary School, Augusta
Canal Street, Lewiston
EPA
Tukey's Bridge-Bean Pot Rd, Portland
356 State St, Portland
YORK
Approximate Elevation
6000
3000
0 feet
Miles
0
10
20
40
60
80

Maine Particulate Matter < 2.5 Microns ($PM_{2.5}$) Data

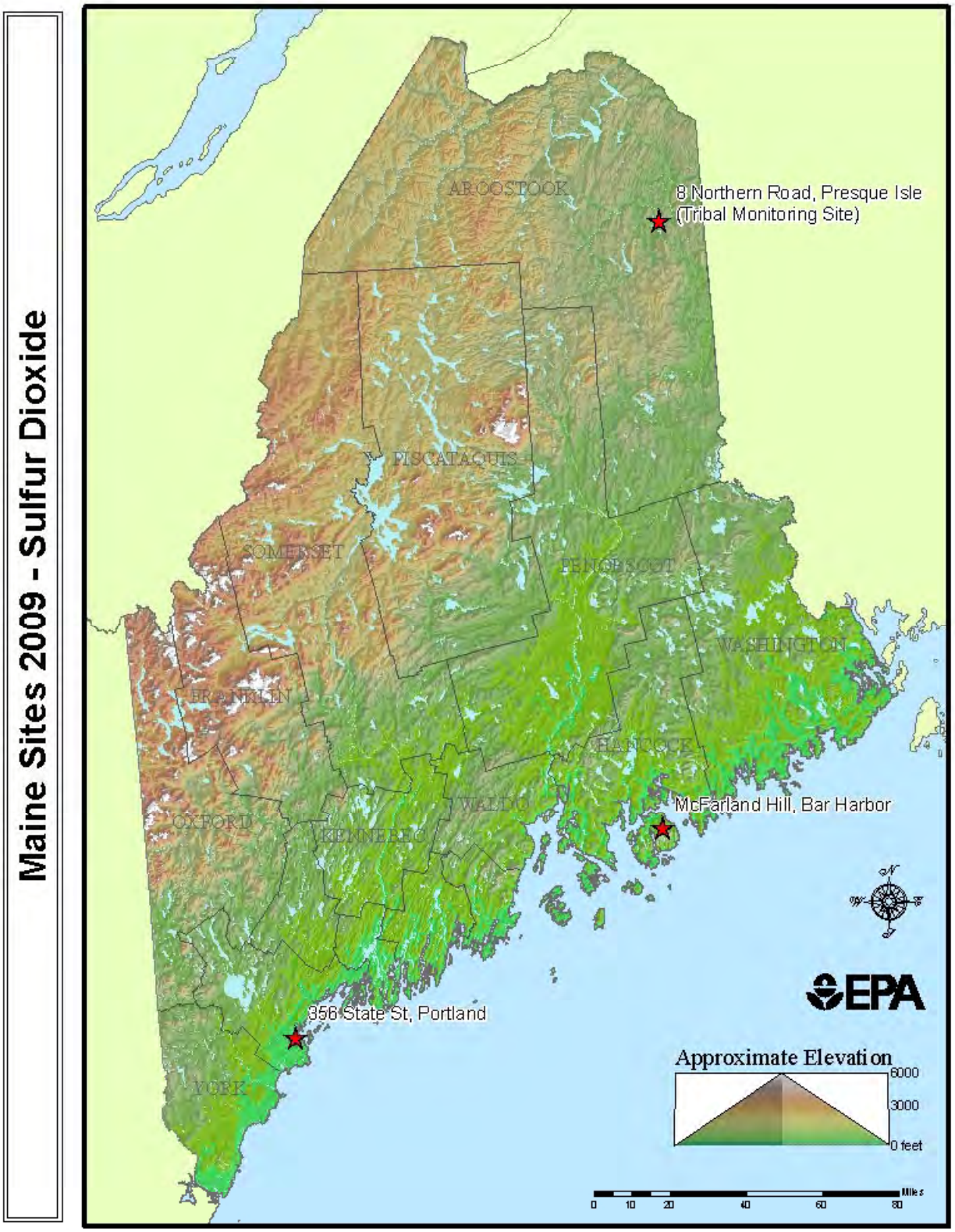




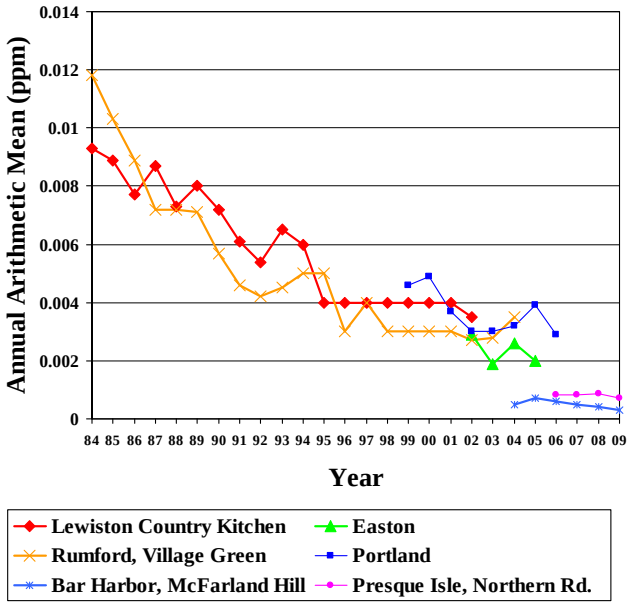
*NAAQS for Particulate Matter less than 2.5 Microns:
Annual: the 3-year average of the Annual Arithmetic Mean - 15.0 µg/m^3
24-Hour: the 3-year average of the 98th percentile of 24-hour average concentrations - 35 µg/m^3

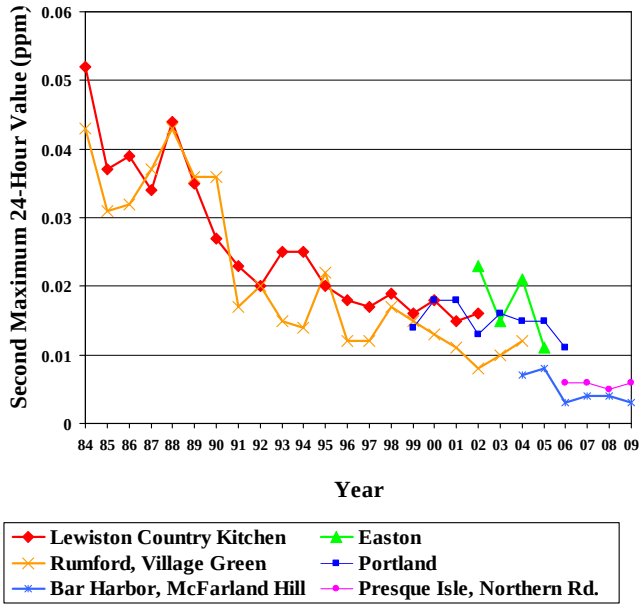
2009														
Maine														
Particulate Matter < 2.5 Microns														
All Values are in µg/m^3 Local Conditions														
	P								2nd	3rd	4th	98th	Wtd.	
	O							#	Highest	Highest	Highest	Highest	Percentile	Arith.	
Site ID	C	PQAO	City	County	Address	Method	Obs	Value	Value	Value	Value	Value	Mean	
23-001-0011	1	635	Lewiston	Androscoggin	COUNTRY KITCHEN LOT, CANAL ST.	118	115	34.5	26.8	25.4	22.5	25.4	7.60	
23-003-0013	1	635	Madawaska	Aroostook	MADAWASKA TANG'S PALACE	118	52	41.5	27.8	25.2	21.6	27.8	10.22	*
23-003-0014	1	635	Madawaska	Aroostook	428 MAIN STREET	118	37	19.6	16.9	12.4	12.3	19.6	6.35	*
23-003-1008	1	635	Presque Isle	Aroostook	PI REG OFF 58 CENTRAL DR.	117	42	19.2	13.8	12.5	12.1	19.2	5.80	*
23-003-1008	2	635	Presque Isle	Aroostook	PI REG OFF 58 CENTRAL DR.	118	36	22.2	11.1	9.9	9.4	22.2	5.51	*
23-003-1011	1	635	Presque Isle	Aroostook	RIVERSIDE STREET	118	108	22.7	19.3	17.7	17.4	17.7	6.84	
23-005-0015	1	635	Portland	Cumberland	TUKEY'S BRIDGE, BEAN POT RD.	118	57	32.7	23.5	17.6	17.2	23.5	8.29	
23-005-0029	1	635	Portland	Cumberland	356 STATE STREET	118	114	32.1	20.8	20.7	18.5	20.7	7.77	
23-005-0029	2	635	Portland	Cumberland	356 STATE STREET	118	27	32.5	20.9	17.4	16.8	32.5	9.89	*
23-009-0103	1	635	Bar Harbor	Hancock	MCFARLAND HILL	118	101	26.1	19.3	10.1	9.5	10.1	4.12	
23-011-0016	1	635	Augusta	Kennebec	LINCOLN ST. ELEMENTARY SCH.	117	60	28.5	27.4	24.0	22.2	27.4	7.96	
23-011-0016	2	635	Augusta	Kennebec	LINCOLN ST. ELEMENTARY SCH.	117	27	28.0	21.6	18.4	17.3	28.0	8.96	
23-017-2011	1	635	Rumford	Oxford	RUMFORD AVENUE	117	60	27.9	20.7	19.4	18.1	20.7	8.20	
23-019-0002	1	635	Bangor	Penobscot	WASHINGTON STREET	118	116	28.0	22.1	21.4	18.9	21.4	7.29	
23-021-0004	1	635	Greenville	Piscataquis	VILLAGE STREET	118	177	29.9	18.0	16.4	12.6	16.4	5.15	
*Indicates that the mean does not meet summary criteria														

During 2009, there were twelve $PM_{2.5}$ monitoring sites operating in Maine, with three collocated monitors. In Madawaska, the monitor was moved from Tang's Palace to the Public Safety building across the street. Data from all of these sites indicate that none of these sites have recorded $PM_{2.5}$ concentrations that would result in an exceedance or violation of either the 24-hour or the annual NAAQS for $PM_{2.5}$. The Augusta – Lincoln St., Portland – Tukey's Bridge, and Rumford – Rumford Ave. sites recorded the highest weighted annual arithmetic means. The Portland – Deering Oaks site recorded the highest 98th percentile 24-hour value at 32.5 µg/m^3. The annual arithmetic mean trend graph remains relatively flat.


Maine Sites 2009 - Sulfur Dioxide
AROOSTOOK
8 Northern Road, Presque Isle
(Tribal Monitoring Site)
PISCATAQUIS
SOMERSET
PENOBSCOT
WASHINGTON
FRANKLIN
HANCOCK
WALDO
OXFORD
KENNEBEC
McFarland Hill, Bar Harbor
356 State St, Portland
YORK
EPA
Approximate Elevation
6000
3000
0 feet
0 10 20 40 60 80
Miles

Maine Sulfur Dioxide Data





NAAQS for Sulfur Dioxide:

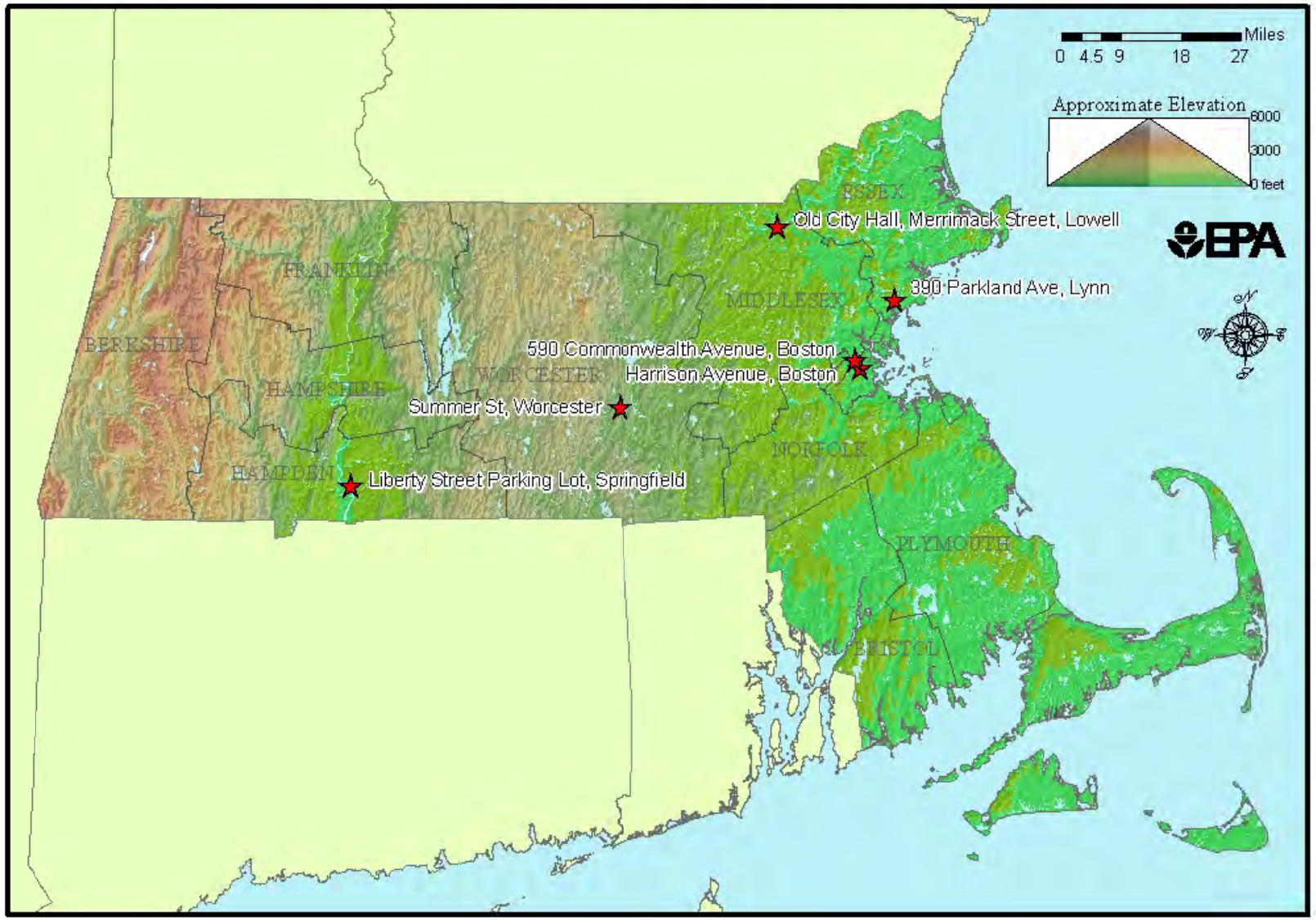
Primary: Annual Arithmetic Mean - 0.03 ppm
24-hour 0.14 ppm
1-hour 75 ppb (0.075 ppm) (Signed June 2, 2010) 99th Percentile

Secondary: 3-hour 0.5 ppm

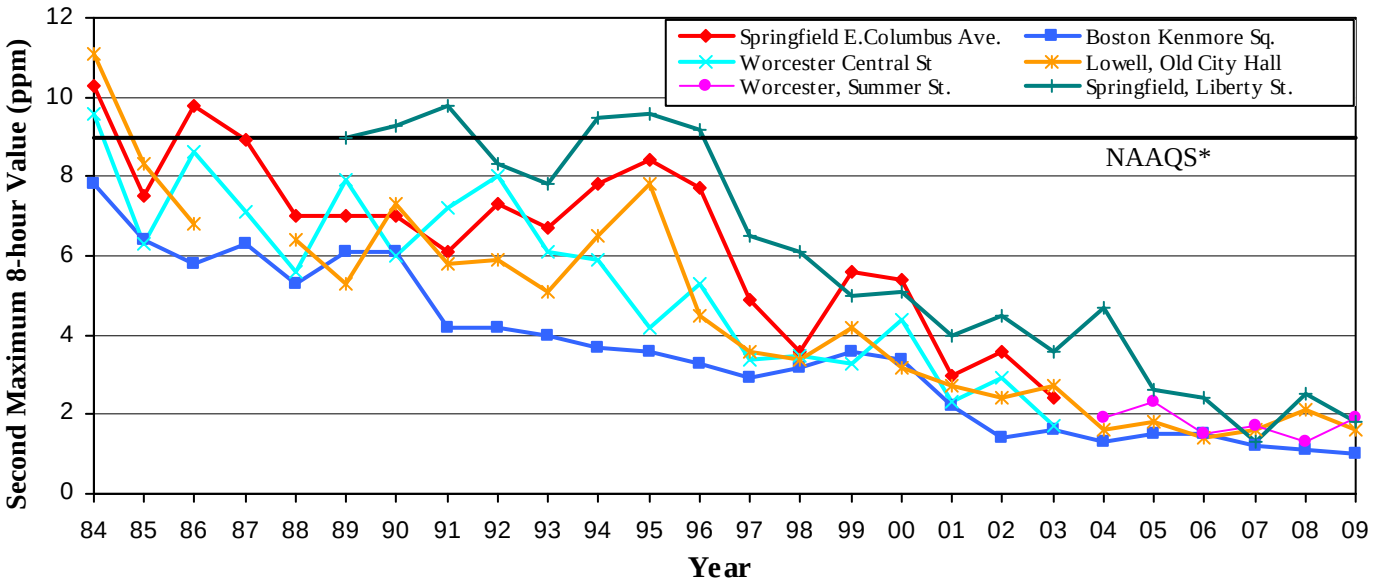
2009																	
Maine																	
Sulfur Dioxide																	
All Values are in Units of Parts Per Million (ppm)																	
									24-	24-		3-hour	3-hour		1-hour	1-hour	
	P								hour	hour			2nd			2nd	
	O						Method	#		2nd	Obs	Highest	Highest	Obs	Highest	Highest	Arith.
Site ID	C	PQAO	City	County	Address		Used	Obs	Highest	Highest	> 0.14	Value	Value	> 0.5	Value	Value	Mean
23-003-1100	1	635	Presque Isle	Aroostook	8 NORTHERN RD		560	6959	0.007	0.006	0	0.012	0.01	0	0.0304	0.013	0.00068
23-005-0029	1	635	Portland	Cumberland	356 STATE STREET		60	8656	0.016	0.012	0	0.042	0.024	0	0.045	0.045	0.0029
23-009-0103	1	635	Bar Harbor	Hancock	MCFARLAND HILL RESEARCH SITE		560	8558	0.004	0.003	0	0.008	0.006	0	0.0126	0.0085	0.00032

In 2009, there were no exceedances or violations of the annual, 24-hour, or 3-hour SO_2 NAAQS at any of the three Maine SO_2 monitoring sites. The Portland - Deering Oaks site recorded the highest arithmetic mean concentration of SO_2 at 0.0029 ppm. This site also reported the highest 24-hour second maximum SO2 concentration at 0.012 ppm, and the highest 3-hour SO_2 second maximum concentration at 0.024 ppm, all well below the standards. The trend for SO_2 concentrations shows a general decline despite small year-to-year variability.

Massachusetts Sites - 2009 - Carbon Monoxide



Massachusetts Carbon Monoxide Data

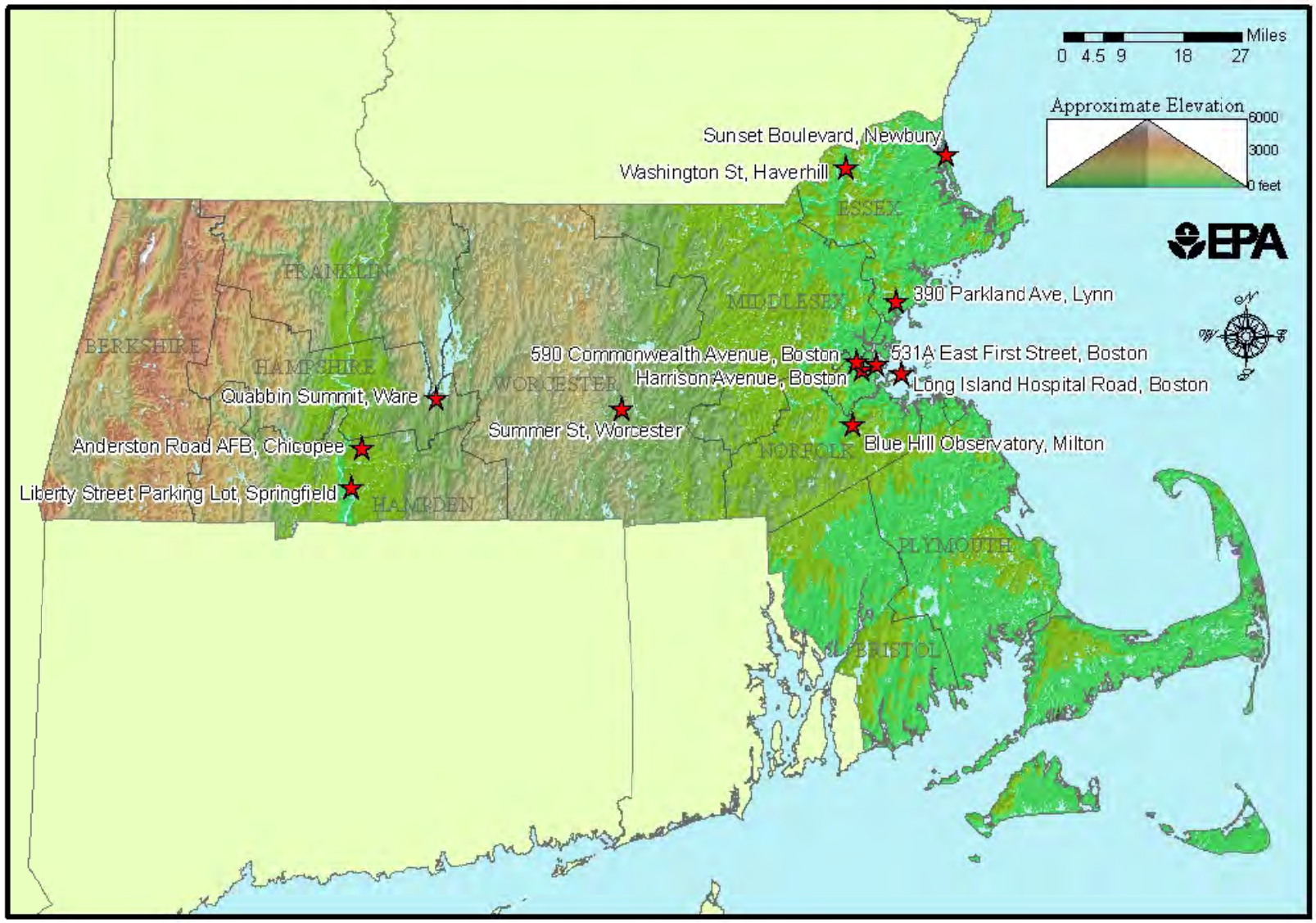


*NAAQS for Carbon Monoxide:
8-hour – 9 ppm, not to be exceeded more than once per year
1-hour – 35 ppm, not to be exceeded more than once per year

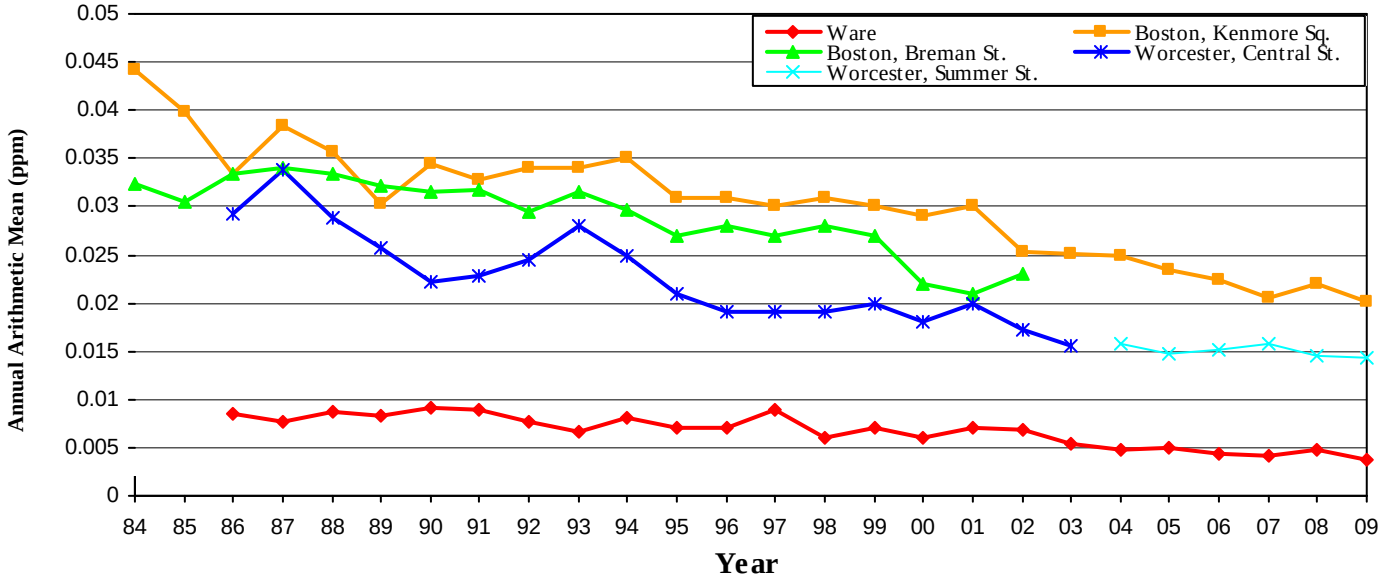
2009														
Massachusetts														
Carbon Monoxide														
All Values are in Units of Parts Per Million (ppm)														
								1-hour	1-hour		8-hour	8-hour	
	P								2nd			2nd	
	O						Methods	#	Highest	Highest		Highest	Highest	
Site ID	C	PQAO	City	County	Address		Used	Obs	Value	Value	OBS > 35	Value	Value	OBS > 9
25-009-2006	1	660	Lynn	Essex	390 PARKLAND		593	8393	0.9	0.8	0	0.6	0.6	0
25-013-0016	1	660	Springfield	Hampden	LIBERTY P-LOT		93	8188	2.4	2.2	0	1.9	1.8	0
25-017-0007	1	660	Lowell	Middlesex	MERRIMACK ST		93	8187	1.8	1.8	0	1.6	1.6	0
25-025-0002	1	660	Boston	Suffolk	KENMORE SQ		93	7000	1.4	1.4	0	1.1	1.0	0
25-025-0042	1	660	Boston	Suffolk	HARRISON AV		593	8534	2.6	2.4	0	1.5	1.2	0
25-027-0023	1	660	Worcester	Worcester	SUMMER ST		67	8183	2.7	2.4	0	2.0	1.9	0

Massachusetts operated six CO ambient monitoring sites in 2009, one of which is a trace level CO site at Lynn. The other sites are located in Boston (one at Kenmore Square and one at Harrison Ave - Roxbury), Springfield (Liberty Street), Worcester (Summer Street), and Lowell (Old City Hall). No exceedances of the 8-hour National Ambient Air Quality Standards (NAAQS) for CO have been recorded at any site in Massachusetts since 1996. The twenty-five year trend graph of second maximum 8-hour CO concentrations in Massachusetts generally shows an average decrease of more than 6 ppm over the twenty-four year period at each of the five sites included in the analysis. The 2nd highest 8-hour value was recorded at the Worcester site and was 1.9 ppm, a slight decrease over the previous year.

Massachusetts Sites - 2009 - Nitrogen Dioxide



Massachusetts Nitrogen Dioxide Data

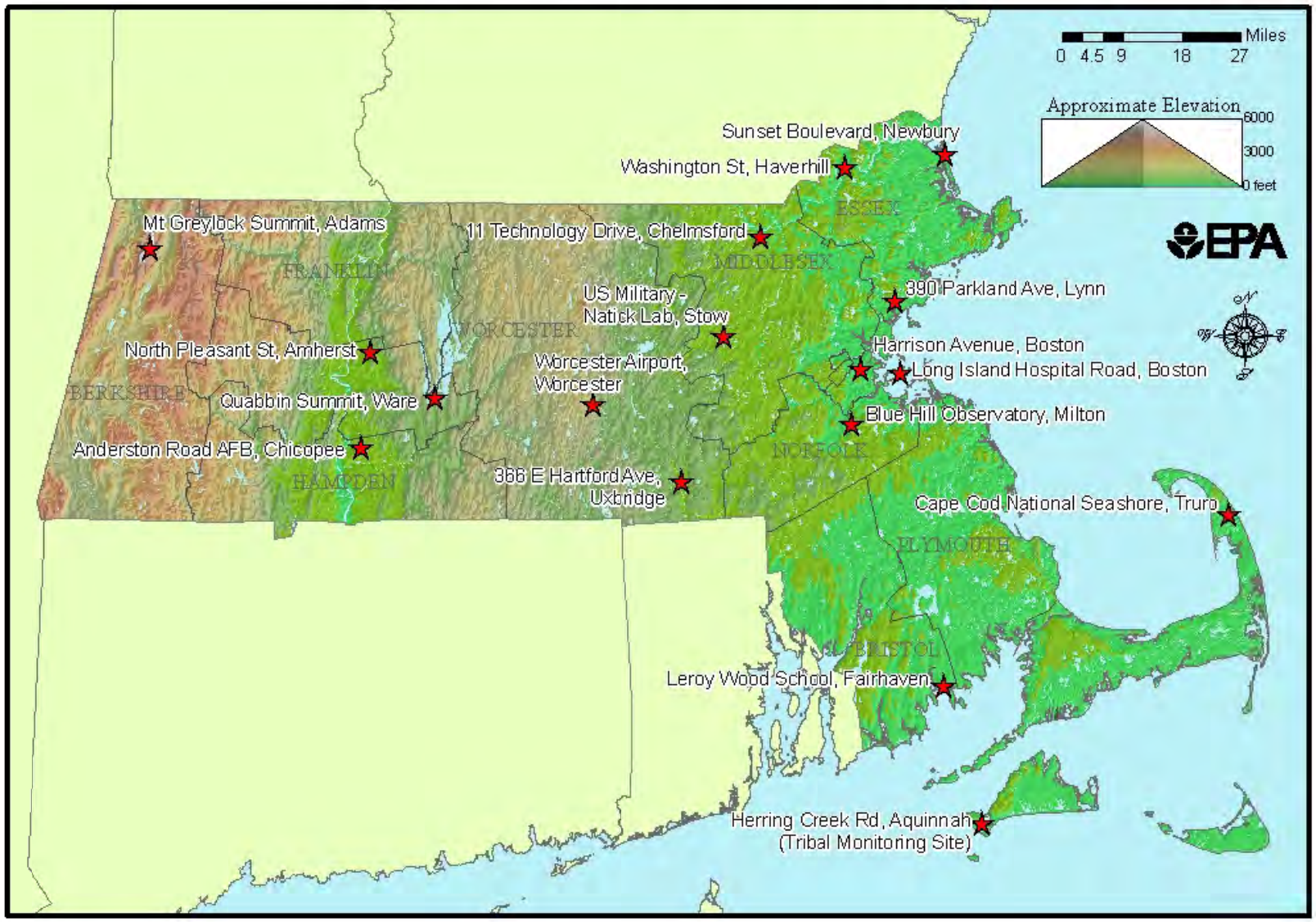


NAAQS for Nitrogen Dioxide:
Annual Arithmetic Mean 0.053 ppm (100 µg/m^3)
1-hour – 100 ppb (or 0.100 ppm) (as of January 22, 2010) 98th Percentile

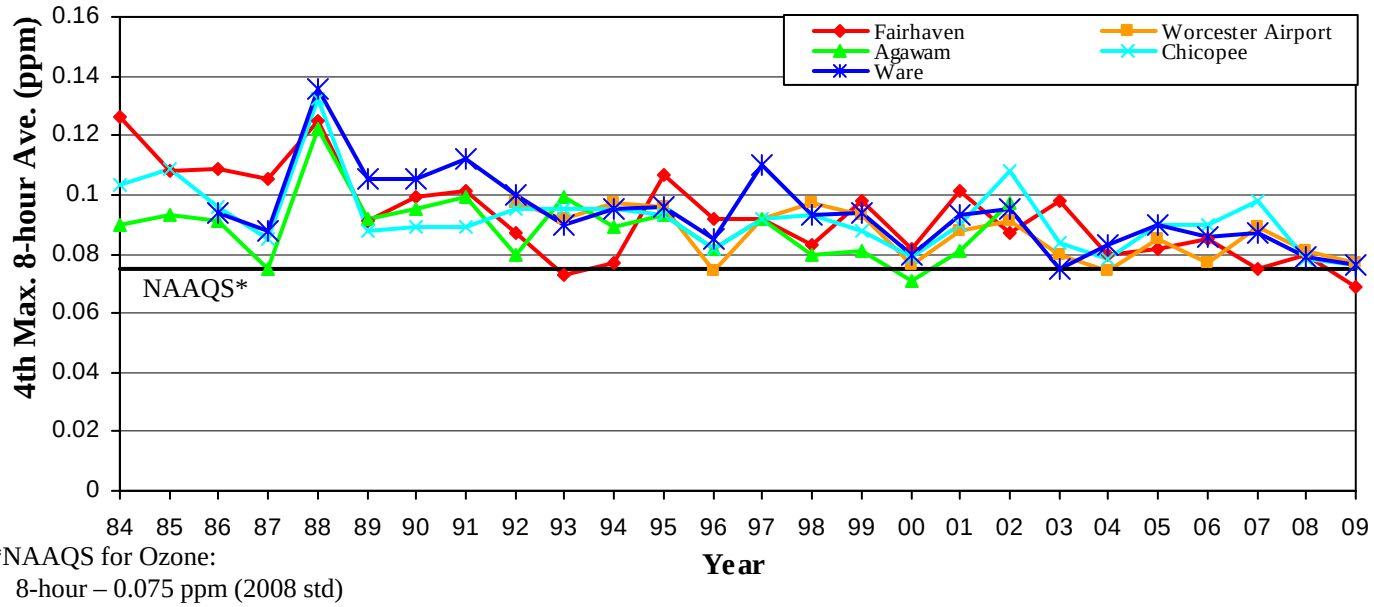
2009											
Massachusetts											
Nitrogen Dioxide											
All Values are in Units of Parts Per Million (ppm)											
								1-hour	1-hour		
	P								2nd	Annual	
	O						#	Highest	Highest	Arith.	
Site ID	C	PQAO	City	County	Address	Method	Obs	Value	Value	Mean	
25-009-2006	1	660	Lynn	Essex	390 PARKLAND	99	8347	0.047	0.046	0.0074	
25-009-4004	1	660	Newbury	Essex	SUNSET BLVD	99	1717	0.019	0.017	0.0031	*
25-009-5005	1	660	Haverhill	Essex	CONSENTINO SCHOOL	99	8428	0.048	0.046	0.0076	
25-013-0008	1	660	Chicopee	Hampden	ANDERSON RD AFB	99	8318	0.046	0.045	0.0078	
25-013-0016	1	660	Springfield	Hampden	LIBERTY P-LOT	99	8355	0.063	0.059	0.0149	
25-015-4002	1	660	Ware	Hampshire	QUABBIN SUMMIT	99	8355	0.036	0.035	0.0037	
25-021-3003	1	660	Milton	Norfolk	BLUE HILL OBS	99	4198	0.045	0.033	0.004	*
25-025-0002	1	660	Boston	Suffolk	KENMORE SQ	99	6969	0.06	0.057	0.0201	
25-025-0040	1	345	Boston	Suffolk	531A EAST FIRST STREET	74	8512	0.197	0.095	0.0149	
25-025-0041	1	660	Boston	Suffolk	LONG ISLAND	99	4185	0.045	0.041	0.0061	*
25-025-0042	1	660	Boston	Suffolk	HARRISON AV	99	8234	0.058	0.057	0.018	
25-027-0023	1	660	Worcester	Worcester	SUMMER ST	99	8270	0.054	0.053	0.0143	
*Indicates that the mean does not meet summary criteria											

Nitrogen dioxide (NO_2) measurements were made at 12 monitoring sites in Massachusetts during 2009. The highest 1-hour concentrations of NO_2 were recorded at monitors in Boston and Worcester. The highest annual mean NO_2 concentration was recorded at Kenmore Square (0.0201 ppm), well below the Annual NAAQS. A generally downward trend in NO_2 concentration can be detected in the twenty-five year trend data.

Massachusetts Sites - 2009 - Ozone



Massachusetts Ozone 8-Hour Data



*NAAQS for Ozone:

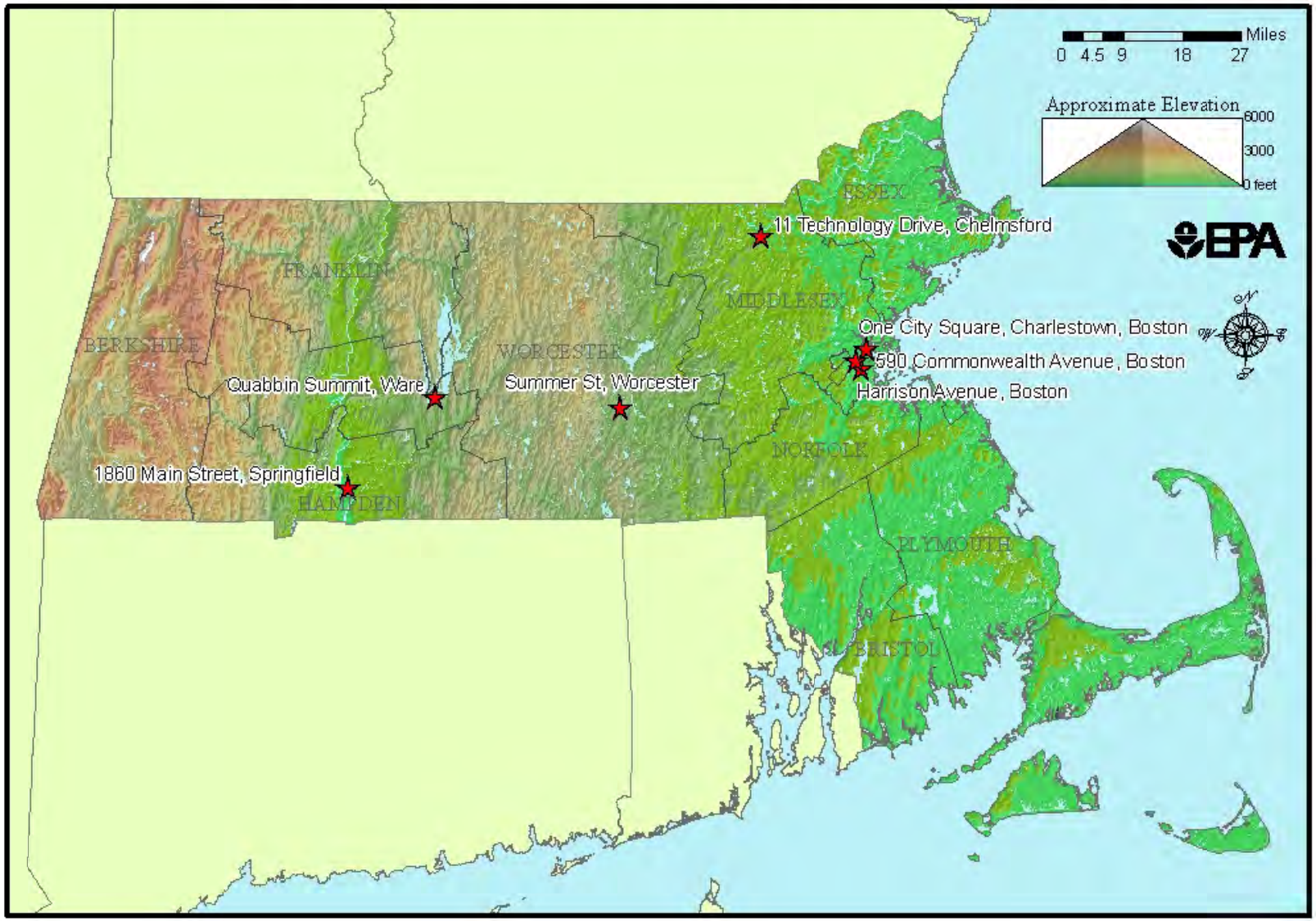
8-hour – 0.075 ppm (2008 std)

(To attain this 0.075 ppm standard, the 3-year average of the fourth-highest daily maximum 8-hour average ozone concentrations measured at each monitor within an area over each year must not exceed 0.075 ppm. This graph represents the 4th highest value for each year for each monitor depicted. Thus, being above or below this NAAQS line does not indicate whether or not a monitor exceeds the NAAQS.)

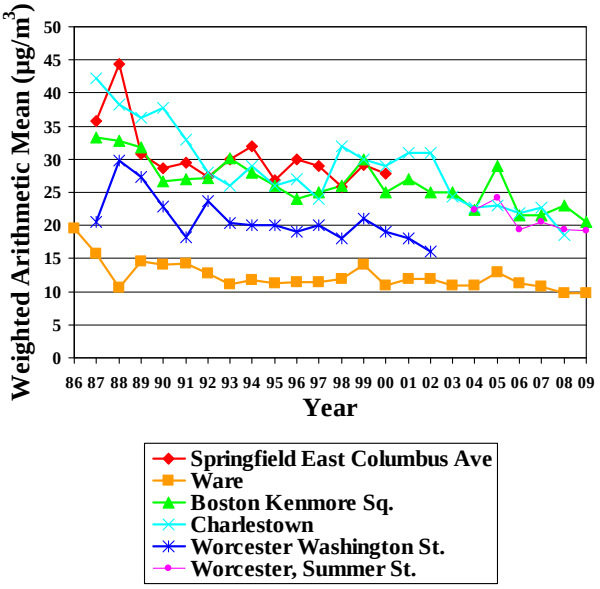
2009															
Massachusetts															
Ozone (8-hour)															
All Values are in Units of Parts Per Million (ppm)															
	P							Valid	Num		2nd	3rd	4th	Days	
	O						Methods	%	Days	Req	Highest	Highest	Highest	Highest	Max >
Site ID	C	PQAO	City	County	Address		Reported	Obs	Meas.	Days	8-Hr Value	8-Hr Value	8-Hr Value	8-Hr Value	0.075
25-001-0002	1	660	Truro	Barnstable	FOX BOTTOM AREA		87	97	177	183	0.082	0.078	0.073	0.071	2
25-003-4002	1	660	Adams	Berkshire	MT GREYLOCK SUMMIT		87	84	153	183	0.083	0.079	0.075	0.066	2
25-005-1002	1	660	Fairhaven	Bristol	LEROY WOOD SCH		87	98	179	183	0.078	0.072	0.071	0.069	1
25-007-0001	1	660	Oak Bluffs	Dukes	HERRING CREEK ROAD		87	69	126	183	0.078	0.075	0.074	0.071	1
25-009-2006	1	660	Lynn	Essex	390 PARKLAND		87	99	181	183	0.079	0.077	0.073	0.073	2
25-009-4004	1	660	Newbury	Essex	SUNSET BLVD		87	41	75	183	0.078	0.077	0.072	0.068	2
25-009-5005	1	660	Haverhill	Essex	CONSENTINO SCHOOL		87	98	180	183	0.075	0.074	0.073	0.07	0
25-013-0008	1	660	Chicopee	Hampden	ANDERSON RD AFB		87	99	181	183	0.080	0.078	0.077	0.076	4
25-015-0103	1	660	North Amherst	Hampshire	N PLEASANT ST		87	93	171	183	0.076	0.073	0.071	0.07	1
25-015-4002	1	660	Ware	Hampshire	QUABBIN SUMMIT		87	98	180	183	0.079	0.079	0.077	0.076	4
25-017-0009	1	660	Chelmsford	Middlesex	11 TECHNOLOGY DRIVE-NERL		47	97	178	183	0.076	0.073	0.069	0.068	1
25-017-1102	1	660	Stow	Middlesex	US MILITARY RES		87	98	180	183	0.082	0.078	0.077	0.071	3
25-021-3003	1	660	Milton	Norfolk	BLUE HILL OBS		87	99	182	183	0.081	0.081	0.076	0.071	3
25-025-0041	1	660	Boston	Suffolk	LONG ISLAND		87	98	179	183	0.081	0.080	0.076	0.075	3
25-025-0042	1	660	Boston	Suffolk	HARRISON AV		87	99	181	183	0.069	0.064	0.063	0.062	0
25-027-0015	1	660	Worcester	Worcester	WORC AIRPORT		87	98	180	183	0.082	0.082	0.080	0.077	4
25-027-0024	1	660	Uxbridge	Worcester	366 E HARTFORD AVE		87	99	181	183	0.086	0.082	0.073	0.071	2

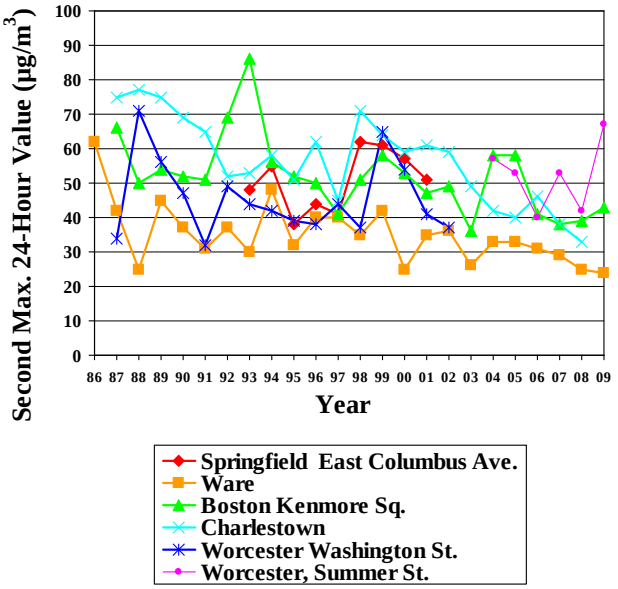
In 2009, four of the seventeen ozone monitoring sites recorded a fourth highest 8-hour average ozone concentration at or above the level of the 8-hour NAAQS. The highest 4th high 8-hour value was at Worcester Airport and measured 0.077 ppm. The highest value was 0.086 ppm at Uxbridge.

Massachusetts Sites - 2009 - Particulate Matter < 10 Microns



Massachusetts Particulate Matter < 10 Microns (PM_{10}) Data



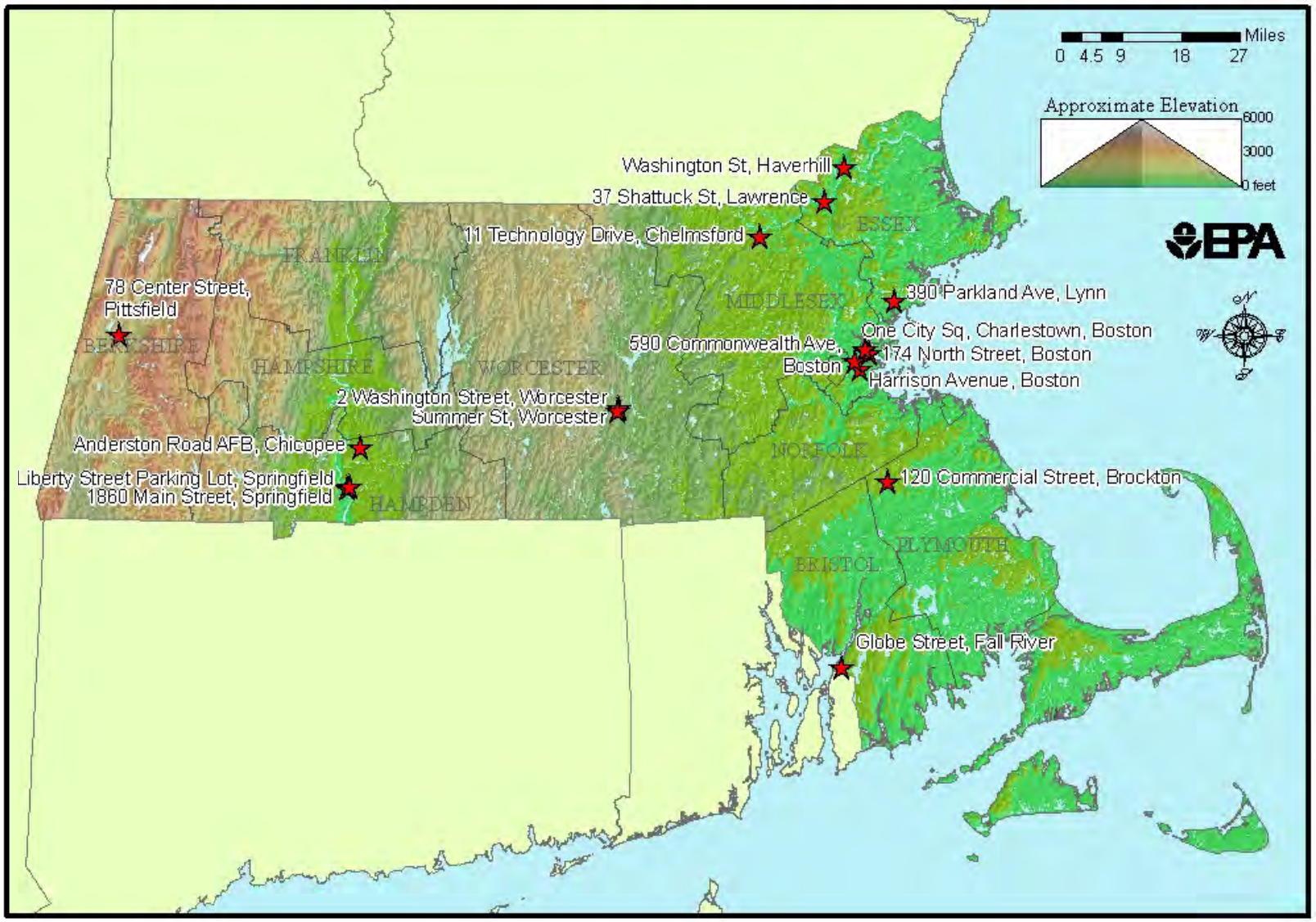


NAAQS for Particulate Matter less than 10 Microns:
24-hour 150 µg/m^3

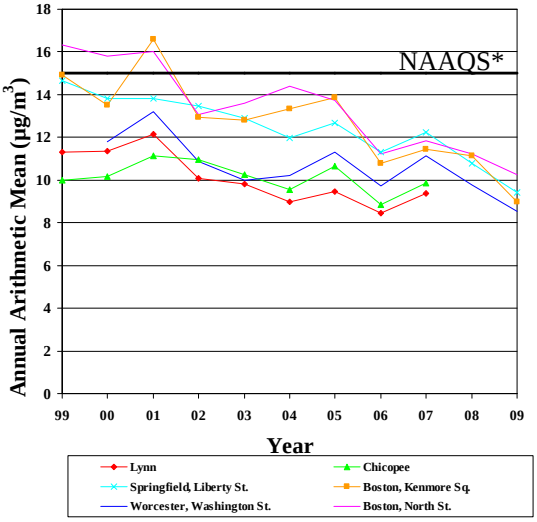
2009																		
Massachusetts																		
Particulate Matter < 10 Microns																		
All Values are in Units of µg/m^3																		
												2nd	3rd	4th	Days	Est. Days	Wtd.	
						Methods			Number	Valid	Highest	Highest	Highest	Highest	Max	Max	Arith.	
SITE ID	POC	PQAO	City	County	Address	Used	# Obs	# Req.	Days	% Obs	Value	Value	Value	Value	>150	>150	Mean	
25-013-2009	4	660	Springfield	Hampden	1860 MAIN ST	127	58	61	58	95	40	38	38	32	0	0	15.9	
25-015-4002	4	660	Ware	Hampshire	QUABBIN Summit	127	51	61	51	84	32	24	22	19	0	0	9.8	*
25-017-0009	1	660	Chelmsford	Middlesex	11 TECHNOLOGY DRIVE	125	59	61	59	97	33	31	25	24	0	0	12	
25-025-0002	4	660	Boston	Suffolk	KENMORE SQ	127	44	61	43	70	69	43	36	35	0	0	20.6	*
25-025-0027	4	660	Boston	Suffolk	ONE CITY SQ	127	61	61	61	100	44	42	32	32	0	0	17.9	
25-025-0042	1	660	Boston	Suffolk	HARRISON AV	63	59	61	58	95	32	31	27	26	0	0	13.8	
25-025-0042	2	660	Boston	Suffolk	HARRISON AV	63	59	61	59	97	34	31	27	25	0	0	13.8	
25-025-0042	4	660	Boston	Suffolk	HARRISON AV	127	59	61	59	97	40	34	31	25	0	0	15.6	
25-025-0042	5	660	Boston	Suffolk	HARRISON AV	127	57	61	57	93	47	38	35	29	0	0	16	
25-027-0023	4	660	Worcester	Worcester	SUMMER ST	127	60	61	60	98	85	67	39	36	0	0	19.2	
*Indicates that the mean does not satisfy summary criteria																		

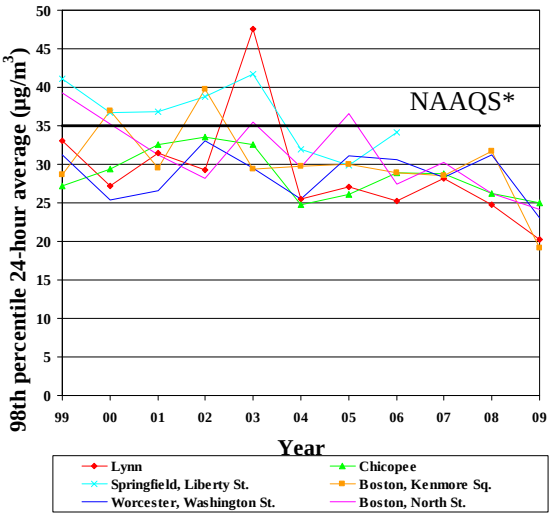
In 2009, Massachusetts had seven ambient monitoring sites (there are collocated monitors at Harrison Ave in Boston) measuring PM_{10} within their network. The second highest 24-hour PM_{10} concentration was recorded at the Worcester site (67 µg/m^3). Over the past twenty-one years PM_{10} levels have shown significant year to year variability especially for the 24-hour sampling period. However, overall PM_{10} levels appear to trend down during the time period.

Massachusetts Sites - 2009 - Particulate Matter < 2.5 Microns



Massachusetts Particulate Matter < 2.5 Microns ($PM_{2.5}$) Data





*NAAQS for Particulate Matter less than 2.5 Microns:
Annual: the 3-year average of the Annual Arithmetic Mean - 15.0 µg/m^3
24-Hour: the 3-year average of the 98th percentile of 24-hour average concentrations - 35 µg/m^3

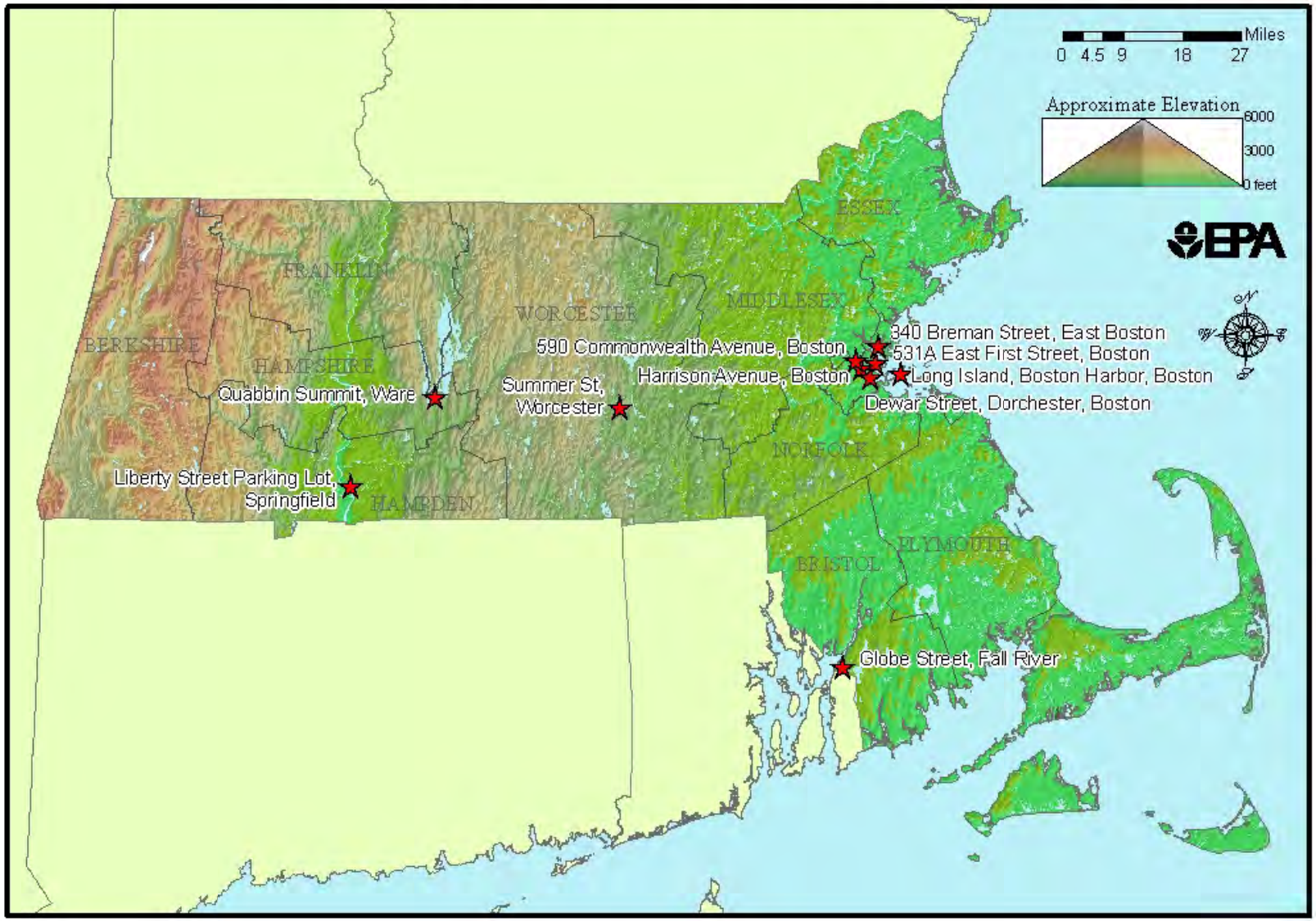
2009
Massachusetts
Particulate Matter < 2.5 Microns
All Values are in µg/m^3 Local Conditions

Site ID	POC	PQAO	City	County	Address	Method	# Obs	Highest Value	2nd Highest Value	3rd Highest Value	4th Highest Value	98th Percentile Value	Wtd. Arith. Mean	
25-003-5001	1	660	Pittsfield	Berkshire	78 CENTER ST	145	120	28.3	24.7	24.5	23.5	24.5	8.71	
25-005-1004	1	660	Fall River	Bristol	659 GLOBE ST	145	118	22.1	22.0	21.2	19.5	21.2	8.05	
25-009-2006	1	660	Lynn	Essex	390 PARKLAND	145	118	28.1	22.5	20.2	16.3	20.2	7.54	
25-009-5005	1	660	Haverhill	Essex	CONSENTINO SCHOOL	145	119	29.7	22.8	20.2	18.9	20.2	7.61	
25-009-6001	1	660	Lawrence	Essex	SHATTUCK ST	145	118	30.6	22.7	20.8	18.6	20.8	8.47	
25-013-0008	1	660	Chicopee	Hampden	ANDERSON RD AFB	145	122	31.2	27.6	25.0	19.5	25.0	7.81	
25-013-0008	2	660	Chicopee	Hampden	ANDERSON RD AFB	145	120	28.4	28.2	26.7	19.8	26.7	7.98	
25-013-0016	1	660	Springfield	Hampden	LIBERTY P-LOT	145	118	32.6	28.9	26.8	23.5	26.8	9.44	
25-013-2009	1	660	Springfield	Hampden	1860 MAIN ST	145	119	31.1	30.3	29.7	22.5	29.7	9.20	
25-017-0009	1	660	Chelmsford	Middlesex	11 TECHNOLOGY DRIVE NERL	142	61	29.2	22.5	21.5	20.8	22.5	8.46	
25-017-0009	2	660	Chelmsford	Middlesex	11 TECHNOLOGY DRIVE NERL	142	44	29.5	21.9	18.8	14.8	29.5	8.97	*
25-023-0004	1	660	Brockton	Plymouth	COMMERCIAL ST	145	118	24.0	22.5	21.8	20.8	21.8	8.44	
25-023-0004	2	660	Brockton	Plymouth	COMMERCIAL ST	145	102	23.9	23.2	22.1	19.5	22.1	8.38	*
25-025-0002	1	660	Boston	Suffolk	KENMORE SQ	145	89	23.9	19.1	19.0	18.2	19.1	8.98	*
25-025-0027	1	660	Boston	Suffolk	ONE CITY SQ	145	121	29.9	24.3	22.0	20.0	22.0	9.79	
25-025-0042	1	660	Boston	Suffolk	HARRISON AV	145	116	27.9	22.5	21.3	17.8	21.3	8.74	
25-025-0043	1	660	Boston	Suffolk	174 NORTH ST	145	360	31.4	29.1	28.2	26.0	24.1	10.24	
25-025-0043	2	660	Boston	Suffolk	174 NORTH ST	145	342	29.1	27.8	26.5	25.2	24.2	10.30	
25-027-0016	1	660	Worcester	Worcester	WASHINGTON ST	145	117	29.4	25.7	23.1	19.7	23.1	8.53	
25-027-0023	1	660	Worcester	Worcester	SUMMER ST	145	117	30.3	25.7	22.8	22.8	22.8	9.17	

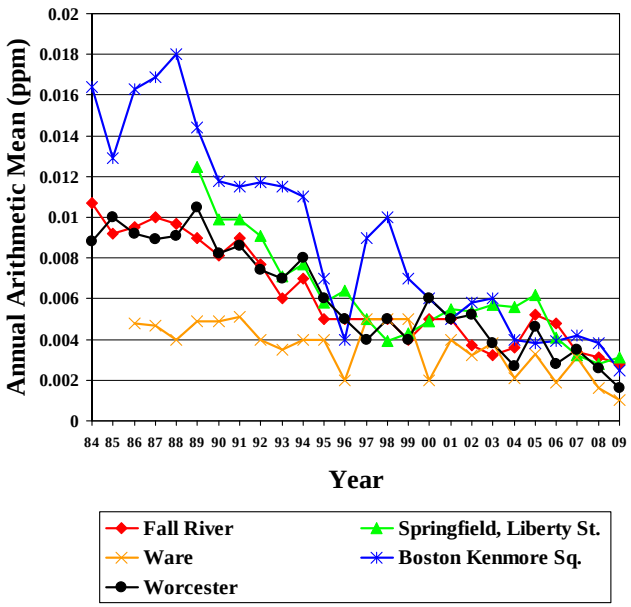
*Indicates that the mean does not meet summary criteria

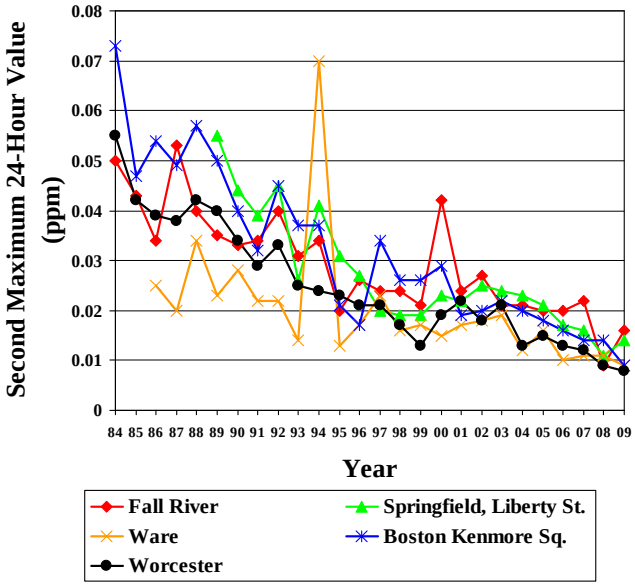
Massachusetts operated a network of sixteen $PM_{2.5}$ ambient monitoring sites in 2009 with 4 collocated monitors. The highest 98th percentile 24-hour concentration was recorded at the Springfield Main Street site and measured 29.7 µg/m^3. The highest annual weighted arithmetic mean was found at the Boston North Ave. site and measured 10.3 µg/m^3. Since 1999, a slight downward trend can be seen in the data.

Massachusetts Sites - 2009 - Sulfur Dioxide



Massachusetts Sulfur Dioxide Data





NAAQS for Sulfur Dioxide:

Primary: Annual Arithmetic Mean - 0.03 ppm
24-hour 0.14 ppm
1-hour 75 ppb (0.075 ppm) (Signed June 2, 2010) 99th percentile

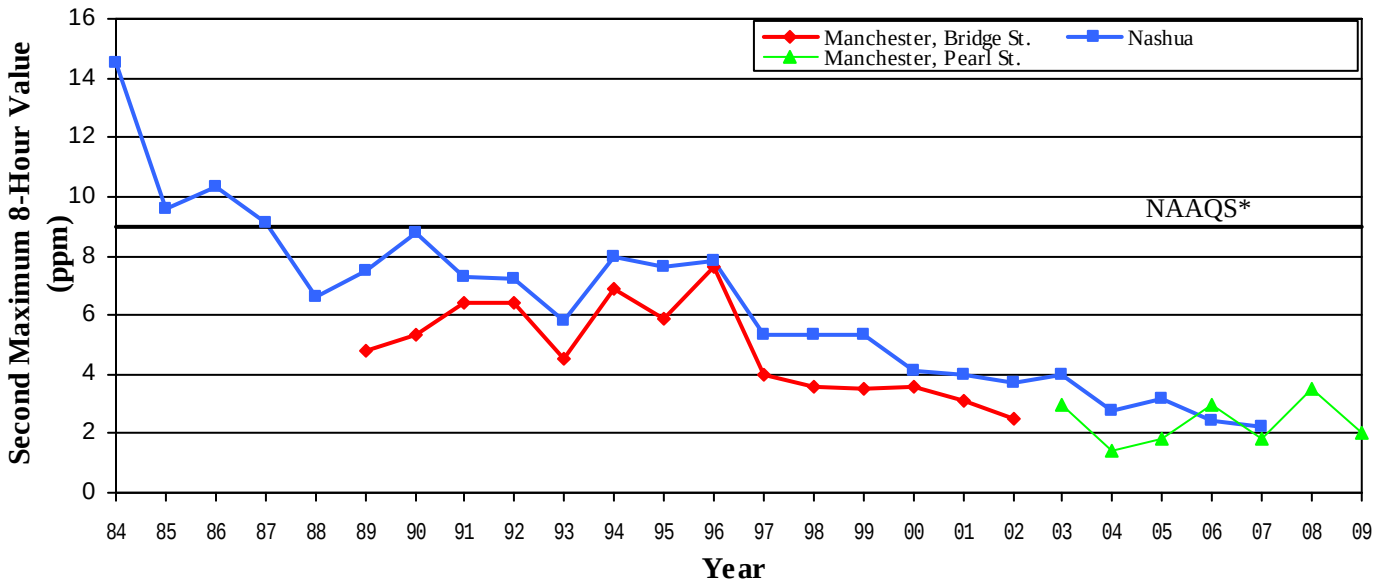
Secondary: 3-hour 0.5 ppm

2009																	
Massachusetts																	
Sulfur Dioxide																	
All Values are in Units of Parts Per Million (ppm)																	
								24-	24-		3-hour	3-hour		1-hour	1-hour	
	P							hour	hour			2nd			2nd	
	O						Method	#		2nd	Obs	Highest	Highest	Obs	Highest	Highest	Arith.
Site ID	C	PQAO	City	County	Address	Used	Obs	Highest	Highest	> 0.14	Value	Value	> 0.5	Value	Value	Mean
25-005-1004	1	660	Fall River	Bristol	659 GLOBE STREET	100	8426	0.02	0.016	0	0.044	0.039	0	0.06	0.058	0.0028
25-013-0016	1	660	Springfield	Hampden	LIBERTY STREET	0	8543	0.015	0.014	0	0.034	0.027	0	0.059	0.035	0.0031
25-015-4002	1	660	Ware	Hampshire	QUABBIN SUMMIT	600	8525	0.009	0.009	0	0.015	0.014	0	0.0164	0.0162	0.001
25-025-0002	1	660	Boston	Suffolk	KENMORE SQ	100	7166	0.009	0.009	0	0.019	0.017	0	0.025	0.025	0.0025
25-025-0019	1	345	Boston	Suffolk	LONG ISLAND, BOSTON HAR	60	8302	0.008	0.007	0	0.014	0.013	0	0.022	0.019	0.0019
25-025-0020	1	345	Boston	Suffolk	DEWAR STREET DORCHESTER	60	8730	0.014	0.011	0	0.026	0.022	0	0.04	0.034	0.0025
25-025-0021	2	345	Boston	Suffolk	340 BREMEN ST. E. BOSTON	60	8691	0.012	0.011	0	0.033	0.02	0	0.039	0.038	0.0027
25-025-0040	1	345	Boston	Suffolk	531A EAST FIRST STREET	60	8350	0.011	0.01	0	0.02	0.02	0	0.025	0.023	0.0027
25-025-0042	1	660	Boston	Suffolk	HARRISON AVE	600	8396	0.013	0.012	0	0.028	0.023	0	0.0325	0.0304	0.0022
25-027-0023	1	660	Worcester	Worcester	SUMMER ST	100	8496	0.009	0.008	0	0.017	0.015	0	0.027	0.024	0.0016

Ten SO_2 monitoring sites were operated in Massachusetts during 2009. No exceedance or violation of the annual or 24-hour (primary) or the 3-hour (secondary) NAAQS for SO_2 was recorded in 2009. All SO_2 trend sites in Massachusetts have shown a general decline in concentrations over the past twenty-four years, and are substantially below the NAAQS. (Monitors with organizational code 345 are industrial monitors.)

New Hampshire Sites 2009 - Carbon Monoxide

New Hampshire Carbon Monoxide Data

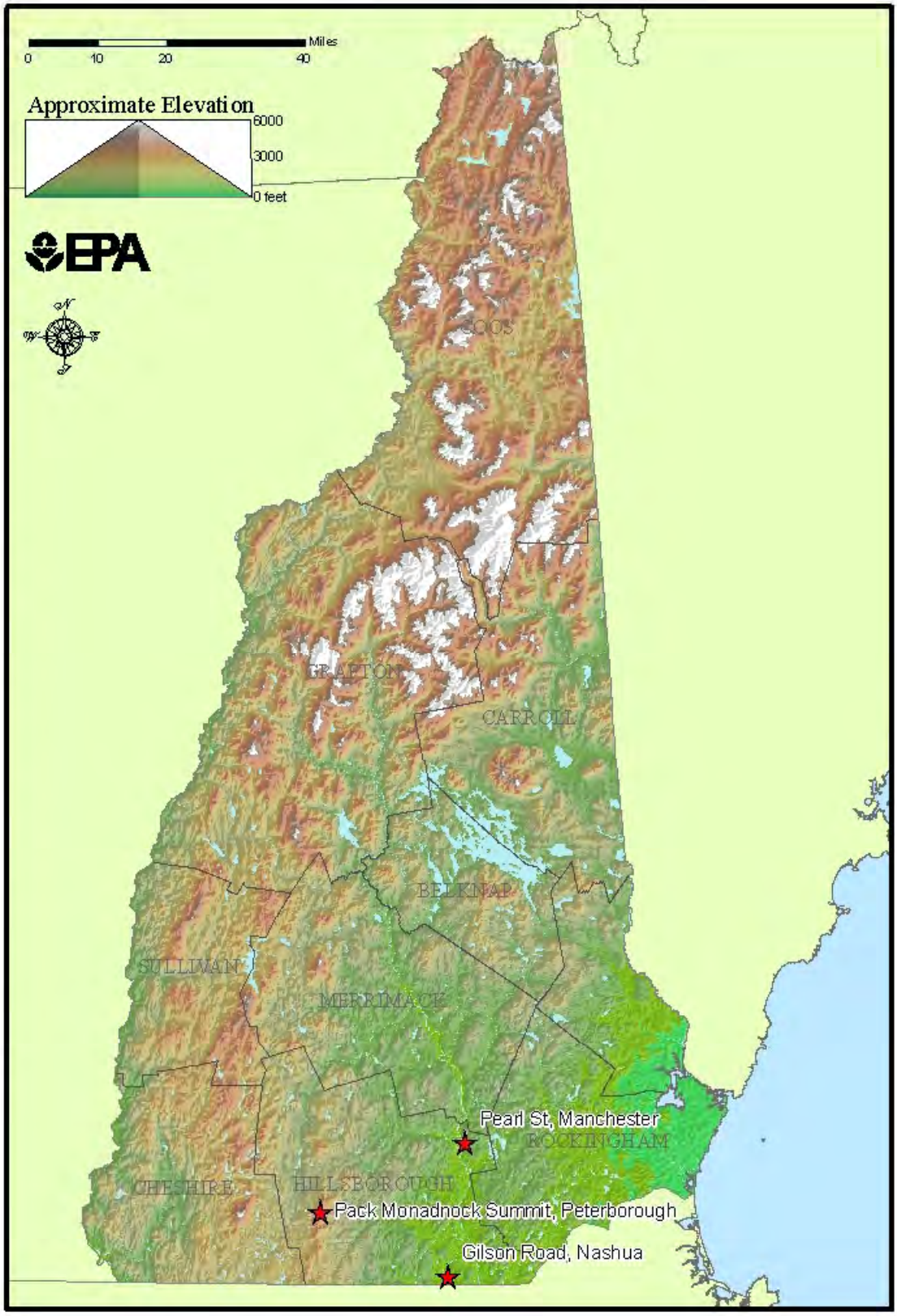


*NAAQS for Carbon Monoxide:
8-hour – 9 ppm, not to be exceeded more than one per year
1-hour – 35 ppm, not to be exceeded more than once per year

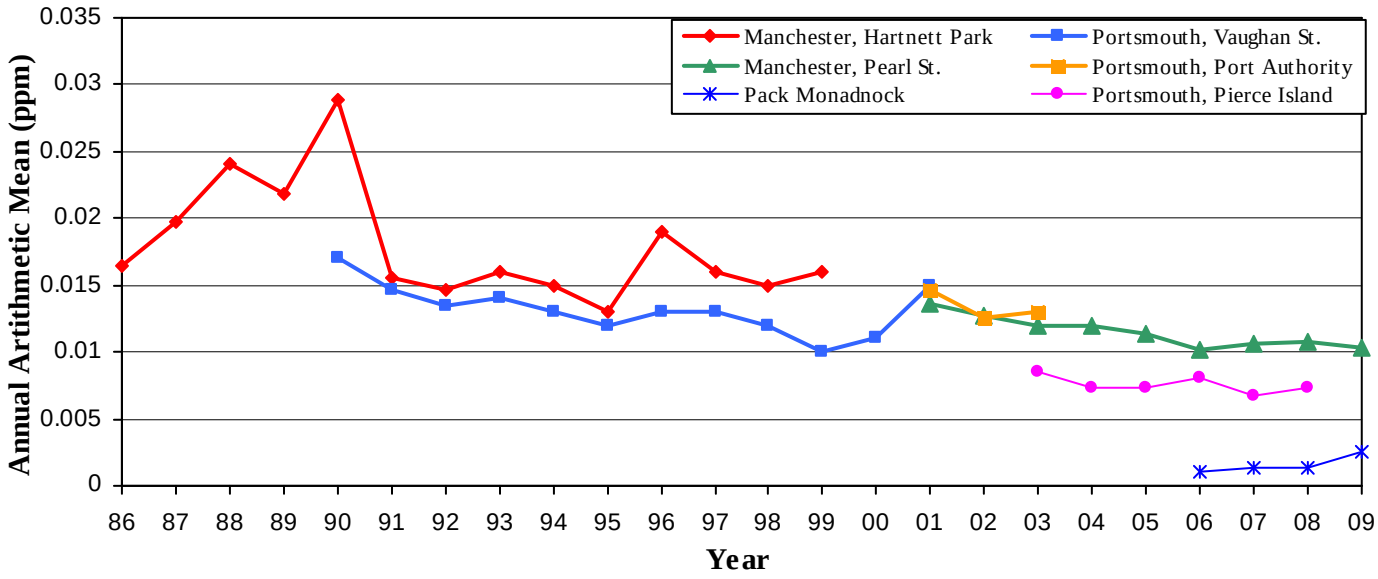
2009													
New Hampshire													
Carbon Monoxide													
All Values are in Units of Parts Per Million (ppm)													
								1-hour	1-hour		8-hour	8-hour	
	P								2nd			2nd	
	O					Methods	#	Highest	Highest		Highest	Highest	
Site ID	C	PQAO	City	County	Address	Used	Obs	Value	Value	OBS > 35	Value	Value	OBS > 9
33-011-0020	1	762	Manchester	Hillsborough	PEARL ST	54	8411	3.3	3.2	0	2.3	2.0	0

New Hampshire currently operates one CO monitoring site located in Manchester. As has been the case for over a decade, in 2009 there were no violations of either the 8-hour or 1-hour National Ambient Air Quality Standard (NAAQS) for CO in New Hampshire. The last exceedance of the 8-hour CO NAAQS occurred in Manchester (13.5 ppm) during the winter of 1996. In 2009, the Manchester – Pearl Street site, reported a second maximum 8-hour average CO concentration of 2.0 ppm. The most recent ten year trend for CO indicates that the CO levels show relatively small year-to-year fluctuations, but tend to be well below the NAAQS.

New Hampshire Sites 2009 - Nitrogen Dioxide



New Hampshire Nitrogen Dioxide Data

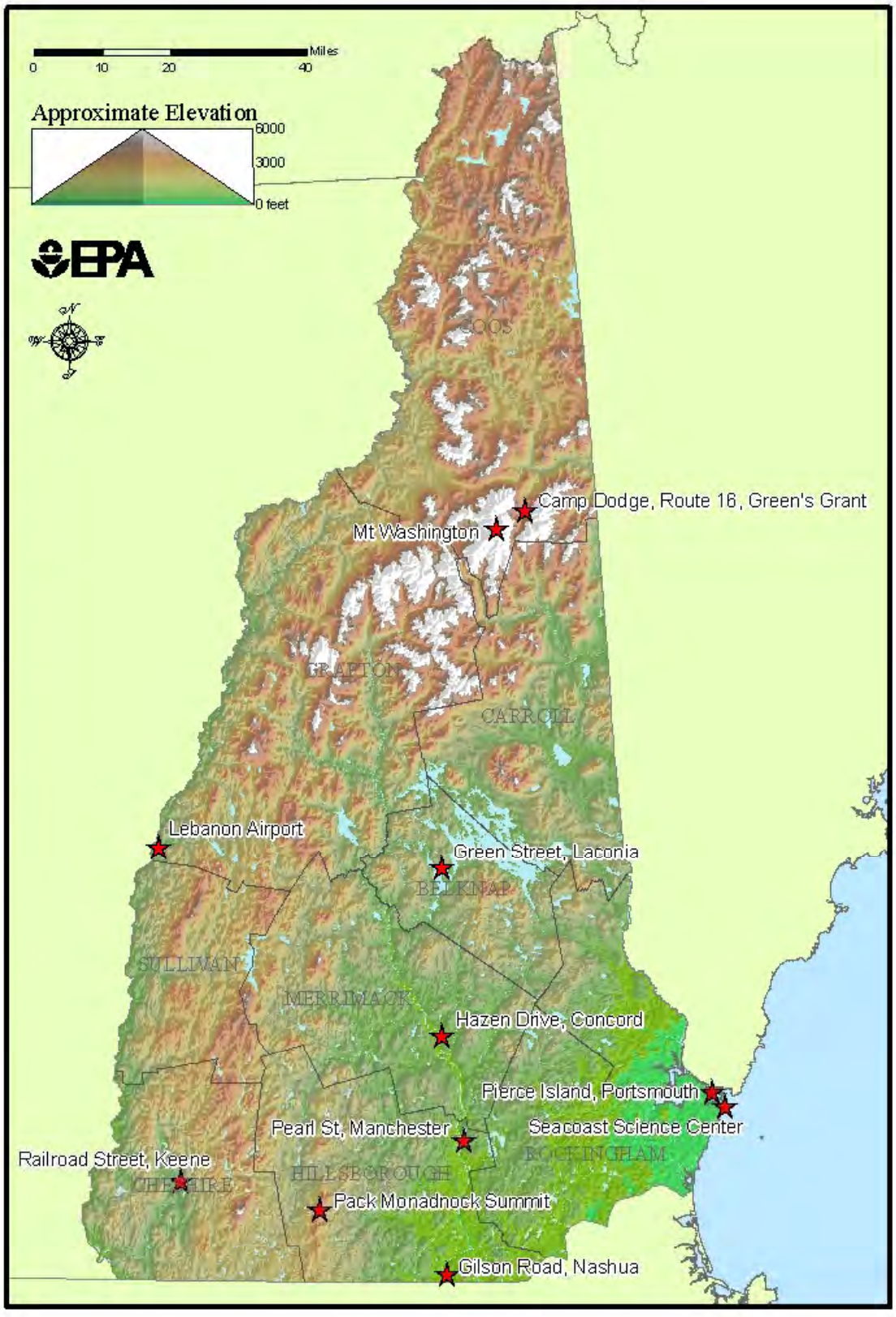


NAAQS for Nitrogen Dioxide:
Annual Arithmetic Mean 0.053 ppm (100 µg/m^3)
1-hour – 100 ppb (or 0.100 ppm) (as of January 22, 2010) 98th percentile

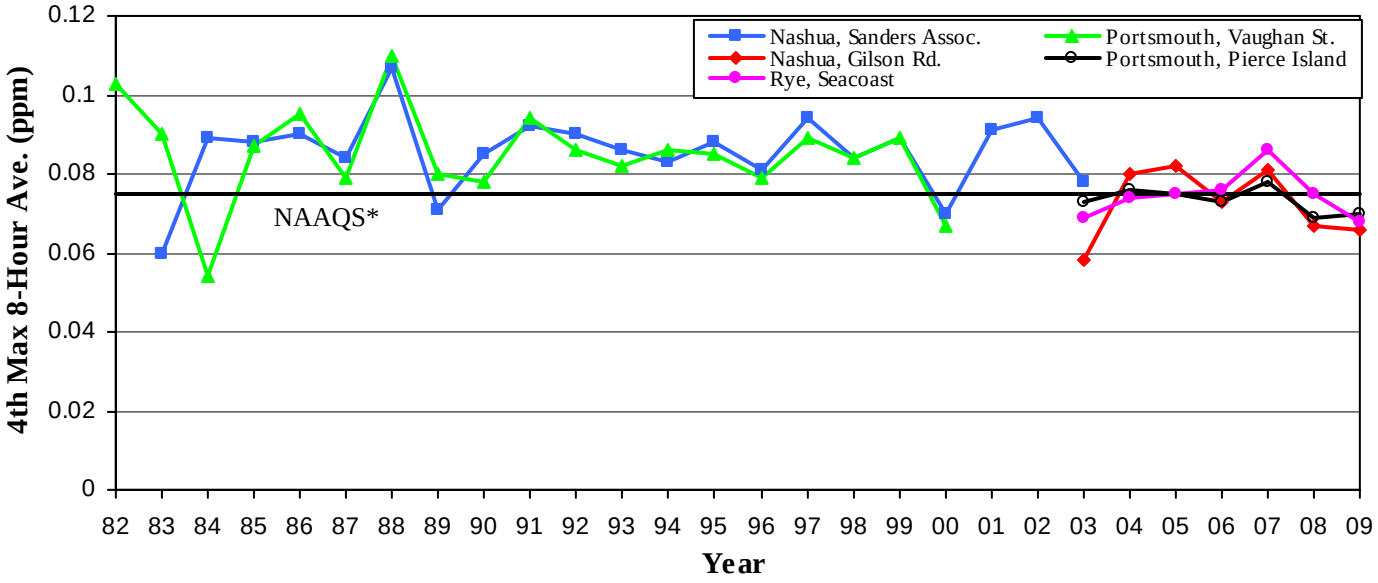
2009											
New Hampshire											
Nitrogen Dioxide											
All Values are in Units of Parts Per Million (ppm)											
									1-hour	1-hour	
	P									2nd	Annual
	O							#	Highest	Highest	Arith.
Site ID	C	PQAO	City	County	Address	Method	Obs	Value	Value	Mean	
33-011-0020	1	762	Manchester	Hillsborough	PEARL ST	74	8586	0.051	0.051	0.0103	
33-011-1011	1	762	Nashua	Hillsborough	GILSON ROAD	74	2827	0.012	0.012	0.0018	*
33-011-5001	1	762	Peterborough	Hillsborough	PACK MONADNOCK SUMMIT	82	2158	0.01	0.01	0.0026	*
*Indicates that the mean does not meet summary criteria											

Nitrogen dioxide (NO_2) was measured at three monitoring sites in 2009; at each of the two PAMS sites (Pack Monadnock and Gilson Road) and at one urban site (Manchester). The Manchester monitoring site recorded the highest NO_2 concentrations, but well below the standard. The ten-year NO_2 concentrations trend indicates that there has been no recent upward or downward trend in concentration. The long term trend (20+ years) is downward.

New Hampshire Sites 2009 - Ozone



New Hampshire Ozone 8-Hour Data



*NAAQS for Ozone:

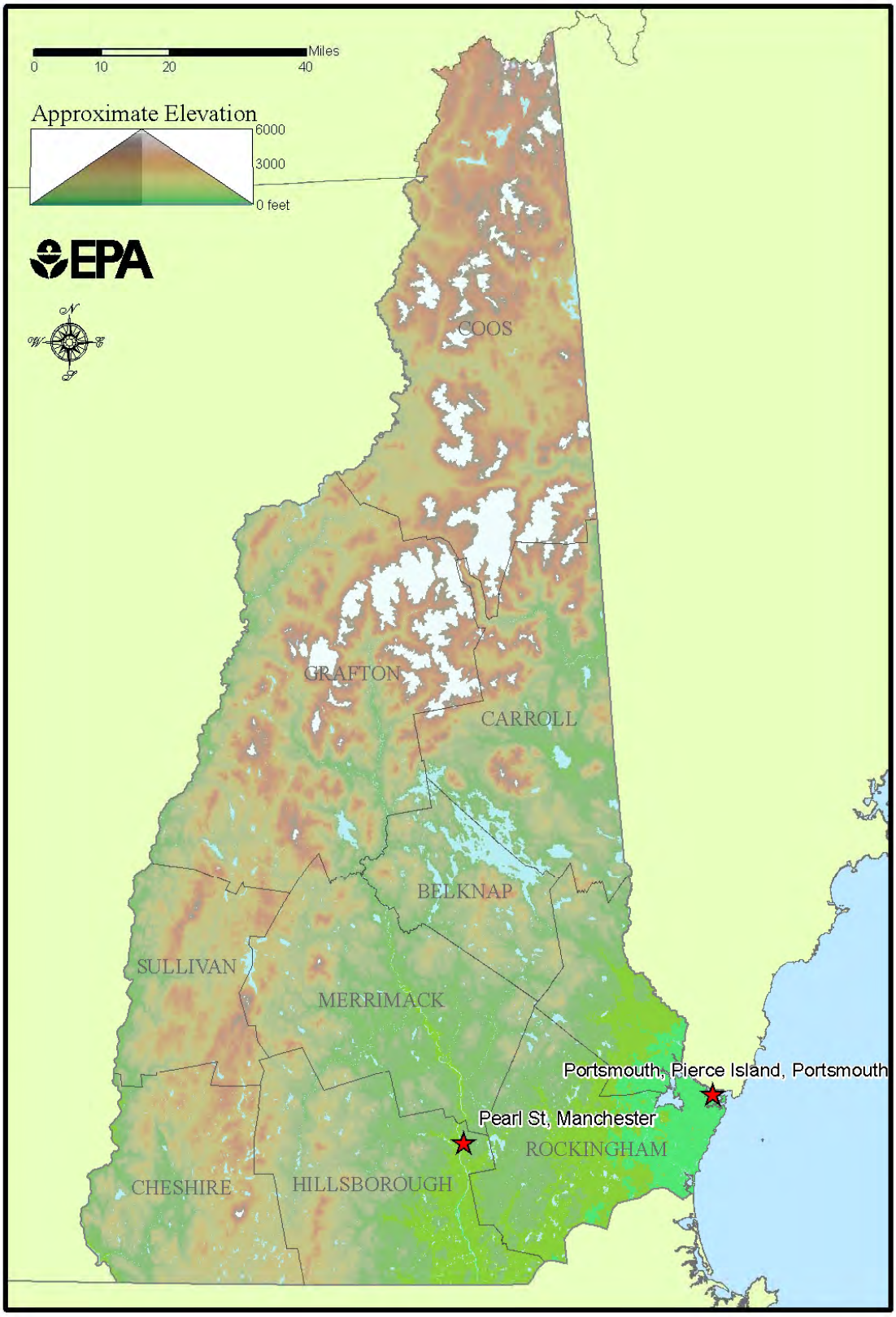
8-hour – 0.075 ppm (2008 std)

(To attain this 0.075 ppm standard, the 3-year average of the fourth-highest daily maximum 8-hour average ozone concentrations measured at each monitor within an area over each year must not exceed 0.075 ppm. This graph represents the 4th highest value for each year for each monitor depicted. Thus, being above or below this NAAQS line does not indicate whether or not a monitor exceeds the NAAQS.)

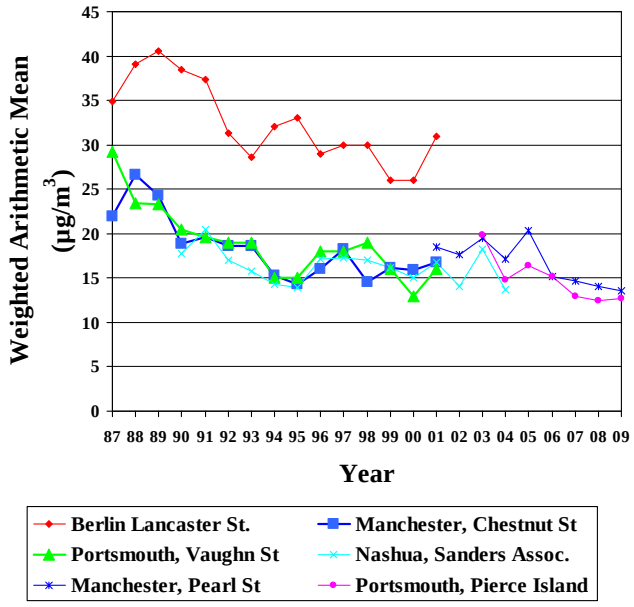
2009														
New Hampshire														
Ozone (8-hour)														
All Values are in Units of Parts Per Million (ppm)														
	P							Valid	Num		2nd	3rd	4th	Days
	O					Methods	%	Days	Required	Highest	Highest	Highest	Highest	Max >
Site ID	C	PQAO	City	County	Address	Reported	Obs	Meas.	Days	8-Hr Value	8-Hr Value	8-Hr Value	8-Hr Value	0.075
33-001-2004	1	762	Laconia	Belknap	GREEN STREET	0	96	175	183	0.069	0.068	0.063	0.062	0
33-005-0007	1	762	Keene	Cheshire	RAILROAD STREET	87	99	181	183	0.071	0.069	0.066	0.062	0
33-007-4001	1	762	Summit	Coos	MT. WASHINGTON	87	95	174	183	0.072	0.070	0.069	0.068	0
33-007-4002	1	762	Greens Grant	Coos	CAMP DODGE, ROUTE 16	47	94	172	183	0.073	0.070	0.058	0.058	0
33-009-0010	1	762	Lebanon	Grafton	LEBANON AIRPORT	87	99	182	183	0.067	0.061	0.061	0.059	0
33-011-0020	1	762	Manchester	Hillsborough	PEARL ST	47	93	171	183	0.068	0.067	0.064	0.06	0
33-011-1011	1	762	Nashua	Hillsborough	GILSON ROAD	87	96	175	183	0.074	0.068	0.067	0.066	0
33-011-5001	1	762	Peterborough	Hillsborough	PACK MONADNOCK SUMMIT	87	99	182	183	0.074	0.072	0.072	0.072	0
33-013-1007	1	762	Concord	Merrimack	HAZEN DRIVE	47	98	179	183	0.072	0.069	0.065	0.064	0
33-015-0014	1	762	Portsmouth	Rockingham	PIERCE ISLAND	0	98	179	183	0.076	0.074	0.072	0.07	1
33-015-0016	1	762	Rye	Rockingham	SEACOAST SCIENCE CENTER	87	98	180	183	0.083	0.076	0.073	0.068	2

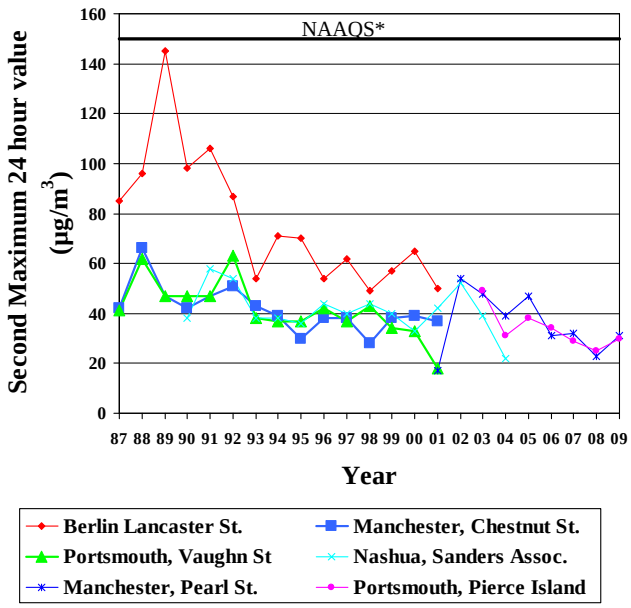
None of the eleven ozone monitors in New Hampshire recorded 4th highest values above the 2008 8-hour ozone standard. In 2009, the absolute maximum 8-hour average ozone concentration occurred at the Seacoast Science Center in Rye (0.083 ppm). The second highest recorded maximum 8-hr ozone concentration occurred at Pierce Island in Portsmouth (0.076 ppm).

New Hampshire Sites 2009 - Particulate Matter < 10 Microns



New Hampshire Particulate Matter < 10 Microns (PM_{10}) Data



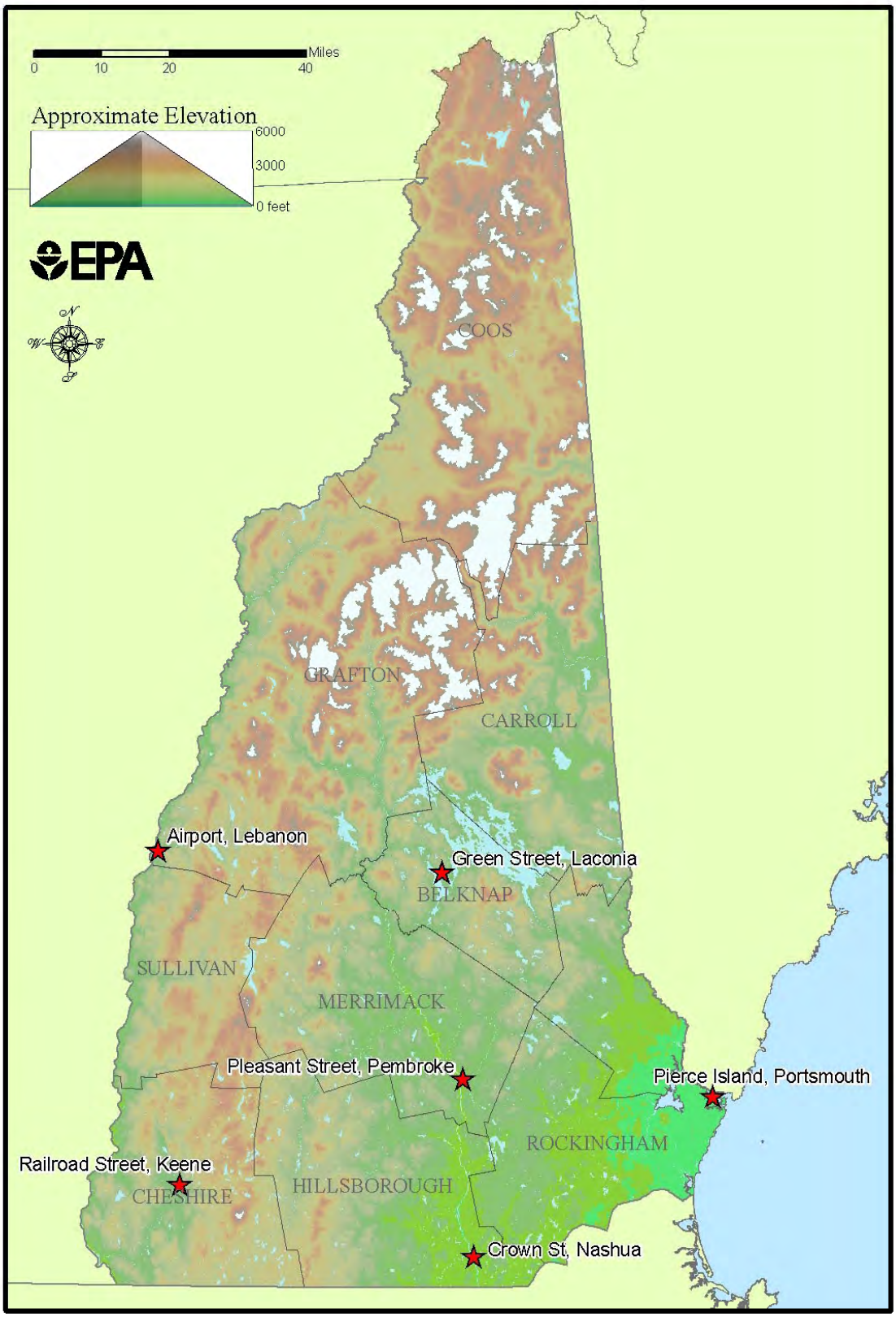


*NAAQS for Particulate Matter less than 10 Microns:
24-hour 150 µg/m^3

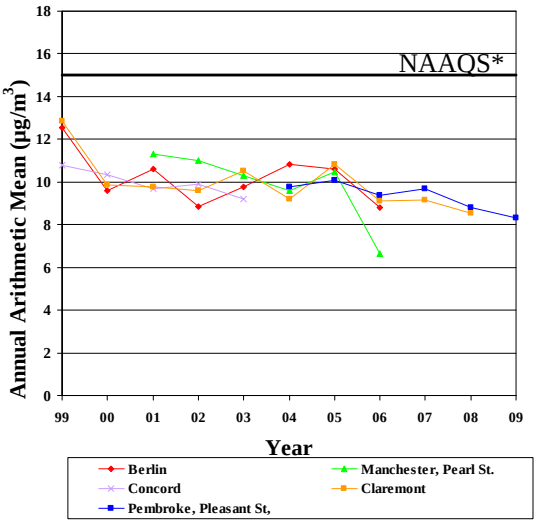
2009																			
New Hampshire																			
Particulate Matter < 10 Microns																			
All Values are in Units of µg/m^3																			
													2nd	3rd	4th	Days	Est. Days	Wtd.	
						Methods			Number	Valid	Highest	Highest	Highest	Highest	Max	Max	Arith.		
SITE ID	POC	PQAO	City	County	Address	Used	# Obs	# Req.	Days	% Obs	Value	Value	Value	Value	>150	>150	Mean		
33-011-0020	1	762	Manchester	Hillsborough	PEARL ST	125	55	61	55	90	31	31	30	29	0	0	13.6	*	
33-011-0020	2	762	Manchester	Hillsborough	PEARL ST	125	61	61	61	100	34	32	32	30	0	0	13.1		
33-015-0014	1	762	Portsmouth	Rockingham	PIERCE ISLAND	0	57	61	57	93	37	30	28	26	0	0	12.7		
*Indicates that the mean does not satisfy summary criteria																			

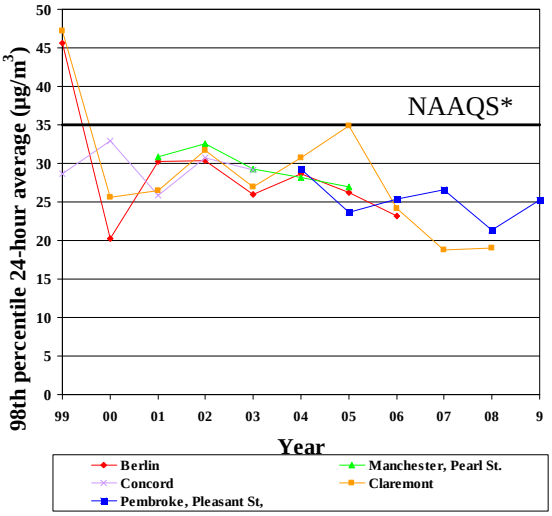
Neither of the two coarse PM_{10} monitoring sites in New Hampshire (Portsmouth and Manchester) has exceeded or violated the annual or 24-hr NAAQS for PM_{10} during the past ten years (2000 -2009). The second highest 24-hour concentration in 2009 was recorded in Manchester (32 ug/m^3). Over the past ten years, all PM_{10} monitors in New Hampshire recorded PM_{10} concentrations well below the national standards despite significant variability.

New Hampshire Sites 2009 - Particulate Matter < 2.5 Microns



New Hampshire Particulate Matter < 2.5 Microns ($PM_{2.5}$) Data



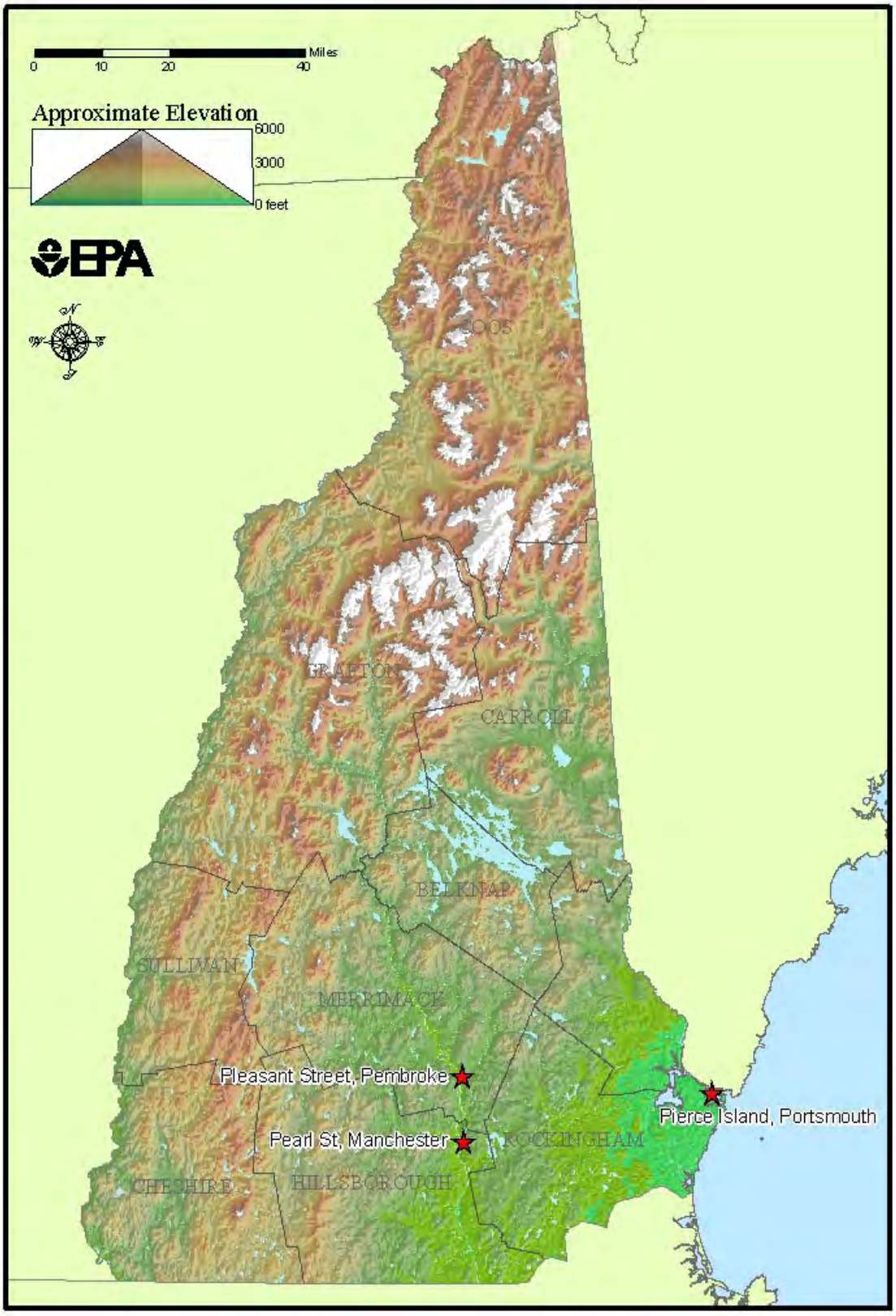


*NAAQS for Particulate Matter less than 2.5 Microns:
Annual: the 3-year average of the Annual Arithmetic Mean - 15.0 µg/m^3
24-Hour: the 3-year average of the 98th percentile of 24-hour average concentrations - 35 µg/m^3

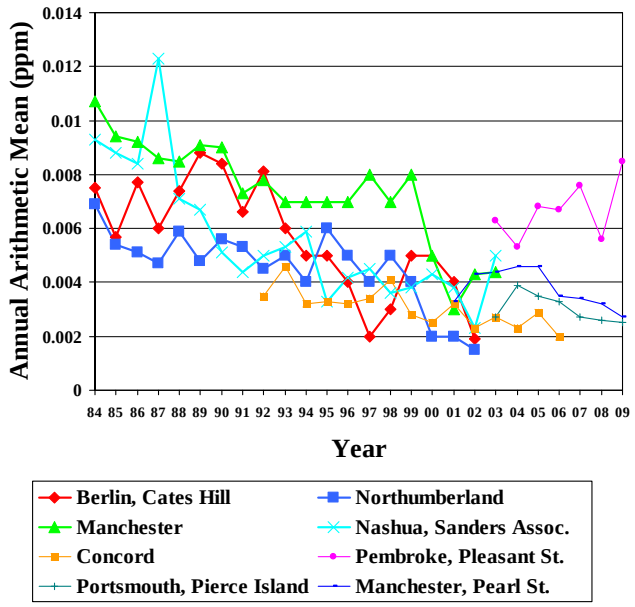
2009														
New Hampshire														
Particulate Matter < 2.5 Microns														
All Values are in µg/m^3 Local Conditions														
	P									2nd	3rd	4th	98th	Wtd.	
	O							#	Highest	Highest	Highest	Highest	Percentile	Arith.	
Site ID	C	PQAO	City	County	Address	Method	Obs	Value	Value	Value	Value	Value	Mean	
33-001-2004	1	762	Laconia	Belknap	GREEN STREET	116	60	27.3	18.1	14.6	13.5	18.1	6.02	
33-005-0007	1	762	Keene	Cheshire	RAILROAD STREET	116	62	34.3	31.2	30.7	30.7	31.2	10.13	
33-005-0007	3	762	Keene	Cheshire	RAILROAD STREET	170	8168	35.8	34.3	33.7	32.7	31.4	10.53	
33-009-0010	3	762	Lebanon	Grafton	LEBANON AIRPORT	170	8176	32.5	30.7	26.5	22.8	20.4	6.59	
33-011-1015	1	762	Nashua	Hillsborough	CROWN ST	116	121	28.0	23.7	22.9	21.5	22.9	7.97	
33-013-1006	1	762	Suncook	Merrimack	PLEASANT STREET	118	119	26.0	25.6	25.2	21.0	25.2	8.30	
33-013-1006	2	762	Suncook	Merrimack	PLEASANT STREET	0	51	26.2	25.1	24.9	20.7	25.1	8.58	*
33-015-0014	1	762	Portsmouth	Rockingham	PORTSMOUTH, PIERCE ISLAND	118	120	29.0	23.1	20.5	17.5	20.5	7.06	
*Indicates that the mean does not meet summary criteria														

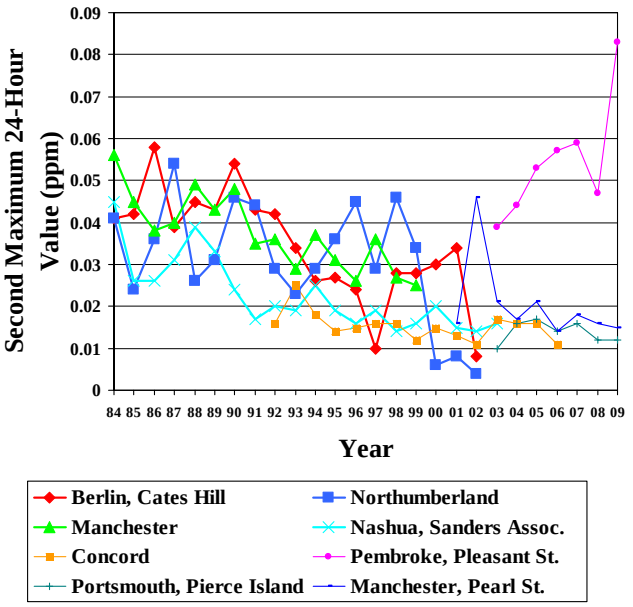
In 2009, six monitoring sites provided data on the concentration of $PM_{2.5}$ in the state, with 2 collocated monitors. Over the past several years the highest concentrations of $PM_{2.5}$ have been recorded in the Pembroke and Keene urban areas. During 2009, relatively high concentrations of fine particulate matter ($PM_{2.5}$) were recorded at the Railroad Street site in Keene (10.53 ug/m^3) for the $PM_{2.5}$ annual and secondary standards compared with the other New Hampshire monitoring sites. Annual concentrations of $PM_{2.5}$ were well below the primary annual standard.

New Hampshire Sites 2009 - Sulfur Dioxide



New Hampshire Sulfur Dioxide Data





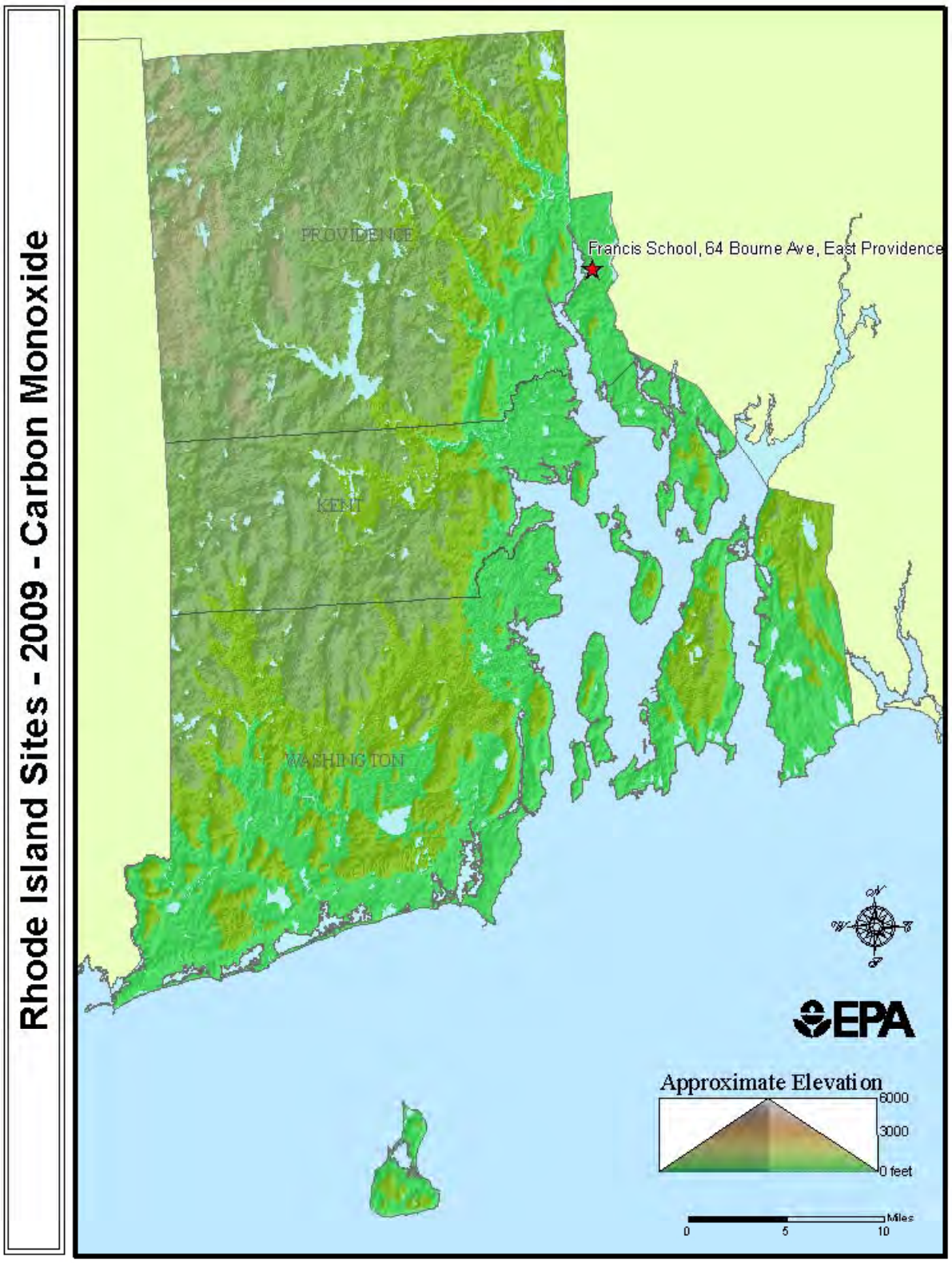
NAAQS for Sulfur Dioxide:

Primary: Annual Arithmetic Mean - 0.03 ppm
24-hour 0.14 ppm
1-hour 75 ppb (0.075 ppm) (Signed June 2, 2010) 99th percentile

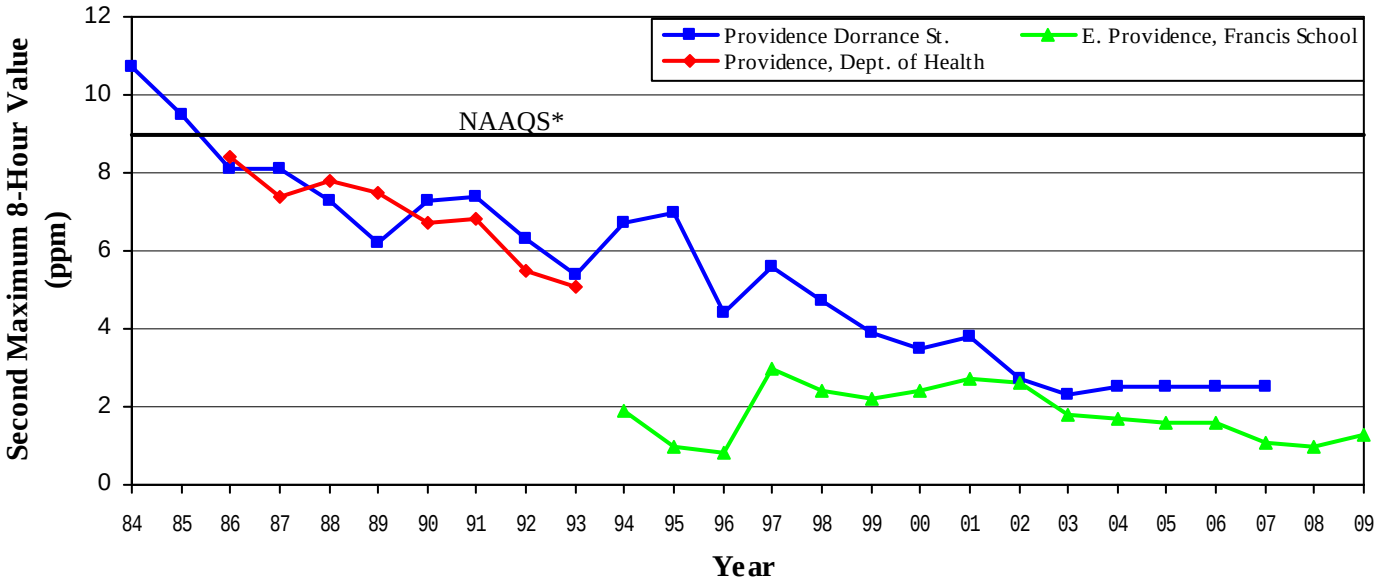
Secondary: 3-hour 0.5 ppm

2009																	
New Hampshire																	
Sulfur Dioxide																	
All Values are in Units of Parts Per Million (ppm)																	
									24-	24-		3-hour	3-hour		1-hour	1-hour	
	P								hour	hour			2nd			2nd	
	O						Method	#		2nd	Obs	Highest	Highest	Obs	Highest	Highest	Arith.
Site ID	C	PQAO	City	County	Address		Used	Obs	Highest	Highest	> 0.14	Value	Value	> 0.5	Value	Value	Mean
33-011-0020	1	762	Manchester	Hillsborough	PEARL ST		60	8590	0.018	0.015	0	0.067	0.045	0	0.119	0.075	0.0027
33-013-1006	1	762	Suncook	Merrimack	PLEASANT STREET		60	8528	0.112	0.083	0	0.215	0.201	0	0.286	0.254	0.0085
33-015-0014	1	762	Portsmouth	Rockingham	PORTSMOUTH, PIERCE		60	8642	0.015	0.012	0	0.034	0.031	0	0.073	0.058	0.0025

During 2009, no exceedance or violation of the existing sulfur dioxide NAAQS (annual, 24-hour, or 3-hour standards) occurred at any of the three monitoring sites in New Hampshire. However, during 2009 the Pembroke monitor recorded elevated 1-hour values that resulted in an exceedence of the new 2010 1-hour standard (three year average of the 99th percentile). The highest annual SO_2 concentration was recorded in Pembroke (0.0085 ppm SO_2). The Pembroke site also reported the highest 24-hour second maximum SO_2 concentration (0.083 ppm SO_2), and the highest 3-hour SO_2 second maximum concentration (0.201 ppm SO_2).


Rhode Island Sites - 2009 - Carbon Monoxide
PROVIDENCE
KENT
WASHINGTON
Francis School, 64 Bourne Ave, East Providence
EPA
Approximate Elevation
6000
3000
0 feet
0
5
10
Miles

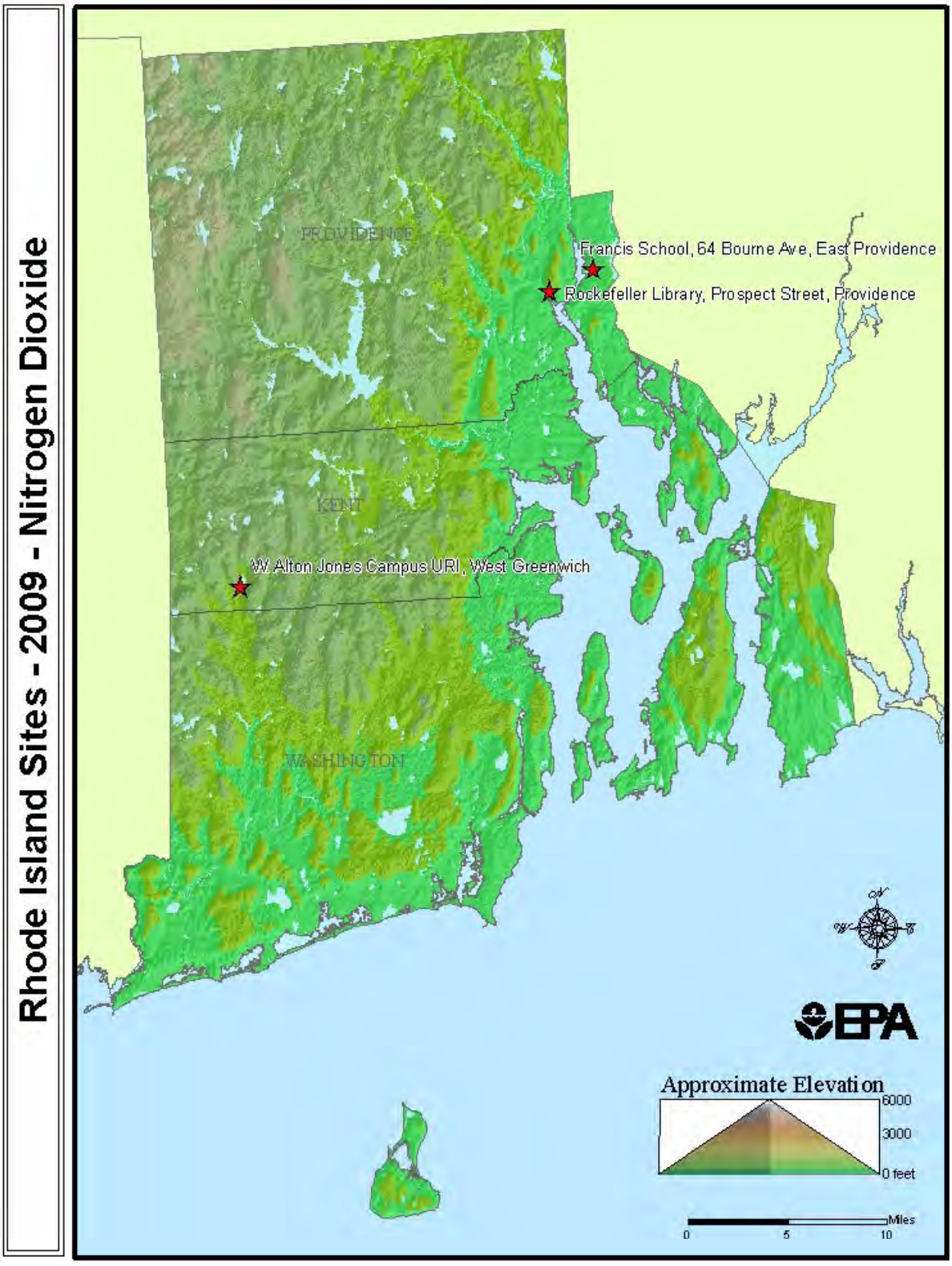
Rhode Island Carbon Monoxide Data



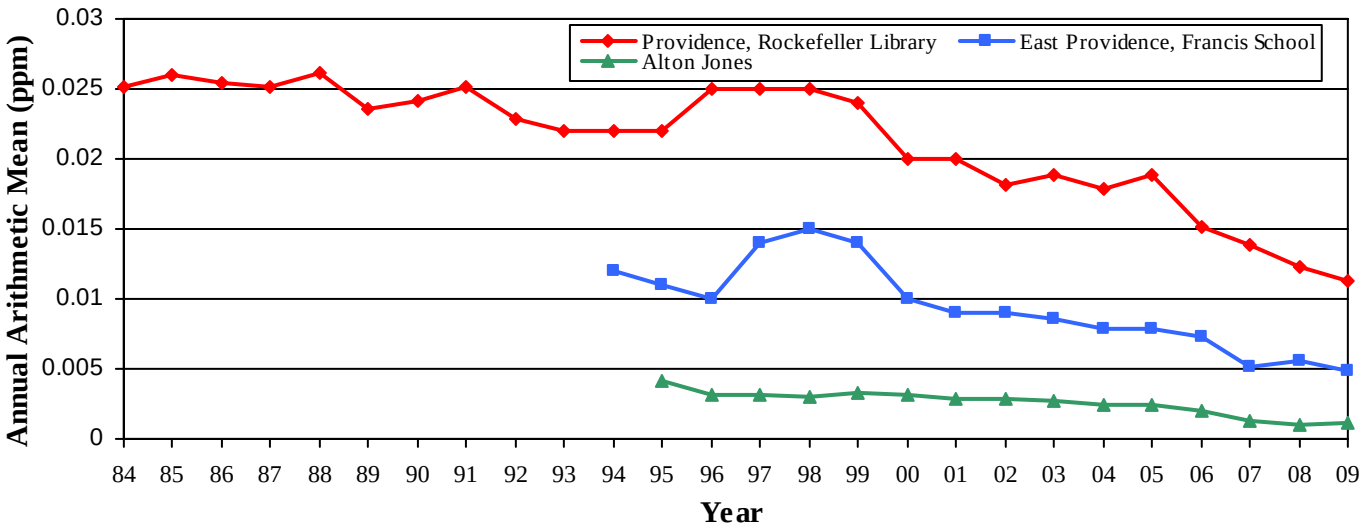
*NAAQS for Carbon Monoxide:
8-hour – 9 ppm, not to be exceeded more than one per year
1-hour – 35 ppm, not to be exceeded more than once per year

2009													
Rhode Island													
Carbon Monoxide													
All Values are in Units of Parts Per Million (ppm)													
								1-hour	1-hour		8-hour	8-hour	
	P								2nd			2nd	
	O						Methods	#	Highest	Highest		Highest	Highest	
Site ID	C	PQAO	City	County	Address		Used	Obs	Value	Value	OBS > 35	Value	Value	OBS > 9
44-007-1010	1	907	East Providence	Providence	FRANCIS SCHOOL, 64 BOURNE AVE.		54	8397	2.8	2.7	0	1.4	1.3	0

Rhode Island operates one carbon monoxide monitor. No exceedance or violation of the 1-hour or 8-hour CO NAAQS were recorded in 2009. The highest 8-hour second maximum CO level recorded during 2009 was 1.3 ppm. Over the past sixteen years the highest 8-hour second maximum concentration of CO at this site was 3.0 ppm, which occurred in 1997. The 26 year trend of CO concentrations in Rhode Island show a downward trend with concentrations leveling off well below the NAAQS between 2003 and 2009.


Rhode Island Sites - 2009 - Nitrogen Dioxide
PROVIDENCE
KENT
WASHINGTON
Francis School, 64 Bourne Ave, East Providence
Rockefeller Library, Prospect Street, Providence
W. Alton Jones Campus URI, West Greenwich
EPA
Approximate Elevation
6000
3000
0 feet
Miles
0
5
10

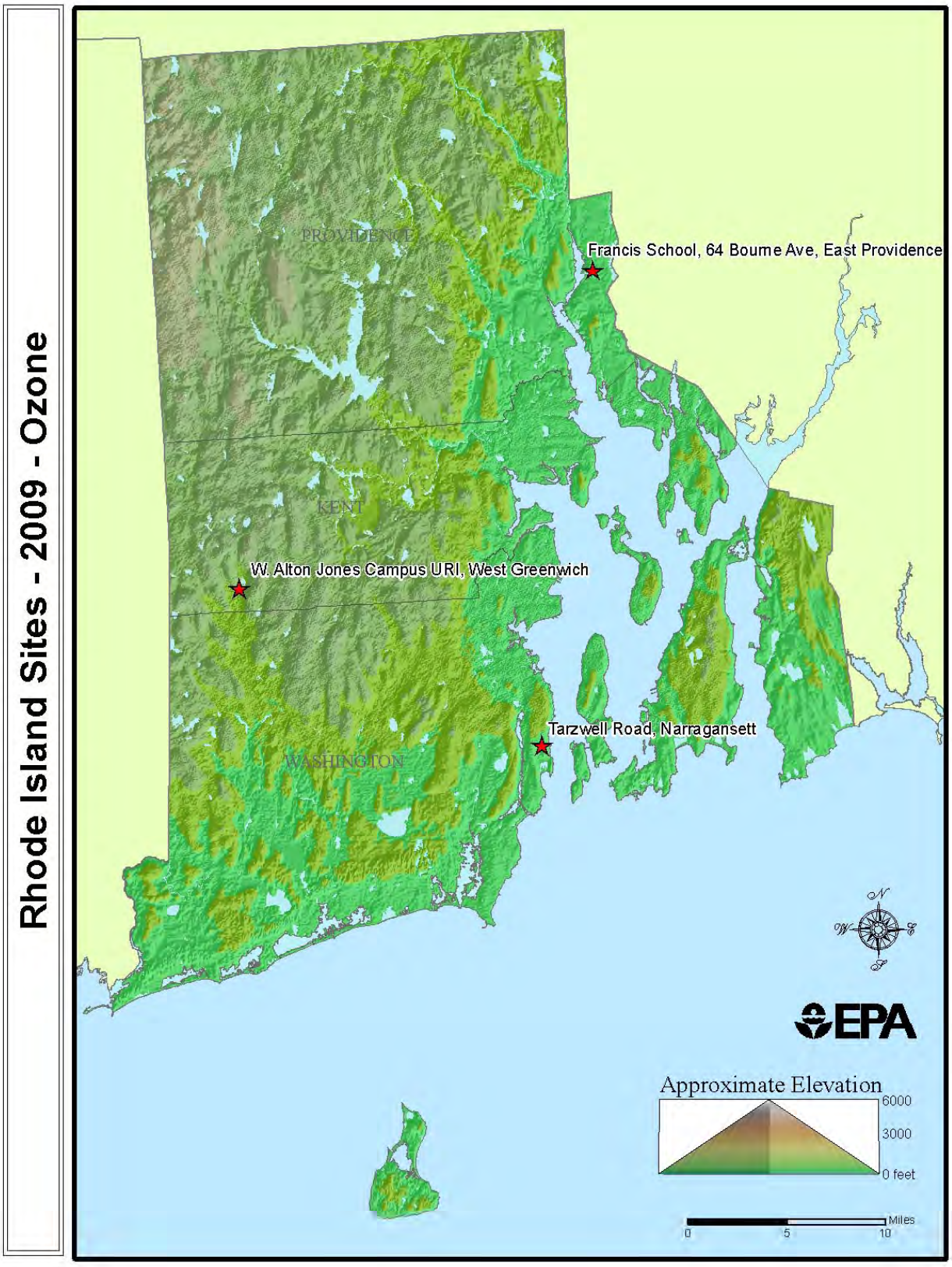
Rhode Island Nitrogen Dioxide Data



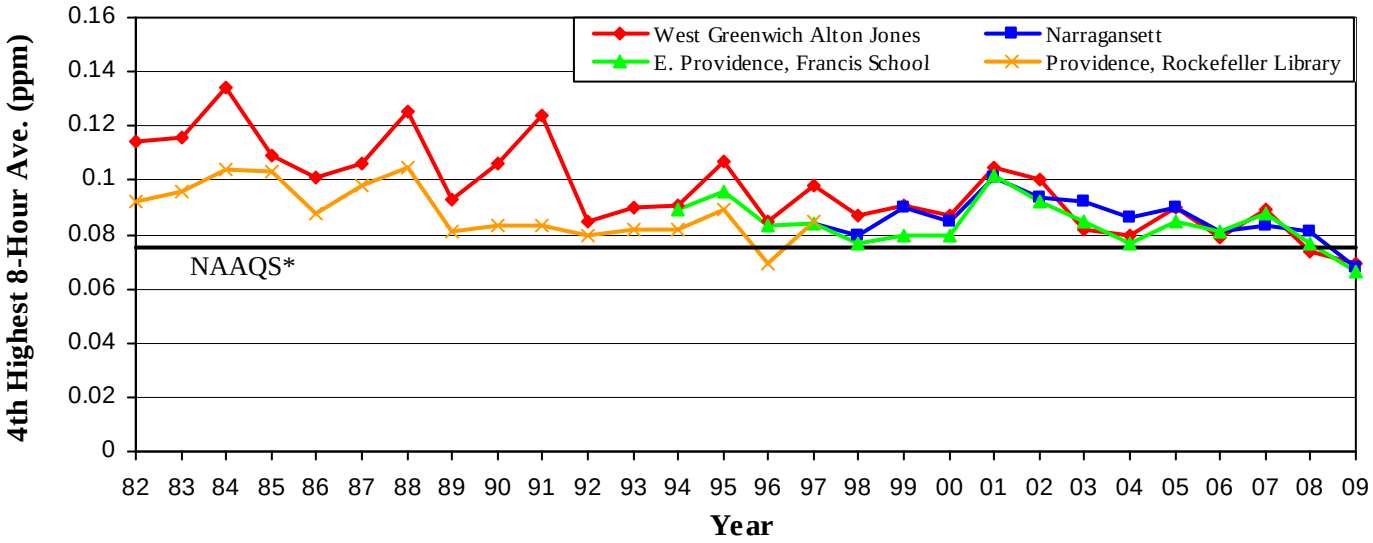
NAAQS for Nitrogen Dioxide:
Annual Arithmetic Mean 0.053 ppm (100 µg/m3)
1-hour – 100 ppb (or 0.100 ppm) (as of January 22, 2010) 98th percentile

2009											
Rhode Island											
Nitrogen Dioxide											
All Values are in Units of Parts Per Million (ppm)											
								1-hour	1-hour		
	P								2nd	Annual	
	O							#	Highest	Highest	Arith.	
Site ID	C	PQAO	City	County	Address	Method	Obs	Value	Value	Mean	
44-003-0002	1	907	West Greenwich	Kent	W. ALTON JONES CAMPUS URI	74	2017	0.015	0.015	0.0012	*
44-007-0012	1	907	Providence	Providence	ROCKEFELLER LIBRARY	74	8085	0.062	0.057	0.0113	
44-007-1010	1	907	East Providence	Providence	FRANCIS SCHOOL, 64 BOURNE AVE	74	2063	0.021	0.02	0.0048	*
*Indicates that the mean does not meet summary criteria											

Rhode Island operated three NO_2 monitoring sites during 2009. NO_2 monitors were located at two PAMS Sites (West Greenwich and East Providence) that operated during June, July and August and at the Rockefeller Library in Providence which operated all year. This latter site recorded the highest annual arithmetic mean NO_2 concentration of 0.0113 ppm, only 21% of the NAAQS. The 26 year NO_2 concentration trend at the Rockefeller Library site has remained relatively flat with a slight decreasing trend beginning in 2000. Each year, over the past ten years, the mean NO_2 concentration during the PAMS season has been three to five times higher at the East Providence site (0.005 - 0.01ppm) compared to the West Greenwich (Alton Jones) Site (0.001 – 0.003 ppm).


Rhode Island Sites - 2009 - Ozone
PROVIDENCE
KENT
WASHINGTON
Francis School, 64 Bourne Ave, East Providence
W. Alton Jones Campus URI, West Greenwich
Tarzwell Road, Narragansett
EPA
Approximate Elevation
6000
3000
0 feet
Miles
0
5
10

Rhode Island 8-Hour Ozone Data



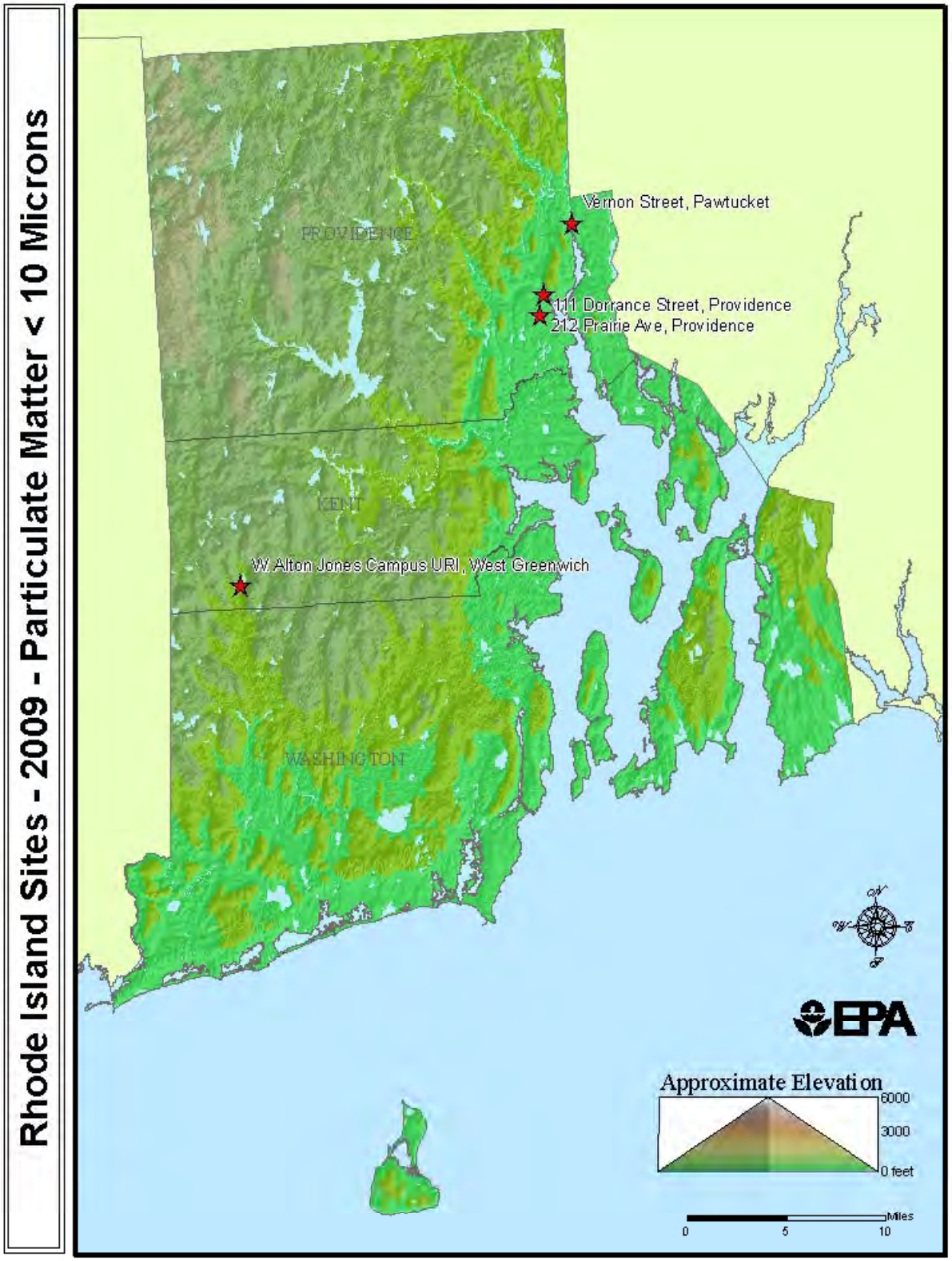
*NAAQS for Ozone:

8-hour – 0.075 ppm (2008 std)

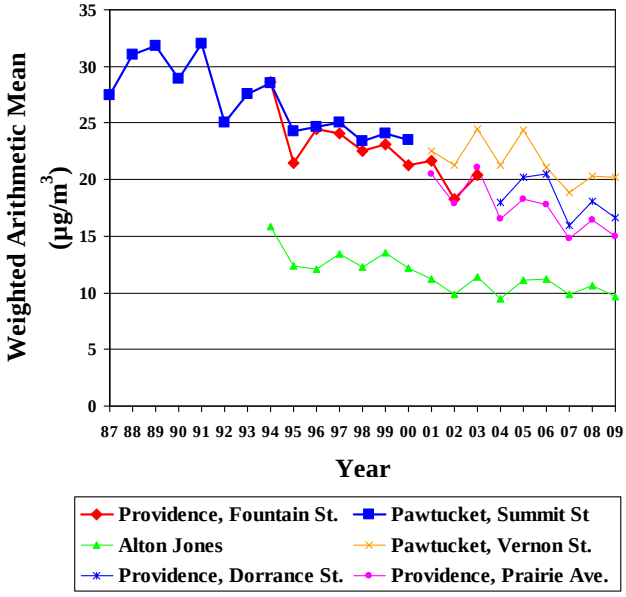
(To attain this 0.075 ppm standard, the 3-year average of the fourth-highest daily maximum 8-hour average ozone concentrations measured at each monitor within an area over each year must not exceed 0.075 ppm. This graph represents the 4th highest value for each year for each monitor depicted. Thus, being above or below this NAAQS line does not indicate whether or not a monitor exceeds the NAAQS.)

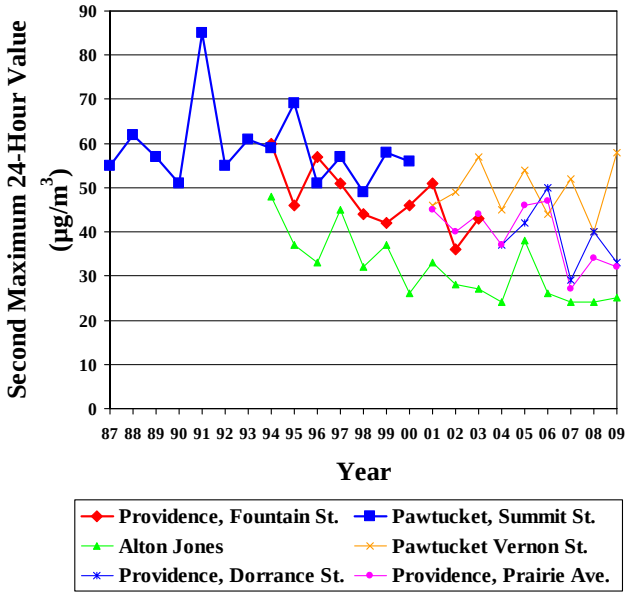
2009														
Rhode Island														
Ozone (8-hour)														
All Values are in Units of Parts Per Million (ppm)														
	P							Valid	Num		2nd	3rd	4th	Days
	O					Meth	%	Days	Req	Highest	Highest	Highest	Highest	Max >
Site ID	C	PQAO	City	County	Address	Rep	Obs	Meas.	Days	8-Hr Value	8-Hr Value	8-Hr Value	8-Hr Value	0.075
44-003-0002	1	907	West Greenwich	Kent	W. ALTON JONES CAMPUS URI	47	93	171	183	0.074	0.073	0.071	0.069	0
44-007-1010	1	907	East Providence	Providence	FRANCIS SCHOOL, 64 BOURNE AVE	47	96	176	183	0.076	0.074	0.070	0.066	1
44-009-0007	1	907	Narragansett	Washington	TARZWELL ROAD	47	99	181	183	0.075	0.075	0.075	0.068	0

In 2009, the West Greenwich, Narragansett and East Providence sites reported a fourth highest 8-hour average O_3 concentration at 0.069 ppm, 0.068 ppm and 0.066 ppm, respectively. The East Providence Site recorded the highest 8-hour average concentration of 0.076 ppm during 2009. Referring to the graph above, there appears to be a decreasing trend after 2007.


Rhode Island Sites - 2009 - Particulate Matter < 10 Microns
Vernon Street, Pawtucket
111 Dorrance Street, Providence
212 Prairie Ave, Providence
W Alton Jones Campus URI, West Greenwich
PROVIDENCE
KENT
WASHINGTON
EPA
Approximate Elevation
6000
3000
0 feet
Miles
0
5
10

Rhode Island Particulate Matter < 10 Microns (PM_{10}) Data

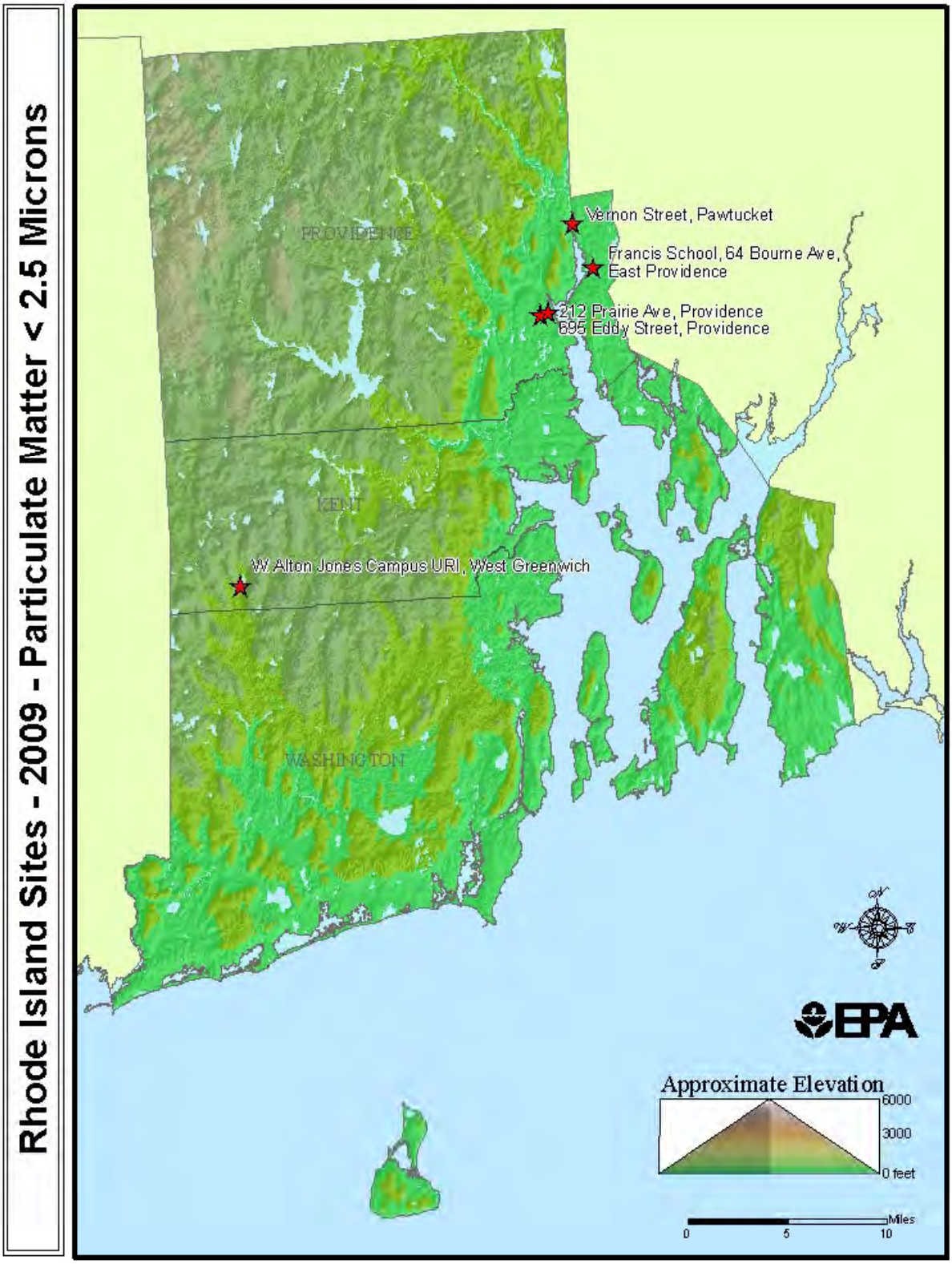




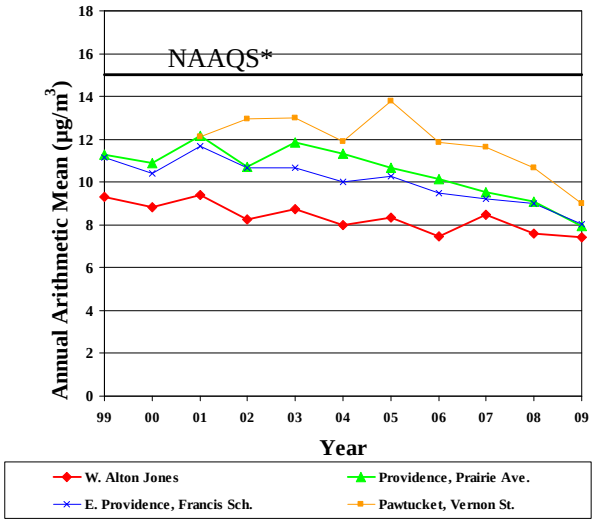
NAAQS for Particulate Matter less than 10 Microns:
24-hour 150 µg/m^3

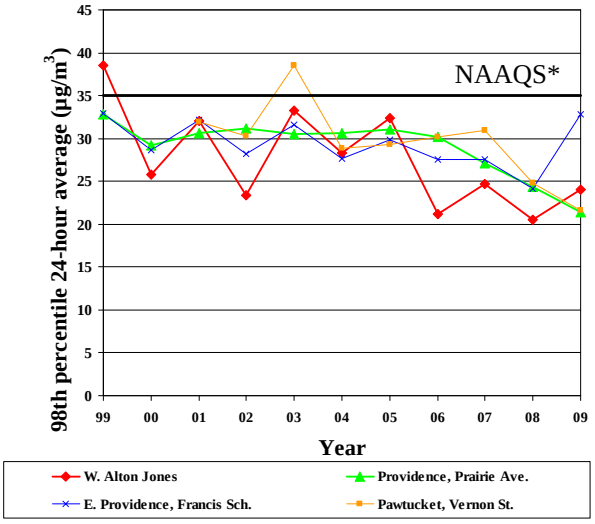
2009																			
Rhode Island																			
Particulate Matter < 10 Microns (ug/m^3)																			
All Values are in Units of µg/m^3																			
													2nd	3rd	4th	Days	Est. Days	Wtd.	
						Methods				Number	Valid	Highest	Highest	Highest	Highest	Max	Max	Arith.	
SITE ID	POC	PQAO	City	County	Address	Used	# Obs	# Req.		Days	% Obs	Value	Value	Value	Value	>150	>150	Mean	
44-003-0002	1	907	West Greenwich	Kent	W. ALTON JONES, URI	63	56	61		56	92	27	25	22	21	0	0	9.7	*
44-007-0022	1	907	Providence	Providence	212 PRAIRIE AVE.	63	57	61		57	93	32	32	30	30	0	0	15	
44-007-0022	2	907	Providence	Providence	212 PRAIRIE AVE.	63	58	61		58	95	34	31	31	30	0	0	15	
44-007-0026	1	907	Pawtucket	Providence	VERNON STREET	63	58	61		58	95	62	58	47	43	0	0	20.2	
44-007-0027	1	907	Providence	Providence	111 DORRANCE ST.	63	60	61		60	98	34	33	33	33	0	0	16.6	
*Indicates that the mean does not satisfy summary criteria																			

None of the PM_{10} sites in Rhode Island had any exceedances or violations of the 24-hour standard during 2009. Of the four PM_{10} monitoring sites, the Vernon Street Site in Pawtucket reported the highest 24-hour maximum value of 62 µg/m^3 during 2009. The other three monitoring sites reported maximum values of 27 µg/m^3, 32 µg/m^3 (co-located monitor was 34 µg/m^3) and 34 µg/m^3 in 2009. The long range graphs for PM_{10} show values varied up and down from year-to-year with a slight downward trend.


Rhode Island Sites - 2009 - Particulate Matter < 2.5 Microns
PROVIDENCE
KENT
WASHINGTON
Vernon Street, Pawtucket
Francis School, 64 Bourne Ave, East Providence
212 Prairie Ave, Providence
695 Eddy Street, Providence
W. Alton Jones Campus URI, West Greenwich
EPA
Approximate Elevation
6000
3000
0 feet
Miles
0
5
10

Rhode Island Particulate Matter < 2.5 Microns ($PM_{2.5}$) Data

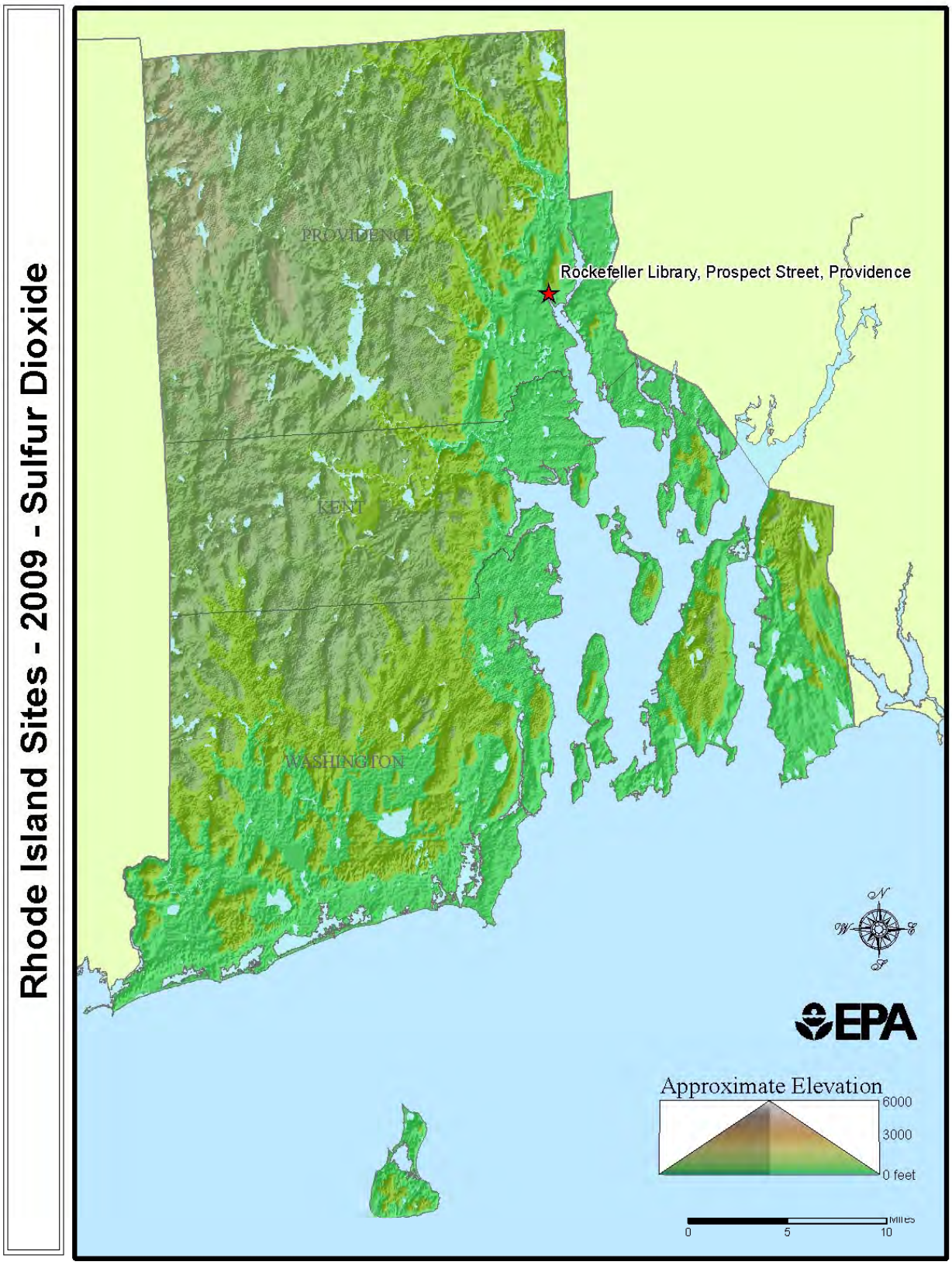




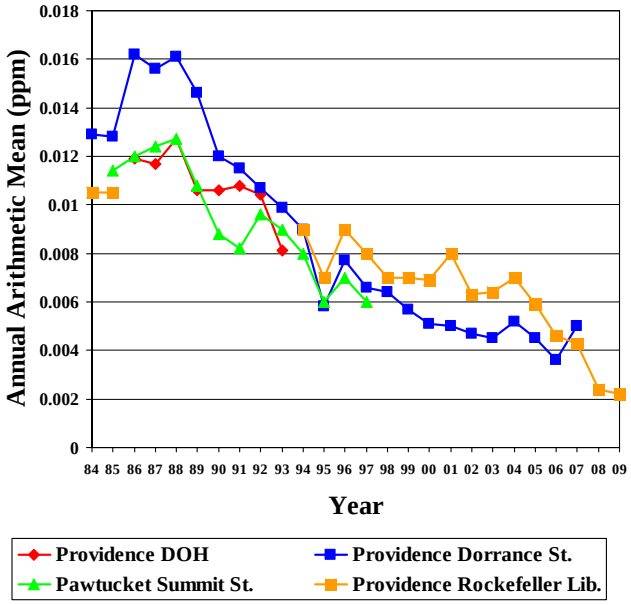
*NAAQS for Particulate Matter less than 2.5 Microns:
Annual: the 3-year average of the Annual Arithmetic Mean - 15.0 µg/m^3
24-Hour: the 3-year average of the 98th percentile of 24-hour average concentrations - 35 µg/m^3

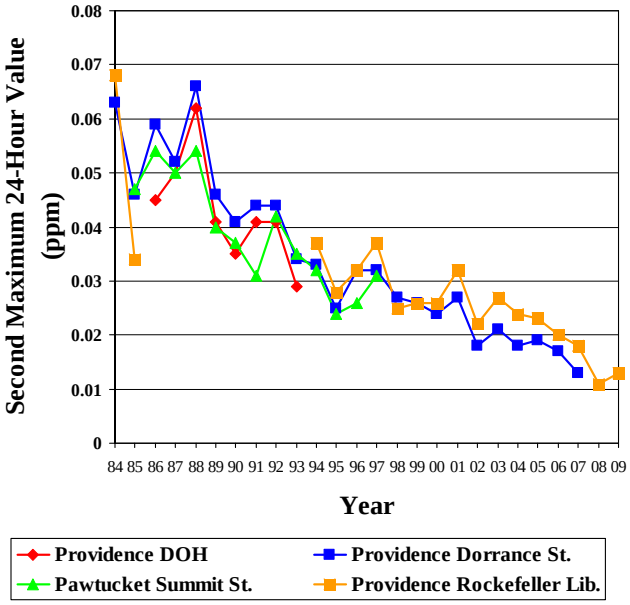
2009														
Rhode Island														
Particulate Matter < 2.5 Microns (ug/m3)														
All Values are in µg/m^3 Local Conditions														
	P								2nd	3rd	4th	98th	Wtd.	
	O							#	Highest	Highest	Highest	Percentile	Arith.	
Site ID	C	PQAO	City	County	Address	Method	Obs	Value	Value	Value	Value	Value	Mean	
44-003-0002	2	907	W. Greenwich	Kent	W. ALTON JONES CAMPUS URI	142	29	24.0	17.5	14.6	12.6	24.0	7.42	*
44-003-0002	3	907	W. Greenwich	Kent	W. ALTON JONES CAMPUS URI	170	7033	26.5	24.8	21.6	20.7	17.5	6.20	*
44-007-0022	1	907	Providence	Providence	212 PRAIRIE AVE.	0	330	31.7	28.9	28.7	25.3	21.4	7.93	
44-007-0022	2	907	Providence	Providence	212 PRAIRIE AVE.	145	69	25.2	24.7	22.6	21.2	24.7	8.71	*
44-007-0026	1	907	Pawtucket	Providence	VERNON STREET	120	112	26.4	21.7	21.6	20.4	21.6	8.98	
44-007-0026	2	907	Pawtucket	Providence	VERNON STREET	120	14	20.5	15.3	14.9	11.7	20.5	8.36	*
44-007-0028	1	907	Providence	Providence	695 EDDY STREET	0	98	21.1	20.8	20.2	19.5	20.8	8.11	*
44-007-1010	1	907	E.Providence	Providence	FRANCIS SCH., 64 BOURNE AVE.	120	346	30.5	26.3	26.1	24.9	23.8	8.05	
*Indicates that the mean does not meet summary criteria														

In 2009, Rhode Island operated a network of five $PM_{2.5}$ sites, with 2 collocated monitors. The West Greenwich site also operated a continuous monitor (POC 3) designated for compliance purposes. During 2009, the annual arithmetic mean concentrations of $PM_{2.5}$ were higher at the urban area sites (i.e. Francis School, Prairie Ave., Vernon St., and Eddy St.) compared to the rural site in West Greenwich. The eleven year annual average concentration trends for the Alton Jones, Francis School, Prairie Ave., and Vernon Street sites have remained relatively flat with a general downward trend, except for a slight increase at the Vernon Street site during 2005. The 2006, 2007, 2008 and 2009 concentrations at the Vernon Street site went back to similar or slightly lower levels as seen in 2004.


Rhode Island Sites - 2009 - Sulfur Dioxide
PROVIDENCE
KENT
WASHINGTON
Rockefeller Library, Prospect Street, Providence
N
W
E
S
EPA
Approximate Elevation
6000
3000
0 feet
0
5
10
Miles

Rhode Island Sulfur Dioxide Data





NAAQS for Sulfur Dioxide:

Primary: Annual Arithmetic Mean - 0.03 ppm
24-hour 0.14 ppm
1-hour 75 ppb (0.075 ppm) (Signed June 2, 2010) 99th percentile

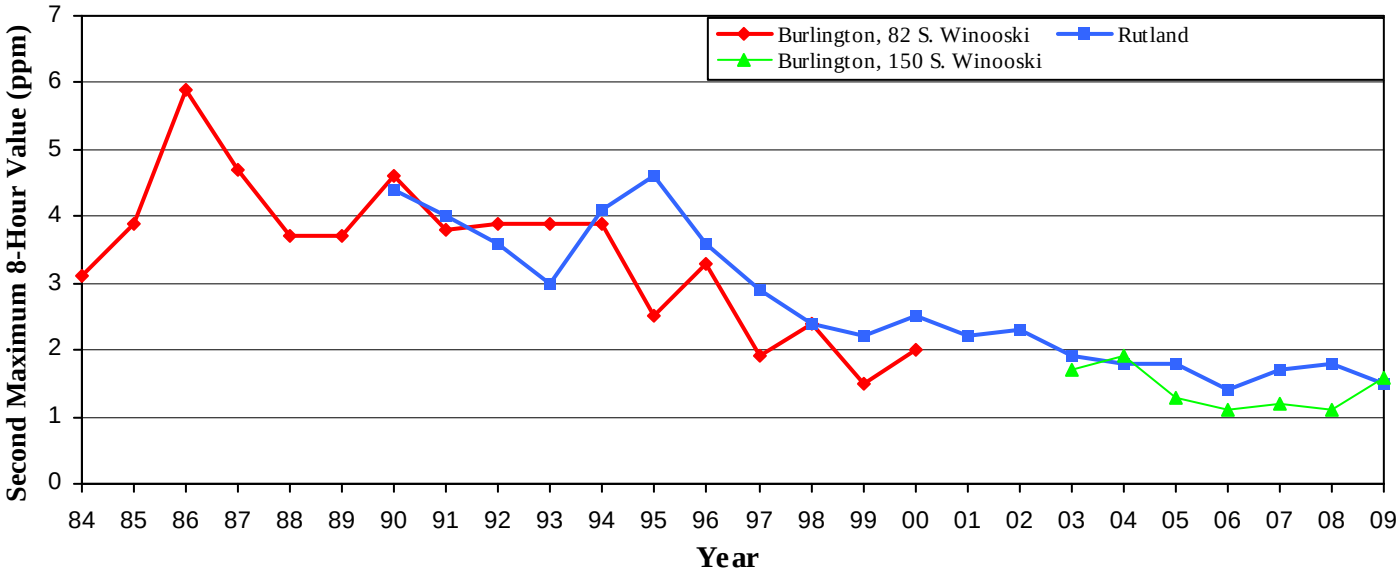
Secondary: 3-hour 0.5 ppm

2009																	
Rhode Island																	
Sulfur Dioxide																	
All Values are in Units of Parts Per Million (ppm)																	
									24-	24-		3-hour	3-hour		1-hour	1-hour	
	P								hour	hour			2nd			2nd	
	O						Method	#		2nd	Obs	Highest	Highest	Obs	Highest	Highest	Arith.
Site ID	C	PQAO	City	County	Address		Used	Obs	Highest	Highest	> 0.14	Value	Value	> 0.5	Value	Value	Mean
44-007-0012	1	907	Providence	Providence	ROCKEFELLER LIBRARY, PROSPECT		60	7963	0.013	0.013	0	0.029	0.026	0	0.033	0.032	0.0022

Only one SO_2 monitoring site operated throughout 2009 in Rhode Island. There were no exceedances or violations of the annual, 24-hour, or 3-hour NAAQS. The Rockefeller Library Site in Providence reported an arithmetic mean concentration of SO_2 at 0.002 ppm, which is 7% of the NAAQS. The 24-hour second maximum concentration of 0.0131 ppm and the 3-hour second maximum concentration of 0.026 ppm were also recorded at the Rockefeller Library site. The long range trend for SO_2 concentrations in Rhode Island continually shows a downward trend.

Vermont Sites 2009 - Carbon Monoxide

Vermont Carbon Monoxide Data



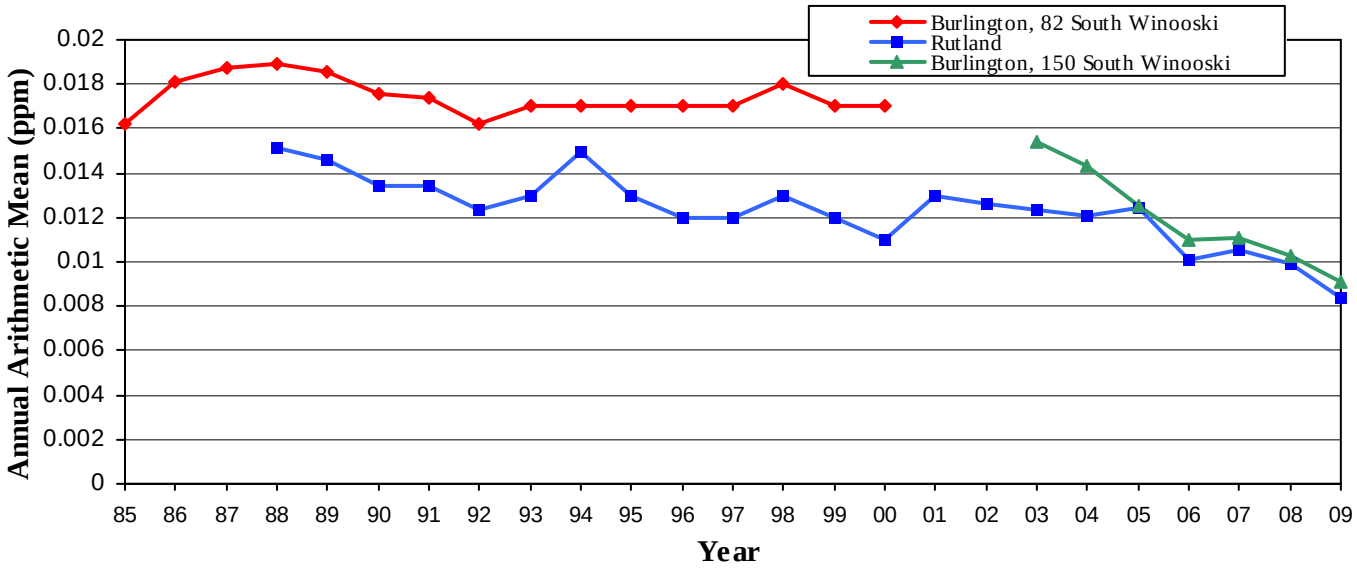
NAAQS for Carbon Monoxide:
8-hour – 9 ppm, not to be exceeded more than one per year
1-hour – 35 ppm, not to be exceeded more than once per year

2009													
Vermont													
Carbon Monoxide													
All Values are in Units of Parts Per Million (ppm)													
								1-hour	1-hour		8-hour	8-hour	
	P								2nd			2nd	
	O						Methods	#	Highest	Highest		Highest	Highest	
Site ID	C	PQAO	City	County	Address	Used	Obs	Value	Value	OBS > 35	Value	Value	OBS > 9
50-007-0014	1	1119	Burlington	Chittenden	150 SOUTH WINOOSKI AVE.	54	8254	2.8	2.2	0	1.8	1.6	0
50-021-0002	1	1119	Rutland	Rutland	96 STATE STREET	54	8259	3.3	3.1	0	1.5	1.5	0

The State of Vermont operated two CO ambient monitoring sites during 2009, one in Rutland and one in Burlington. No exceedance or violation of the 1-hour or 8-hour CO NAAQS was recorded at either of the two monitoring sites during 2009. The second highest 8-hour concentrations of 1.6 ppm of CO was recorded at the Burlington site. A general decline is shown in the 26 year trend of CO concentrations in Vermont.

Vermont Sites 2009 - Nitrogen Dioxide

Vermont Nitrogen Dioxide Data



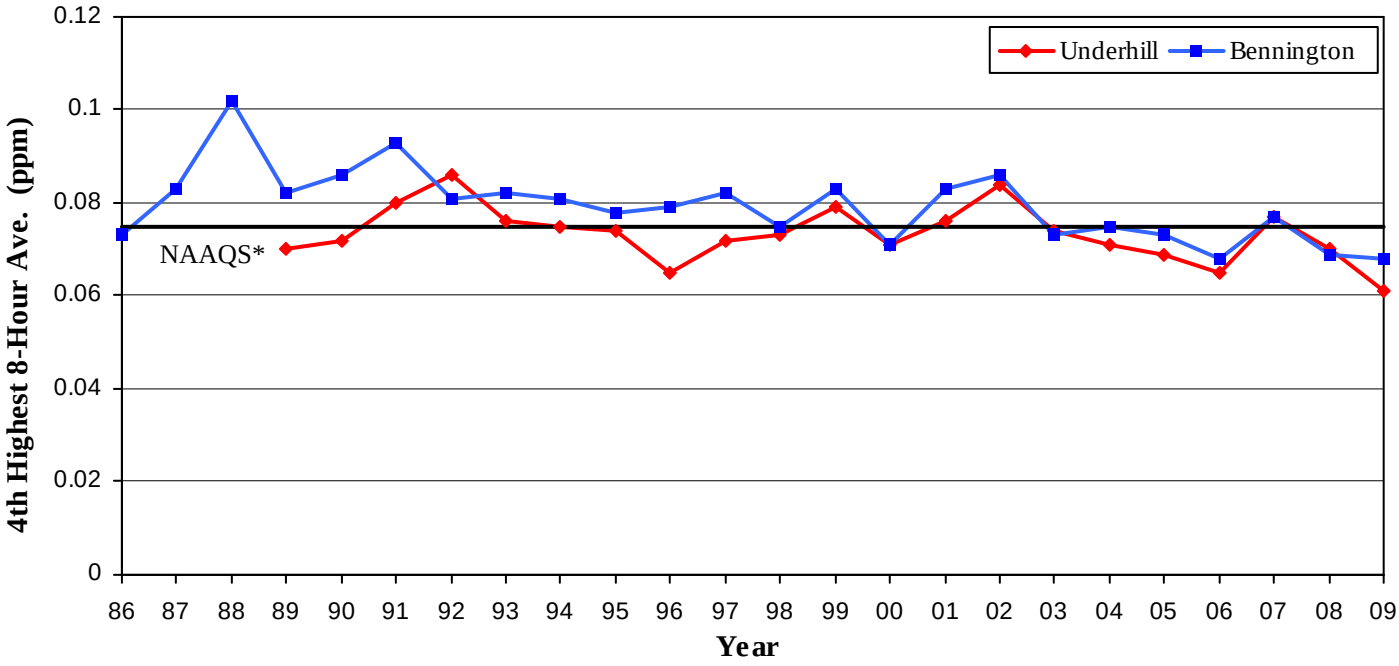
NAAQS for Nitrogen Dioxide:
Annual Arithmetic Mean 0.053 ppm (100 µg/m^3)
1-hour – 100 ppb (or 0.100 ppm) (as of January 22, 2010) 98th percentile

2009										
Vermont										
Nitrogen Dioxide										
All Values are in Units of Parts Per Million (ppm)										
								1-hour	1-hour	
	P								2nd	Annual
	O							#	Highest	Highest	Arith.
Site ID	C	PQAO	City	County	Address	Method	Obs	Value	Value	Mean
50-007-0014	1	1119	Burlington	Chittenden	150 SOUTH WINOOSKI AVE.	74	7402	0.049	0.047	0.0091
50-021-0002	1	1119	Rutland	Rutland	96 STATE STREET	74	8244	0.052	0.051	0.0084

Two NO_2 monitoring sites (Rutland and Burlington) were operated by the state during 2009. The past 25 years of NO_2 data indicate that the concentrations of NO_2 have remained relatively steady with a slight decrease in the past few years. These concentrations are very low in comparison with the NAAQS. During 2009, the highest annual arithmetic mean concentration of NO_2 in Vermont was measured at the Burlington site. This value was 0.0091 ppm, which is approximately 17% of the NAAQS.


Vermont Sites 2009 - Ozone
FRANKLIN
ORLEANS
ESSEX
LAMOILLE
58 Harvey Road, Underhill
CHITTENDEN
CALEDONIA
WASHINGTON
ADDISON
ORANGE
RUTLAND
WINDSOR
BENNINGTON
WINDHAM
Airport Rd, Bennington
EPA
Approximate Elevation
6000
3000
0 feet
Miles
0
5
10
20
30

Vermont 8-Hour Ozone Data



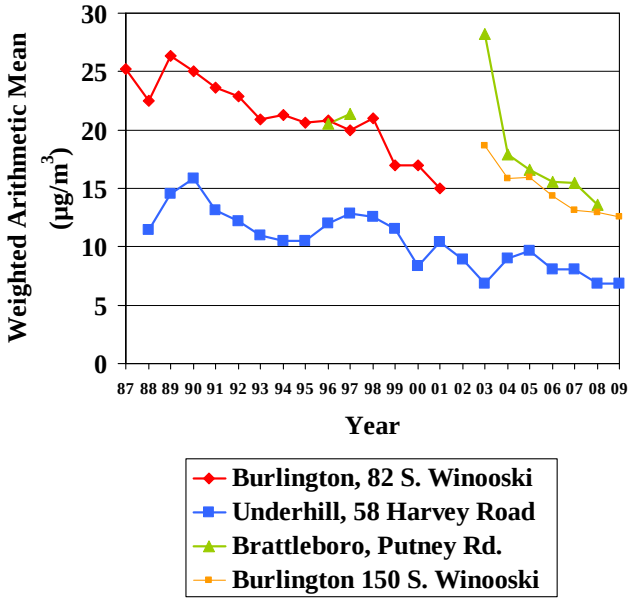
*NAAQS for Ozone:
8-hour – 0.075 ppm (2008 std)
(To attain this 0.075 ppm standard, the 3-year average of the fourth-highest daily maximum 8-hour average ozone concentrations measured at each monitor within an area over each year must not exceed 0.075 ppm. This graph represents the 4th highest value for each year for each monitor depicted. Thus, being above or below this NAAQS line does not indicate whether or not a monitor exceeds the NAAQS.)

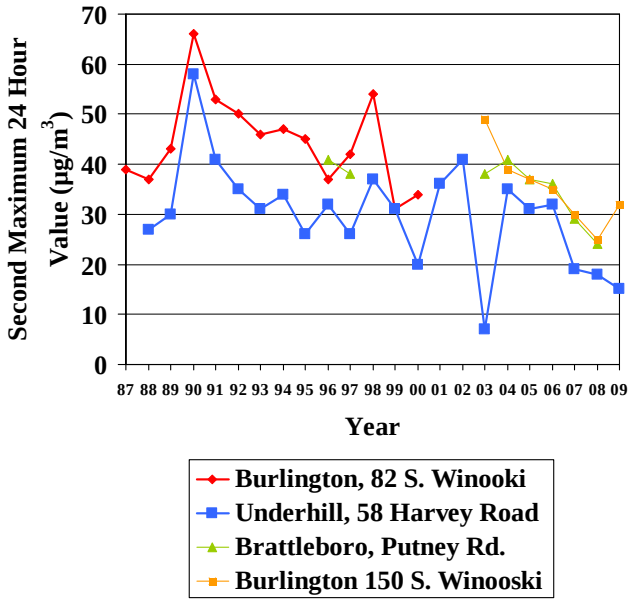
2009															
Vermont															
Ozone (8-Hour)															
All Values are in Units of Parts Per Million (ppm)															
	P								Valid	Num		2nd	3rd	4th	Days
	O						Methods	%	Days	Req	Highest	Highest	Highest	Highest	Max >
Site ID	C	PQAO	City	County	Address		Reported	Obs	Meas.	Days	8-Hr Value	8-Hr Value	8-Hr Value	8-Hr Value	0.075
50-003-0004	1	1119	Bennington	Bennington	AIRPORT RD		87	95	173	183	0.075	0.074	0.072	0.068	0
50-007-0007	1	1119	Underhill	Chittenden	58 HARVEY ROAD		87	97	178	183	0.068	0.063	0.063	0.061	0

Neither of the two ozone monitoring sites in Vermont (Underhill and Bennington) recorded a fourth highest 8-hr average ozone concentration above the level of the 8-hr ozone NAAQS in 2009. The highest 8-hour average ozone concentration in Vermont during 2009 was recorded at the Bennington site and was 0.075 ppm.


Vermont Sites 2009 - Particulate Matter < 10 Microns
FRANKLIN
ORLEANS
ESSEX
LAMOILLE
58 Harvey Rd. Underhill
150 South Winooski Avenue, Burlington
CALEDONIA
CHITTENDEN
WASHINGTON
ADDISON
ORANGE
96 State Street, Rutland
RUTLAND
WINDSOR
BENNINGTON
WINDHAM
EPA
Approximate Elevation
6000
3000
0 feet
Miles
0 5 10 20 30

Vermont Particulate Matter < 10 Microns (PM_{10}) Data





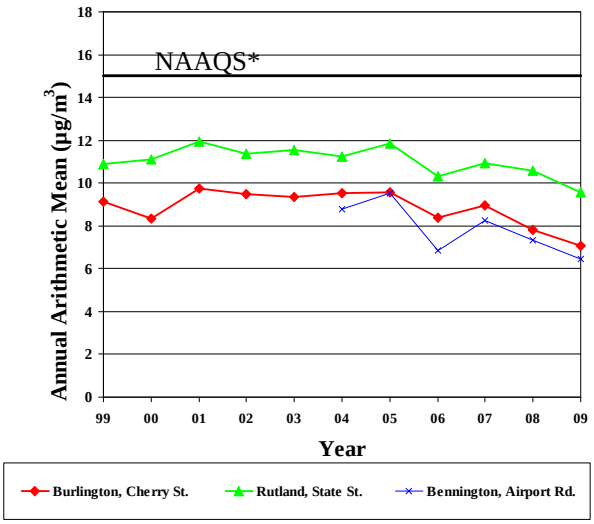
NAAQS for Particulate Matter less than 10 Microns:
24-hour 150 µg/m^3

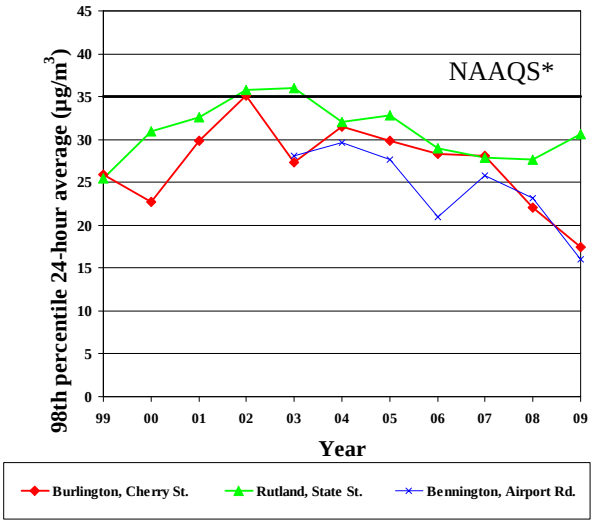
2009																		
Vermont																		
Particulate Matter < 10 Microns																		
All Values are in Units of µg/m^3																		
												2nd	3rd	4th	Days	Est. Days	Wtd.
							Method			Number	Valid	Highest	Highest	Highest	Highest	Max	Max	Arith.
SITE ID	POC	PQAO	City	County	Address		Used	# Obs	# Req.	Days	% Obs	Value	Value	Value	Value	>150	>150	Mean
50-007-0007	1	1119	Underhill	Chittenden	58 HARVEY ROAD		62	60	61	60	98	33	15	15	13	0	0	6.8
50-007-0014	1	1119	Burlington	Chittenden	150 SOUTH WINOOSKI		62	58	61	58	95	34	32	26	26	0	0	12.6
50-007-0014	2	1119	Burlington	Chittenden	150 SOUTH WINOOSKI		62	60	61	60	98	33	28	23	20	0	0	11.4
50-021-0002	1	1119	Rutland	Rutland	96 STATE STREET		62	60	61	60	98	35	32	31	26	0	0	12.7

During 2009, Vermont maintained three ambient monitoring sites measuring PM_{10}, with one collocated monitor. The sites include Underhill, Burlington, and Rutland. Data for 2009 continued the 14 year trend of low PM_{10} concentrations recorded by the Vermont monitoring sites. The second highest 24-hour PM_{10} concentration in the state was recorded at the Burlington and Rutland ambient monitoring sites and measured 32 µg/m^3. This concentration was well below the NAAQS for PM_{10}.


Vermont Sites 2009 - Particulate Matter < 2.5 Microns
FRANKLIN
ORLEANS
ESSEX
LAMOILLE
58 Harvey Road, Underhill
108 Cherry Street, Burlington
CALEDONIA
CHITTENDEN
WASHINGTON
ADDISON
ORANGE
96 State Street, Rutland
RUTLAND
WINDSOR
BENNINGTON
WINDHAM
Airport Rd, Bennington
EPA
Approximate Elevation
6000
3000
0 feet
Miles
0
5
10
20
30

Vermont Particulate Matter < 2.5 Microns ($PM_{2.5}$) Data





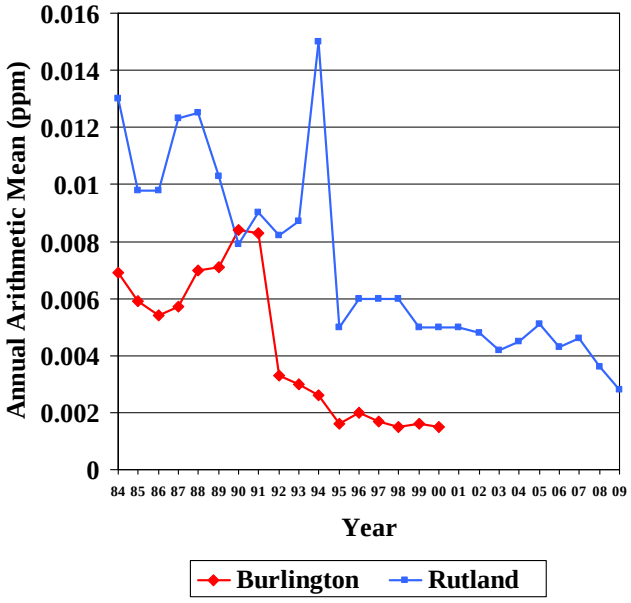
*NAAQS for Particulate Matter less than 2.5 Microns:
Annual: the 3-year average of the Annual Arithmetic Mean - 15.0 µg/m^3
24-Hour: the 3-year average of the 98th percentile of 24-hour average concentrations - 35 µg/m^3

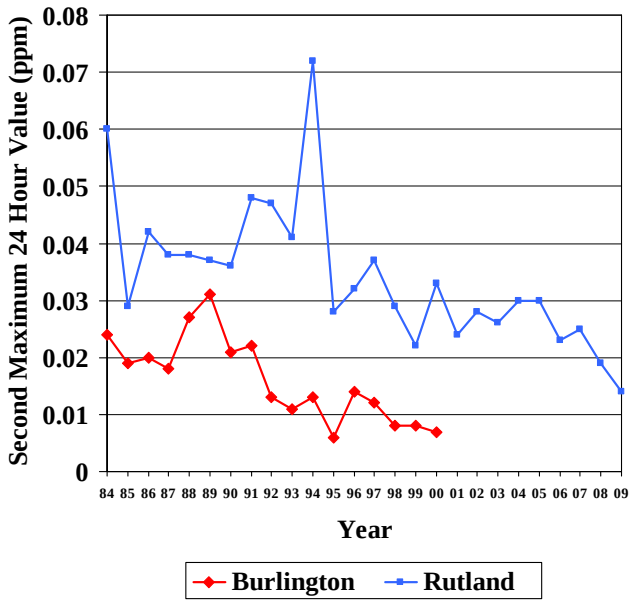
2009													
Vermont													
Particulate Matter < 2.5 Microns													
All Values are in µg/m^3 Local Conditions													
	P								2nd	3rd	4th	98th	Wtd.
	O							#	Highest	Highest	Highest	Highest	Percentile	Arith.
Site ID	C	PQAO	City	County	Address	Method	Obs	Value	Value	Value	Value	Value	Mean
50-003-0004	1	1119	Bennington	Bennington	AIRPORT RD,	145	120	22.2	21.2	16.0	15.0	16.0	6.45
50-007-0007	1	1119	Underhill	Chittenden	58 HARVEY ROAD	145	120	27.8	15.8	12.9	12.7	12.9	5.00
50-007-0012	1	1119	Burlington	Chittenden	108 CHERRY STREET	145	120	29.8	17.6	17.4	14.9	17.4	7.07
50-007-0012	2	1119	Burlington	Chittenden	108 CHERRY STREET	145	121	29.4	17.3	17.2	14.9	17.2	6.82
50-021-0002	1	1119	Rutland	Rutland	96 STATE STREET	145	120	34.3	31.0	30.6	27.5	30.6	9.57

Vermont operated a network of four $PM_{2.5}$ ambient monitoring sites in 2009, with one collocated monitor. The sites include Bennington, Underhill, Burlington and Rutland. $PM_{2.5}$ concentrations in Vermont have historically been below the NAAQS. The Rutland site recorded the highest annual weighted arithmetic mean which was 9.57 µg/m^3.

Vermont Sites 2009 - Sulfur Dioxide

Vermont Sulfur Dioxide Data





NAAQS for Sulfur Dioxide:

Primary: Annual Arithmetic Mean - 0.03 ppm
24-hour 0.14 ppm
1-hour 75 ppb (Signed June 2, 2010) 99th percentile

Secondary: 3-hour 0.5 ppm

2009																	
Vermont																	
Sulfur Dioxide																	
All Values are in Units of Parts Per Million (ppm)																	
									24-	24-		3-hour	3-hour		1-hour	1-hour	
	P								hour	hour			2nd			2nd	
	O						Method	#		2nd	Obs	Highest	Highest	Obs	Highest	Highest	Arith.
Site ID	C	PQAO	City	County	Address		Used	Obs	Highest	Highest	> 0.14	Value	Value	> 0.5	Value	Value	Mean
50-021-0002	1	1119	Rutland	Rutland	96 STATE STREET		60	8256	0.021	0.014	0	0.033	0.033	0	0.039	0.034	0.0028

The state operated one SO_2 ambient monitoring site during 2009, located in Rutland. The second highest 3-hour SO_2 concentration at the site was 0.033 ppm. The highest 24-hour average SO_2 concentration was 0.021 ppm and the annual arithmetic mean was 0.0028 ppm. With the exception of 1994, the historical data indicate a general decline in the concentration of SO_2 in the state of Vermont, and is well below the NAAQS.

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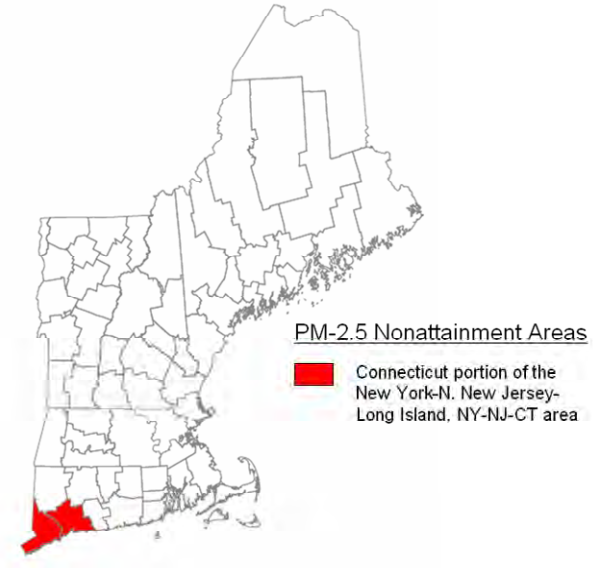
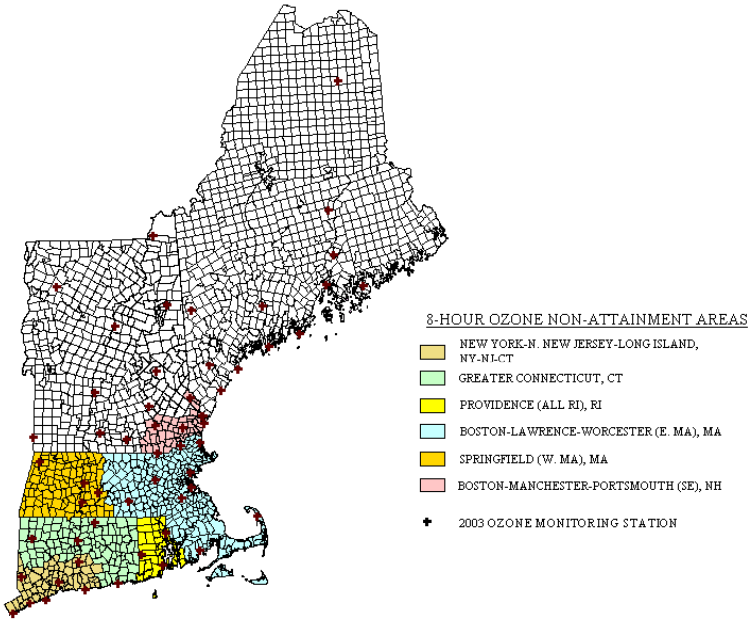
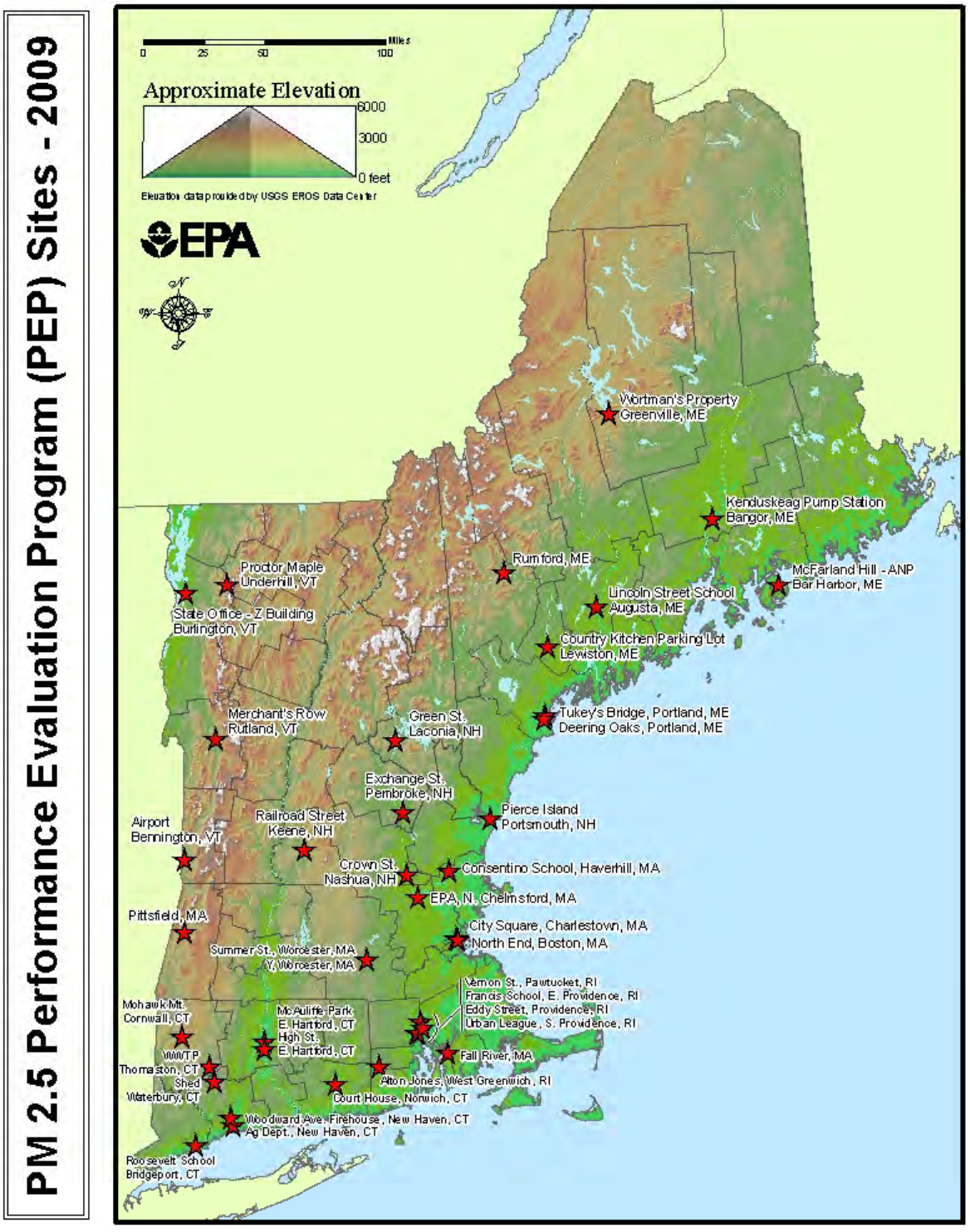
Non-Attainment Areas

Non-Attainment Areas for the 1997 $PM_{2.5}$ Annual and 2006 $PM_{2.5}$ 24- hour Standard

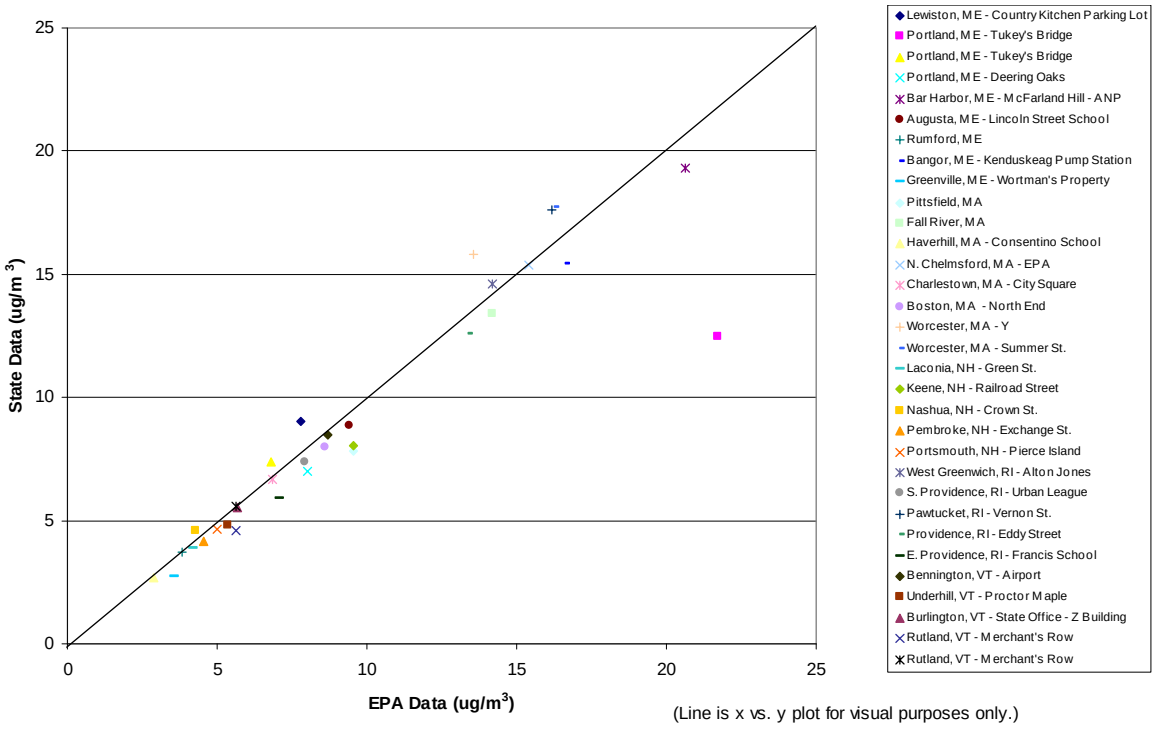


Non-Attainment Areas for the 1997 8-Hour Ozone Standard




PM 2.5 Performance Evaluation Program (PEP) Sites - 2009
Miles
0 25 50 100
Approximate Elevation
6000
3000
0 feet
Elevation data provided by USGS EROS Data Center
EPA
Wortman's Property
Greenville, ME
Kenduskeag Pump Station
Bangor, ME
Rumford, ME
McFarland Hill - ANP
Bar Harbor, ME
Lincoln Street School
Augusta, ME
Country Kitchen Parking Lot
Lewiston, ME
Proctor Maple
Underhill, VT
State Office - Z Building
Burlington, VT
Merchant's Row
Rutland, VT
Green St.
Laconia, NH
Tukey's Bridge, Portland, ME
Deering Oaks, Portland, ME
Exchange St.
Pembroke, NH
Pierce Island
Portsmouth, NH
Airport
Bennington, VT
Railroad Street
Keene, NH
Crown St.
Nashua, NH
Consentino School, Haverhill, MA
EPA, N. Chelmsford, MA
Pittsfield, MA
City Square, Charlestown, MA
North End, Boston, MA
Summer St., Worcester, MA
Y, Worcester, MA
Vernon St., Pawtucket, RI
Francis School, E. Providence, RI
Eddy Street, Providence, RI
Urban League, S. Providence, RI
Mohawk Mt.
Cornwall, CT
McAuliffe Park
E. Hartford, CT
High St.
E. Hartford, CT
WWTP
Thomaston, CT
Shed
Waterbury, CT
Fall River, MA
Alton Jones, West Greenwich, RI
Court House, Norwich, CT
Woodward Ave. Firehouse, New Haven, CT
Ag Dept., New Haven, CT
Roosevelt School
Bridgeport, CT

2009 $PM_{2.5}$ Performance Evaluation Program (PEP) Audits



(Line is x vs. y plot for visual purposes only.)

The $PM_{2.5}$ Performance Evaluation Program (PEP) is part of a National Quality Assurance Program for $PM_{2.5}$. Its purpose is to determine total bias for the $PM_{2.5}$ sample collection and laboratory analysis processes. EPA contractors collocate portable federally referenced $PM_{2.5}$ samplers adjacent to states' routine $PM_{2.5}$ samplers. The instruments run for a 24-hour period at the states' monitoring sites. Once the run is completed in Region 1, the $PM_{2.5}$ PEP filters are sent to an independent EPA East Coast Weighing Laboratory in Region IV where $PM_{2.5}$ concentrations are determined and later compared in order to assess bias. Statistical analyses are conducted between EPA's data and the States' data in order to decide if bias exists, and to address any findings.

In September 2006, the PEP program was modified as follows:

Primary Quality Assurance Organizations (PQAOs) with five or less $PM_{2.5}$ monitoring sites are required to have five valid audits per year distributed across four quarters; PQAOs with more than five $PM_{2.5}$ monitoring sites are required to have eight valid audits per year distributed across four quarters.

100% completeness is required (meaning doing as many audits as necessary in order to obtain either five or eight valid samples).

All samplers are subject to an audit within six years.

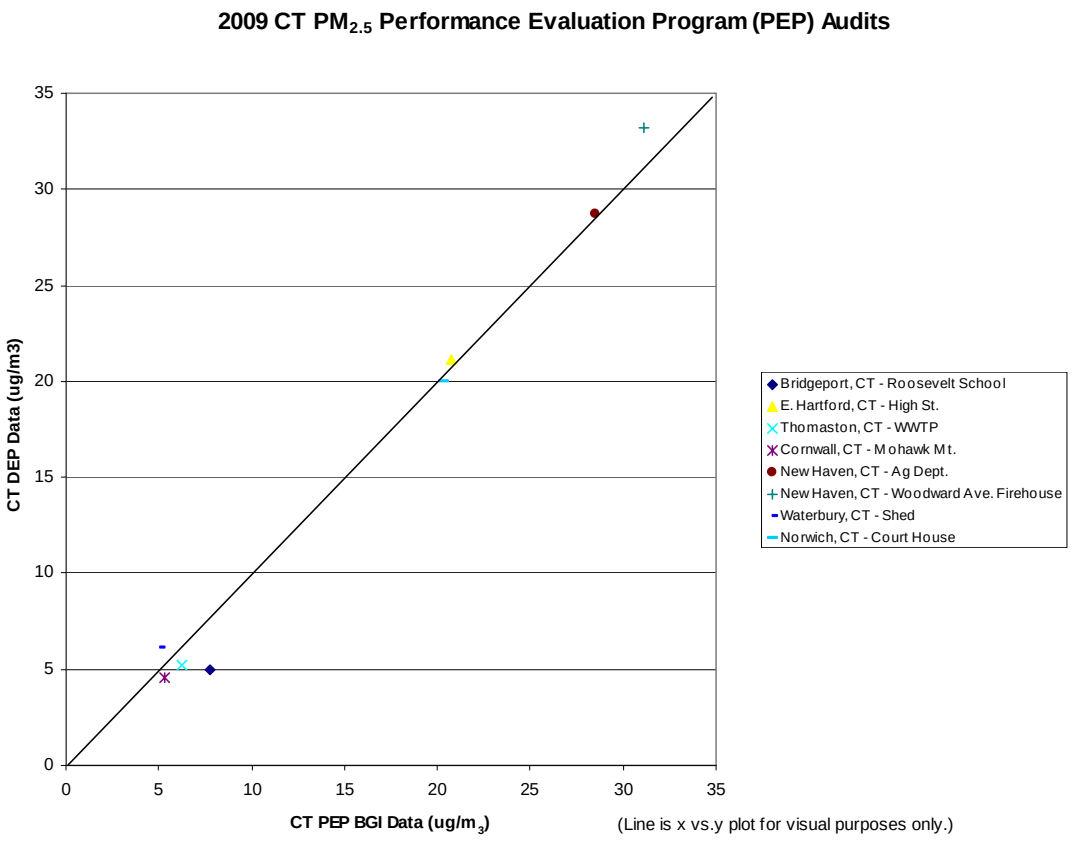
If a $PM_{2.5}$ PEP audit is not successfully completed (either because of problems with the states' or contractor's equipment, or other obstacles), make up audits are performed as soon as possible – usually within the same quarter. This allows for better data completeness.

In 2008, CT DEP began implementing their own $PM_{2.5}$ PEP program. In order to do this, they had to demonstrate adequacy and independence as well as follow EPA's National $PM_{2.5}$ PEP guidance.

This year, CT DEP participated with the EPA contractors in one Regional semi-annual "parking lot collocation studies." All of the portable $PM_{2.5}$ samplers that were used in Region I to conduct the $PM_{2.5}$ PEP audits were collocated for three 24-hour sampling periods at EPA's North Chelmsford, MA facility. CT DEP conducted their other semi-annual "parking lot collocation study" at their facility in Windsor, CT. The EPA contractors conducted a separate semi-annual "parking lot collocation study" at the EPA North Chelmsford, MA facility.

The 2009 $PM_{2.5}$ PEP graph shows that in general, all five states performed very well this year. There is a separate graph depicting CT DEP's 2009 $PM_{2.5}$ PEP audits. Overall, their performance was very good as well.

Additional information about the $PM_{2.5}$ PEP program can be found on the Ambient Monitoring Technical Information Center's web site: http://www.epa.gov/ttn/amtic/



See previous page for discussion of Connecticut's $PM_{2.5}$ PEP

Through The Probe Audits

	AQS#	Location	Parameters Audited	2009
CT	09-001-9003	Westport	O_3, SO_2, NO_2	9/10/2009
CT	09-003-1003	East Hartford	O_3, SO_2, NO_2	7/8/2009
CT	09-009-0027	New Haven	O_3, SO_2, NO_2	9/9/2009
ME	23-005-0029	Portland, State St	O_3, NO_2	9/17/2009
ME	23-005-2003	Cape Elizabeth	O_3	6/15/2009
ME	23-011-2005	Gardiner	O_3	7/29/2009
ME	23-017-3001	Lovell	O_3	6/17/2009
ME	23-019-1100	Indian Island (Tribal)	O_3	9/24/2009
ME	23-019-4008	Holden	O_3	9/22/2009
ME	23-029-0032	Perry (Tribal)	O_3	9/23/2009
ME	23-031-0038	Hollis	O_3	6/16/2009
ME	23-031-0040	Shapleigh	O_3	6/15/2009
ME	23-031-2002	Kennebunk	O_3	6/16/2009
MA	25-013-0016	Springfield, Liberty St.	NO_2, SO_2, CO	7/1/2009
MA	25-017-0009	N.Chelmsford	O_3	3/30/2009
MA	25-027-0015	Worcester Airport	O_3	4/28/2009
MA	25-027-0024	Uxbridge	O_3	4/29/2009
NH	33-011-0020	Manchester	O_3, NO_2, SO_2, CO	8/5/2009
RI	44-003-0002	Alton Jones	O_3, NO_2	7/14/2009
RI	44-007-1010	East Providence	0_3, NO_2, CO	8/19/2009
RI	44-009-0007	Narragansett	O_3	7/15/2009
VT	50-007-0007	Underhill	O_3	10/8/2009
VT	50-021-0002	Rutland	NO_2, SO_2, CO	10/27/2009

All sites passed their audits in 2009.

2009 NPAP Through The Probe Audit Program (TTP)

The Through The Probe Audit Program is part of the National Performance Audit Program (NPAP). The purpose of this program is to challenge Ambient Air Monitoring Station gaseous analyzers with gaseous pollutants traceable to known concentrations from the National Institute of Science and Technology (NIST). The PEP program described earlier serves a similar purpose for particulate based pollution.

For decades, EPA Region 1 has conducted these audits one instrument at a time by introducing the NIST traceable gas directly into at the back of each gaseous analyzer. In 2009, Region 1 adopted the new national TTP program where these audit gases are introduced into the sample inlet manifold at the roof line where the sample air is drawn into the instrument. This new procedure challenges the entire sample train including the analyzer and provides simultaneous site instrument comparisons. It is intended to confirm that the monitoring equipment in the field measures concentrations accurately through the entire monitoring system- from the inlet of the manifold, through the probe, and into the back of the instrument/ analyzer. In the course of the audit, several different known concentrations of gas are fed "through the probe" and the monitor's recorded concentrations are recorded and compared to the NIST traceable known concentration.

The goal of this program is to audit 20 percent of each Primary Quality Assurance Organization's (PQAO) gaseous monitoring network each year and report the results to EPA Headquarters. (PQAOs are state based in New England.) Region 1 has modified the TTP schedule to focus on States where Regional Technical System Audits are being conducted. Where each PQAO is audited every three years, two of New England's six states will have a more aggressive TTP audit schedule.

By 2011, Region 1 plans to add NPAP/TTP audits at much lower concentrations, also known as trace level monitoring sites. This will require additional equipment and expertise.

The above chart shows sites that were audited in 2009.

Regional Atmospheric Deposition of Sulfates and Nitrates

Atmospheric deposition has both wet and dry components. The dry components are particles and gases that fall upon or adhere to vegetation, water bodies, and man-made structures. Wet components include rain, hail, fog and cloud water, ice, and snow. Types of harmful atmospheric deposition include acidic precipitation (acid rain), nutrients, toxic trace elements (such as mercury) and toxic organic compounds. Acid rain is probably the most commonly known and best understood type of atmospheric deposition in New England. This section provides a brief discussion of long-term trends in regional acid rain, focusing on its most important constituents, sulfate and nitrate.

There are ten long-term acid precipitation monitoring sites in New England that began operating in the late 1970's and early 1980's. These monitoring sites are part of a North American network of 200+ sites that constitute the National Atmospheric Deposition Monitoring Program/National Trends Network (NADP/NTN), which was established in the late 1970's to monitor trends in the chemistry of wet and dry deposition throughout North America. The NADP/NTN is operated and maintained by a consortium of federal, state, tribal and provincial agencies; as well as universities and private industry.

The New England NADP/NTN sites are located on Figure 1. This map includes all of the sites in the region, and highlights the New England trend sites. Table 1 lists these sites and provides additional information on their history and location.

Figure 1

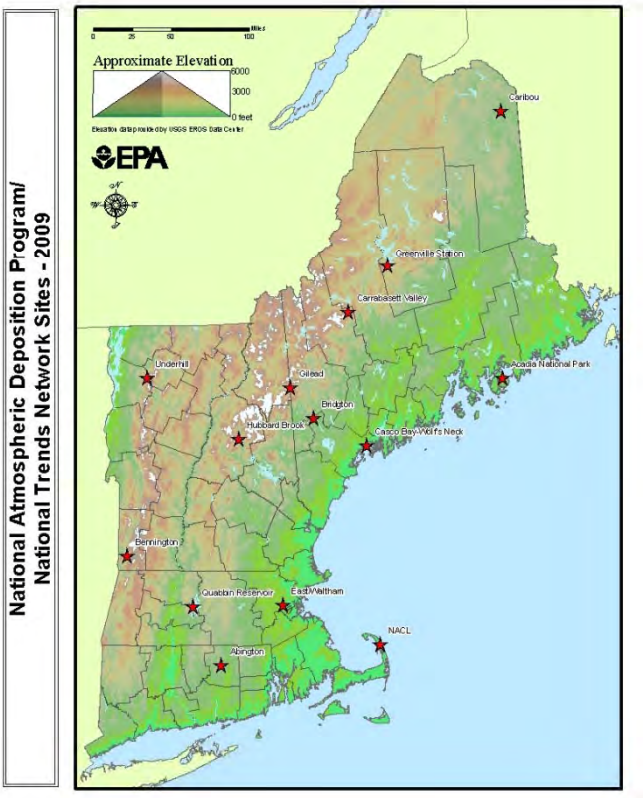


Table 1. National Atmospheric Deposition Program/National Trends Network sites located in New England. Sites in bold print constitute the New England trend sites.

Site Name	Site ID	Elevation (m)	Latitude / Longitude	Operating Agency	Start Up
Abington	CT15	209	41.84 / -72.0101	US EPA	1999
NACL/Truro	MA01	41	41.9758 / -71.0247	National Park Service	1981
East/Waltham	MA13	18	42.3839 / -71.2147	U of Massachusetts	1982
Quabbin Reservoir	MA08	306	42.3925 / -72.3444	U of Massachusetts	1982
Acadia National Park	ME98	150	44.3772 / -68.2608	National Park Service	1981
Caribou	ME00	191	46.8675 / -68.0134	Maine DEP	1980
Greenville Station	ME09	322	45.4891 / -69.6647	Maine DEP	1979
Carrabasett Valley	ME04	270	45.0803 / -70.2119	Penobscot Indian Nation	2002
Gilead	ME08	212	44.4003 / -71.0098	US Geological Survey	1999
Bridgton	ME02	222	44.1075 / -70.7289	Maine DEP	1980
Casco Bay-Wolf's Neck	ME96	15	43.8325 / -70.0645	Maine DEP	1998
Hubbard Brook	NH02	250	43.9433 / -71.7029	NRS - US Forest Service	1978
Underhill	VT99	399	44.5283 / -72.8684	U of Vermont, USGS	1984
Bennington	VT01	305	42.8761 / -73.1633	Vermont DEC	1981

Almost all forms of precipitation are efficient scavengers of atmospheric pollution. Hence, the chemistry of precipitation can reflect changes in the level of pollutants in the atmosphere and provide evidence of trends in air pollution emissions. The NADP/NTN sites in New England provide a unique view of long-term changes in the deposition and concentration of pollutants in precipitation that fall on New England landscapes.

Figures 2 and 3 provide long-term trend data on the amount of wet sulfate and nitrate deposited on New England landscapes (kilograms per hectare) (Kg/ha) along with historical national emissions inventory data for SO_2 and NOx. The annual wet deposition data are a composite average of the ten trend sites for each year since 1990. The emissions data, presented here in millions of tons (Mtons) of SO_2 and NOx, are from the EPA National Emissions Inventory Report. Internally consistent and continuous emissions data can be obtained from this report for the period 1990 – 2008.

These two figures show long-term declines (1990 through 2008) in NOx and SO_2 emissions and long-term declines in regional sulfate and nitrate deposition. Recent data, however, indicate that the long-term decline in sulfate deposition has reversed since its lowest value in 2001. Nitrate deposition appears to continue to decline.

Figure 2. Long-term trends in national sulfur dioxide emissions (Mtons) and sulfate deposition (kg/ha) on New England landscapes (1990-2008).

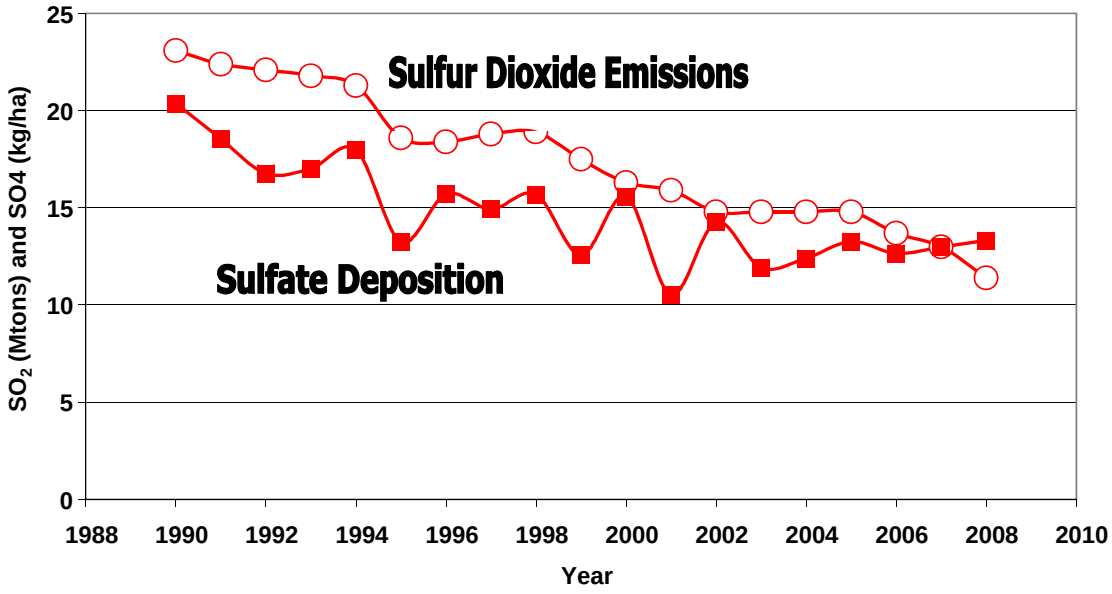
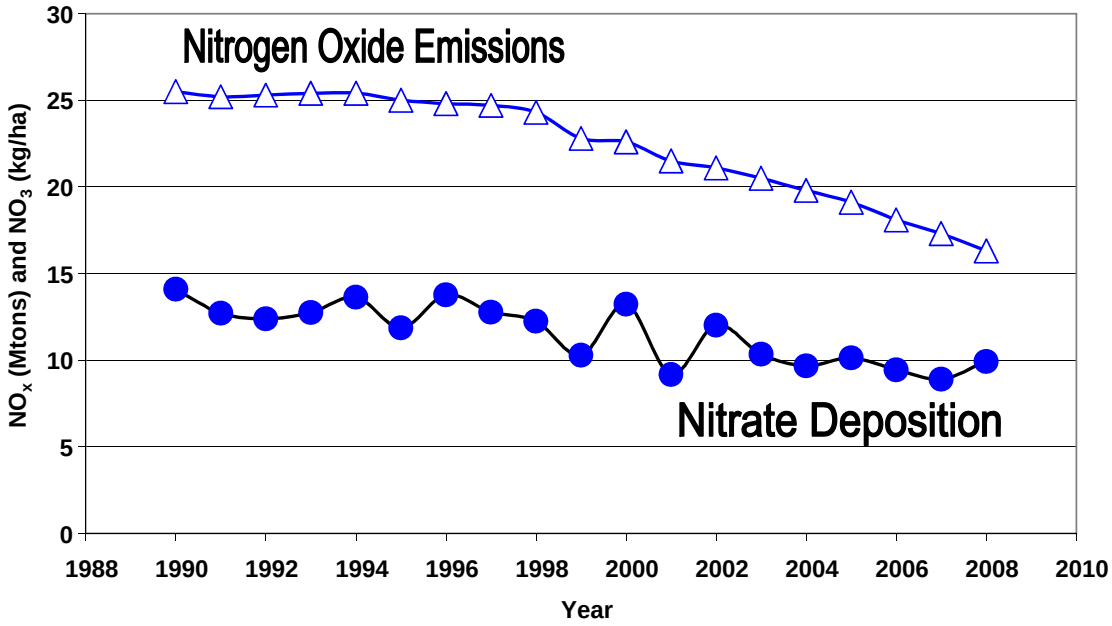


Figure 3. Long-term trends in national nitrogen oxide emissions (Mtons) and nitrate deposition (kg/ha) on New England landscapes (1990-2008).



Photochemical Assessment Monitoring Stations (PAMS)

The enhanced ozone precursor monitoring program, known as the PAMS program, is one of the most ambitious air monitoring programs ever attempted by the EPA and the states. Its overall purpose is to provide long-term data (10+ years) to monitor the changes in atmospheric concentrations of ozone and its precursors VOCs and NOx that continue to be rigorously controlled. The data that are produced by the PAMS program can be used to enhance ozone modeling capabilities, fine tune and reconcile state emissions inventories and provide measurements of toxic organic compounds that have been identified as Hazardous Air Pollutants (HAPs) in the 1990 Clean Air Act Amendments.

The PAMS monitoring network has been required in non-attainment areas that have been designated as serious, severe, and extreme ozone non-attainment areas. At the onset of the program all New England states, except Vermont, began monitoring as part of the PAMS network. In the northeast, the non-attainment areas lay adjacent to each other, along the eastern seaboard. The abutting nature of these non-attainment areas and the common ozone and ozone precursor transport mechanisms (which cross non-attainment areas) provided an opportunity to optimize the PAMS network along the eastern seaboard. The New England part of this ozone transport corridor is the northeasternmost part of a necklace of PAMS sites that begins in Virginia and extends into downeast Maine. Deployment of the PAMS sites began in 1993.

In general, there are four different types of PAMS sites (Type 1 through 4). Each serves a different purpose within the PAMS network. Type 1 sites measure ozone and ozone precursors entering into an urban core (up-wind sites). These sites may be considered background sites. The Type 2 sites measure ambient concentrations of ozone precursors emanating from areas of maximum ozone precursor emissions (“fresh” emissions) from multiples source areas of the urban core. The Type 3 sites are located in the region(s) where maximum ozone concentrations tend to occur. The Type 4 sites also represent far downwind regions where ozone concentrations are high but may not be the highest in the network.

Over the past decade the number of PAMS sites has changed. Sites have been relocated or shut down to optimize siting and meet resource constraints. Currently there are 14 PAMS monitoring sites in New England. Their locations, and those of inactive sites, are shown in Figure 4. Table 2 lists the current and inactive PAMS sites in New England. The # corresponds to location of each PAMS site on Figure 4.

Figure 4, Approximate location of active (blue) and inactive (black) PAMS sites in New England (1995-2009)

The numbers correspond to the PAMS sites cross referenced in Table 2.

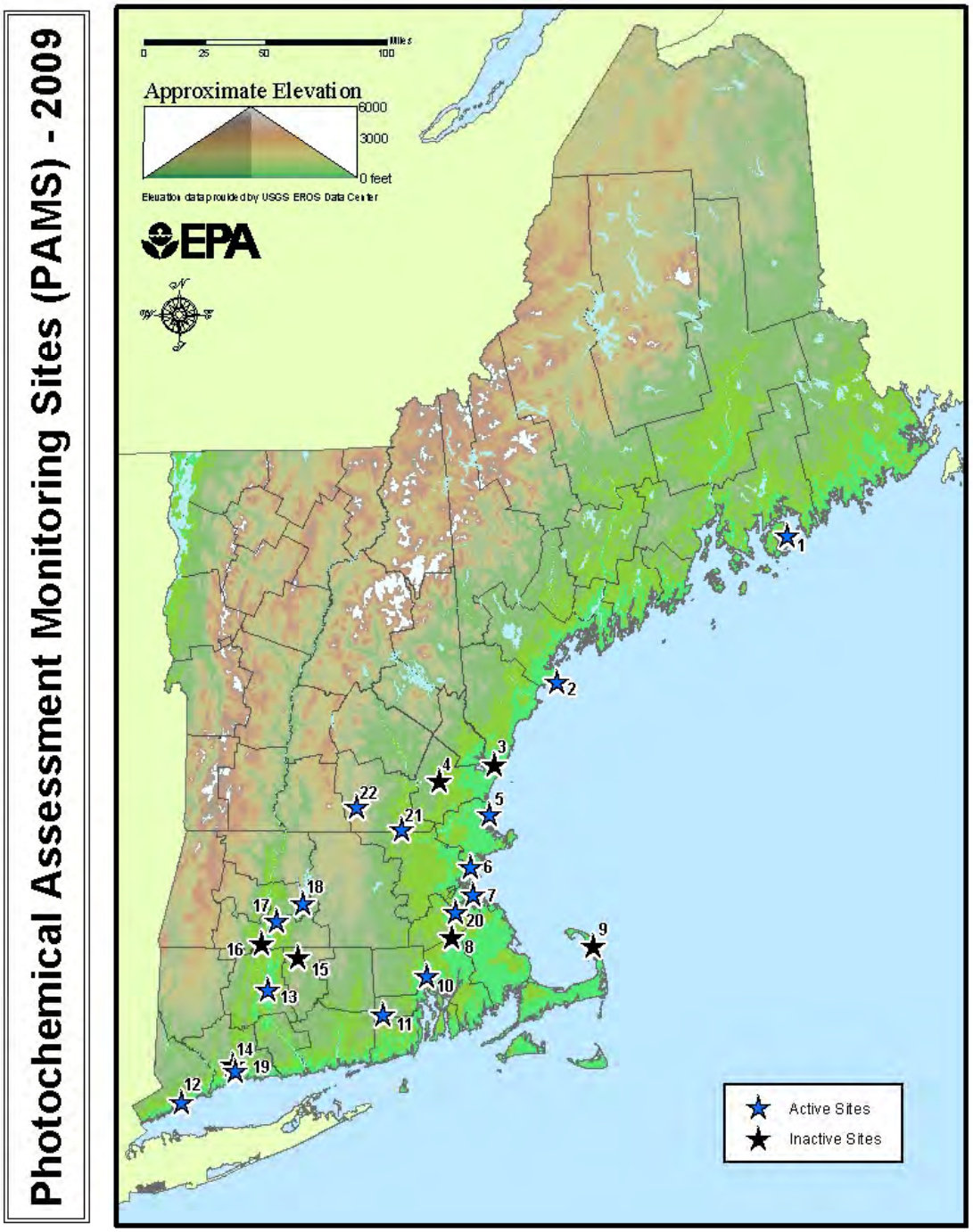


Table 2. Location, classification, deployment date, and active/inactive status of PAMS sites in New England (2009).

Site Location	#	PAMS Classification	Deployment	Status
Acadia NP (ME)	1	Type 4	1996	
Cape Elizabeth (ME)	2	Type 3/4	1994	
Kittery (ME)	3	Type 2	1998	inactive
Brentwood (NH)	4	Type 1	1997	inactive
Newbury/Plub Island (MA)	5	Type 3	1994	
Lynn (MA)	6	Type 2	1993	
Long Island/Boston (MA)	7	Type 2	1997	
Easton/Borderland (MA)	8	Type 1/3	1995	inactive
Truro (MA)	9	Type 4	1995	inactive
East Providence (RI)	10	Type 2	1996	
West Greenwich (RI)	11	Type 1	1993	
Westport/Sherwood Island (CT)	12	Type 1/3	1996	
East Hartford (CT)	13	Type 2	1993	
Hamden (CT)	14	Type 2	1997	inactive
Stafford Springs (CT)	15	Type 3	1994	inactive
Agawam (MA)	16	Type 1	1995	inactive
Chicopee (MA)	17	Type 2	1993	
Ware/Quabbin Summit (MA)	18	Type 3	1994	
New Haven (CT)	19	Type 2	2004	
Blue Hill (MA)	20	Type 1/3	2002	
Gilson/Nashua (NH)	21	Type 3	2005	
Pack Monadnock Summit (NH)	22	Type 1	2006	

Most PAMS sites measure 50+ different hydrocarbon compounds (VOCs) (Table 3). The most comprehensive measurements are made at the Type 2 sites, which currently measure VOCs and carbonyl compounds (aldehydes and ketones), as well as oxides of nitrogen. Most VOC measurements are hourly measurements, with the exceptions. of carbonyl compounds which are measured as 3-hour composites.

Table 3. Measurements made at PAMS sites in New England.

Organic Hydrocarbon Compounds		
Ethane	Cyclopentene	n-Octane
Ethylene	2,3-Dimethylbutane	Ethylbenzene
Acetylene	2-Methylpentane	m,p-Xylene
Proylene	3-Methylpentane	Styrene
Propane	n-Hexane	o-Xylene
Isobutane	trans-2-Hexene	n-Nonane
n-Butane	Methylcyclopentane	Isoprpylbenzene
trans-2-Butene	2,4-Dimethylpentane	m-Ethyltoluene
cis-2-Butene	Benzene	p-Ethyltoluene
3-Methyl-1-Butene	Cyclobenzene	p-Ethylbenzene
Isopentane	2-Methylhexane	1,3,5-Trimethylbenzene
1-Pentene	2,2,4-Trimethylpentane	o-Ethylbenzene
n-Pentane	n-Heptane	1,2,4-Trimethylbenzene
Isoprene	Methylcyclohexane	m-Diethylbenzene
trans-2-Pentene	2,3,4-Trimethylpentane	p-Diethylbenzene
cis-2-Pentene	Toluene	n-Decane
2-Methyl-2-Butene	2-Methylheptane	n-Undecane
2,2-Dimethylbutane	3-Methylheptane	TNMOC
		sum of unknowns
Carbonyls Compounds		
Formaldehyde	Acetaldehyde	
Inorganic Gases		
Ozone	NO, NO_2, NOx, NOy	
Meteorological Measurements		
Wind Speed	Ultraviolet Radiation	Solar Radiation
Wind Direction	Barometric Pressure	Humidity

One of the most important purposes of the PAMS network is to track the concentrations of ozone precursors, VOC and NOx. Tracking ambient concentrations of VOCs provides regulators with an observational measure of emissions reductions. Figures 5 and 6 provide evidence for significant reductions (~50%) in total nonmethane hydrocarbons (VOCs or TNMOC as ppbC) measured at several PAMS Type 2 sites (East Hartford, Chicopee, and Lynn) and the East Providence Type 2 site, for the period 1995 through 2008 (data for 2009 remains incomplete at this time). The data presented in Figure 5 are seasonal (June, July, and August) 1-hour average concentrations of TNMOC (ppbC) as a composite of the three PAMS Type 2 sites for each year since 1995.

The East Providence data show similar long-term seasonal average measurements of TNMOC, based on 3-hour canister samples (Figure 6). Finally, Figure 7 provides evidence of a similar trend for four Type 3 and 4 PAMS sites.

Figure 5. Average 1-hour measurements of TNMOC (ppbC) recorded at three New England PAMS Type 2 sites during the summer months (June, July, and August) for the period 1995 through 2008.

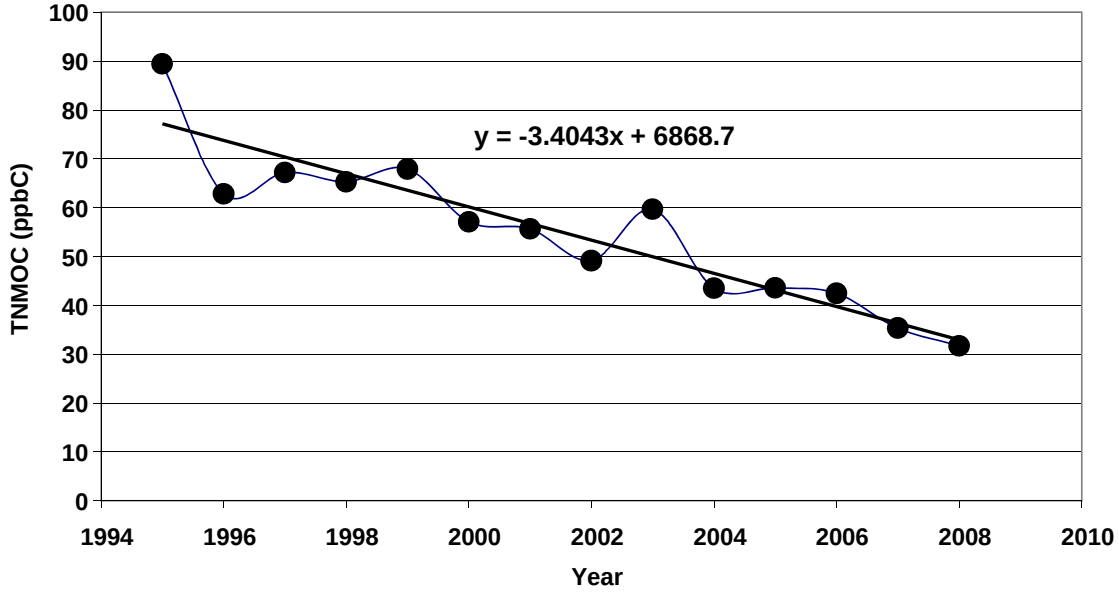


Figure 6. Summer average 3-hour concentration of TNMOC (ppbC) recorded at the E. Providence Type 2 PAMS site (1995 - 2008).

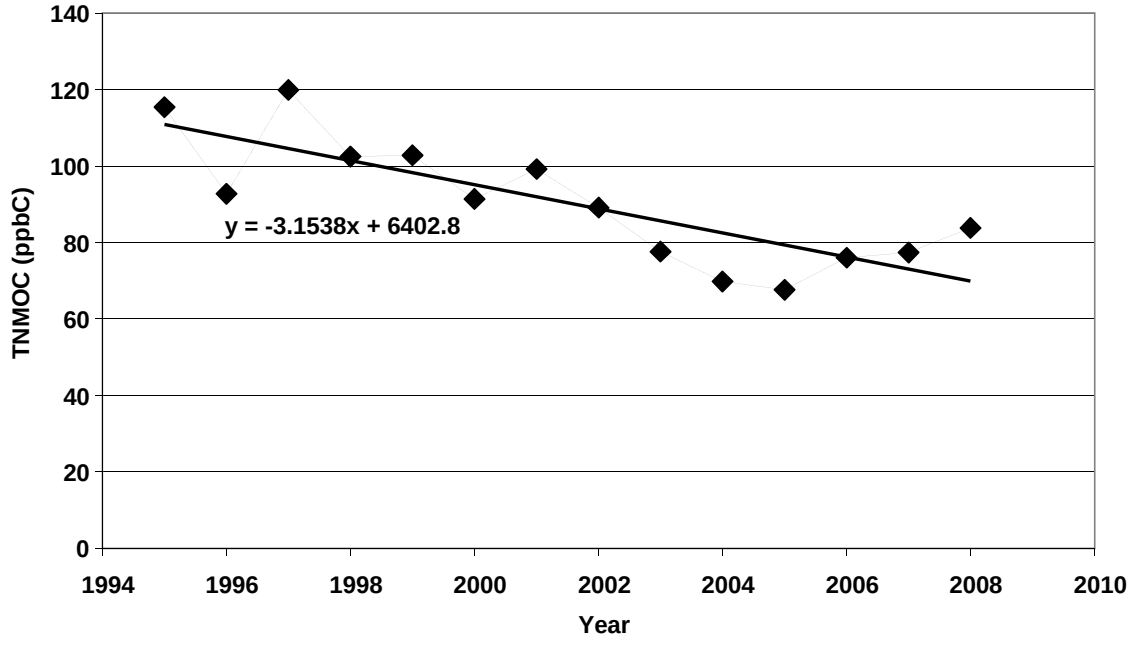
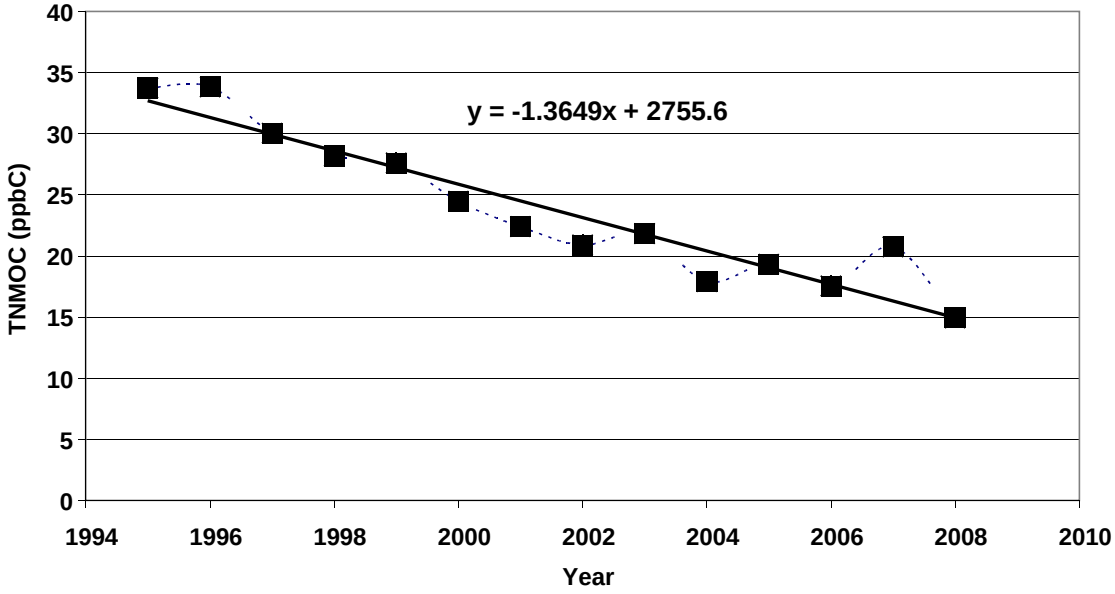


Figure 7. Average 1-hour measurements of TNMOC (ppbC) recorded at four New England Type 3 and 4 PAMS sites during the summer months (June, July, and August) for the period 1995 through 2008.



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