

# 2008 Annual Report on Air Quality in New England



United States Environmental Protection Agency, Region 1  
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Ecosystems Assessment Unit

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

The Photo on the cover is from Camp Ogontz in NH.

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## 2008 ANNUAL REPORT ON AIR QUALITY IN NEW ENGLAND

This report provides a summary of 2008 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 air 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.

The air quality concentrations included in this report reflect the AQS database as of August, 2009. 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 had designated areas in New England as non-attainment for the 1997 8-hour ozone standard as reflected in the map of ozone non-attainment areas on page 81. Designations for the 2006 PM<sub>2.5</sub> 24-hour standard are expected to be issued in the fall of 2009. Formal designations for the 2008 ozone standard are scheduled to be issued in 2010.

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 6, 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 SO<sub>2</sub>, PM<sub>10</sub> and NO<sub>2</sub>). An annual mean is not valid for intermittent data unless there are four valid quarters. For PM<sub>10</sub> and PM<sub>2.5</sub>, 75% of the scheduled samples must be available for a quarter to be considered valid. For continuous data, 75% of the year must be available to calculate a valid annual average. 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 than the level of the standard.

Included with this data summary are graphs of selected air quality monitoring sites that show a multi-year span of data for PM<sub>10</sub>, CO, PM<sub>2.5</sub>, SO<sub>2</sub>, O<sub>3</sub>, and NO<sub>2</sub>.

The State maps display the location of the monitoring sites (when measuring particulates, each state has at least one location where duplicate, or co-located, 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<sub>2.5</sub> Performance Evaluation Program Audits which are meant to assure the quality of particulate matter data.

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<sup>3</sup>), and micrograms per cubic meter of air (µg/m<sup>3</sup>).

Pollutant	Primary Standards		Secondary Standards	
	Level	Averaging Time	Level	Averaging Time
Carbon Monoxide	9 ppm (10 mg/m <sup>3</sup> )	8-hour <a href="#">(1)</a>	None	
	35 ppm (40 mg/m <sup>3</sup> )	1-hour <a href="#">(1)</a>		
Lead	0.15 µg/m <sup>3</sup> <a href="#">(2)</a>	Rolling 3-Month Average	Same as Primary	
	1.5 µg/m <sup>3</sup>	Quarterly Average	Same as Primary	
Nitrogen Dioxide	0.053 ppm (100 µg/m <sup>3</sup> )	Annual (Arithmetic Mean)	Same as Primary	
Particulate Matter (PM <sub>10</sub> )	150 µg/m <sup>3</sup>	24-hour <a href="#">(3)</a>	Same as Primary	
Particulate Matter (PM <sub>2.5</sub> )	15.0 µg/m <sup>3</sup>	Annual <a href="#">(4)</a> (Arithmetic Mean)	Same as Primary	
	35 µg/m <sup>3</sup>	24-hour <a href="#">(5)</a>	Same as Primary	
Ozone	0.075 ppm (2008 std)	8-hour <a href="#">(6)</a>	Same as Primary	
	0.08 ppm (1997 std)	8-hour <a href="#">(7)</a>	Same as Primary	
Sulfur Dioxide	0.03 ppm	Annual (Arithmetic Mean)	0.5 ppm (1300 µg/m <sup>3</sup> )	3-hour <a href="#">(1)</a>
	0.14 ppm	24-hour <a href="#">(1)</a>		

(1) Not to be exceeded more than once per year.

(2) Final rule signed October 15, 2008.

(3) Not to be exceeded more than once per year on average over 3 years.

(4) To attain this standard, the 3-year average of the weighted annual mean PM<sub>2.5</sub> concentrations from single or multiple community-oriented monitors must not exceed 15.0 µg/m<sup>3</sup>.

(5) 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 µg/m<sup>3</sup> (effective December 17, 2006).

(6) 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)

(7) (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.

# 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 disorders: 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<sub>3</sub>)**

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<sub>2</sub>)**

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<sub>2.5</sub>. Major sources include power plants and industrial boilers.

## **Nitrogen Dioxide (NO<sub>2</sub>)**

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<sub>2.5</sub>. 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<sub>2.5</sub> and PM<sub>10</sub>)**

Both fine and coarse 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 symptoms. 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

<b>SITE ID</b>	Site Identification number	<b>OBS &gt; 35</b>	Number of observations greater than 35 ppm for CO
<b>POC</b>	Parameter Occurrence Code - differentiates between monitors for a given pollutant	<b>MAX 8-HR:</b>	1st Highest 8-hour value recorded in the year
<b>MT</b>	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		2nd Second highest 8-hour value recorded in the year
<b>YR</b>	Year	<b>OBS &gt; 9</b>	Number of 8-hour ave. greater than 9 ppm for CO
<b>REP ORG</b>	Reporting Organization	<b>OBS &gt; 365</b>	Number of 24-hour ave. greater than 365 ug/m <sup>3</sup> for SO <sub>2</sub>
<b>#OBS</b>	Number of Observations	<b>MAX 3-HR:</b>	1st Highest 3-hour value recorded in the year
<b>MAX 24-HR:</b>	1st Highest 24-hour value recorded in the year		2nd Second highest 3-hour value recorded in the year
	2nd Second highest 24-hour value for the year	<b>Obs &gt; 1300</b>	Number of 3-hour ave. greater than 1300 ug/m <sup>3</sup> for SO <sub>2</sub>
	3rd Third highest 24-hour value for the year.	<b>NUM MEAS</b>	The valid number of days measured
	4th Fourth highest 24-hour value for the year.	<b>NUM REQ</b>	The valid number of days in the ozone season
<b>ARITH MEAN</b>	Arithmetic mean	<b>NUM OBS</b>	Number of Observations
<b>WTD ARITH MEAN</b>	Weighted arithmetic mean	<b>SCHEDULED NUM OBS</b>	Number of observations scheduled
<b>GEO MEAN</b>	Geometric mean	<b>% OBS</b>	Percent completed of number of observations scheduled
<b>GEO STD</b>	Geometric standard deviation	<b>MISS DAYS ASSUMED &lt; STANDARD</b>	Number of missing days assumed to be less than the standard
<b>QUARTERLY ARITH MEANS:</b>		<b>“METHOD” REPORTED</b>	= Details can be found at: <a href="http://www.epa.gov/ttn/airs/airsaqs/manuals/">http://www.epa.gov/ttn/airs/airsaqs/manuals/</a> A “code “0” is included if Multiple Methods codes are input for the same year.
	1ST First quarter arithmetic mean		
	2ND Second quarter arithmetic mean		
	3RD Third quarter arithmetic mean		
	4TH Fourth quarter arithmetic mean		
<b>MEANS &gt; 1.5</b>	Number of quarterly means greater than 1.5 ug/m <sup>3</sup> for lead		
<b>MAX VALUES:</b>	1st Highest 24-hour value recorded for the year		
	2nd Second highest 24-hour value in the year.		
<b>METHOD</b>	Method		
<b>MAX 1-HR:</b>	1st Highest 1-hour value recorded in the year		
	2nd Second highest 1-hour value recorded in the year		

# 2008 Summary of New England Ambient Air Quality

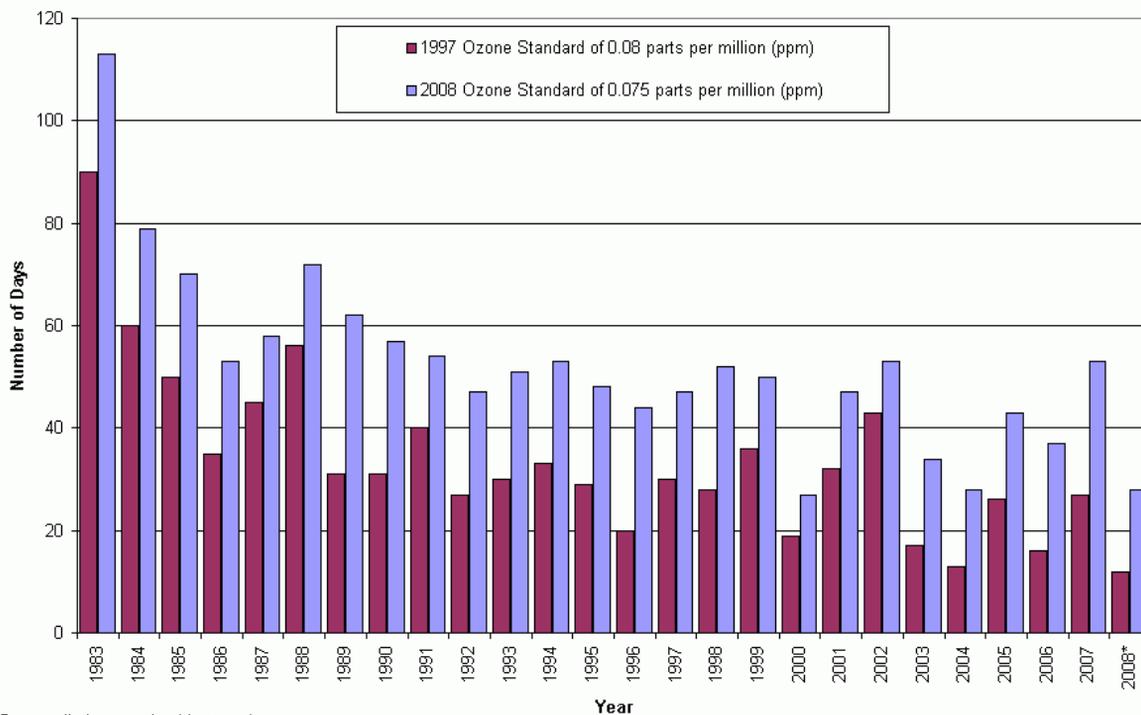
## 2008 Summary of Ambient Air Quality in New England

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: carbon monoxide (CO), sulfur dioxide (SO<sub>2</sub>), nitrogen dioxide (NO<sub>2</sub>), ozone (O<sub>3</sub>), lead (Pb), and particulate matter (PM<sub>10</sub> and PM<sub>2.5</sub>). Levels of these pollutants are compared to the National Ambient Air Quality Standards (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<sub>2.5</sub>) 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<sub>2.5</sub> 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 2008, weather conditions during the summer were generally warmer and wetter than normal. However in August there were no 90 degree F days, leading to fewer high ozone days. Concentrations of ozone and fine particles were higher at sites in southern New England than in northern New England. Using the number of days when at least one ozone monitoring site exceeded the 2008 8-hour ozone standard (0.075 ppm), 2008 had 28 days which exceeded the NAAQS. In contrast, relative to the less stringent 1997 8-hour ozone standard (0.08 ppm), there were only been 12 days which exceeded the previous 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.

**Days Exceeding the 8- Hour Ozone Standard in New England**



\*Data preliminary and subject to change

More information can be found at [www.epa.gov/region1/aqi](http://www.epa.gov/region1/aqi). In 2008, the highest 8-hour ozone concentration was measured in Truro, Massachusetts (0.106 ppm). The other New England states measured maximum 8-hour concentrations ranging from 0.105 ppm (CT) to 0.08 ppm (ME). Twenty (20) monitoring sites in New England exceeded the fourth highest 8-hour ozone threshold ( $\geq 0.075$  ppm).

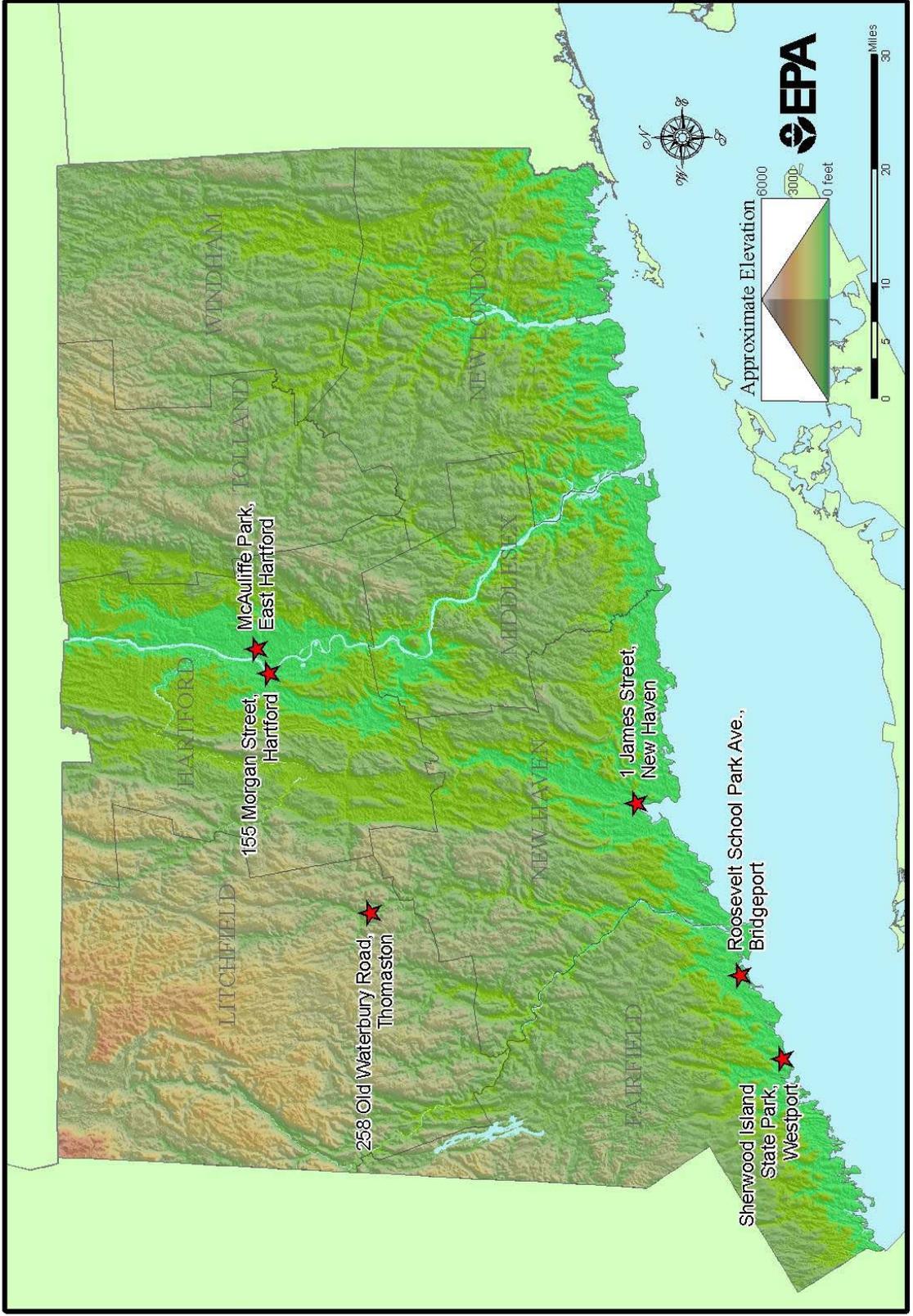
Since 1993, the New England states (except Vermont) have operated Photochemical Assessment Monitoring Stations (PAMS), which measure ozone precursors (oxides of nitrogen and organic compounds). The 2008 PAMS data indicate that the highest concentrations of organics, measured as Total Non-Methane Organic Compounds (TNMOC), were recorded at the New Haven (CT) Type 2 urban site. The lowest concentrations were recorded at the far downwind sites located in Maine (Cape Elizabeth and Acadia National Park). In general, TNMOC concentrations remained below those measured during the 1990's, but were similar to the last five years of measurements.

During 2008, the highest daily concentrations of fine particulate matter  $PM_{2.5}$  (on the order of 45-55  $\mu\text{g}/\text{m}^3$ ) were measured at sites in Massachusetts, Maine, and Connecticut. However, based on 2006-2008 data, all sites in New England meet the 24-hour and the annual  $PM_{2.5}$  NAAQS. The highest annual average concentrations for fine particulate matter was measured at New Haven (CT), at 12.1  $\mu\text{g}/\text{m}^3$ . 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 ( $<6.0 \mu\text{g}/\text{m}^3$ ). For coarse particulate matter ( $PM_{10}$ ), the highest daily concentration was measured at the Portland (ME) site (123  $\mu\text{g}/\text{m}^3$ ). 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.

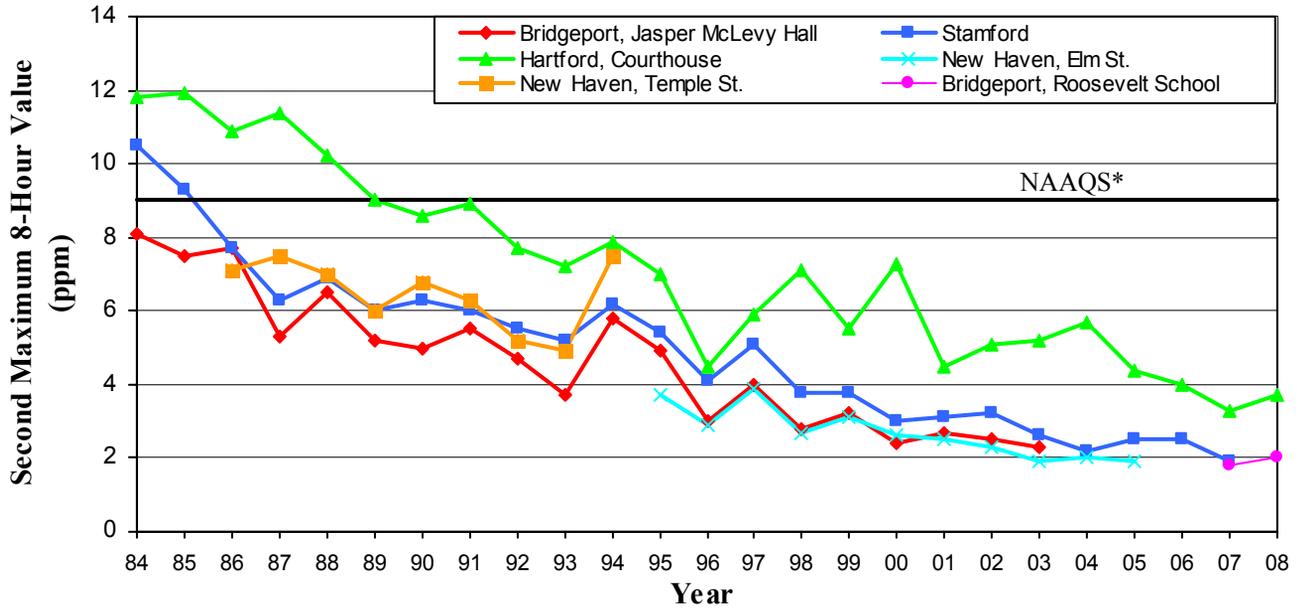
In general, the concentrations for all of the other criteria pollutants ( $\text{SO}_2$ ,  $\text{NO}_2$ , CO, and Pb) measured at monitoring sites throughout New England either declined or remained at historically low levels. Ambient air concentrations of  $\text{SO}_2$ ,  $\text{NO}_2$ , CO, and Pb measured at sites in New England were well below the NAAQS.

In the coming two years, with the substantially strengthened NAAQS for lead, EPA expects that additional monitors will be placed to better characterize lead concentrations in population centers in New England.

# Connecticut Sites - 2008 - Carbon Monoxide



# Connecticut Carbon Monoxide Data



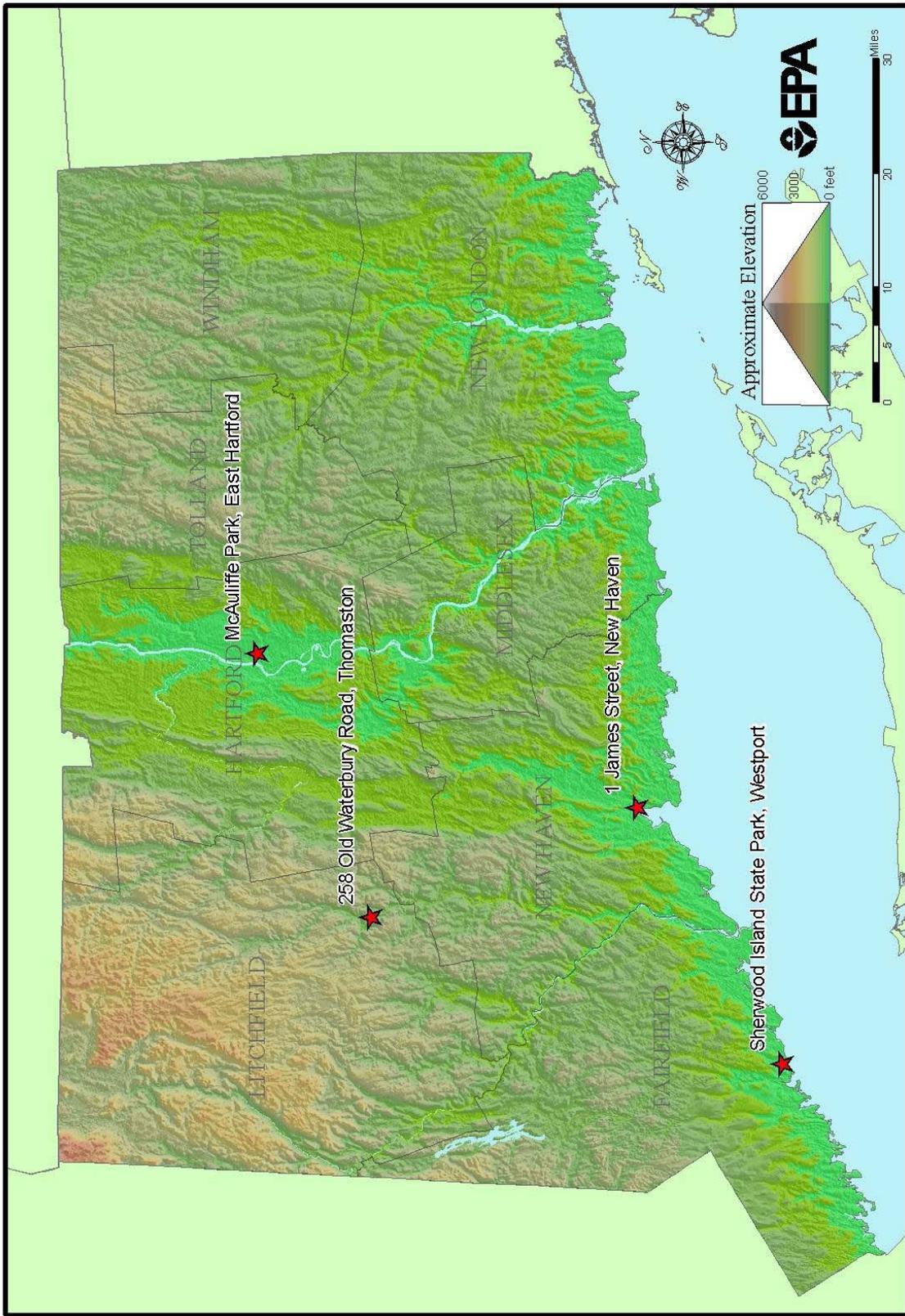
\*NAAQS for Carbon Monoxide:

- 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.

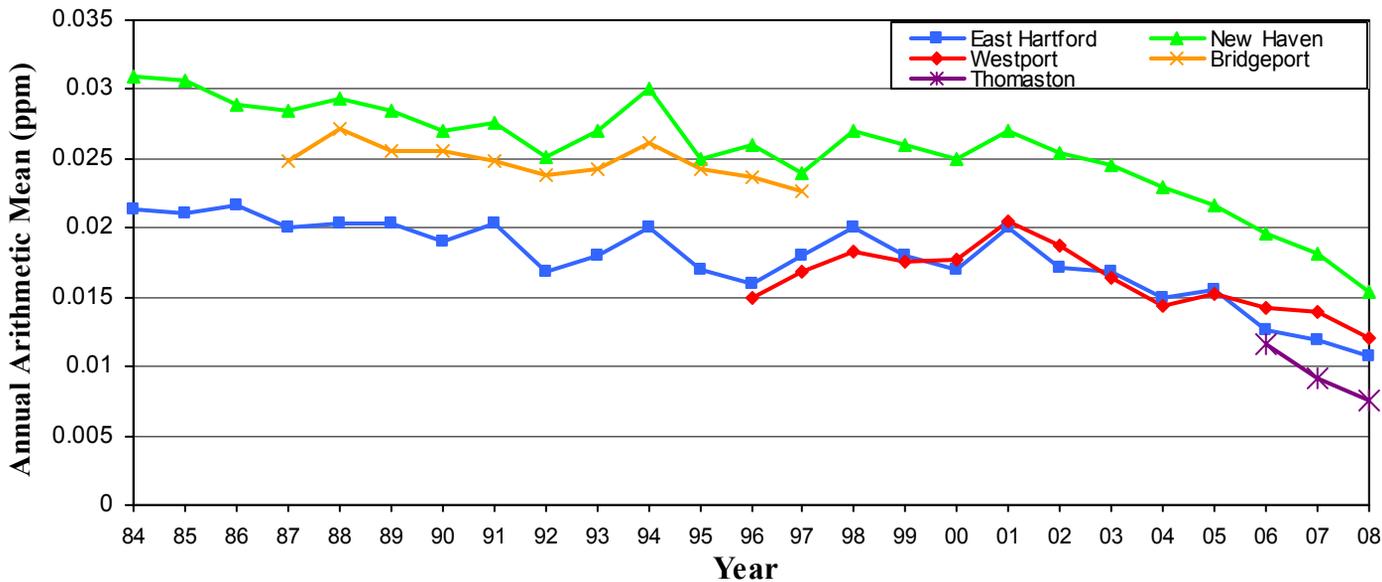
2008													
Connecticut													
Carbon Monoxide													
All Values are in Units of Parts Per Million													
	P							1-hour	1-hour		8-hour	8-hour	
	O							2nd	2nd		2nd	2nd	
Site ID	C	Type	City	County	Address	Method	#	Highest	Highest	# > 35	Highest	Highest	# > 9
09-001-0010	1	251	Bridgeport	Fairfield	ROOSEVELT SCHOOL, PARK AVE	54	8350	3.300	3.200	0	2.2	2.0	0
09-001-9003	1	251	Westport	Fairfield	SHERWOOD ISLAND STATE PARK	554	8464	1.615	1.573	0	1.4	1.1	0
09-003-0017	1	251	Hartford	Hartford	COURTHOUSE, 155 MORGAN STREET	54	8689	6.000	5.900	0	3.7	3.1	0
09-003-1003	1	251	East Hartford	Hartford	MCAULIFFE PARK	54	8582	1.800	1.800	0	1.3	1.2	0
09-005-0004	1	251	Thomaston	Litchfield	258 OLD WATERBURY ROAD	554	8660	1.191	1.077	0	0.9	0.9	0
09-009-0027	1	251	New Haven	New Haven	1 JAMES STREET	0	5388	2.200	2.100	0	1.9	1.6	0

Six carbon monoxide (CO) ambient monitoring sites operated in 2008, 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 2008. The second highest recorded maximum 8-hour concentration of 3.1 ppm was recorded at the Hartford Courthouse site, and shows a fairly steady and substantial downward trend.

# Connecticut Sites - 2008 - Nitrogen Dioxide



# Connecticut Nitrogen Dioxide Data



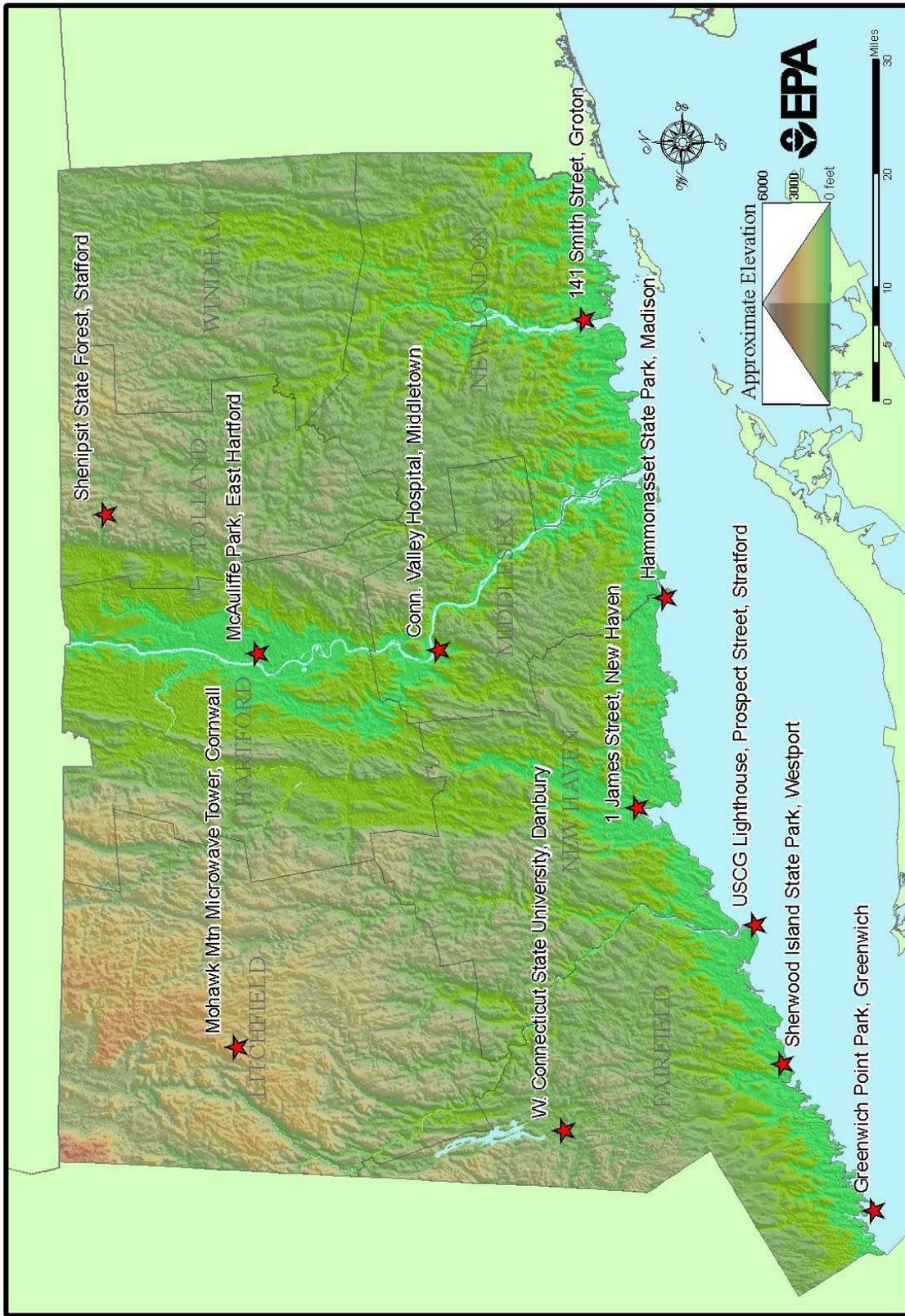
NAAQS for Nitrogen Dioxide:

Annual Arithmetic Mean 0.053 ppm (100 µg/m<sup>3</sup>)

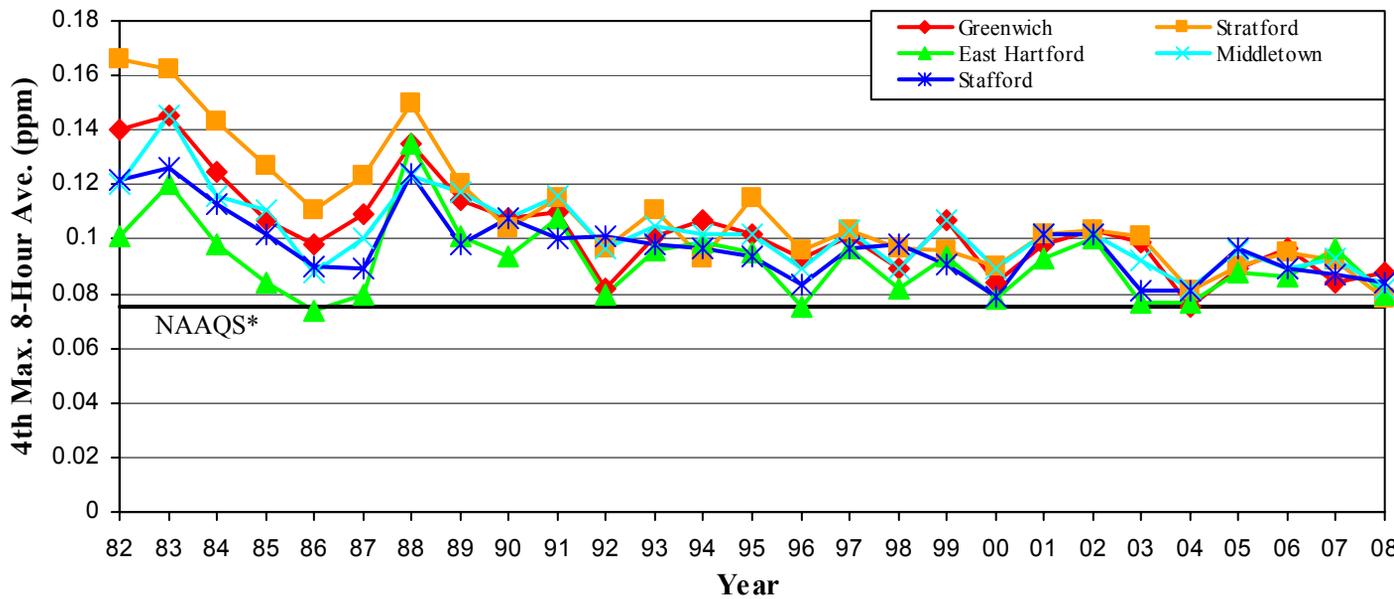
2008 NO2										
Connecticut										
Parameter: Nitrogen Dioxide										
All Values are in Units of Parts Per Million										
								1-hour	1-hour	
	P							Highest	2nd	Annual
Site ID	O Rept.	C Org.	City	County	Address	Method	# Obs	Value	Highest Value	Arith. Mean
09-001-9003	1	251	Westport	Fairfield	SHERWOOD ISL. STATE PARK	74	8452	0.110	0.100	0.0121
09-003-1003	1	251	East Hartford	Hartford	MCAULIFFE PARK	74	8535	0.054	0.052	0.0107
09-005-0004	1	251	Thomaston	Litchfield	258 OLD WATERBURY ROAD	74	8636	0.096	0.086	0.0076
09-009-0027	1	251	New Haven	New Haven	1 JAMES STREET	74	8091	0.100	0.064	0.0154

The four nitrogen dioxide (NO<sub>2</sub>) ambient air monitoring sites that operated during 2008, did not measure any violation of the NAAQS. The New Haven site reported the highest annual arithmetic mean NO<sub>2</sub> concentration of 0.0154 ppm, which is 29% of the NAAQS. The Photochemical Assessment Monitoring Stations (PAMS) located in East Hartford and Westport both reported concentrations of NO<sub>2</sub> well below the NAAQS. The trend graph shows for the past twenty four years annual concentrations of NO<sub>2</sub> have been relatively constant with a slight downward trend since 2001.

# Connecticut Sites - 2008 - Ozone



# Connecticut Ozone 8-Hour Data



\*NAAQS for Ozone:

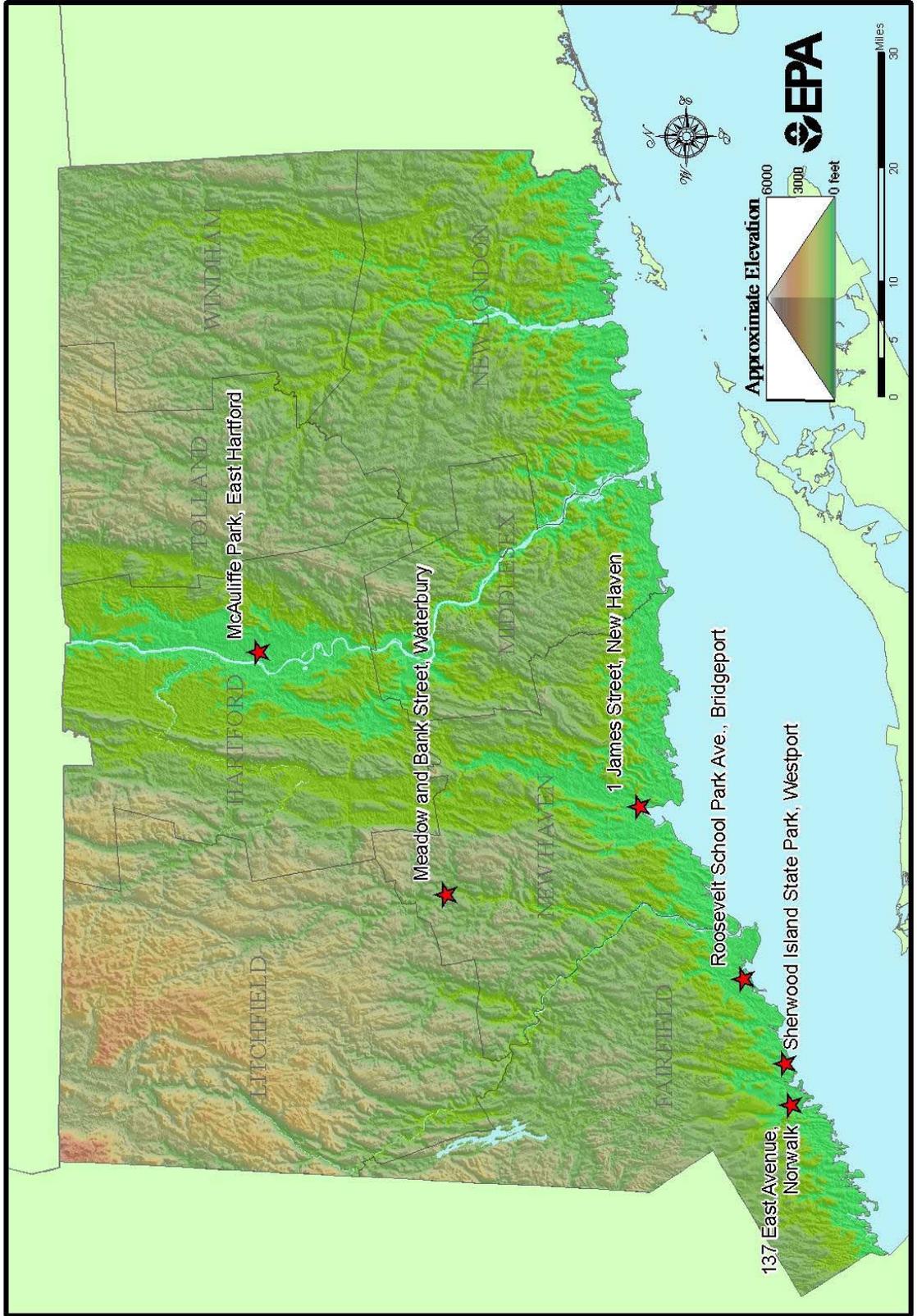
8-hour – 0.075ppm (2008 std)

(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 0.075ppm. This graph represents the 4<sup>th</sup> 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.)

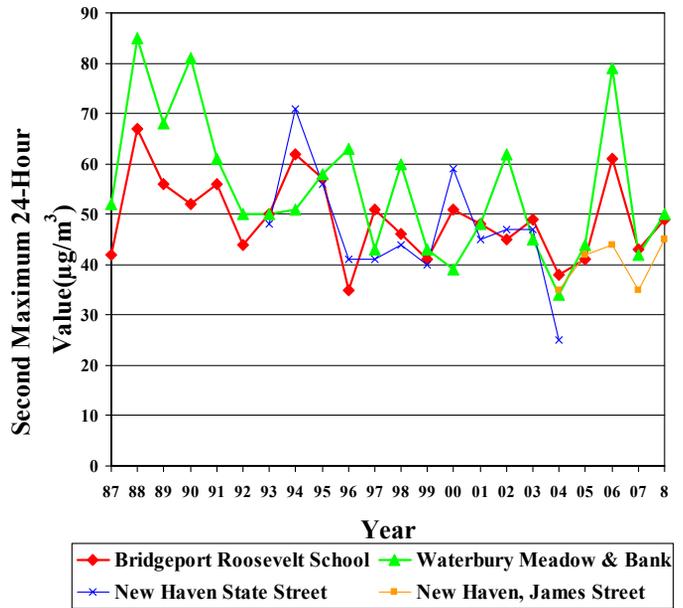
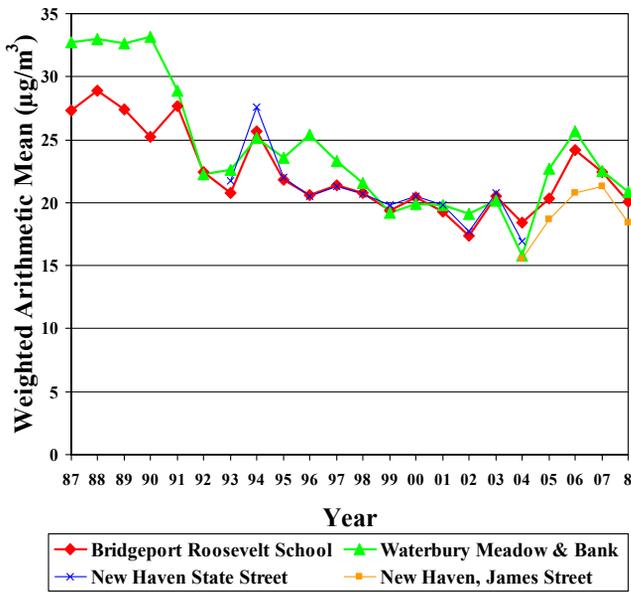
2008												
O3 8hour												
Connecticut												
Parameter: Ozone (8-Hour)												
All Values are in Units of Parts Per Million												
	P					Valid	Num		2nd	3rd	4th	Days
	O				%	Days	Required	Highest	Highest	Highest	Highest	Max >
Site ID	City	County	Address	Method	Obs	Meas.	Days	8-Hr Value	8-Hr Value	8-Hr Value	8-Hr Value	0.075
09-001-0017	Greenwich	Fairfield	GREENWICH POINT PARK	47	94	172	183	0.105	0.102	0.090	0.088	14
09-001-1123	Danbury	Fairfield	W. CONNECTICUT STATE U.	47	98	180	183	0.093	0.091	0.088	0.086	9
09-001-3007	Stratford	Fairfield	USCG LIGHTHOUSE , PROSPECT ST.	47	95	173	183	0.103	0.094	0.083	0.078	6
09-001-9003	Westport	Fairfield	SHERWOOD ISLAND STATE PARK	47	93	171	183	0.103	0.095	0.093	0.090	10
09-003-1003	East Hartford	Hartford	MCAULIFFE PARK	47	99	182	183	0.089	0.086	0.080	0.080	4
09-005-0005	Cornwall	Litchfield	MOHAWK MTN MICROWAVE TOWER	47	84	153	183	0.090	0.081	0.079	0.077	4
09-007-0007	Middletown	Middlesex	CONN. VALLEY HOSP	47	99	182	183	0.091	0.083	0.083	0.082	8
09-009-0027	New Haven	New Haven	1 JAMES STREET	47	92	168	183	0.084	0.080	0.074	0.074	2
09-009-3002	Madison	New Haven	HAMMONASSET STATE PARK	47	97	178	183	0.105	0.092	0.085	0.078	7
09-011-0124	Groton	New London	141 SMITH STREET	47	98	180	183	0.094	0.093	0.081	0.080	6
09-013-1001	Stafford	Tolland	ROUTE 190, SHENIPSIT STATE FOR.	47	99	182	183	0.094	0.087	0.087	0.084	7

During 2008, ten 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. The Westport site recorded the highest 4<sup>th</sup> high value of 0.090 ppm. In 2008, 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. The highest 8-hour ozone concentration in 2006 was recorded at the Westport site at 0.119 ppm.

# Connecticut Sites - 2008 - Particulate Matter < 10 Microns



# Connecticut Particulate Matter < 10 Microns (PM<sub>10</sub>) Data

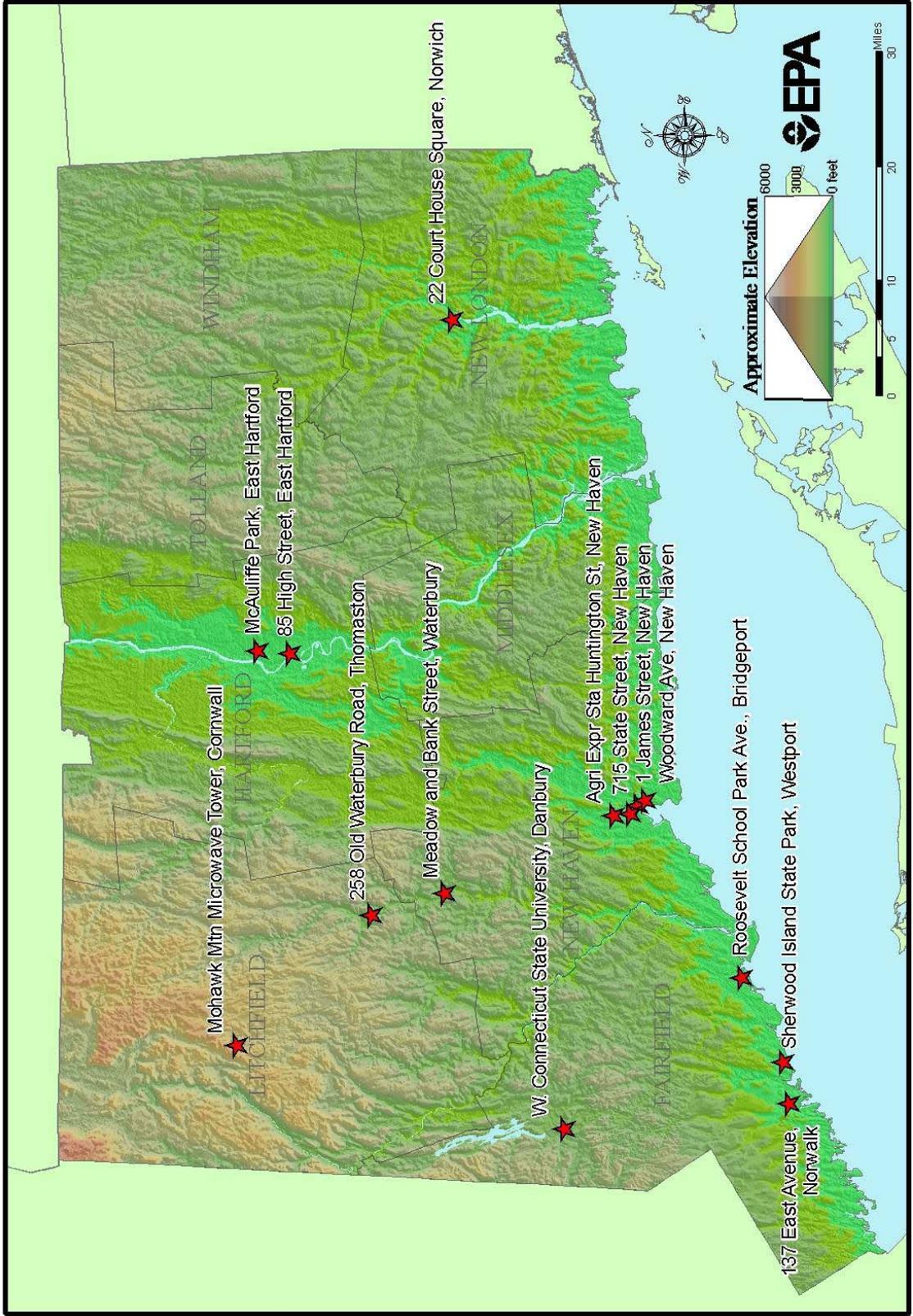


NAAQS for Particulate Matter less than 10 Microns:  
24-hour 150 µg/m<sup>3</sup>

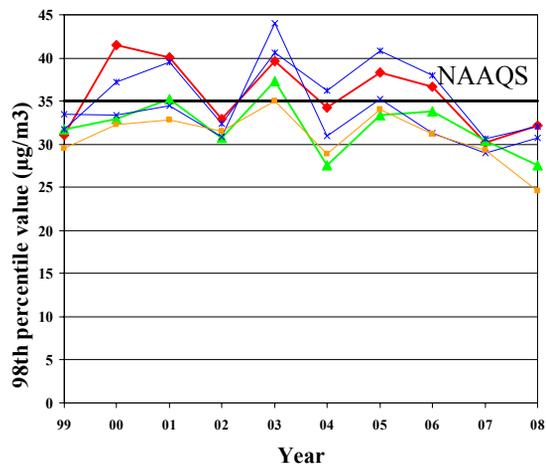
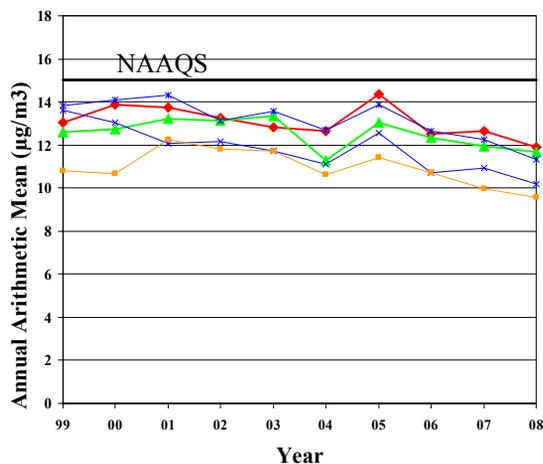
2008 Connecticut Particulate Matter < 10 Microns ug/m3																	
SITE ID	P C	Rep. Org	City	County	Address	Method	# Obs	# Req.	Number Valid		Highest	2nd Highest	3rd Highest	4th Highest	Days Max >150	Est. Max >150	Da Wtd. Arith. Mean
									Days	% Obs	Value	Value	Value	Value			
09-001-0010	1	251	Bridgeport	Fairfield	ROOSEVELT SCHOOL, PARK AVE.	126	61	61	61	100	68	49	43	38	0	0	20.1
09-001-3005	1	251	Norwalk	Fairfield	NORWALK HEALTH DEPT, 137 EAST A	126	54	61	54	89	67	38	37	35	0	0	18.2
09-001-9003	1	251	Westport	Fairfield	SHERWOOD ISLAND STATE PARK	126	58	61	58	95	76	55	34	31	0	0	15.8
09-003-1003	1	251	East Hartford	Hartford	MCAULIFFE PARK	126	56	61	56	92	36	36	35	24	0	0	14.2
09-009-0027	1	251	New Haven	New Haven	1 JAMES STREET	127	58	61	58	95	50	45	35	33	0	0	18.4
09-009-0027	2	251	New Haven	New Haven	1 JAMES STREET	127	60	61	60	98	50	45	37	36	0	0	18.7
09-009-2123	1	251	Waterbury	New Haven	MEADOW AND BANK STREETS	126	56	61	56	92	63	50	46	41	0	0	20.9
09-009-2123	2	251	Waterbury	New Haven	MEADOW AND BANK STREETS	126	59	61	59	97	61	49	46	40	0	0	22.5

The six Connecticut sites (there are two co-located monitors in New Haven County) measuring particulate matter of less than 10 microns (PM<sub>10</sub>) did not record an exceedance or violation of the 24-hour NAAQS during 2008. The Waterbury site at Meadow and Bank streets reported the highest 24-hour second maximum value of 49 µg/m<sup>3</sup> during 2008, which is 32% of the NAAQS.

# Connecticut Sites - 2008 - Particulate Matter < 2.5 Microns



# Connecticut Particulate Matter < 2.5 Microns (PM<sub>2.5</sub>) Data

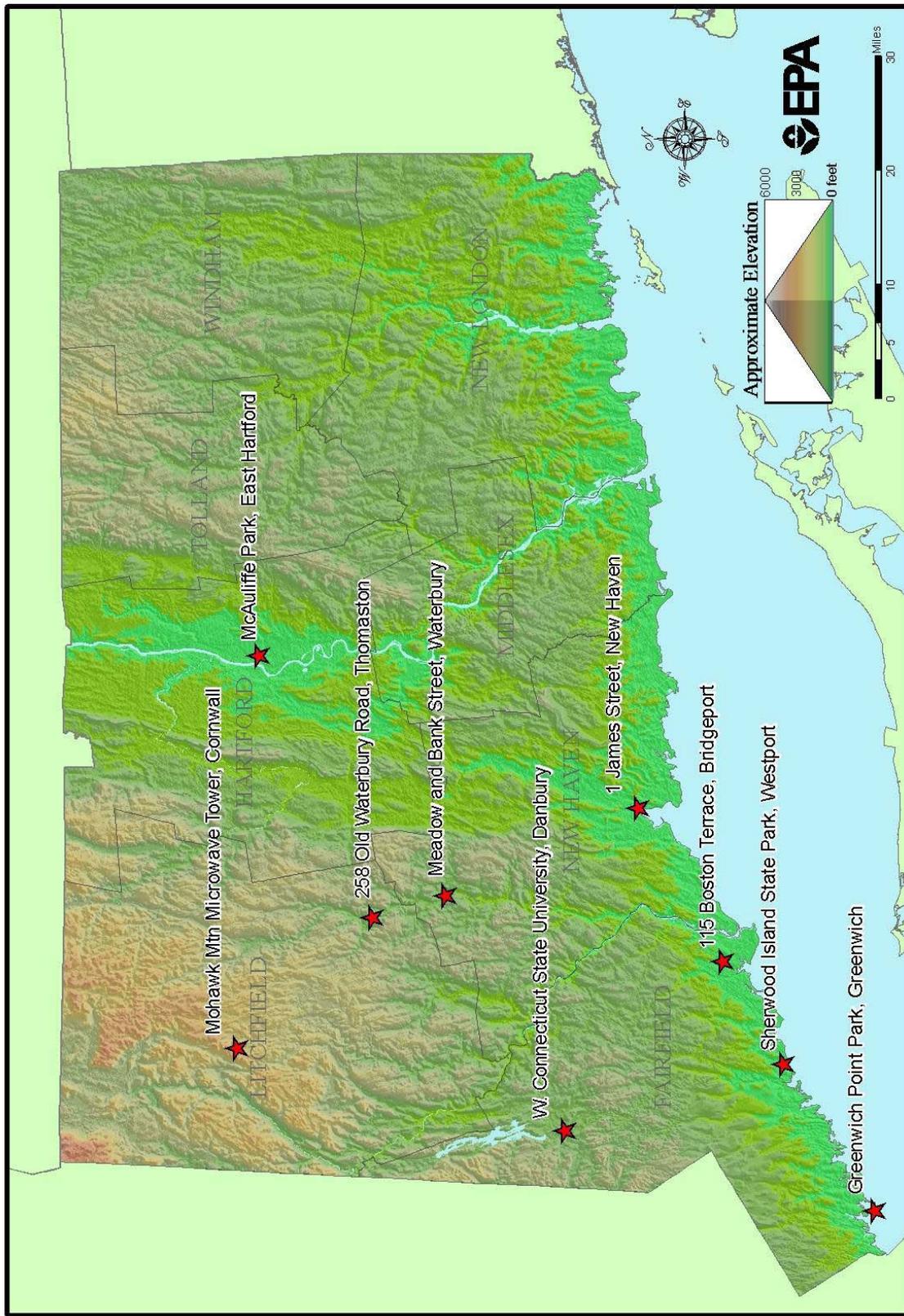


\*NAAQS for Particulate Matter less than 2.5 Microns:  
 Primary: Annual Arithmetic Mean - 15.0 µg/m<sup>3</sup>  
 Secondary: the 3-year average of the 98th percentile of 24-hour concentrations at each population-oriented monitor <35 µg/m<sup>3</sup>

2008 Connecticut													
Parameter: PM 2.5													
All Values are in UG/CU Meters Local Conditions													
	P							2nd	3rd	4th	98th	Wtd.	
	O	Rept.				#	Highest	Highest	Highest	Highest	Percentile	Arith.	
Site ID	C	Org.	City	County	Address	Method	Obs	Value	Value	Value	Value	Mean	
09-001-0010	1	251	Bridgeport	Fairfield	ROOSEVELT SCHOOL PARK AVE.	145	109	50.9	35.5	32.3	29.3	32.3	11.9
09-001-1123	1	251	Danbury	Fairfield	TRAILER, W. CONN STATE U.	145	116	46.8	30.1	27.5	26.4	27.5	11.7
09-001-3005	1	251	Norwalk	Fairfield	NORWALK HEALTH DEPT., 137 EAST A	145	111	55.8	30.7	26.3	26.1	26.3	11.8
09-001-9003	1	251	Westport	Fairfield	SHERWOOD ISLAND STATE PARK	145	349	50.0	37.0	34.6	33.2	30.7	10.2
09-003-1003	1	251	East Hartford	Hartford	MCAULIFFE PARK	145	343	32.3	30.8	30.2	29.7	24.6	9.6
09-003-2006	1	251	East Hartford	Hartford	85 HIGH STREET	145	112	31.0	27.2	26.4	21.5	26.4	10.6
09-005-0004	1	251	Thomaston	Litchfield	258 OLD WATERBURY ROAD	145	118	30.5	25.0	24.8	24.4	24.8	9.0
09-005-0005	1	251	Cornwall	Litchfield	MOHAWK MTN MICROWAVE TOWER	145	119	27.3	23.0	22.2	20.9	22.2	6.7
09-009-0026	1	251	New Haven	New Haven	WOODWARD AVENUE	145	120	43.8	37.0	30.9	26.7	30.9	11.5
09-009-0027	1	251	New Haven	New Haven	1 JAMES STREET	145	352	44.3	38.7	37.9	36.7	31.5	11.3
09-009-0027	2	251	New Haven	New Haven	1 JAMES STREET		60	42.5	26.1	23.4	23.3	26.1	11.3
09-009-1123	1	251	New Haven	New Haven	715 STATE STREET	145	118	49.2	36.8	32.1	28.3	32.1	12.1
09-009-2008	1	251	New Haven	New Haven	AGRI EXPR STA, HUNTINGTON ST.	145	113	46.6	34.7	25.4	25.1	25.4	10.6
09-009-2123	1	251	Waterbury	New Haven	MEADOW AND BANK STREETS	145	121	46.0	45.0	28.4	27.0	28.4	11.7
09-009-2123	2	251	Waterbury	New Haven	MEADOW AND BANK STREETS	118	59	43.7	26.8	24.9	23.9	26.8	11.5
09-011-3002	1	251	Norwich	New London	22 COURT HOUSE SQUARE	145	349	39.0	38.5	35.1	35.0	25.0	10.0

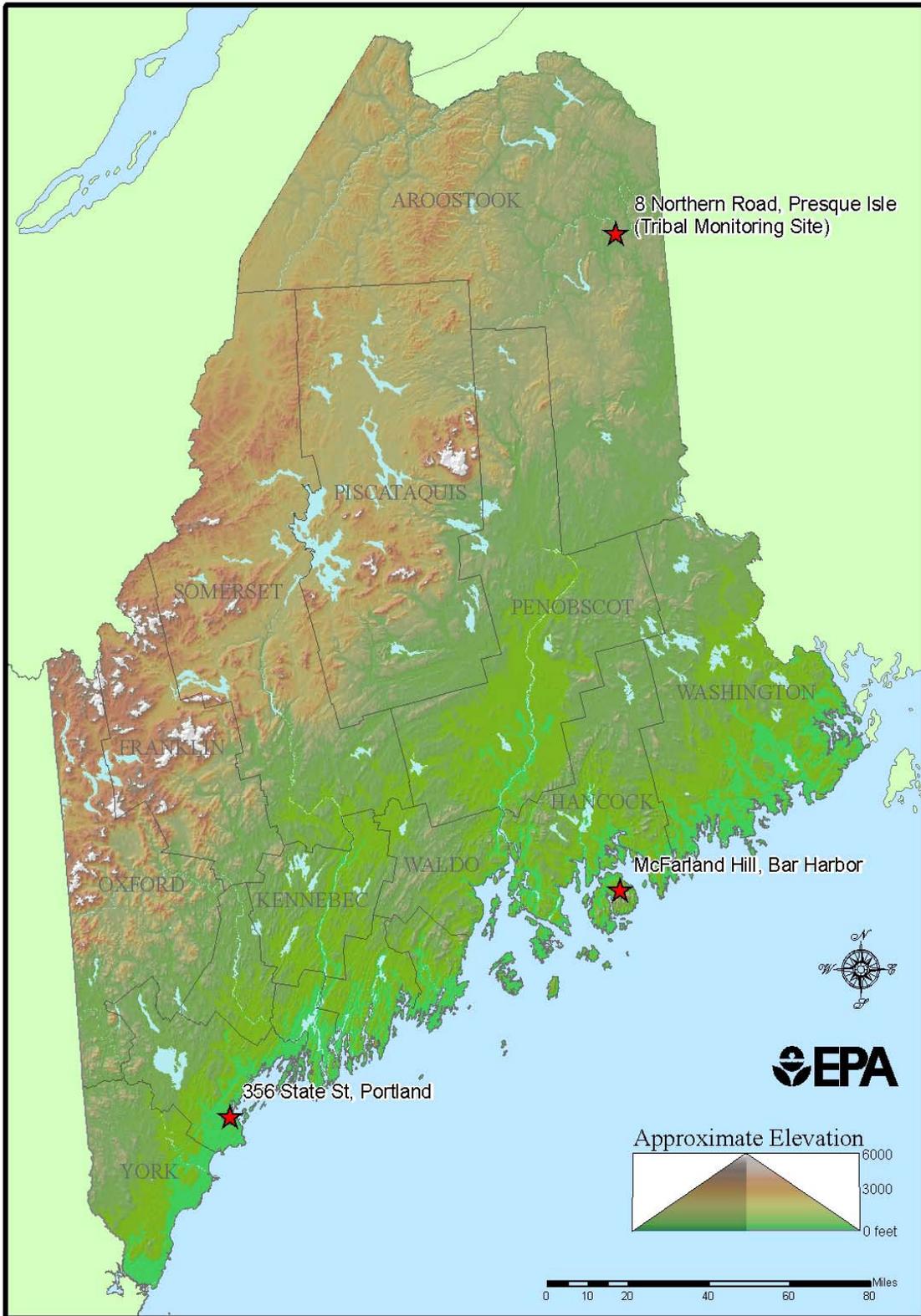
In 2008, Connecticut operated a network of fourteen fine particulate matter (PM<sub>2.5</sub>) sites, with two co-located monitors. During 2008, the annual arithmetic mean concentration of PM<sub>2.5</sub> was the highest at the State Street site in New Haven with a value of 12.1 µg/m<sup>3</sup>. The highest 98th percentile 24-hour value was 32.3 µg/m<sup>3</sup> recorded at the Bridgeport site. 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 remained relatively flat, except for a slight increase during 2005.

# Connecticut Sites - 2008 - Sulfur Dioxide

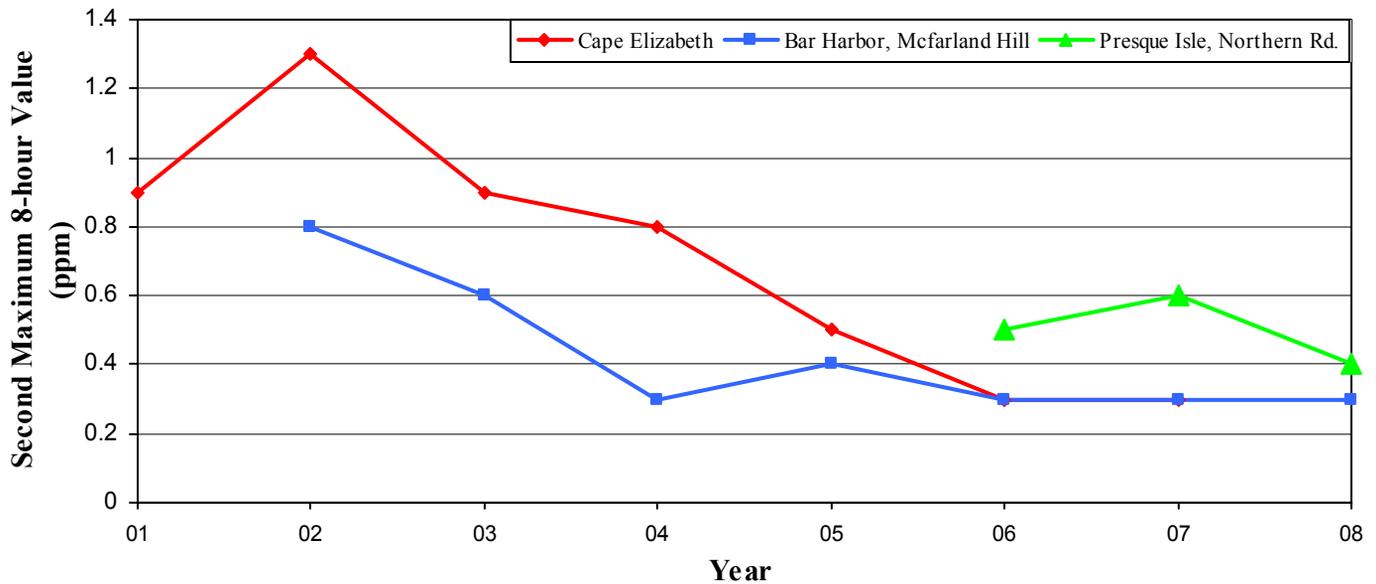




Maine Sites 2008 - Carbon Monoxide



# Maine Carbon Monoxide Data



NAAQS for Carbon Monoxide:

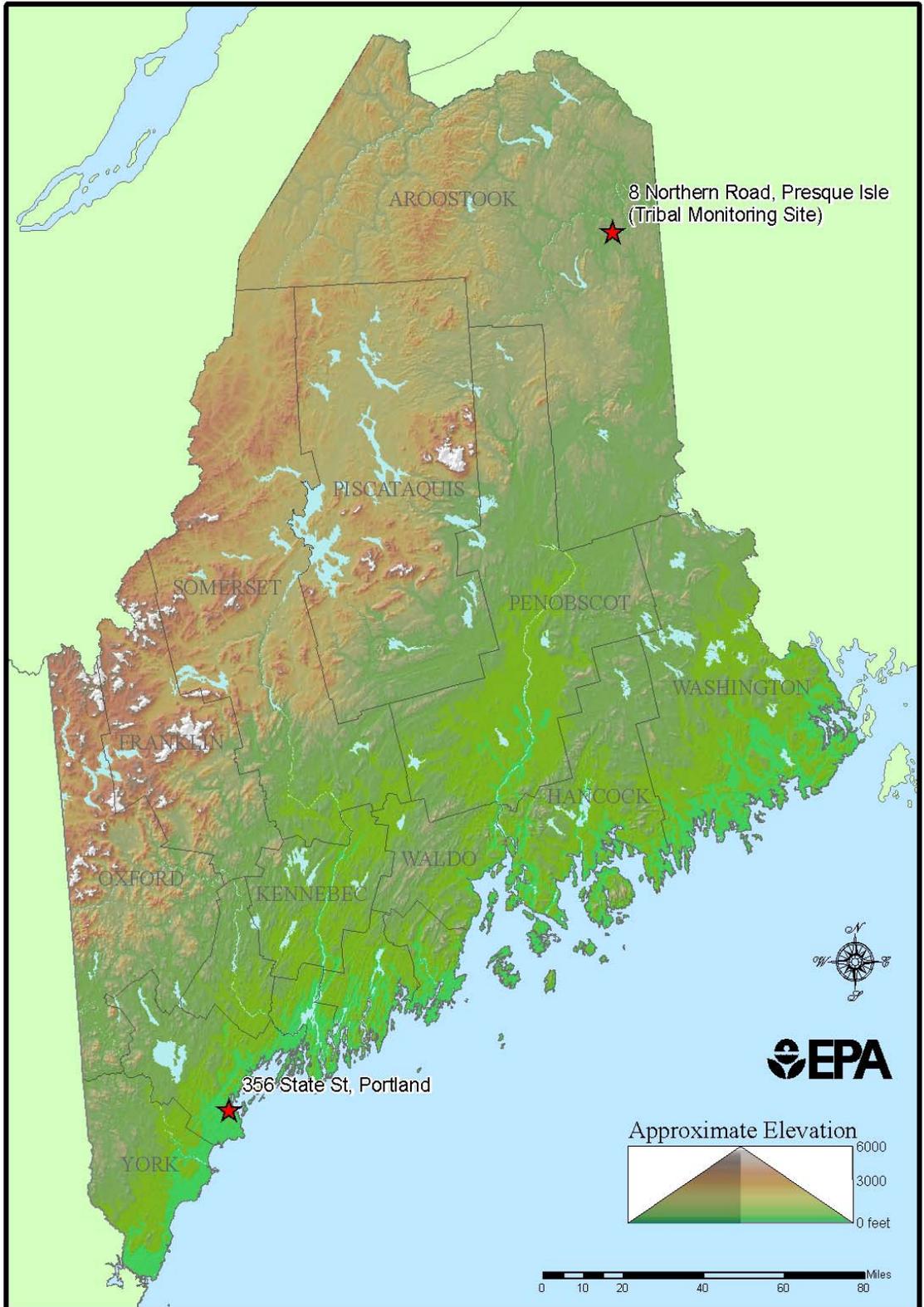
8-hour – 9 ppm, not to be exceeded more than one per year

1-hour – 35 ppm, not to be exceeded more than once per year.

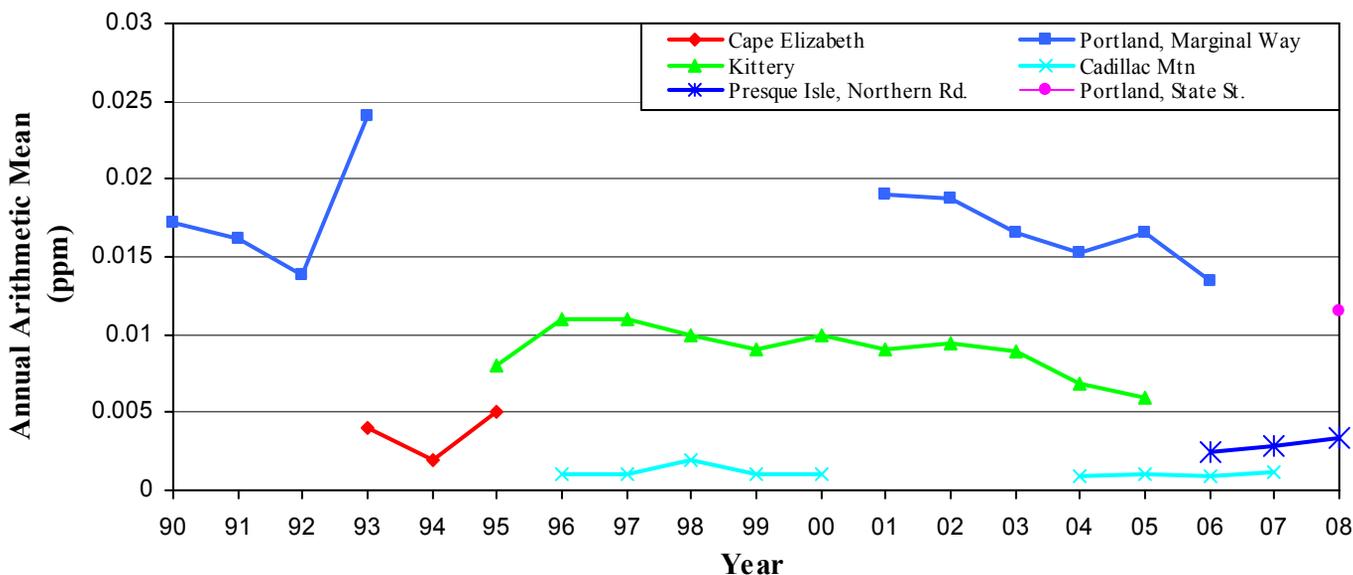
2008													
Maine													
Carbon Monoxide													
All Values are in Units of Parts Per Million													
								1-hour	1-hour		8-hour	8-hour	
	P								2nd			2nd	
	O	Org						#	Highest	Highest	Highest	Highest	
Site ID	C	Type	City	County	Address	Method	Obs	Value	Value	# > 35	Value	Value	# > 9
23-003-1100	1	635	Presque Isle	Aroostook	8 NORTHERN ROAD	554	7176	0.794	0.629	0	0.4	0.4	0
23-005-0029	1	635	Portland	Cumberland	356 STATE STREET	54	5816	1.600	1.400	0	1.3	1.0	0
23-009-0103	1	635	Not in a city	Hancock	MCFARLAND HILL	554	7082	0.426	0.400	0	0.4	0.3	0

In 2008, the State of Maine operated two low-level trace carbon monoxide (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 2008 - Nitrogen Dioxide



# Maine Nitrogen Dioxide Data

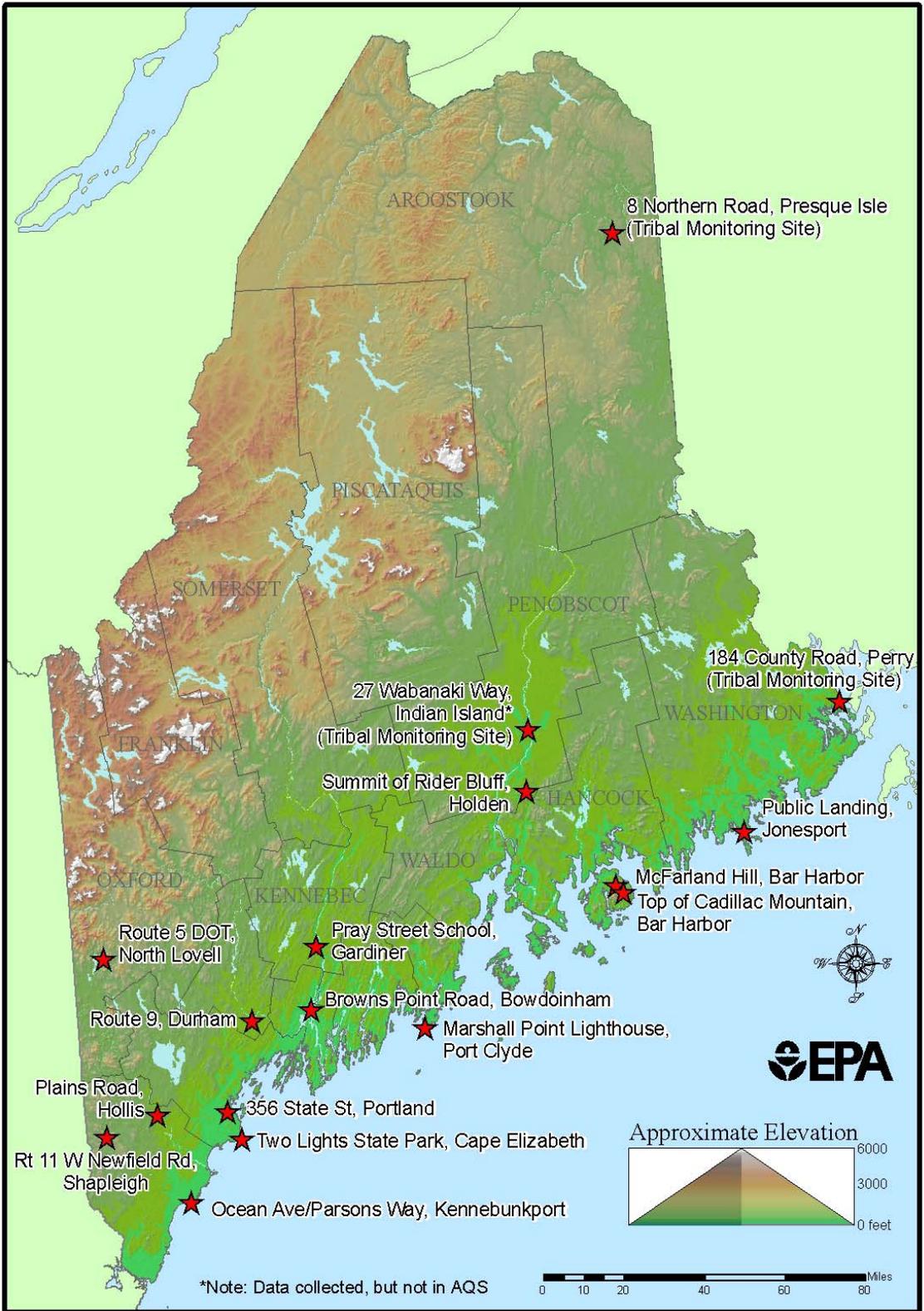


NAAQS for Nitrogen Dioxide:  
Annual Arithmetic Mean 0.053 ppm (100 µg/m<sup>3</sup>)

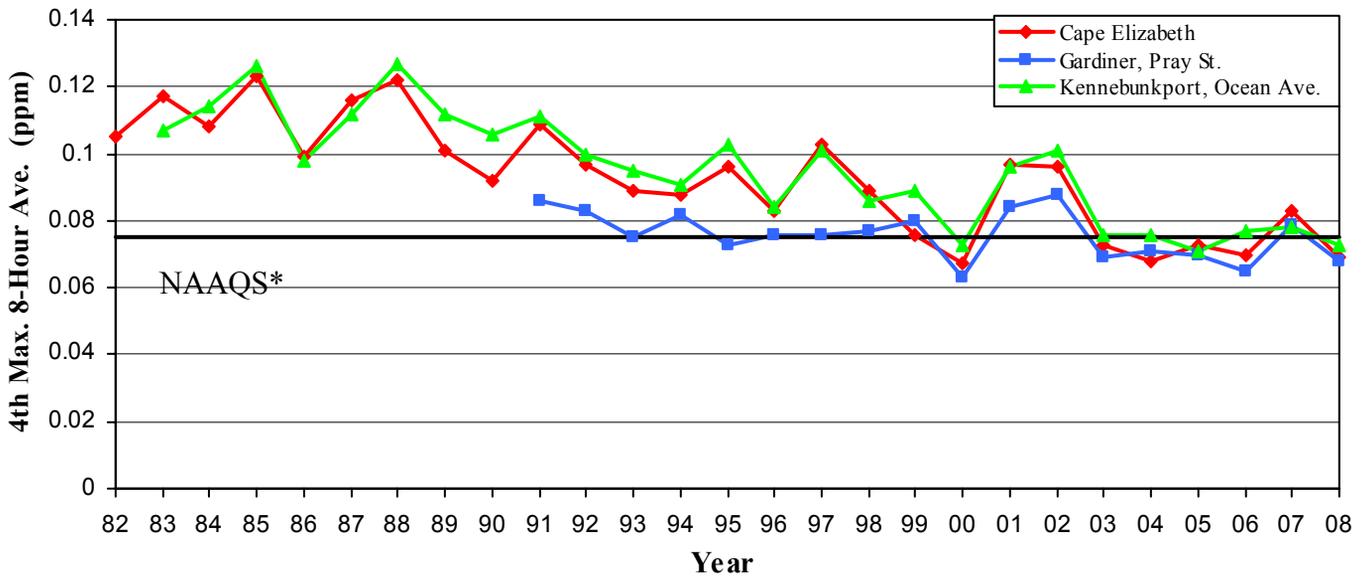
2008 NO <sub>2</sub>										
Maine										
Parameter: Nitrogen Dioxide										
All Values are in Units of Parts Per Million										
								1-hour	1-hour	
	P								2nd	Annual
Site ID	O Rept.	C Org.	City	County	Address	Method	# Obs	Highest Value	Highest Value	Arith. Mean
23-003-1100	1	635	Presque Isle	Aroostook	8 NORTHERN ROAD	74	8125	0.034	0.031	0.0030 *
23-005-0029	1	635	Portland	Cumberland	356 STATE STREET	75	7619	0.064	0.064	0.0115
*Indicates that the mean does not meet summary criteria										

There were two nitrogen dioxide (NO<sub>2</sub>) monitoring sites that operated during 2008, 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 are well below the NAAQS.

# Maine Sites 2008 - Ozone



# Maine Ozone 8-Hour Data



\*NAAQS for Ozone:

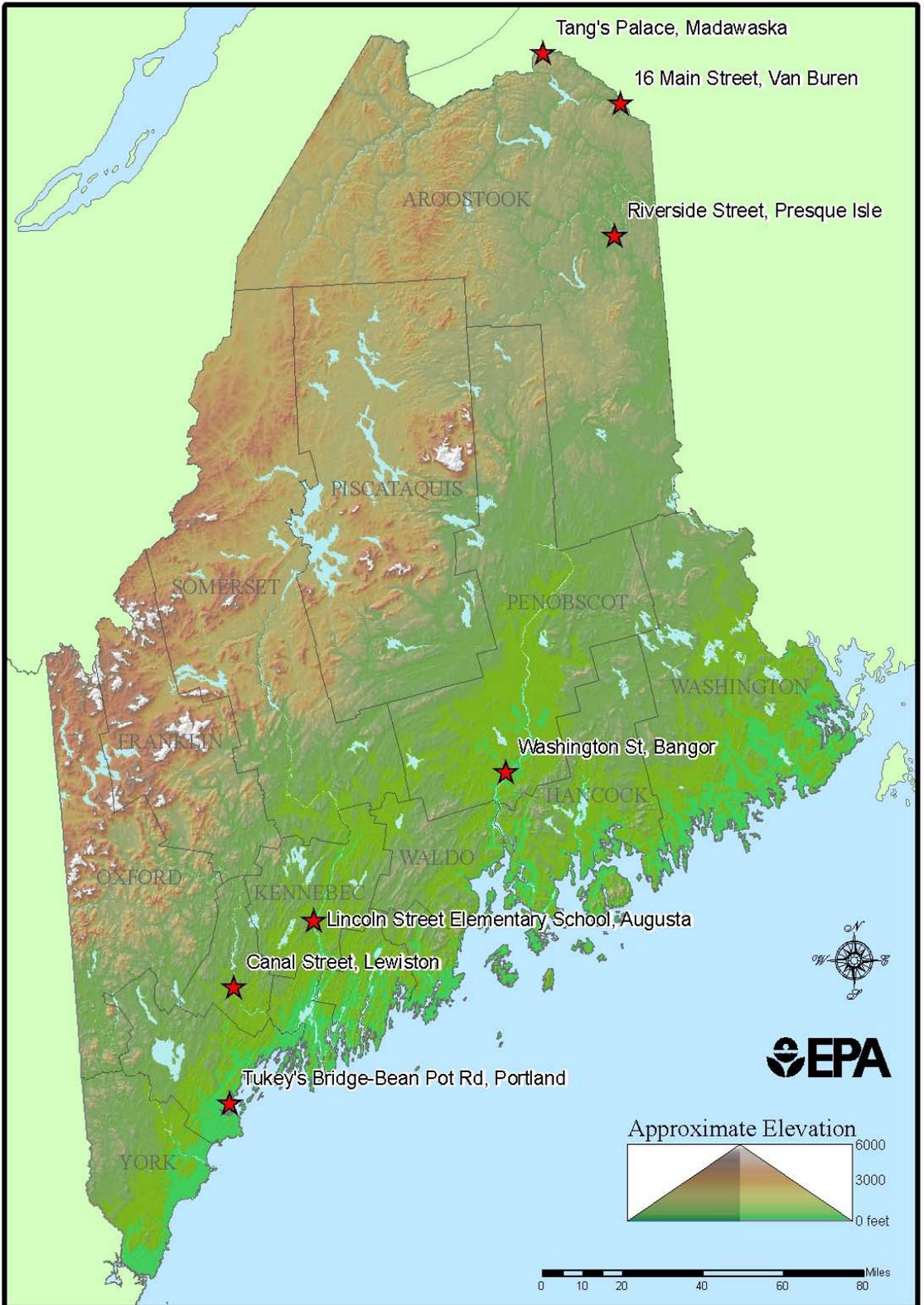
8-hour – 0.075 ppm (2008 std)

(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 0.075ppm. This graph represents the 4<sup>th</sup> 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.)

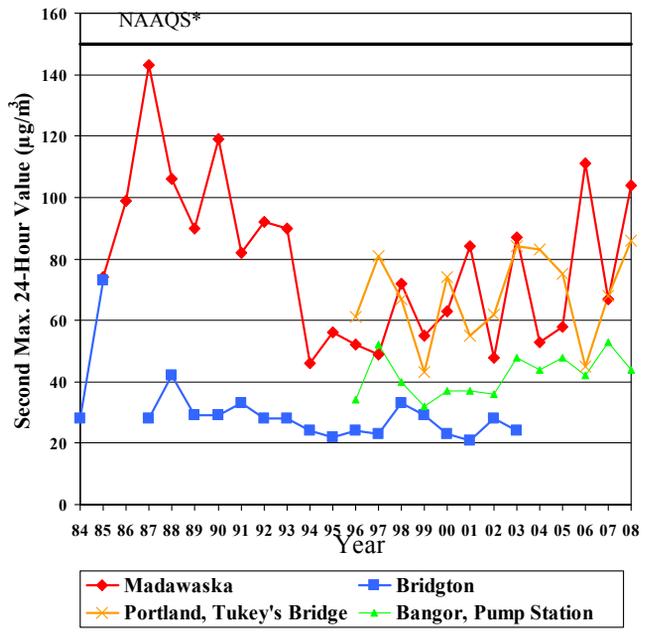
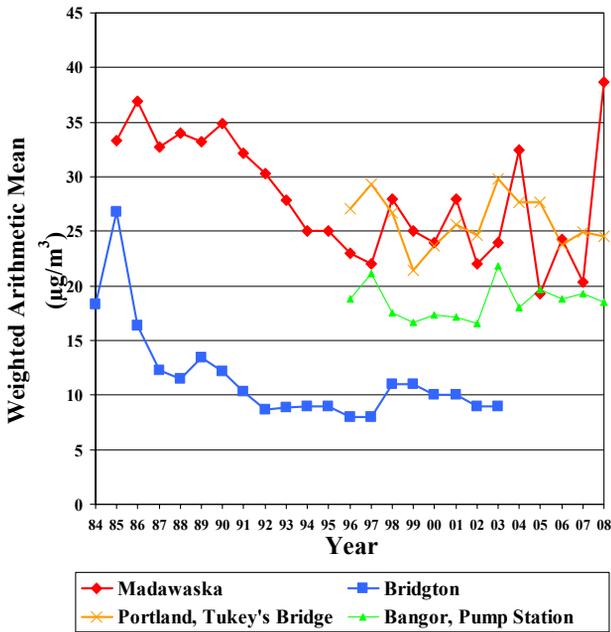
2008													
Maine													
Parameter: Ozone (8-Hour)													
All Values are in Units of Parts Per Million													
	P					Valid	Num		2nd	3rd	4th	Days	
	O				Method	%	Days	Required	Highest	Highest	Highest	Highest	Max >
Site ID	City	County	Address			Obs	Meas.	Days	8-Hr Value	8-Hr Value	8-Hr Value	8-Hr Value	0.075
23-001-0014	Durham	Androscoggin	ROUTE 9		47	99	182	183	0.079	0.075	0.072	0.070	1
23-003-1100	Presque Isle	Aroostook	8 NORTHERN ROAD		47	98	179	183	0.067	0.066	0.055	0.054	0
23-005-0029	Portland	Cumberland	356 STATE STREET		47	99	182	183	0.070	0.065	0.063	0.061	0
23-005-2003	Cape Elizabeth	Cumberland	TWO LIGHTS STATE PARK		47	99	182	183	0.076	0.075	0.070	0.069	1
23-009-0102	Bar Harbor	Hancock	TOP OF CADILLAC MOUNTAIN		47	95	174	183	0.078	0.075	0.074	0.074	1
23-009-0103	Bar Harbor	Hancock	MCFARLAND HILL		47	99	181	183	0.070	0.067	0.065	0.064	0
23-011-2005	Gardiner	Kennebec	PRAY STREET SCHOOL		47	98	180	183	0.071	0.069	0.068	0.068	0
23-013-0004	Port Clyde	Knox	MARSHALL POINT LIGHTHOUSE		47	100	183	183	0.068	0.061	0.061	0.061	0
23-017-3001	Lovell	Oxford	ROUTE 5, NORTH LOVELL DOT		47	97	177	183	0.065	0.064	0.063	0.059	0
23-019-4008	Holden	Penobscot	SUMMIT OF RIDER BLUFF		47	98	179	183	0.072	0.071	0.068	0.062	0
23-023-0006	Bowdoinham	Sagadahoc	BROWN'S POINT ROAD		47	95	139	146	0.072	0.072	0.071	0.065	0
23-029-0019	Jonesport	Washington	JONESPORT - PUBLIC LANDING		47	98	179	183	0.060	0.060	0.059	0.058	0
23-029-0032	Perry	Washington	184 COUNTY ROAD		47	100	183	183	0.064	0.058	0.056	0.056	0
23-031-0038	Hollis	York	PLAINS ROAD,		47	97	177	183	0.075	0.070	0.063	0.061	0
23-031-0040	Shapleigh	York	Rt. 11, WEST NEWFIELD ROAD		47	99	109	110	0.061	0.060	0.060	0.057	0
23-031-2002	Kennebunkport	York	OCEAN AVE/PARSONS WAY		47	100	183	183	0.080	0.077	0.076	0.073	3

During 2008, none of Maine's 16 ozone (O<sub>3</sub>) 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 high value of 0.074 ppm and the Kennebunkport - Ocean Ave. at Parsons Way site recorded a fourth highest value of 0.073 ppm. The Kennebunkport site recorded the highest 8-hour ozone concentration at 0.080 ppm. O<sub>3</sub> levels in 2008 were similar to those recorded over the past several years.

**Maine Sites 2008 - Particulate Matter < 10 Microns**



# Maine Particulate Matter < 10 Microns (PM10) Data



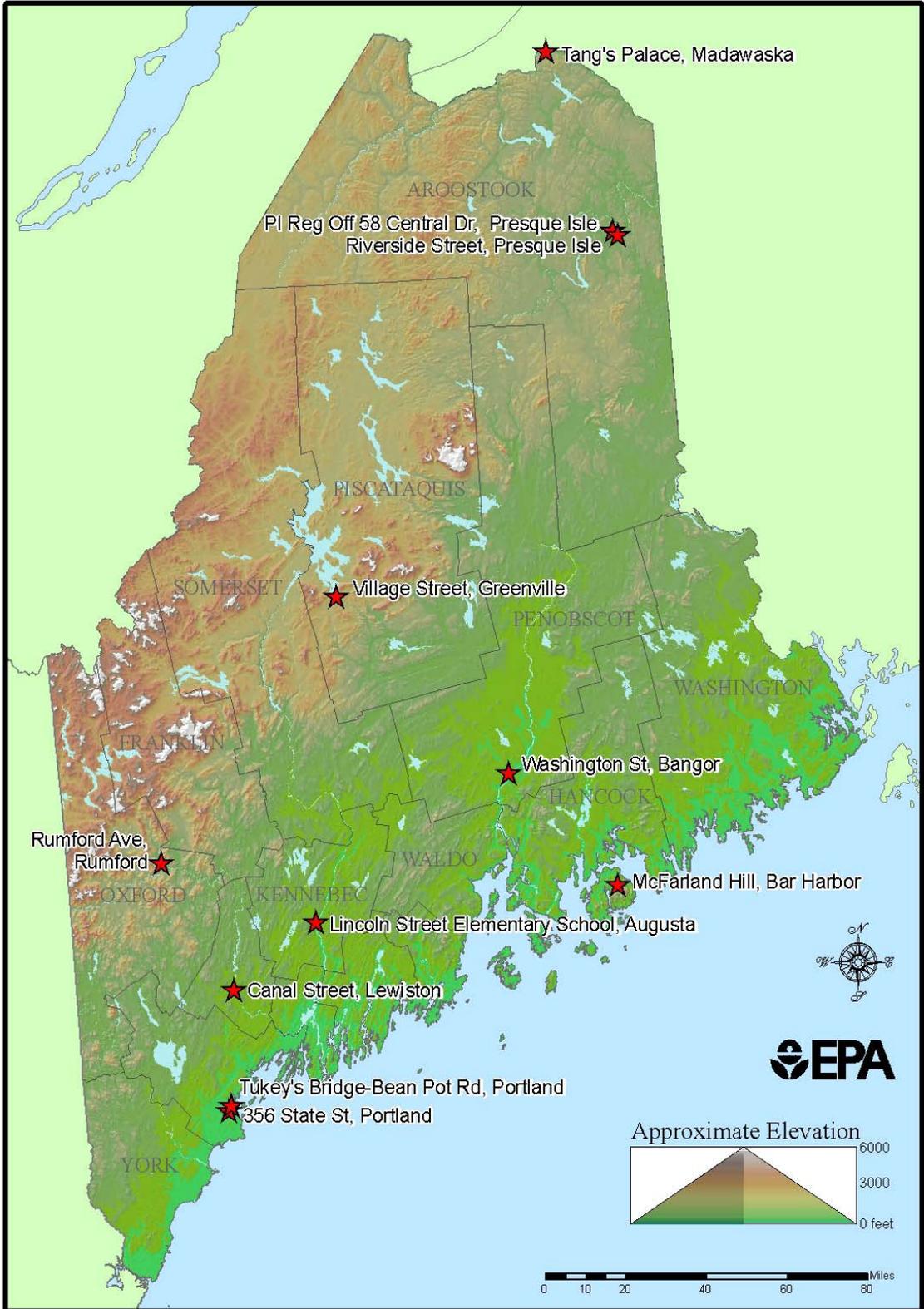
\*NAAQS for Particulate Matter less than 10 Microns:  
24-hour 150 µg/m<sup>3</sup>

Maine																		
Particulate Matter < 10 Microns																		
ug/m <sup>3</sup>																		
SITE ID	P O C	Rep. Org	City	County	Address	Meth	# Obs	# Req.	Days	Valid % Obs	Highest Value	2nd	3rd	4th	Days Est.	Days Wtd.		
												Highest Value	Highest Value	Highest Value	Max >150	Max >150	Arith. Mean	
23-001-0011	2	635	Lewiston	Androscoggin	COUNTRY KITCHEN		126	54	61	54	89	46	38	33	31	0	0	15.7
23-003-0013	3	635	Madawaska	Aroostook	TANG'S PALACE		127	114	182	114	63	120	104	102	90	0	0	38.7 *
23-003-1011	2	635	Presque Isle	Aroostook	RIVERSIDE STREET		79	8418	366	348	95	90	74	73	71	0	0	14.7
23-003-1019	1	635	Van Buren	Aroostook	16 MAIN STREET		127	40	61	40	66	62	54	53	50	0	0	27.3 *
23-005-0015	2	635	Portland	Cumberland	TUKEY'S BR. BEAN POT RD		126	57	61	57	93	121	86	80	56	0	0	24.5
23-005-0015	3	635	Portland	Cumberland	TUKEY'S BR. BEAN POT RD		126	28	30	28	93	123	70	51	46	0	0	27
23-011-0016	2	635	Augusta	Kennebec	LINCOLN ST.		126	55	61	55	90	36	35	26	25	0	0	13.8
23-019-0002	3	635	Bangor	Penobscot	WASHINGTON ST.		126	55	61	54	89	51	44	43	41	0	0	18.5 *
23-019-0016	1	0635	Bradley	Penobscot	90 Broad Street		127	115	35	31	89	36	30	21	21	0	0	9.6 *

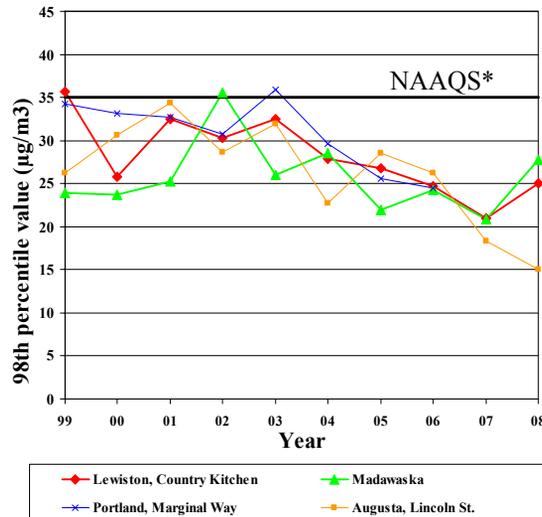
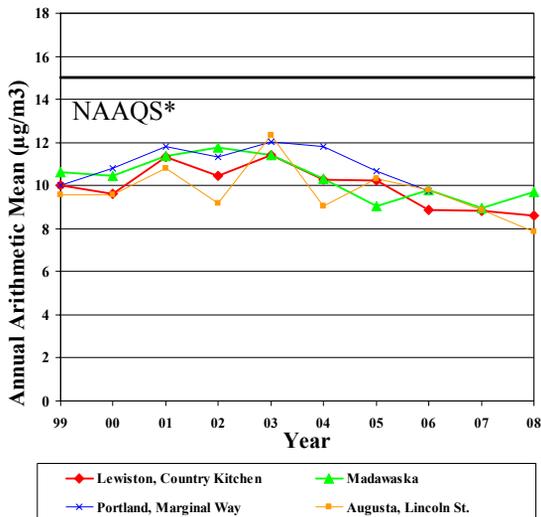
\*Indicates that the mean does not satisfy summary criteria

None of Maine's seven particulate matter sites (including the collocated monitor in Portland) which measured particles of 10 microns or less (PM<sub>10</sub>) reported any exceedances of the 24-hour NAAQS during 2008. The second highest 24-hour PM<sub>10</sub> concentration was recorded at the Madawaska monitoring site at 104 ug/m<sup>3</sup>.

Maine Sites 2008 - Particulate Matter < 2.5 Microns



# Maine Particulate Matter < 2.5 Microns (PM<sub>2.5</sub>) Data



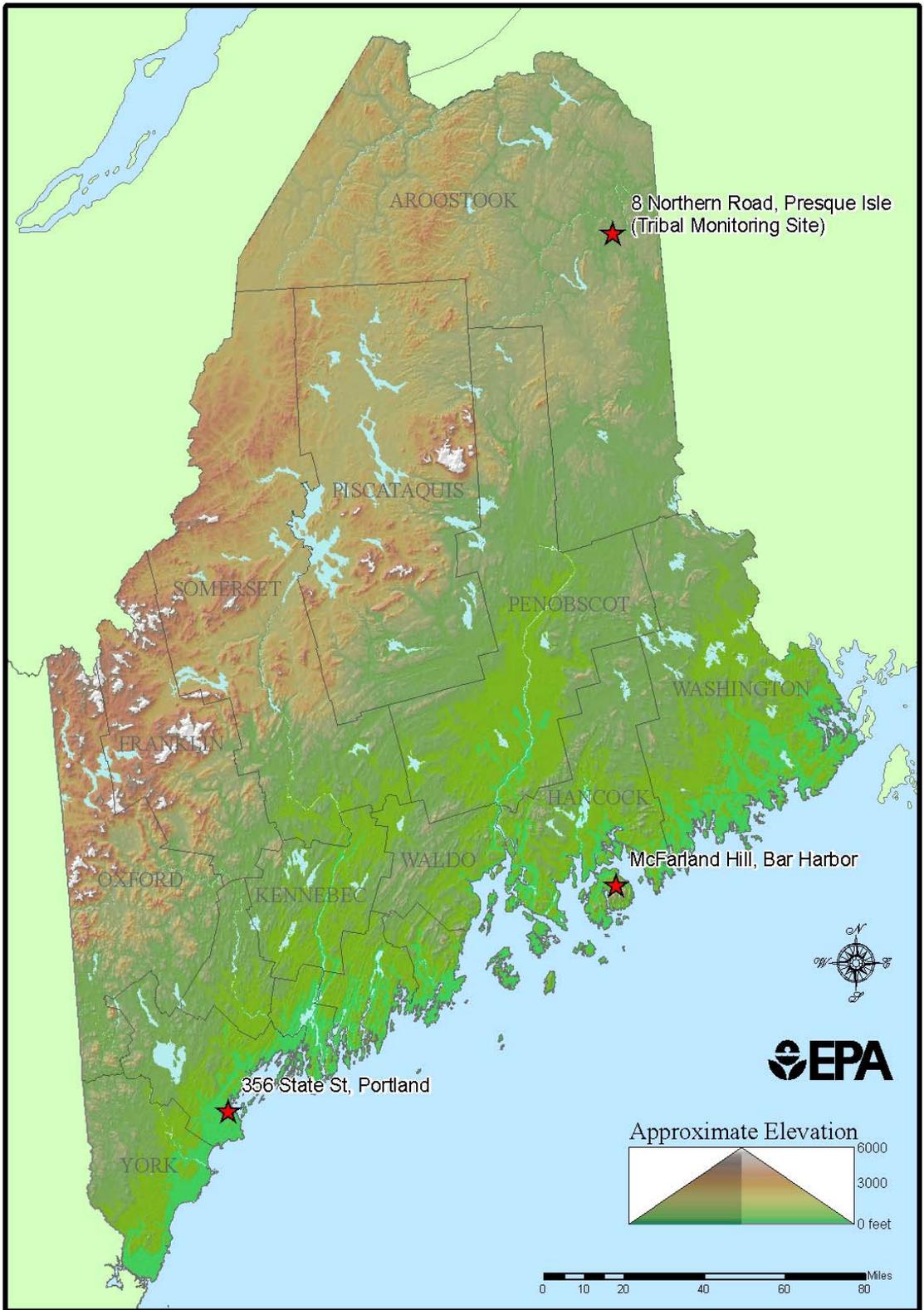
\*NAAQS for Particulate Matter less than 2.5 Microns:  
 Primary: Annual Arithmetic Mean - 15.0 µg/m<sup>3</sup>  
 Secondary: the 3-year average of the 98th percentile of 24-hour concentrations at each population-oriented monitor <35 µg/m<sup>3</sup>

2008													
Maine													
Parameter: PM 2.5													
All Values are in UG/CU Meters Local Conditions													
	P												
	O	Rept.											
Site ID	C	Org.	City	County	Address	Method	# Obs	Highest Value	2nd Highest Value	3rd Highest Value	4th Highest Value	98th Percentile Value	Wtd. Arith. Mean
23-001-0011	1	635	Lewiston	Androscoggin	COUNTRY KITCHEN, CANAL ST.	118	108	50.2	33.2	25.0	21.3	25.0	8.62 *
23-003-0013	1	635	Madawaska	Aroostook	MADAWASKA TANG'S PALACE	118	78	28.4	27.8	25.7	25.5	27.8	9.71 *
23-003-1008	1	635	Presque Isle	Aroostook	PI REG OFF 58 CENTRAL DR	117	78	23.0	16.5	14.2	12.8	16.5	5.79 *
23-003-1011	1	635	Presque Isle	Aroostook	RIVERSIDE STREET	118	73	26.8	20.3	18.9	18.4	20.3	7.60 *
23-005-0015	1	635	Portland	Cumberland	TUKEY'S BRIDGE-BEAN POT RD.	118	55	20.2	16.0	15.0	14.8	16.0	8.84
23-005-0029	1	635	Portland	Cumberland	356 STATE STREET	118	113	23.7	19.7	19.0	17.7	19.0	8.82
23-005-0029	2	635	Portland	Cumberland	356 STATE STREET	118	27	16.6	15.1	15.1	14.3	16.6	9.80
23-009-0103	1	635	Bar Harbor	Hancock	MCFARLAND HILL	118	80	20.7	18.6	14.1	12.8	18.6	4.75 *
23-011-0016	1	635	Augusta	Kennebec	LINCOLN ST. ELEMENTARY SCHOOL	117	54	32.7	15.0	14.4	14.0	15.0	7.86 *
23-011-0016	2	635	Augusta	Kennebec	LINCOLN ST. ELEMENTARY SCHOOL	117	26	33.9	15.1	15.0	12.7	33.9	8.96 *
23-017-2011	1	635	Rumford	Oxford	RUMFORD AVENUE	117	51	44.7	16.5	14.3	13.6	16.5	8.61 *
23-019-0002	1	635	Bangor	Penobscot	PUMP STATION-WASHINGTON ST.	118	110	29.2	24.9	23.8	16.9	23.8	7.75 *
23-021-0004	1	635	Greenville	Piscataquis	VILLAGE STREET	118	156	30.1	20.0	18.9	18.5	18.5	5.40 *

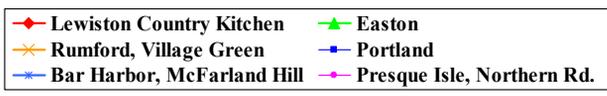
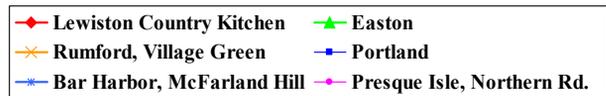
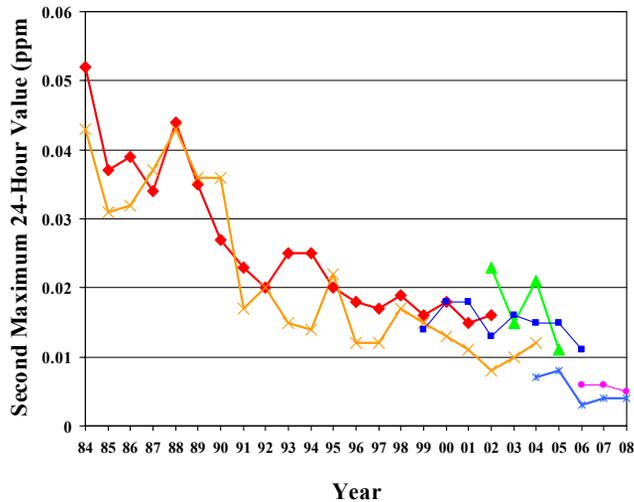
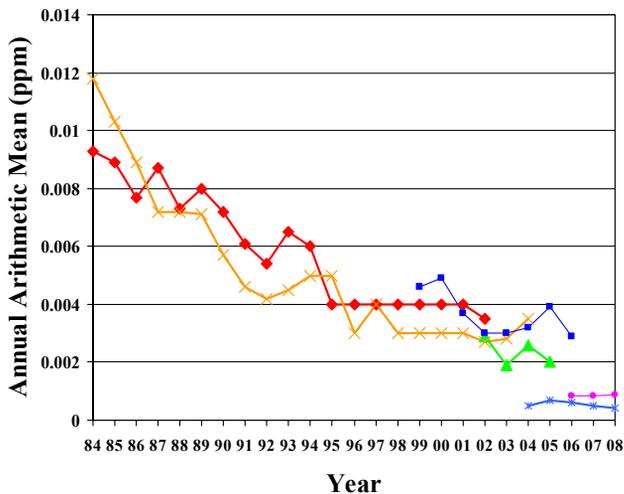
\*Indicates that the mean does not meet summary criteria

During 2008, there were eleven PM<sub>2.5</sub> monitoring sites operating in Maine, with two colocated monitors. Data from all of these sites indicate that none of these sites have recorded PM<sub>2.5</sub> concentrations that would result in an exceedance or violation of either the 24-hour or the annual NAAQS for PM<sub>2.5</sub>. The two Portland sites recorded the highest weighted annual arithmetic means. The Augusta – Lincoln St. site recorded the highest 98<sup>th</sup> percentile 24-hour value at 33.9 µg/m<sup>3</sup>. The annual arithmetic mean trend graph remains relatively flat.

Maine Sites 2008 - Sulfur Dioxide



# Maine Sulfur Dioxide Data



**NAAQS for Sulfur Dioxide:**

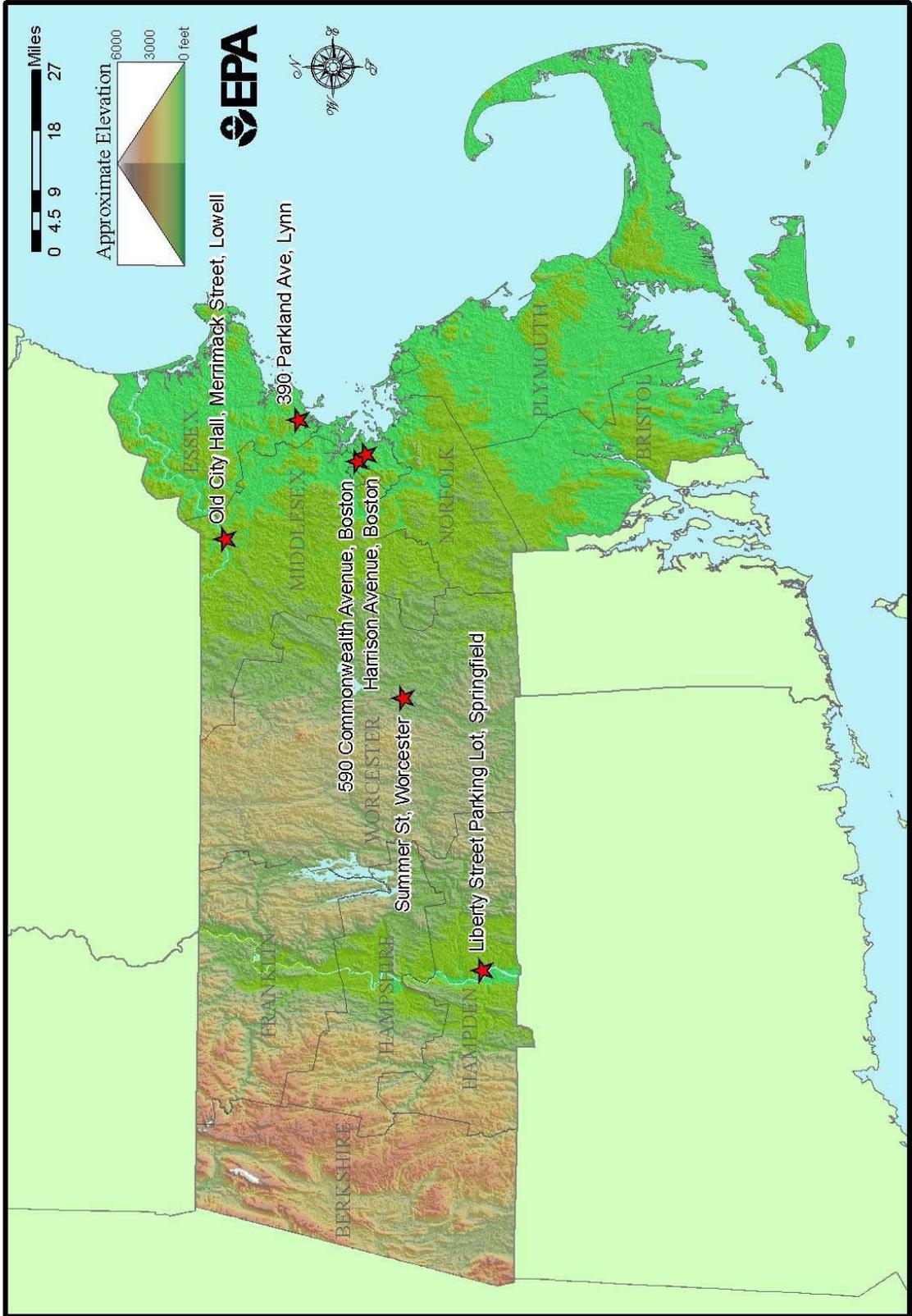
Primary: Annual Arithmetic Mean - 0.03ppm  
 24-hour 0.14ppm

Secondary: 3-hour 0.5ppm

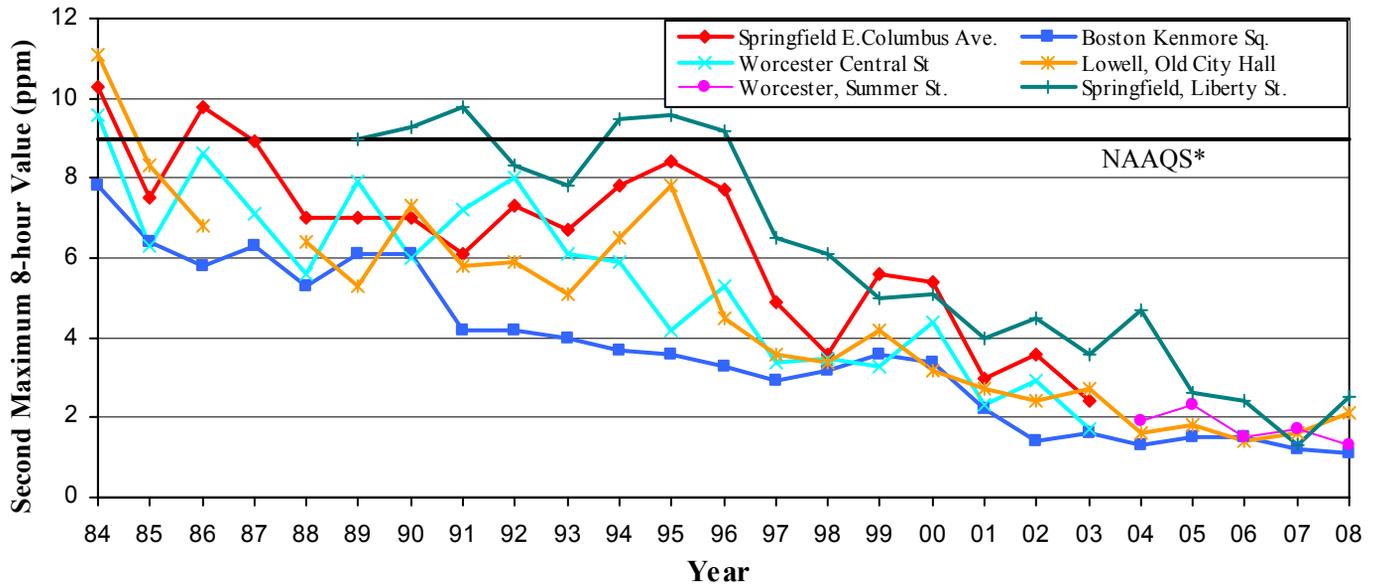
2008																
Maine																
Parameter: Sulfur Dioxide																
All Values are in Units of Parts Per Million																
	P						24-hour	24-hour		3-hour	3-hour		1-hour	1-hour		
	O	Org				#	hour	hour	Obs	Highest	Highest	Obs	Highest	Highest	Arith.	
Site ID	C	Type	City	County	Address	Method	Obs	Highest	Highest	> 0.14	Value	Value	> 0.5	Value	Value	Mean
23-003-1100	1	635	Presque Isle	Aroostook	8 NORTHERN ROAD	560	7946	0.005	0.005	0	0.011	0.010	0	0.0161	0.0151	0.00088
23-005-0029	1	635	Portland	Cumberland	356 STATE STREET	60	8112	0.012	0.012	0	0.028	0.025	0	0.0470	0.0410	0.00270
23-009-0103	1	635	Bar Harbor	Hancock	MCFARLAND HILL	560	7198	0.005	0.004	0	0.007	0.005	0	0.0074	0.0073	0.00040

In 2008, there were no exceedances or violations of the sulfur dioxide (SO<sub>2</sub>) NAAQS at any of the three SO<sub>2</sub> monitoring sites in Maine. The Portland Deering Oaks site recorded the second highest 3-hour, second highest 24-hour, and arithmetic mean SO<sub>2</sub> concentrations at 0.025 ppm, 0.012 ppm, and 0.0027 ppm respectively, all well below the standards. The trend for SO<sub>2</sub> concentrations shows a general decline despite small year-to-year variability.

# Massachusetts Sites - 2008 - Carbon Monoxide



# Massachusetts Carbon Monoxide Data



\*NAAQS for Carbon Monoxide:

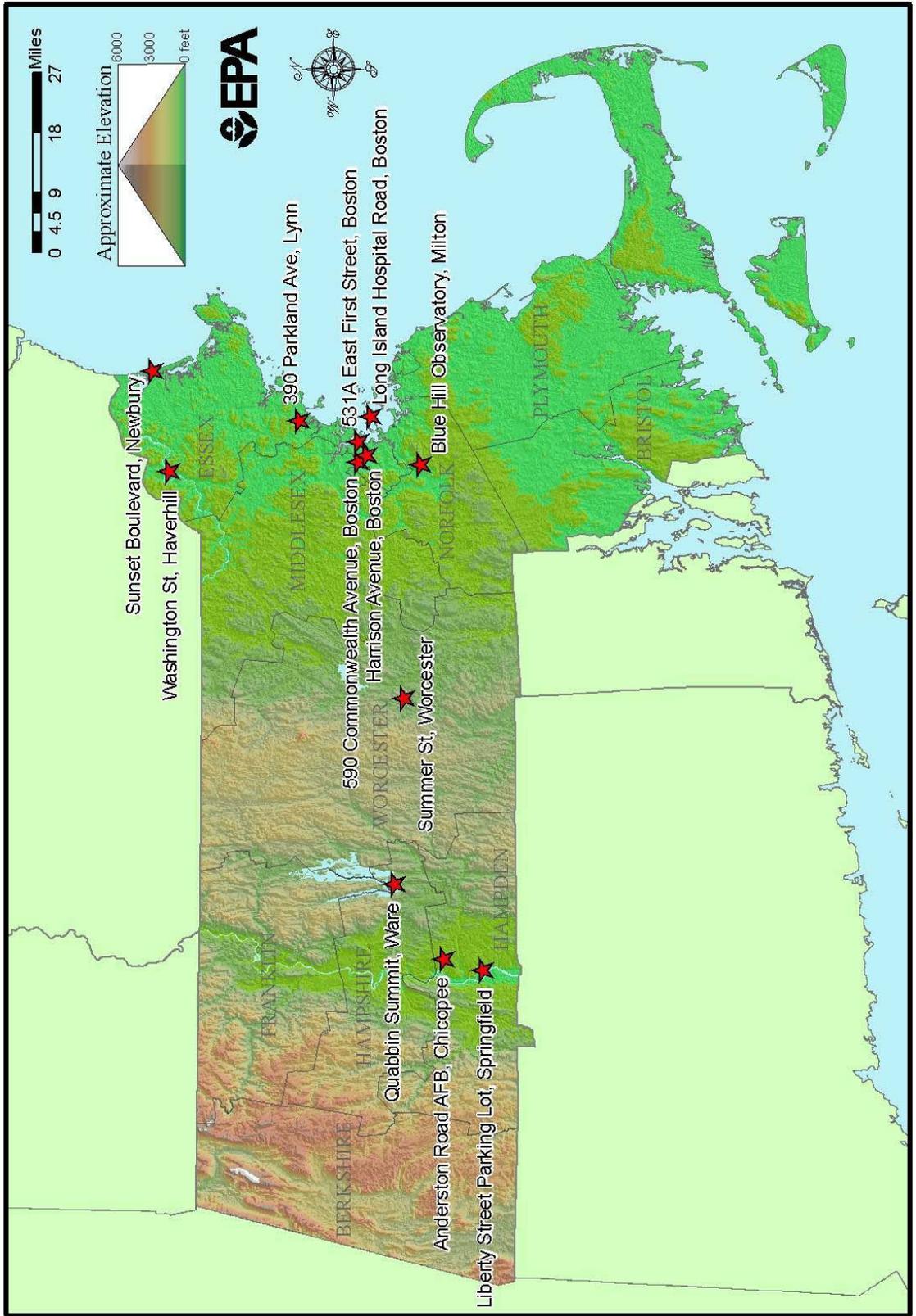
8-hour – 9 ppm, not to be exceeded more than once per year

1-hour – 35 ppm, not to be exceeded more than once per year

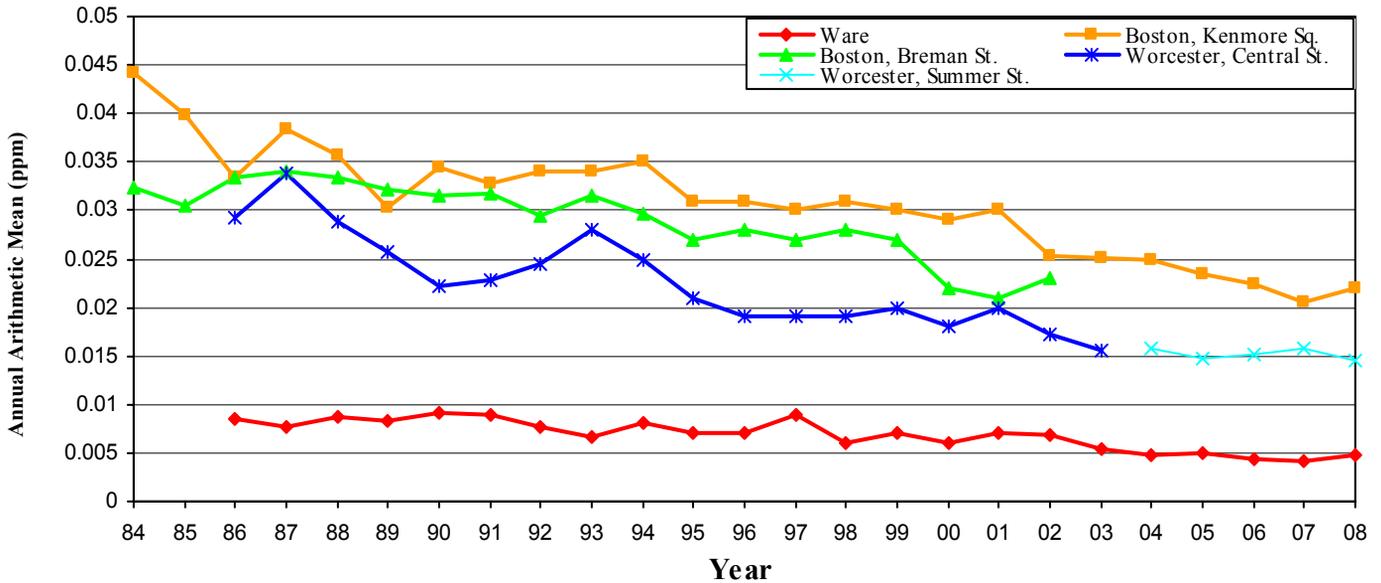
2008															
Massachusetts															
Carbon Monoxide															
All Values are in Units of Parts Per Million															
Site ID	P	O	C	Type	City	County	Address	Method	#	1-hour	1-hour	8-hour	8-hour		
										Highest	Highest	Highest	Highest		
									Obs	Value	Value	# > 35	Value	Value	# > 9
25-009-2006	1		660	Lynn	Essex	390 PARKLAND	593	7179	0.875	0.737	0	0.5	0.4	0	
25-013-0016	1		660	Springfield	Hampden	LIBERTY P-LOT	93	7956	3.400	3.400	0	3.0	2.5	0	
25-017-0007	1		660	Lowell	Middlesex	MERRIMACK ST	93	8204	3.700	3.200	0	2.6	2.1	0	
25-025-0002	1		660	Boston	Suffolk	KENMORE SQ	93	8155	1.700	1.600	0	1.3	1.1	0	
25-025-0042	1		660	Boston	Suffolk	HARRISON AV	0	8273	1.500	1.500	0	1.1	1.0	0	
25-027-0023	1		660	Worcester	Worcester	SUMMER ST	67	8201	2.800	2.700	0	1.7	1.3	0	

Massachusetts operated six carbon monoxide (CO) ambient monitoring sites in 2008, 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), 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 Springfield site and was 2.5 ppm, a slight increase over the previous year.

# Massachusetts Sites - 2008 - Nitrogen Dioxide



# Massachusetts Nitrogen Dioxide Data

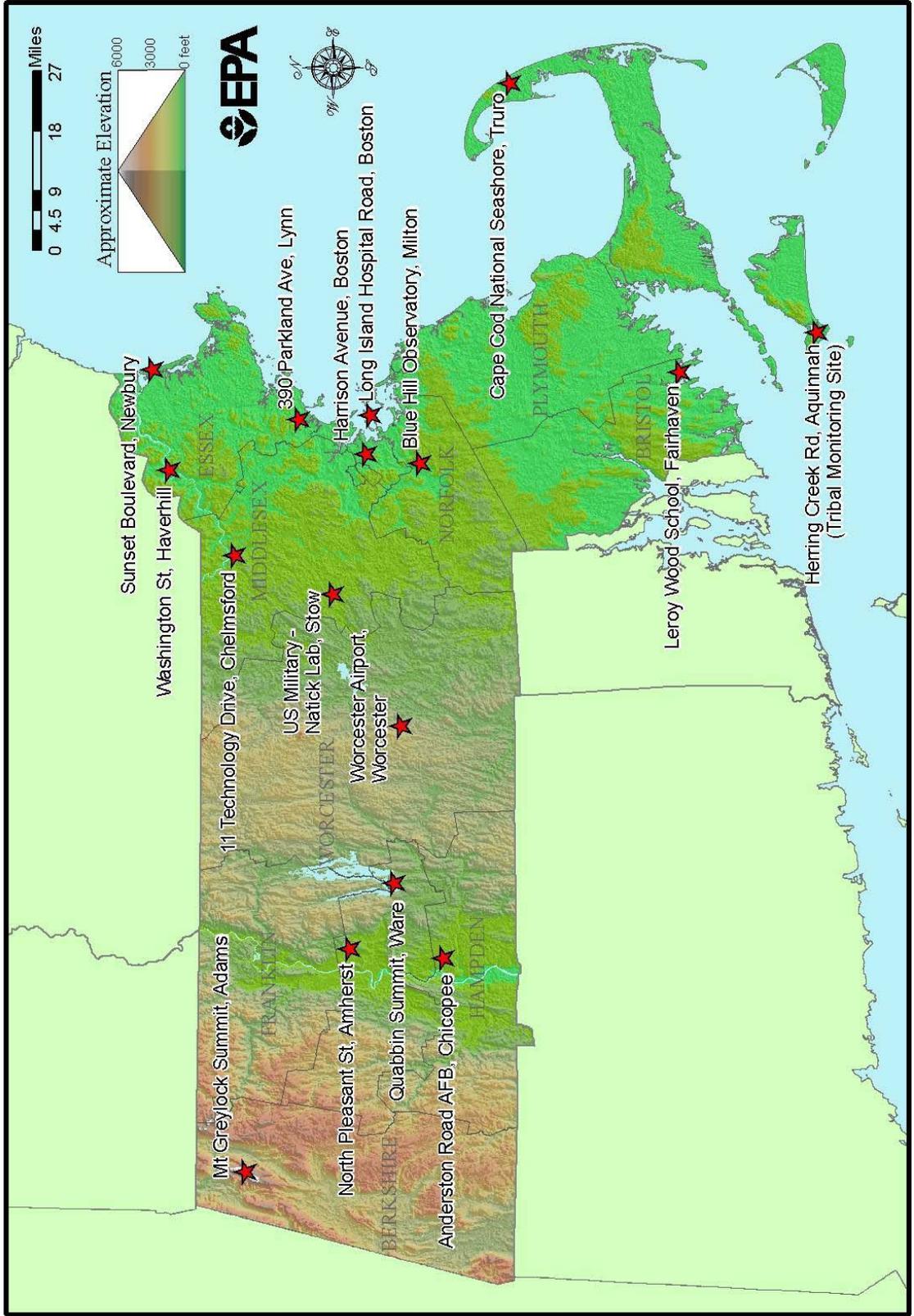


NAAQS for Nitrogen Dioxide:  
Annual Arithmetic Mean 0.053 ppm (100 µg/m<sup>3</sup>)

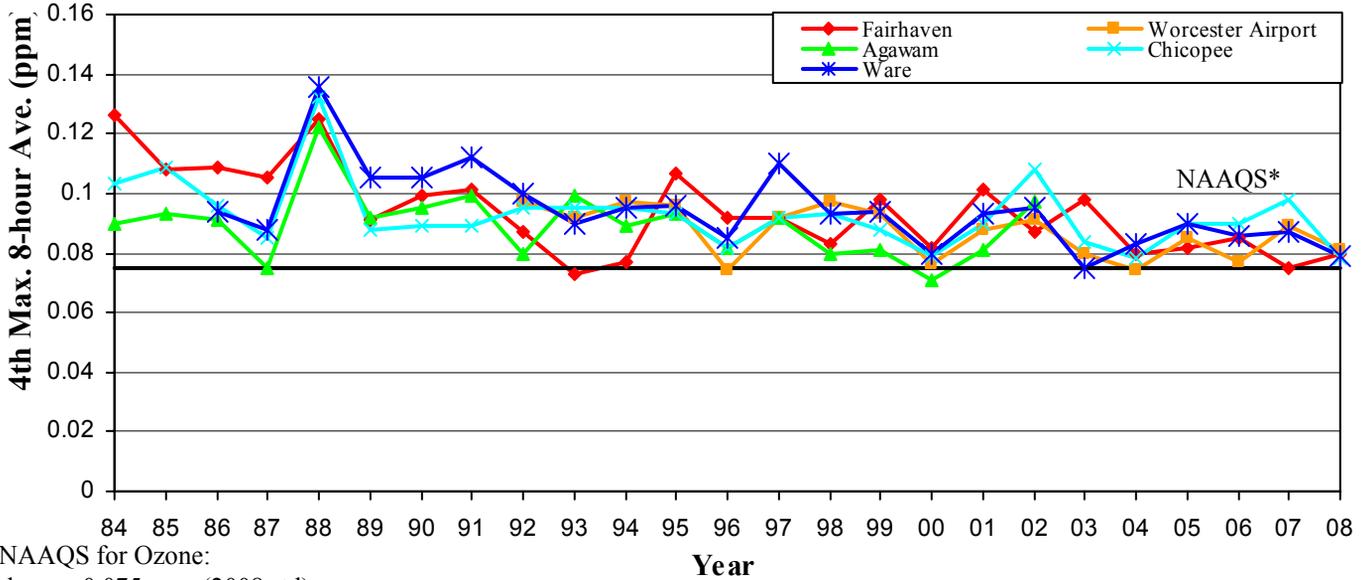
2008 NO2										
Massachusetts										
Parameter: Nitrogen Dioxide										
All Values are in Units of Parts Per Million										
								1-hour	1-hour	
	P								2nd	Annual
Site ID	O Rept.	C Org.	City	County	Address	Method	# Obs	Highest Value	Highest Value	Arith. Mean
25-009-2006	1	660	Lynn	Essex	390 PARKLAND	99	8102	0.061	0.061	0.0079
25-009-4004	1	660	Newbury	Essex	SUNSET BLVD	99	4108	0.024	0.023	0.0030
25-009-5005	1	660	Haverhill	Essex	CONSENTINO SCHOOL	99	8457	0.049	0.048	0.0081
25-013-0008	1	660	Chicopee	Hampden	ANDERSON RD AFB	99	8235	0.048	0.048	0.0084
25-013-0016	1	660	Springfield	Hampden	LIBERTY P-LOT	99	8414	0.061	0.060	0.0165
25-015-4002	1	660	Ware	Hampshire	QUABBIN SUMMIT	99	8007	0.040	0.037	0.0047
25-021-3003	1	660	Milton	Norfolk	BLUE HILL OBS	99	4192	0.032	0.031	0.0045
25-025-0002	1	660	Boston	Suffolk	KENMORE SQ	99	8377	0.071	0.071	0.0219
25-025-0040	1	345	Boston	Suffolk	531A EAST FIRST STREET	74	8544	0.166	0.163	0.0163
25-025-0041	1	660	Boston	Suffolk	LONG ISLAND	99	4170	0.054	0.050	0.0070
25-025-0042	1	660	Boston	Suffolk	HARRISON AVE	99	8402	0.063	0.062	0.0197
25-027-0023	1	660	Worcester	Worcester	SUMMER ST	99	8119	0.095	0.074	0.0146

Nitrogen dioxide (NO<sub>2</sub>) measurements were made at 12 monitoring sites in Massachusetts during 2008. The highest 1-hour concentrations of NO<sub>2</sub> were recorded at monitors in Boston and Worcester. The highest annual mean NO<sub>2</sub> concentration was recorded at Kenmore Square (0.0219 ppm), well below the NAAQS. A generally downward trend in NO<sub>2</sub> concentration can be detected in the twenty-five year trend data.

# Massachusetts Sites - 2008 - Ozone



# Massachusetts Ozone 8-Hour Data



\*NAAQS for Ozone:

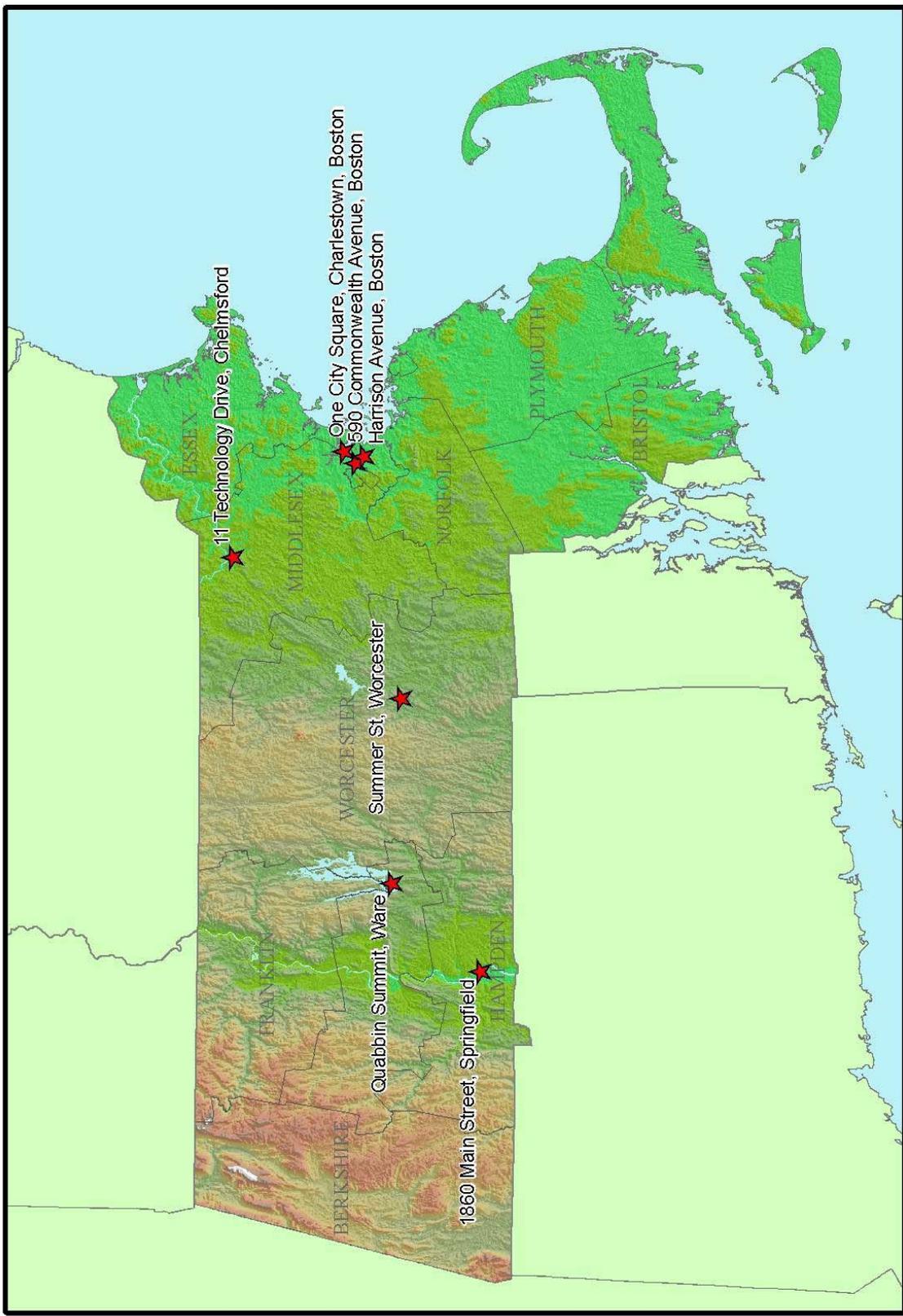
8-hour – 0.075 ppm (2008 std)

(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 0.075ppm. This graph represents the 4<sup>th</sup> 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.)

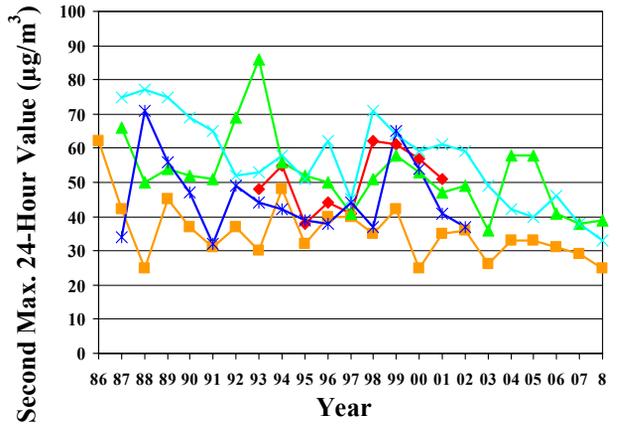
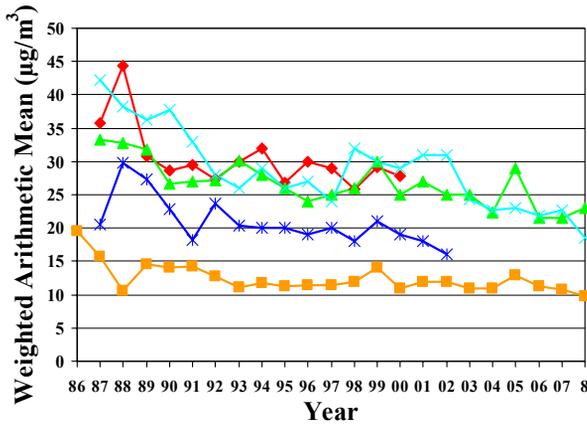
2008															
Massachusetts															
Parameter: Ozone (8-Hour)															
All Values are in Units of Parts Per Million															
	P							Valid	Num		2nd	3rd	4th	Days	
Site ID	O	Rept.					%	Days	Required	Highest	Highest	Highest	Highest	Max >	
	C	Org.	City	County	Address	Method	Obs	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	98	179	183	0.106	0.086	0.082	0.075	3
25-003-4002	1	660	Adams	Berkshire	MT GREYLOCK SUMMIT		87	79	144	183	0.100	0.092	0.075	0.072	2
25-005-1002	1	660	Fairhaven	Bristol	LEROY WOOD SCH		87	98	180	183	0.088	0.085	0.082	0.080	4
25-007-0001	1	660	Aquinnah	Dukes	HERRING CREEK RD		87	99	181	183	0.101	0.100	0.087	0.083	5
25-009-2006	1	660	Lynn	Essex	390 PARKLAND		87	99	182	183	0.086	0.081	0.079	0.078	5
25-009-4004	1	660	Newbury	Essex	SUNSET BLVD		87	98	179	183	0.085	0.080	0.077	0.075	3
25-009-5005	1	660	Haverhill	Essex	CONSENTINO SCHOOL		87	99	181	183	0.093	0.084	0.083	0.073	3
25-013-0008	1	660	Chicopee	Hampden	ANDERSON RD AFB		87	99	181	183	0.086	0.085	0.080	0.078	6
25-015-0103	1	660	North Amherst	Hampshire	NORTH PLEASANT ST		87	98	179	183	0.078	0.075	0.074	0.073	1
25-015-4002	1	660	Ware	Hampshire	QUABBIN SUMMIT		87	98	180	183	0.095	0.082	0.079	0.079	7
25-017-0009	1	660	Chelmsford	Middlesex	11 TECHNOLOGY DRIVE		47	88	161	183	0.079	0.071	0.071	0.069	1
25-017-1102	1	660	Stow	Middlesex	US MILITARY RES		87	98	179	183	0.090	0.076	0.075	0.074	2
25-021-3003	1	660	Milton	Norfolk	BLUE HILL OBS		87	98	180	183	0.082	0.078	0.077	0.076	4
25-025-0041	1	660	Boston	Suffolk	LONG ISLAND		87	97	178	183	0.083	0.073	0.072	0.072	1
25-025-0042	1	660	Boston	Suffolk	HARRISON AVE		87	99	181	183	0.066	0.065	0.062	0.062	0
25-027-0015	1	660	Worcester	Worcester	WORCESTER AIRPORT		87	98	179	183	0.104	0.089	0.084	0.081	8

In 2008, nine of the sixteen ozone monitoring sites recorded a fourth highest 8-hour average ozone concentration at or above the level of the 8-hour NAAQS. The highest 4<sup>th</sup> high 8-hour value was on Martha's Vineyard at Aquinnah and measured 0.083 ppm. The highest value was 0.106 ppm at Truro.

# Massachusetts Sites - 2008 - Particulate Matter < 10 Microns



# Massachusetts Particulate Matter < 10 Microns (PM<sub>10</sub>) Data

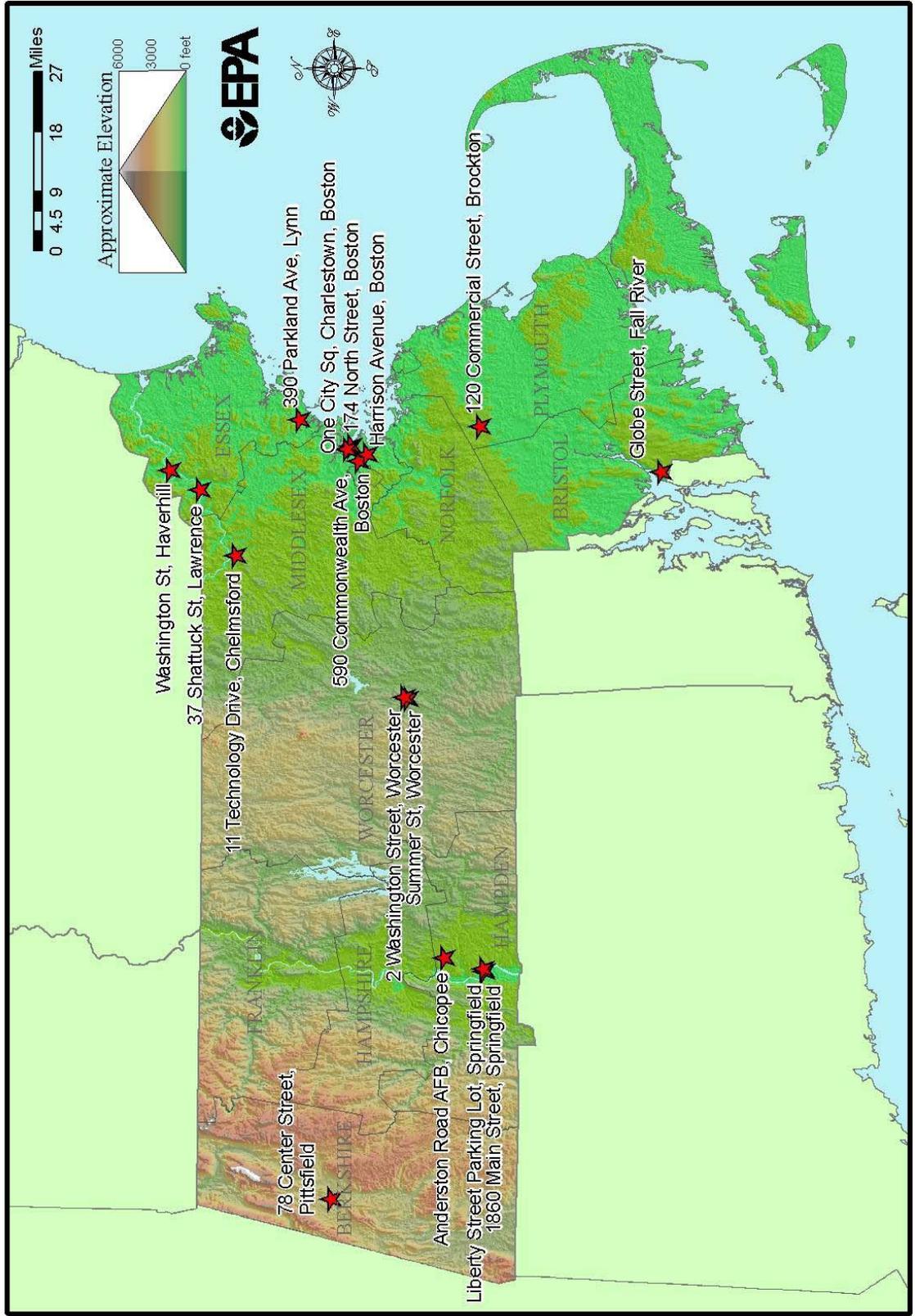


NAAQS for Particulate Matter less than 10 Microns:  
24-hour 150 µg/m<sup>3</sup>

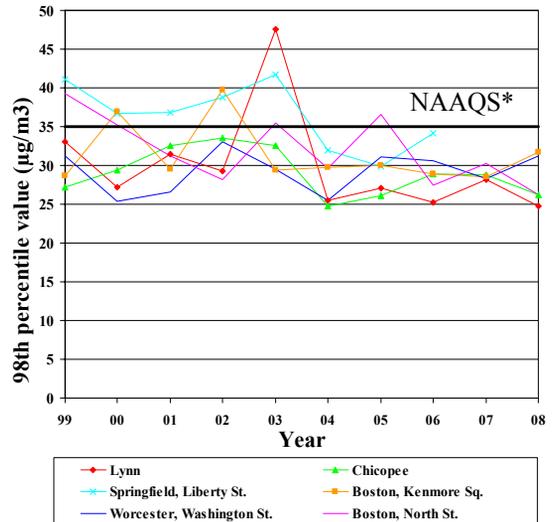
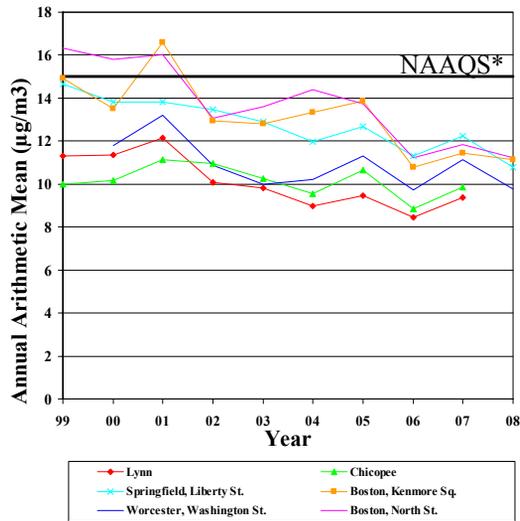
2008																	
Massachusetts																	
Particulate Matter < 10 Microns																	
ug/m <sup>3</sup>																	
SITE ID	P	O	Rep.	City	County	Address	Method	# Obs	# Req.	Number Days	Valid % Obs	Highest Value	2nd	3rd	4th	Days Est.	Days Wtd.
													Highest Value	Highest Value	Highest Value	>150	>150
25-013-2009	4	660	Springfield	Hampden	1860 MAIN ST	127	60	61	60	98	57	35	34	28	0	0	16.6
25-015-4002	4	660	Ware	Hampshire	QUABBIN SUMMIT	127	60	61	60	98	33	25	19	18	0	0	9.8
25-017-0009	1	660	Chelmsford	Middlesex	11 TECHNOLOGY DRIVE	125	61	61	61	100	33	28	25	21	0	0	13.9
25-025-0002	4	660	Boston	Suffolk	KENMORE SQ	127	58	61	58	95	53	39	39	38	0	0	23.0
25-025-0027	4	660	Boston	Suffolk	ONE CITY SQ	127	57	61	57	93	44	33	30	29	0	0	18.5
25-025-0042	1	660	Boston	Suffolk	HARRISON AVE	63	58	61	58	95	28	27	26	25	0	0	14.0
25-025-0042	2	660	Boston	Suffolk	HARRISON AVE	63	55	61	55	90	28	27	24	24	0	0	14.1
25-025-0042	4	660	Boston	Suffolk	HARRISON AVE	127	60	61	60	98	34	34	34	28	0	0	16.7
25-025-0042	5	660	Boston	Suffolk	HARRISON AVE	127	60	61	60	98	35	35	34	27	0	0	16.5
25-027-0023	4	660	Worcester	Worcester	SUMMER ST	127	59	61	59	97	56	42	34	34	0	0	19.4

In 2008, Massachusetts maintained seven ambient monitoring sites (there are colocated monitors at Harrison Ave in Boston) measuring particulate matter less than 10 microns (PM<sub>10</sub>). The second highest 24-hour PM<sub>10</sub> concentration was recorded at the Boston – Kenmore Square site (39 µg/m<sup>3</sup>). Over the past twenty-one years PM<sub>10</sub> levels have shown significant year to year variability especially for the 24-hour sampling period. However, overall PM<sub>10</sub> levels appear to trend down during the time period.

# Massachusetts Sites - 2008 - Particulate Matter < 2.5 Microns



# Massachusetts Particulate Matter < 2.5 Microns (PM<sub>2.5</sub>) Data



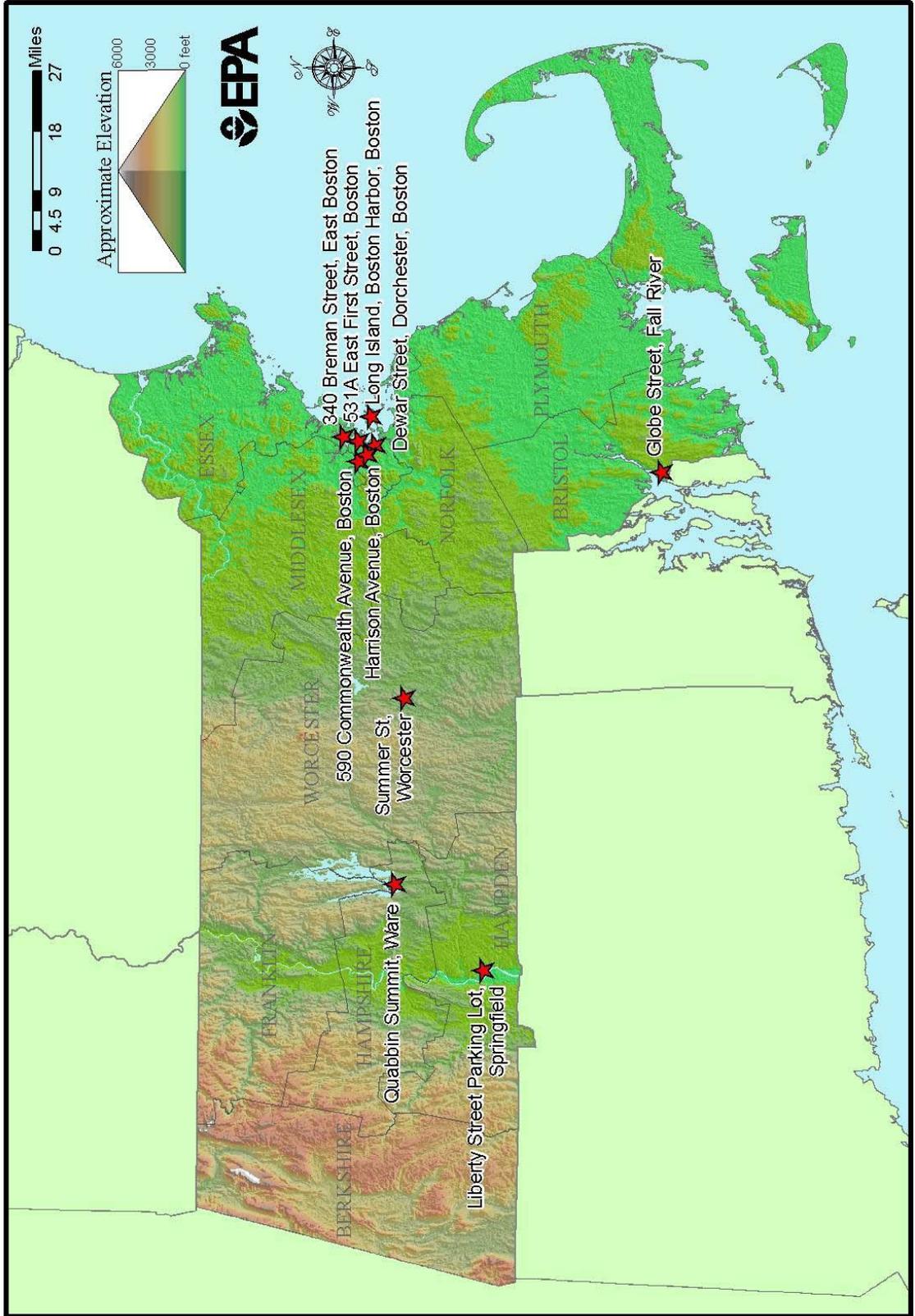
\*NAAQS for Particulate Matter less than 2.5 Microns:  
 Primary: Annual Arithmetic Mean - 15.0 µg/m<sup>3</sup>  
 Secondary: the 3-year average of the 98th percentile of 24-hour concentrations at each population-oriented monitor <35 µg/m<sup>3</sup>

2008													
Massachusetts													
Parameter: PM 2.5													
All Values are in UG/CU Meters Local Conditions													
	P								2nd	3rd	4th	98th	Wtd.
	O	Rept.				#	Highest	Highest	Highest	Highest	Percentile	Arith.	
Site ID	C	Org.	City	County	Address	Method	Obs	Value	Value	Value	Value	Value	
25-003-5001	1	660	Pittsfield	Berkshire	78 CENTER ST	145	120	40.5	27.9	26.6	25.6	26.6	9.94
25-005-1004	1	660	Fall River	Bristol	659 GLOBE ST	145	122	34.3	23.7	23.7	21.4	23.7	9.04
25-009-2006	1	660	Lynn	Essex	390 PARKLAND	145	114	28.8	27.2	24.8	21.8	24.8	8.67
25-009-5005	1	660	Haverhill	Essex	CONSENTINO SCHOOL	145	116	28.2	27.8	24.1	21.3	24.1	8.59
25-009-6001	1	660	Lawrence	Essex	SHATTUCK ST	145	122	29.8	28.3	25.2	20.6	25.2	9.04
25-013-0008	1	660	Chicopee	Hampden	ANDERSON RD AFB	145	118	38.4	26.6	26.2	25.3	26.2	9.2
25-013-0008	2	660	Chicopee	Hampden	ANDERSON RD AFB	145	111	38.0	26.9	26.0	25.5	26.0	9.22
25-013-0016	1	660	Springfield	Hampden	LIBERTY P-LOT	145	119	50.8	29.1	28.4	27.5	28.4	10.78
25-013-2009	1	660	Springfield	Hampden	1860 MAIN ST	145	121	46.6	28.1	27.0	27.0	27.0	10.81
25-017-0009	1	660	Chelmsford	Middlesex	11 TECHNOLOGY DRIVE	142	61	29.5	21.0	15.2	14.9	21.0	8.97
25-017-0009	2	660	Chelmsford	Middlesex	11 TECHNOLOGY DRIVE	142	61	29.3	20.7	14.1	13.4	20.7	8.43
25-023-0004	1	660	Brockton	Plymouth	COMMERCIAL ST	145	121	30.3	25.4	23.9	21.7	23.9	9.55
25-023-0004	2	660	Brockton	Plymouth	COMMERCIAL ST	145	103	30.3	25.4	24.1	21.8	24.1	9.61 *
25-025-0002	1	660	Boston	Suffolk	KENMORE SQ	145	114	28.4	26.3	26.0	25.5	26.0	11.14
25-025-0027	1	660	Boston	Suffolk	ONE CITY SQ	145	116	30.5	24.1	23.2	22.1	23.2	10.69
25-025-0042	1	660	Boston	Suffolk	HARRISON AVE	145	118	28.1	28.0	25.7	23.8	25.7	9.82
25-025-0043	1	660	Boston	Suffolk	174 NORTH ST	145	366	34.1	32.1	30.5	29.9	26.2	11.22
25-025-0043	2	660	Boston	Suffolk	174 NORTH ST	145	353	31.7	31.2	29.9	29.4	25.4	10.99
25-027-0016	1	660	Worcester	Worcester	WASHINGTON ST	145	117	31.8	27.7	27.7	23.3	27.7	9.79
25-027-0023	1	660	Worcester	Worcester	SUMMER ST	145	116	27.7	27.5	23.3	22.5	23.3	10.29

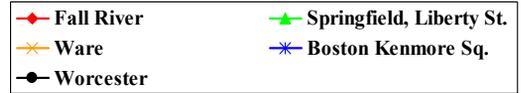
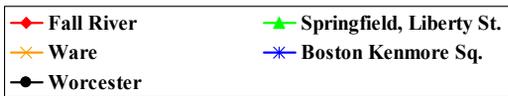
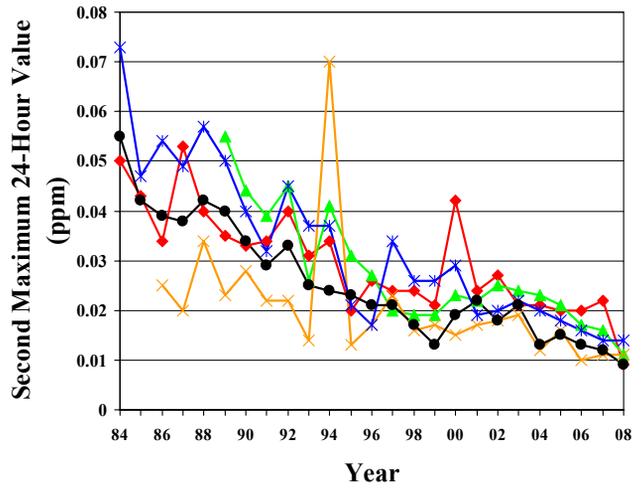
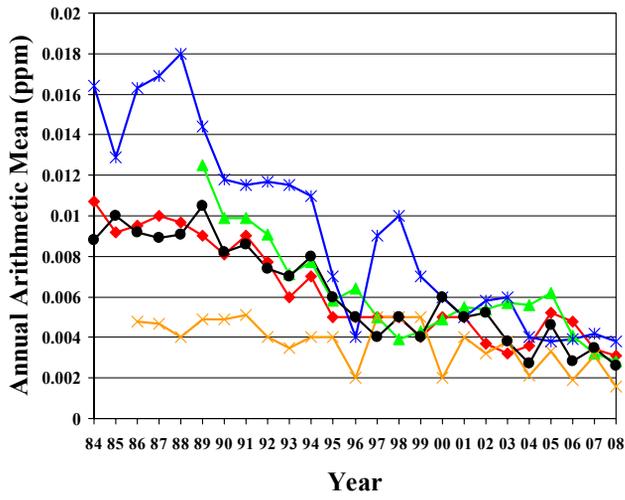
\*Indicates that the mean does not meet summary criteria

Massachusetts operated a network of sixteen fine particulate matter (PM<sub>2.5</sub>) ambient monitoring sites in 2008 with 4 collocated monitors. The highest 98<sup>th</sup> percentile 24-hour concentration was recorded at the Springfield Liberty site and measured 28.4 µg/m<sup>3</sup>. The highest annual weighted arithmetic mean was found at the Boston North Ave. site and measured 11.22 µg/m<sup>3</sup>. Since 1999, a slight downward trend can be seen in the data.

# Massachusetts Sites - 2008 - Sulfur Dioxide



# Massachusetts Sulfur Dioxide Data



NAAQS for Sulfur Dioxide:

Primary: Annual Arithmetic Mean - 0.03ppm

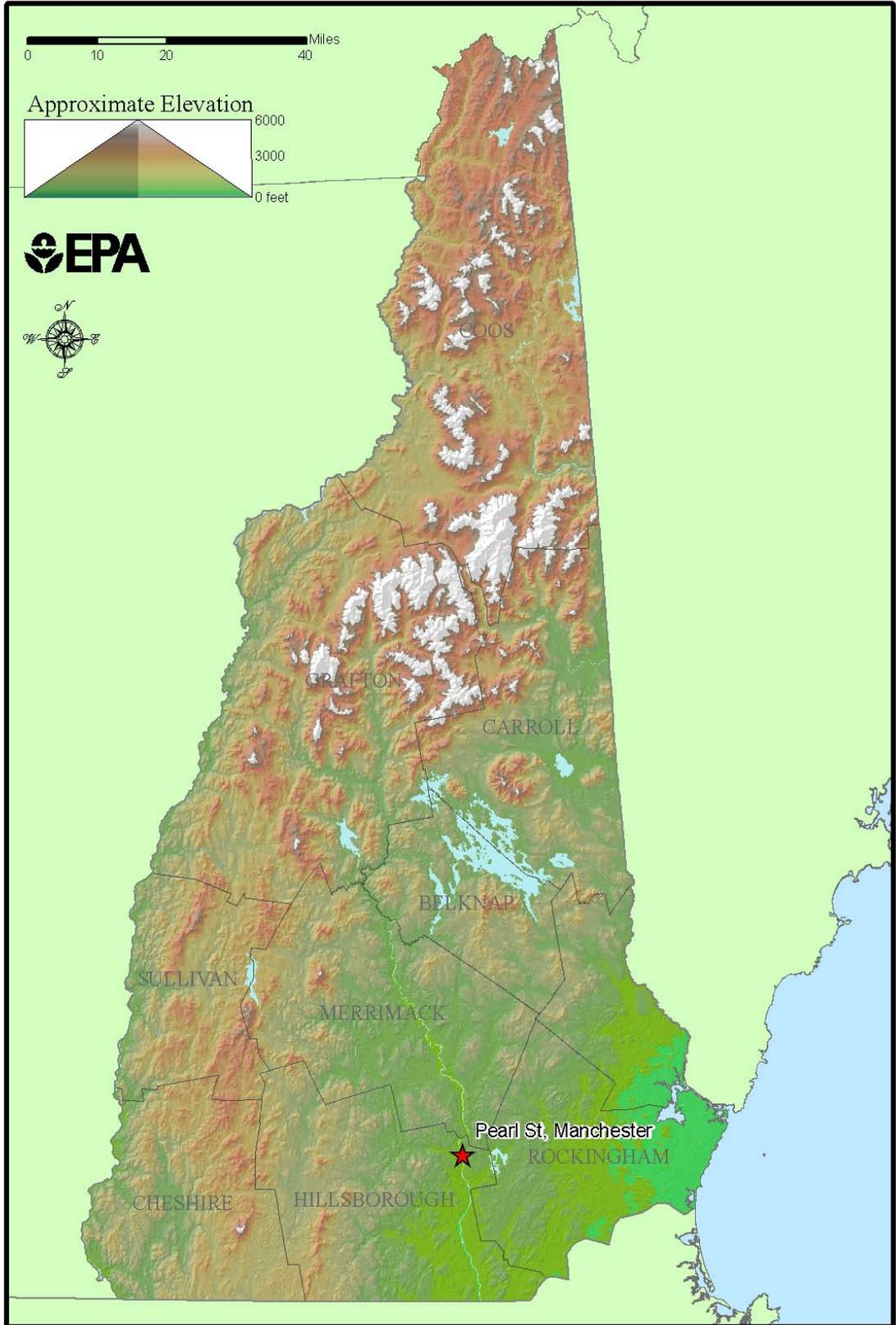
24-hour 0.14ppm

Secondary: 3-hour 0.5ppm

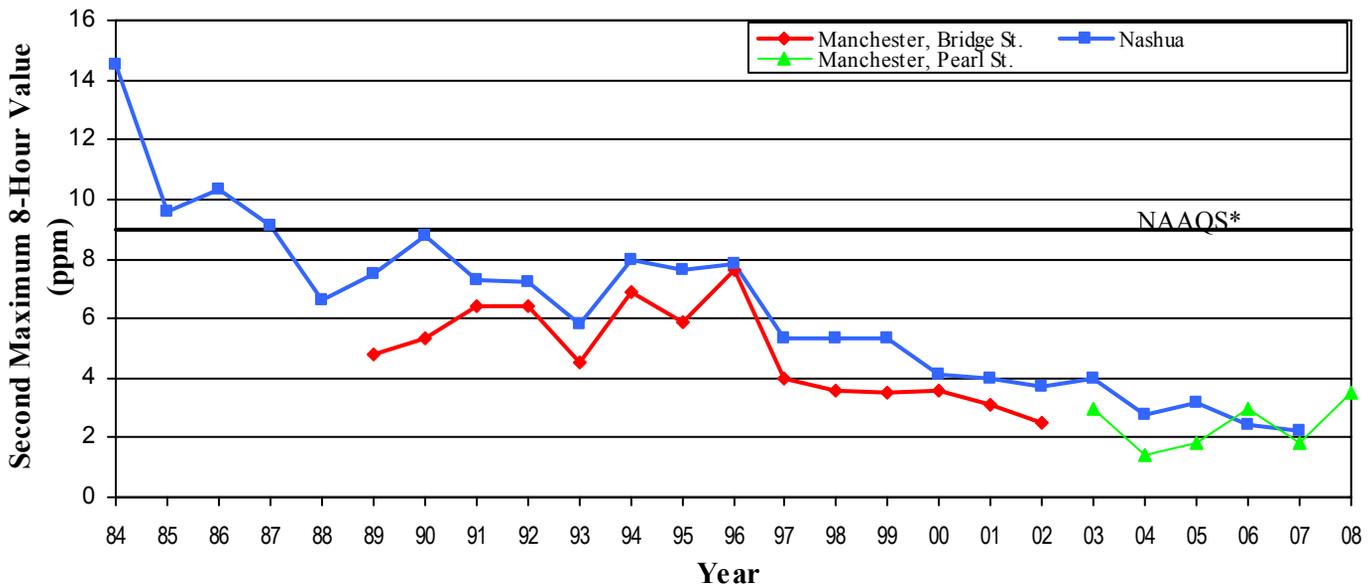
2008																	
Massachusetts																	
Parameter: Sulfur Dioxide																	
All Values are in Units of Parts Per Million																	
	P							24-	24-		3-hour	3-hour		1-hour	1-hour		
	O	Org				#	hour	hour			hour	hour		hour	hour		
Site ID	C	Type	City	County	Address	Method	Obs	Highest	Highest	> 0.14	Value	Highest	Value	> 0.5	Value	Highest	Arith.
25-005-1004	1	660	Fall River	Bristol	659 GLOBE ST	100	8161	0.016	0.009	0	0.058	0.032	0	0.0750	0.0710	0.00310	
25-013-0016	1	660	Springfield	Hampden	LIBERTY P-LO	60	8570	0.016	0.011	0	0.033	0.022	0	0.0380	0.0360	0.00280	
25-015-4002	1	660	Ware	Hampshire	QUABBIN SUMMIT	0	8468	0.012	0.011	0	0.016	0.015	0	0.0200	0.0190	0.00160	
25-025-0002	1	660	Boston	Suffolk	KENMORE SQ	0	8531	0.018	0.014	0	0.024	0.024	0	0.0290	0.0250	0.00380	
25-025-0019	1	345	Boston	Suffolk	LONG ISLAND	60	8453	0.014	0.010	0	0.018	0.018	0	0.0280	0.0200	0.00340	
25-025-0020	1	345	Boston	Suffolk	DEWAR ST. DORCH.	60	8570	0.013	0.010	0	0.021	0.017	0	0.0240	0.0230	0.00460	
25-025-0021	2	345	Boston	Suffolk	340 BREMEN ST.	60	8454	0.017	0.013	0	0.023	0.021	0	0.0270	0.0240	0.00460	
25-025-0040	1	345	Boston	Suffolk	531A EAST FIRST ST.	60	8323	0.016	0.014	0	0.044	0.030	0	0.0460	0.0450	0.00370	
25-025-0042	1	660	Boston	Suffolk	HARRISON AVE.	600	8509	0.013	0.012	0	0.021	0.019	0	0.0245	0.0235	0.00241	
25-027-0023	1	660	Worcester	Worcester	SUMMER ST	100	8472	0.014	0.009	0	0.018	0.017	0	0.0190	0.0180	0.00260	

Ten sulfur dioxide (SO<sub>2</sub>) monitoring sites were operated in Massachusetts during 2008. No exceedance or violation of the annual or 24-hour (primary) or the 3-hour (secondary) NAAQS for SO<sub>2</sub> was recorded in 2008. All SO<sub>2</sub> 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 2008 - Carbon Monoxide



# New Hampshire Carbon Monoxide Data



\*NAAQS for Carbon Monoxide:

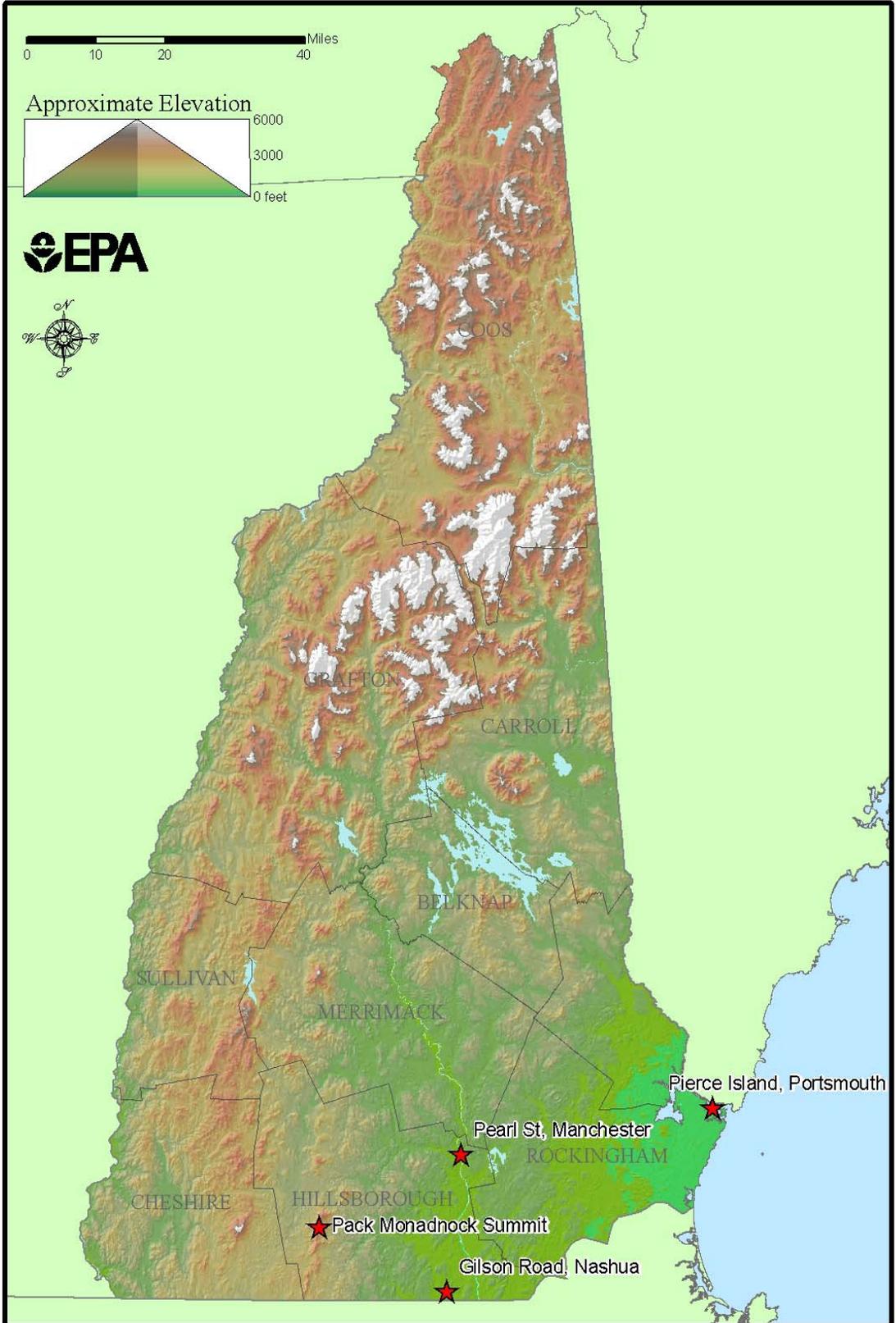
8-hour – 9 ppm, not to be exceeded more than one per year

1-hour – 35 ppm, not to be exceeded more than once per year.

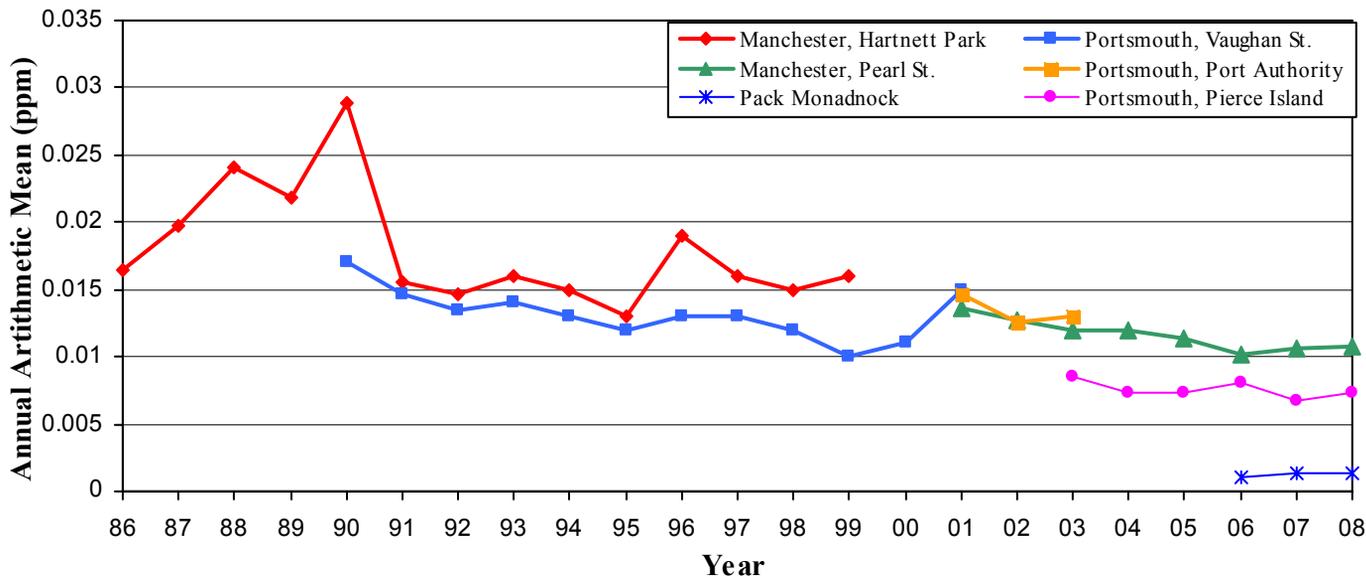
2008														
New Hampshire														
Carbon Monoxide														
All Values are in Units of Parts Per Million														
	P							1-hour	1-hour	8-hour	8-hour			
	O							#	Highest	Highest	Highest	Highest		
Site ID	C	Type	City	County	Address	Method	Obs	Value	Value	# > 35	Value	Value	# > 9	
33-011-0020	1	762	Manchester	Hillsborough	PEARL ST		54	8632	9.400	6.000	0	4.4	3.5	0

New Hampshire currently operates one CO monitoring site. As has been the case for over a decade, in 2008 there were no violations of either the 8-hour or 1-hour National Ambient Air Quality Standard (NAAQS) for carbon monoxide (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 2008, the Manchester – Pearl Street site, reported a second maximum 8-hour average CO concentration of 3.5 ppm, which was less than 40% of the standard. 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 2008 - Nitrogen Dioxide



# New Hampshire Nitrogen Dioxide Data

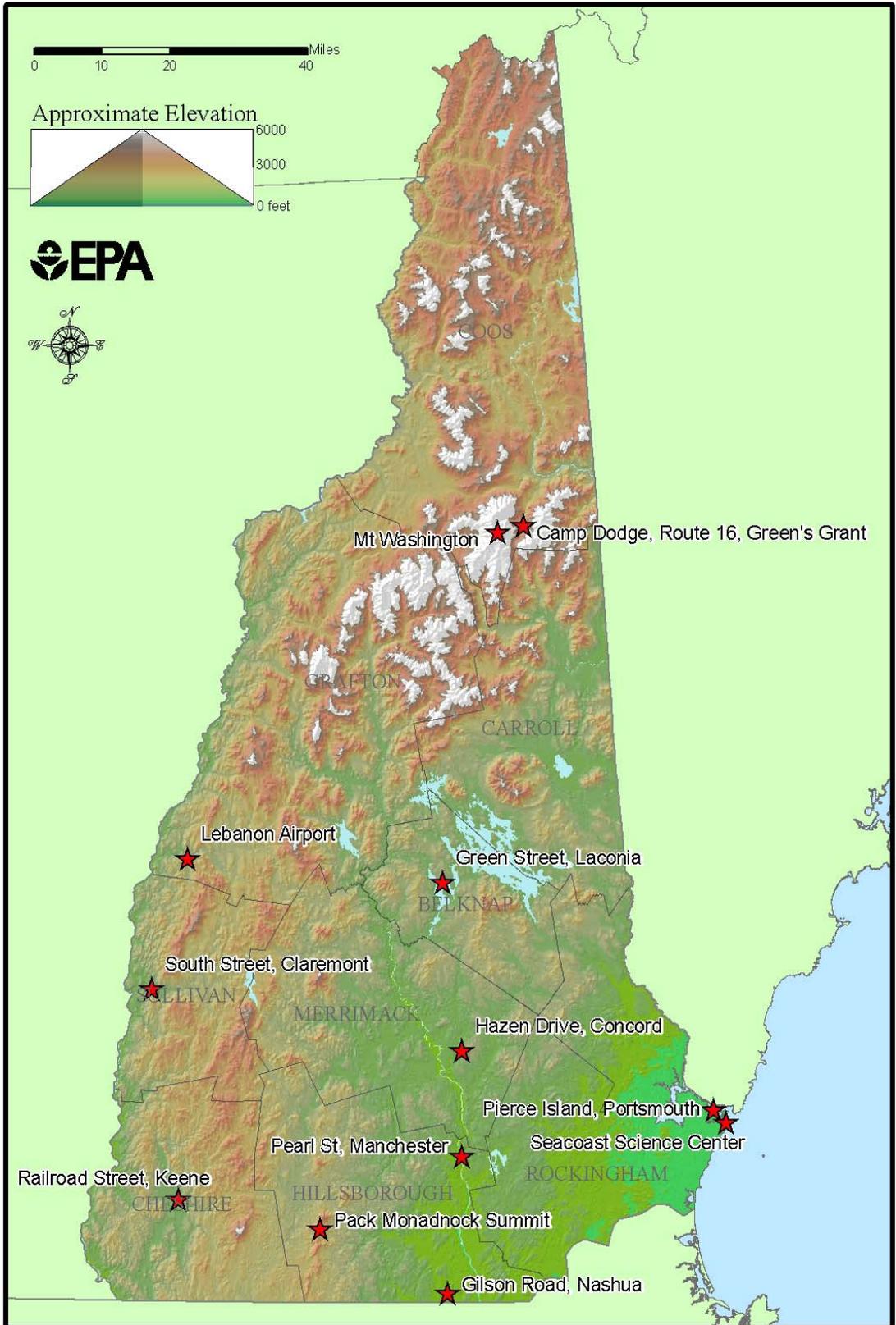


NAAQS for Nitrogen Dioxide:  
Annual Arithmetic Mean 0.053 ppm (100  $\mu\text{g}/\text{m}^3$ )

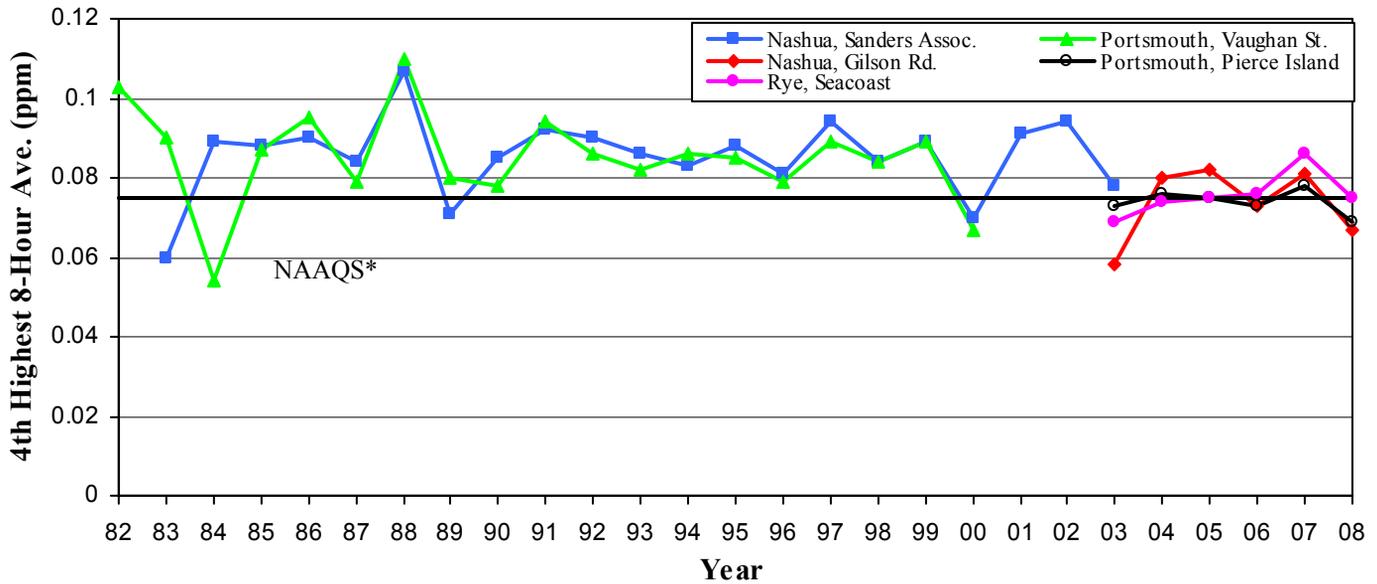
2008 NO <sub>2</sub>										
New Hampshire										
Parameter: Nitrogen Dioxide										
All Values are in Units of Parts Per Million										
								1-hour	1-hour	Annual
	P							Highest	2nd	Arith.
Site ID	O Rept.	C Org.	City	County	Address	Method	Obs	Value	Highest	Mean
33-011-0020	1	762	Manchester	Hillsborough	PEARL ST	74	8611	0.075	0.068	0.0108
33-011-1011	1	762	Nashua	Hillsborough	GILSON ROAD	74	4318	0.038	0.033	0.0035 *
33-011-5001	1	762	Peterborough	Hillsborough	PACK MONADNOCK SUMMIT	74	4195	0.036	0.036	0.0013 *
33-015-0014	1	762	Portsmouth	Rockingham	PIERCE ISLAND	74	8455	0.049	0.046	0.0074
*Indicates that the mean does not meet summary criteria										

In 2008, nitrogen dioxide (NO<sub>2</sub>) was measured at four monitoring sites, the two PAMS sites (Pack Monadnock and Gilson Road) and two urban sites (Portsmouth and Manchester). The Manchester monitoring site recorded the highest NO<sub>2</sub> concentrations, but well below the standard. The ten-year NO<sub>2</sub> concentrations trend indicates that there has been no recent upward or downward trend in concentration, but the long term trend is downward.

# New Hampshire Sites 2008 - Ozone



# New Hampshire Ozone 8-Hour Data



\*NAAQS for Ozone:

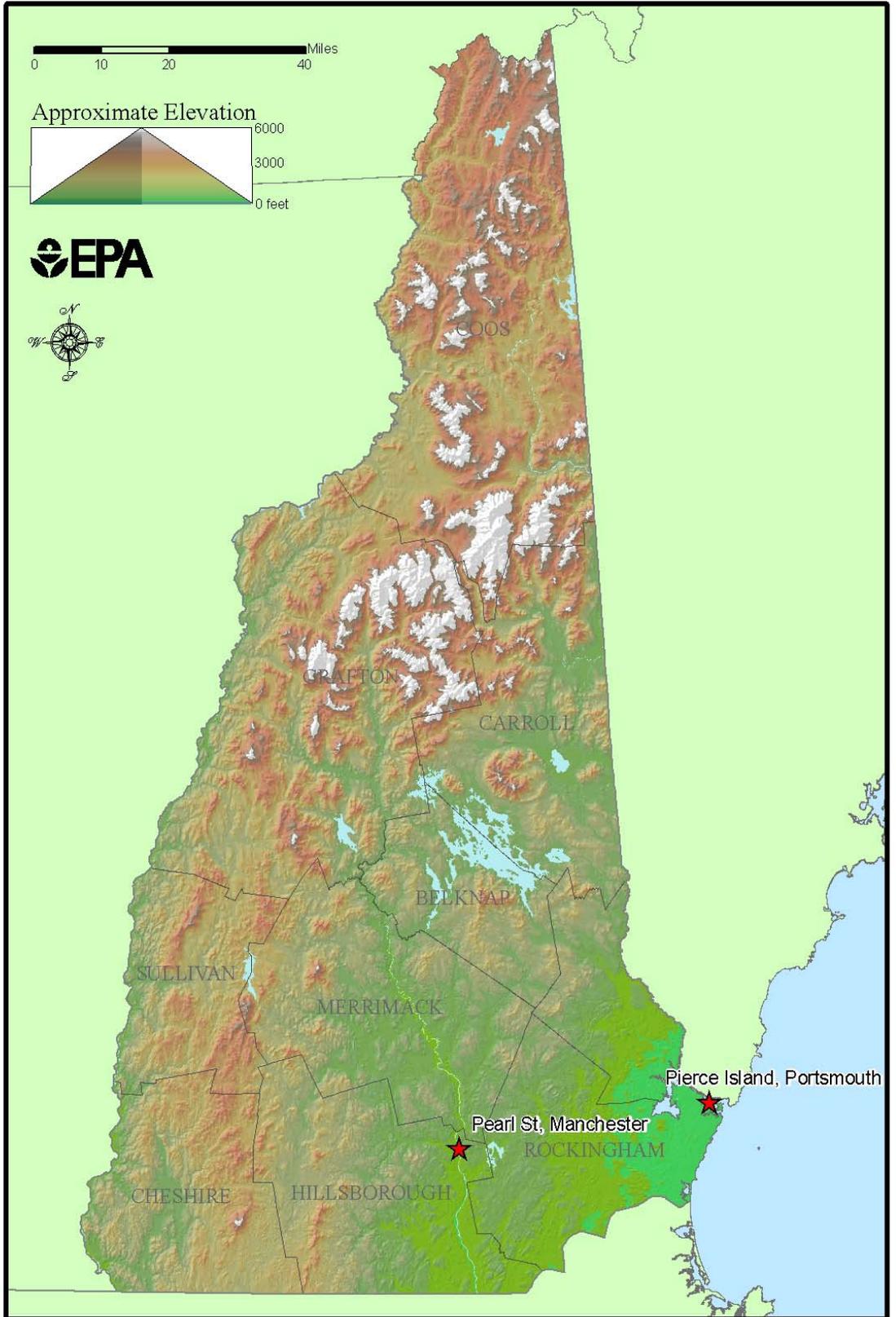
8-hour – 0.075 ppm (2008 std)

(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 0.075ppm. This graph represents the 4<sup>th</sup> 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.)

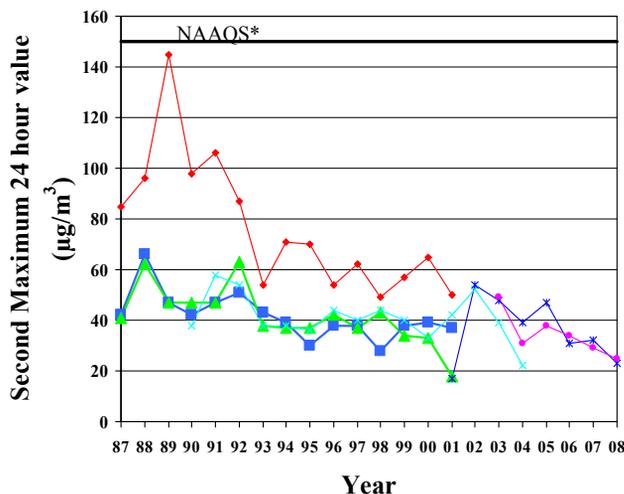
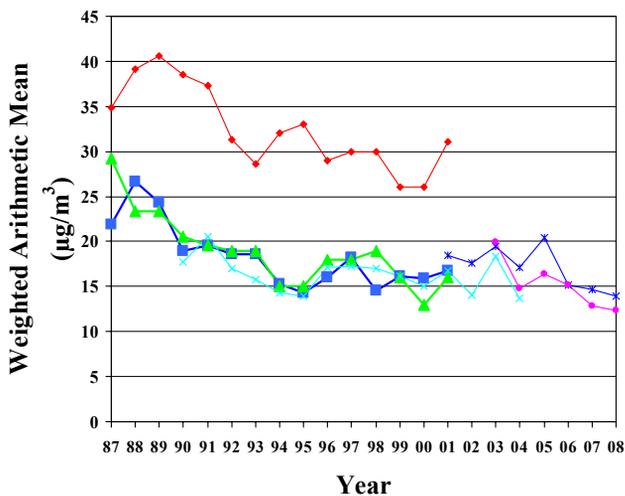
2008														
New Hampshire														
Parameter: Ozone (8-Hour)														
All Values are in Units of Parts Per Million														
Site ID	P O Rept. C Org.	City	County	Address	Method	% Obs	Valid Days	Num Required Days	Highest 8-Hr Value	2nd Highest 8-Hr Value	3rd Highest 8-Hr Value	4th Highest 8-Hr Value	Days Max ≥	0.075
33-001-2004	1	762 Laconia	Belknap	GREEN STREET		47	99	181	183	0.071	0.070	0.070	0.070	0
33-005-0007	1	762 Keene	Cheshire	RAILROAD STREET		47	99	182	183	0.080	0.071	0.069	0.068	1
33-007-4001	1	762 Mt. Washington sumr	Coos	MT. WASHINGTON		47	76	139	183	0.085	0.077	0.077	0.075	3
33-007-4002	1	762 Greens Grant	Coos	CAMP DODGE, ROUTE 16		47	99	182	183	0.068	0.066	0.065	0.065	0
33-009-0010	1	762 Lebanon	Grafton	LEBANON AIRPORT		47	100	183	183	0.077	0.069	0.068	0.068	1
33-011-0020	1	762 Manchester	Hillsborough	PEARL ST		47	100	183	183	0.064	0.064	0.064	0.064	0
33-011-1011	1	762 Nashua	Hillsborough	GILSON ROAD		47	95	174	183	0.070	0.069	0.068	0.067	0
33-011-5001	1	762 Peterborough	Hillsborough	PACK MONADNOCK SUMMIT		47	99	181	183	0.087	0.083	0.082	0.076	5
33-013-1007	1	762 Concord	Merrimack	HAZEN DRIVE		47	97	178	183	0.068	0.067	0.067	0.067	0
33-015-0014	1	762 Portsmouth	Rockingham	PIERCE ISLAND		47	100	183	183	0.079	0.072	0.070	0.069	1
33-015-0016	1	762 Rye	Rockingham	SEACOAST SCIENCE CENTER		47	98	179	183	0.083	0.078	0.076	0.075	3
33-019-0003	1	762 Claremont	Sullivan	SOUTH STREET		47	99	182	183	0.079	0.070	0.069	0.066	1

Three of the twelve ozone monitors in New Hampshire recorded 4<sup>th</sup> highest values above the new 8-hour ozone standard. The 4<sup>th</sup> highest 8-hour concentration exceeded the standard at each of the two mountain summits and at the Seacoast Science Center (Rye). In 2008, the maximum 8-hour average ozone concentration occurred at the Pack Monadnock Summit monitoring site (0.087 ppm).

**New Hampshire Sites 2008 - Particulate Matter < 10 Microns**



# New Hampshire Particulate Matter < 10 Microns (PM<sub>10</sub>) Data



- ◆ Berlin Lancaster St.
- Manchester, Chestnut St.
- ▲ Portsmouth, Vaughn St.
- ◆ Nashua, Sanders Assoc.
- ★ Manchester, Pearl St.
- ◆ Portsmouth, Pierce Island

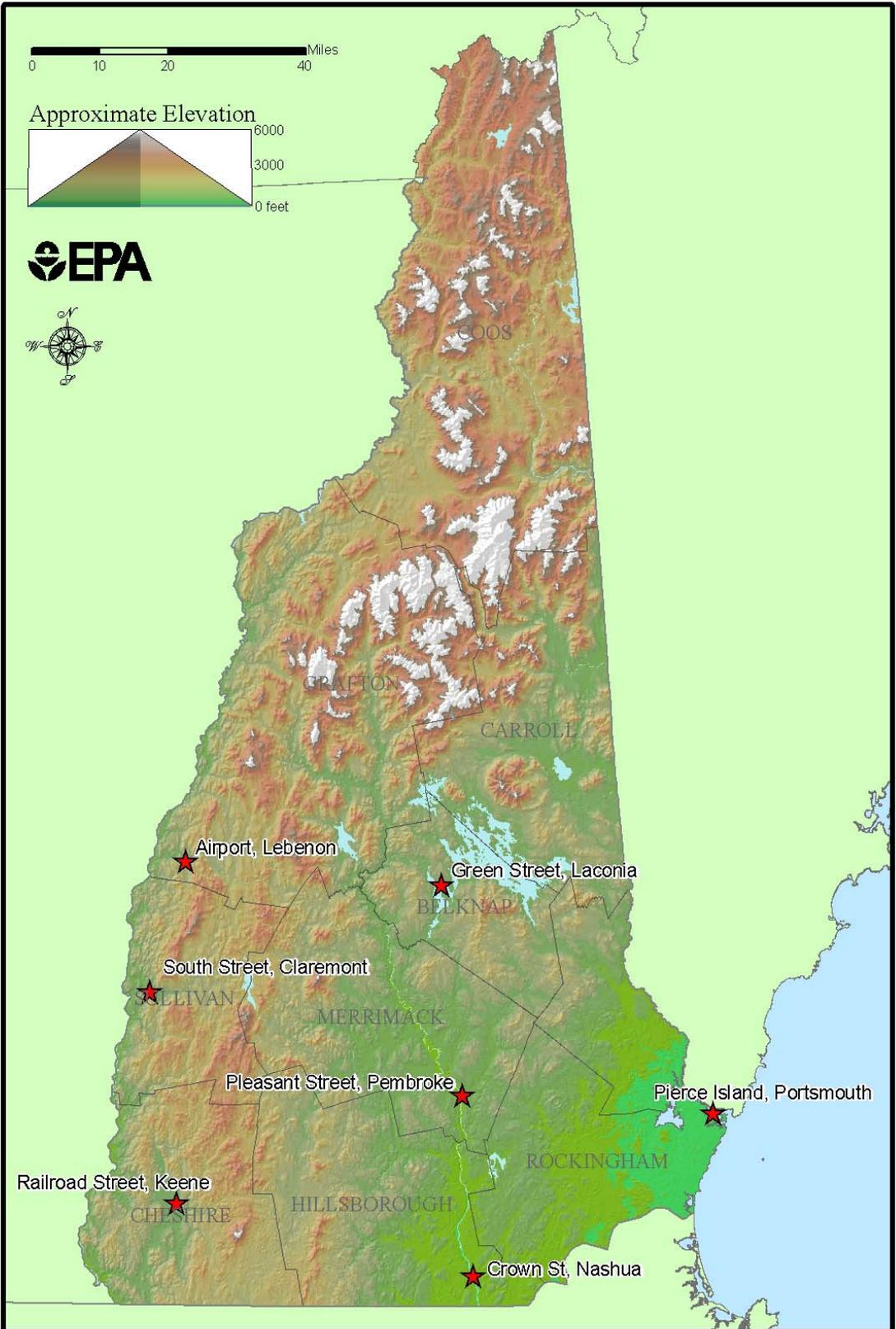
- ◆ Berlin Lancaster St.
- Manchester, Chestnut St.
- ▲ Portsmouth, Vaughn St.
- ◆ Nashua, Sanders Assoc.
- ★ Manchester, Pearl St.
- ◆ Portsmouth, Pierce Island

\*NAAQS for Particulate Matter less than 10 Microns:  
24-hour 150 µg/m<sup>3</sup>

2008																		
New Hampshire																		
Particulate Matter < 10 Microns																		
ug/m3																		
	P											2nd	3rd	4th	Days Est.	Day:	Wtd.	
	O	Rep.							Number	Valid	Highest	Highest	Highest	Highest	Max	Max	Arith.	
SITE ID	C	Org	City	County	Address	Method	# Obs	# Req.	Days	% Obs	Value	Value	Value	Value	>150	>150	Mean	
33-011-0020	1	762	Manchester	Hillsborough	PEARL ST	0	59	61	59	97	53	23	22	21	0	0	14	
33-011-0020	2	762	Manchester	Hillsborough	PEARL ST	0	61	61	61	100	54	25	22	22	0	0	14.2	
33-015-0014	1	762	Portsmouth	Rockingham	PIERCE ISLAND	130	61	61	61	100	34	25	25	25	0	0	12.4	

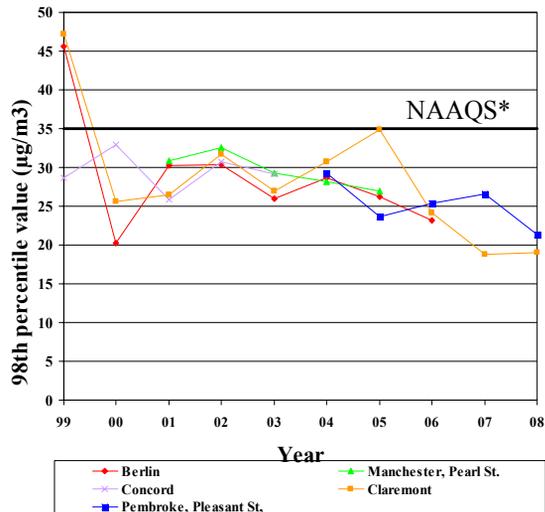
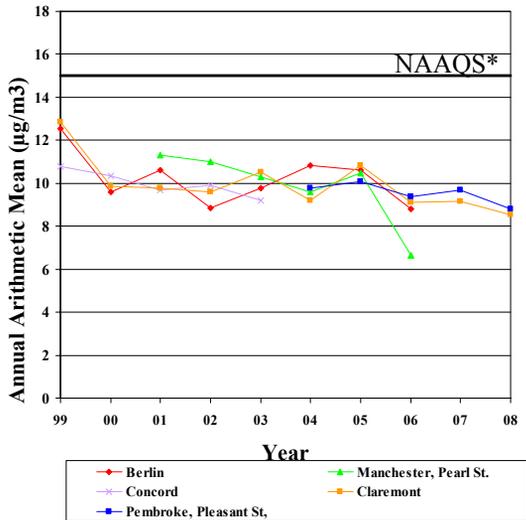
Neither of the two coarse particulate matter (PM<sub>10</sub>) monitoring sites in New Hampshire (Portsmouth and Manchester) has exceeded or violated the annual or 24-hr NAAQS for PM<sub>10</sub> over the past ten years (1999-2008). The second highest 24-hour concentration in 2008 was recorded in both Portsmouth and Manchester (25 ug/m<sup>3</sup>). Over the past ten years, all of the PM<sub>10</sub> monitors in New Hampshire recorded PM<sub>10</sub> concentrations well below the national standards. PM<sub>10</sub> concentration variability is common, due to differences in weather and local PM<sub>10</sub> emissions.

**New Hampshire Sites 2008 - Particulate Matter < 2.5 Microns**



# New Hampshire Particulate Matter < 2.5 Microns (PM<sub>2.5</sub>) Data

NAAQS\*



\*NAAQS for Particulate Matter less than 2.5 Microns:

Primary: Annual Arithmetic Mean - 15.0 µg/m<sup>3</sup>

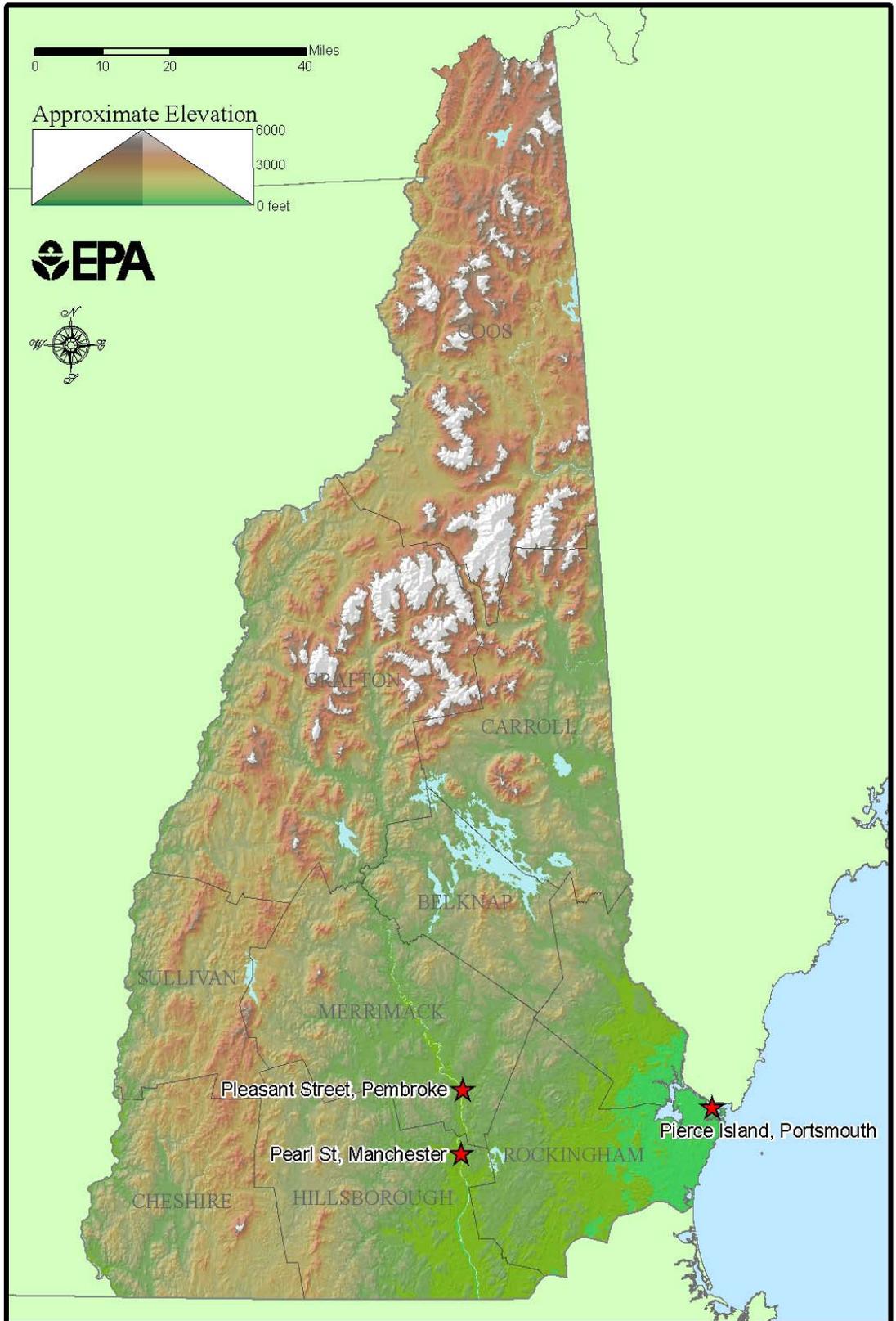
Secondary: the 3-year average of the 98th percentile of 24-hour concentrations at each population-oriented monitor <35 µg/m<sup>3</sup>

Site ID	P	O	Rept.	City	County	Address	Method	#	Highest	2nd	3rd	4th	98th	Wtd.
	C	Org.						Obs	Value	Highest	Highest	Highest	Percentile	Arith.
										Value	Value	Value	Value	Mean
33-001-2004	1	762	Laconia	Belknap	GREEN STREET	116	61	22.5	11.8	11.6	11.0	11.8	6.12	
33-001-2004	2	762	Laconia	Belknap	GREEN STREET	116	61	22.0	11.7	11.6	11.1	11.7	6.06	
33-005-0007	1	762	Keene	Cheshire	RAILROAD STREET	116	60	43.4	25.6	24.6	19.8	25.6	10.38	
33-005-0007	3	762	Keene	Cheshire	RAILROAD STREET	170	2162	32.2	28.5	27.8	26.7	28.5	11.74 *	
33-009-0010	1	762	Lebanon	Grafton	LEBANON AIRPORT	116	60	26.0	19.6	13.2	12.9	19.6	7.32	
33-009-0010	3	762	Lebanon	Grafton	LEBANON AIRPORT	170	368	13.2	11.9	11.2	9.9	13.2	5.49 *	
33-011-1015	1	762	Nashua	Hillsborough	CROWN ST	116	121	31.5	29.5	23.6	22.0	23.6	9.19	
33-013-1006	1	762	Pembroke	Merrimack	PLEASANT STREET	0	121	36.0	23.0	21.3	20.6	21.3	8.79	
33-013-1006	2	762	Pembroke	Merrimack	PLEASANT STREET	117	61	35.4	19.6	18.0	17.5	19.6	8.49	
33-015-0014	1	762	Portsmouth	Rockingham	PIERCE ISLAND	116	122	33.2	24.0	22.4	19.6	22.4	8.19	
33-019-0003	1	762	Claremont	Sullivan	SOUTH STREET	116	60	32.1	19.0	17.5	16.6	19.0	8.55	

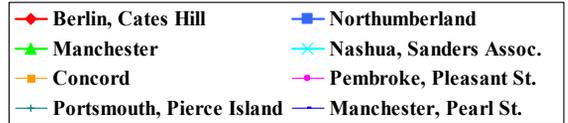
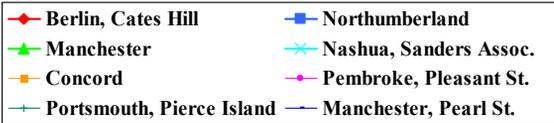
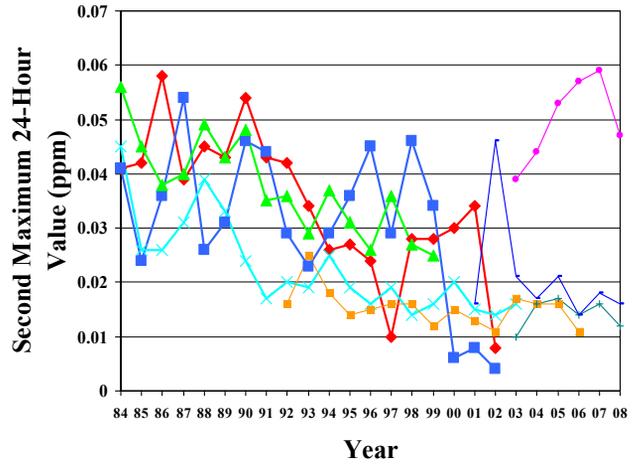
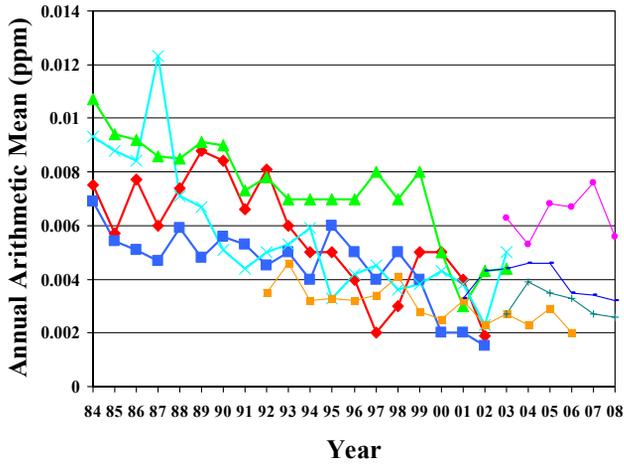
\*Indicates that the mean does not meet summary criteria

In 2008, seven monitoring sites provided data on the concentration of PM<sub>2.5</sub> in the state, with 4 colocated monitors. Over the past several years the highest concentrations of PM<sub>2.5</sub> have been recorded in the Pembroke and Keene urban areas. During 2008, relatively high concentrations of fine particulate matter (PM<sub>2.5</sub>) were recorded at the Railroad Street site in Keene (10.38 ug/m<sup>3</sup>) for the PM<sub>2.5</sub> annual standard compared with the other New Hampshire monitoring sites. These concentrations were well below the primary annual standard for PM<sub>2.5</sub>.

# New Hampshire Sites 2008 - Sulfur Dioxide



# New Hampshire Sulfur Dioxide Data



## NAAQS for Sulfur Dioxide:

Primary: Annual Arithmetic Mean - 0.03ppm

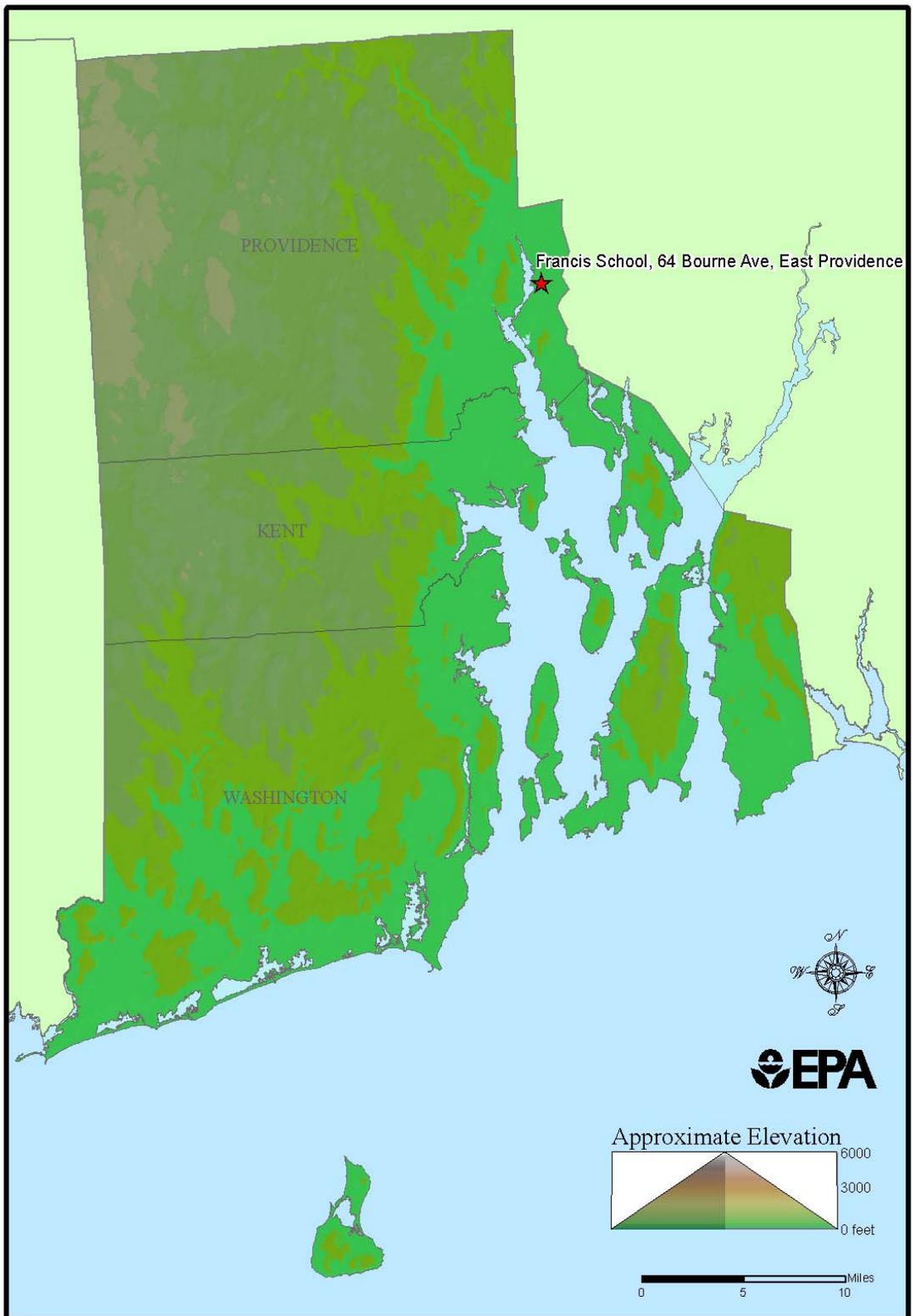
24-hour 0.14ppm

Secondary: 3-hour 0.5ppm

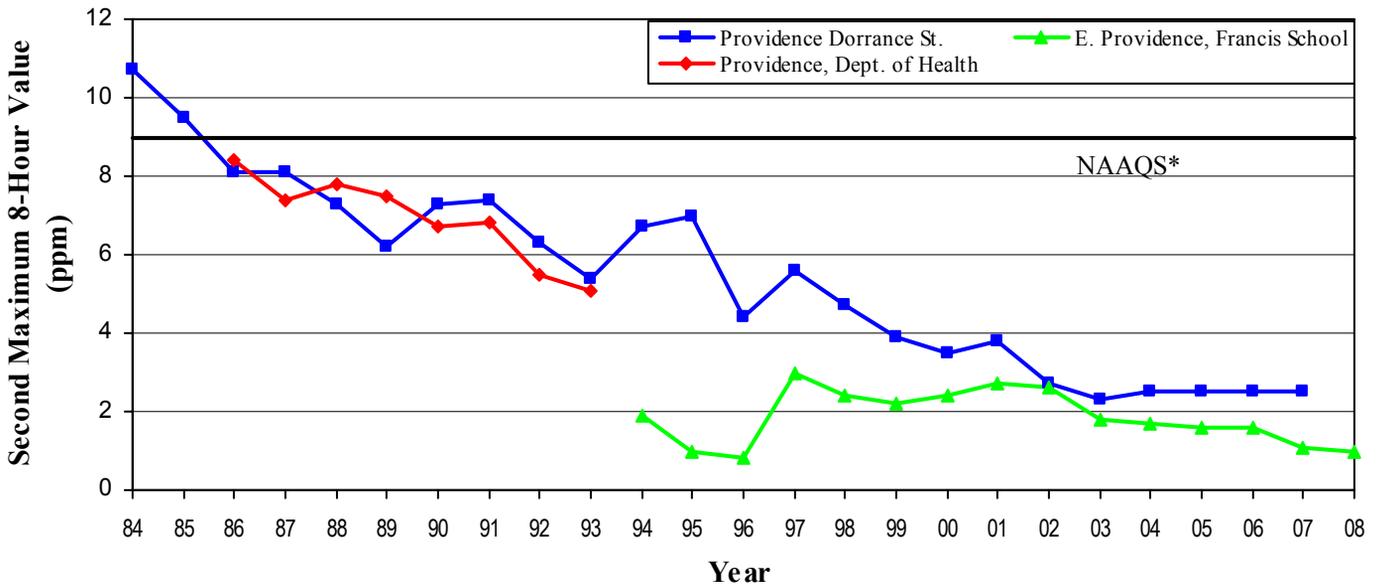
2008																
New Hampshire																
Parameter: Sulfur Dioxide																
All Values are in Units of Parts Per Million																
Site ID	P	O	Type	City	County	Address	Method	#	24-hour	24-hour	3-hour	3-hour	1-hour	1-hour	Arith. Mean	
									Obs	Highest	Highest	Obs	Highest	Highest		Obs
	C								> 0.14	Value	Value	> 0.5	Value	Value		
33-011-0020	1	762	Manchester	Hillsborough	PEARL ST	60	8586	0.017	0.016	0	0.036	0.036	0	0.0760	0.0720	0.00320
33-013-1006	1	762	Pembroke	Merrimack	PLEASANT STREET	60	8690	0.053	0.047	0	0.206	0.204	0	0.3220	0.3130	0.00560
33-015-0014	1	762	Portsmouth	Rockingham	PIERCE ISLAND	60	8596	0.025	0.012	0	0.045	0.045	0	0.0850	0.0750	0.00260

During 2008, no exceedance or violation of the sulfur dioxide NAAQS occurred at any of the three monitoring sites in New Hampshire. The highest annual SO<sub>2</sub> concentration was recorded in Pembroke (0.0056 ppm SO<sub>2</sub>). The Pembroke site also reported the highest 24-hour second maximum SO<sub>2</sub> concentration (0.047 ppm SO<sub>2</sub>), and the highest 3-hour SO<sub>2</sub> second maximum concentration (0.204 ppm SO<sub>2</sub>).

Rhode Island Sites - 2008 - Carbon Monoxide



# Rhode Island Carbon Monoxide Data



\*NAAQS for Carbon Monoxide:

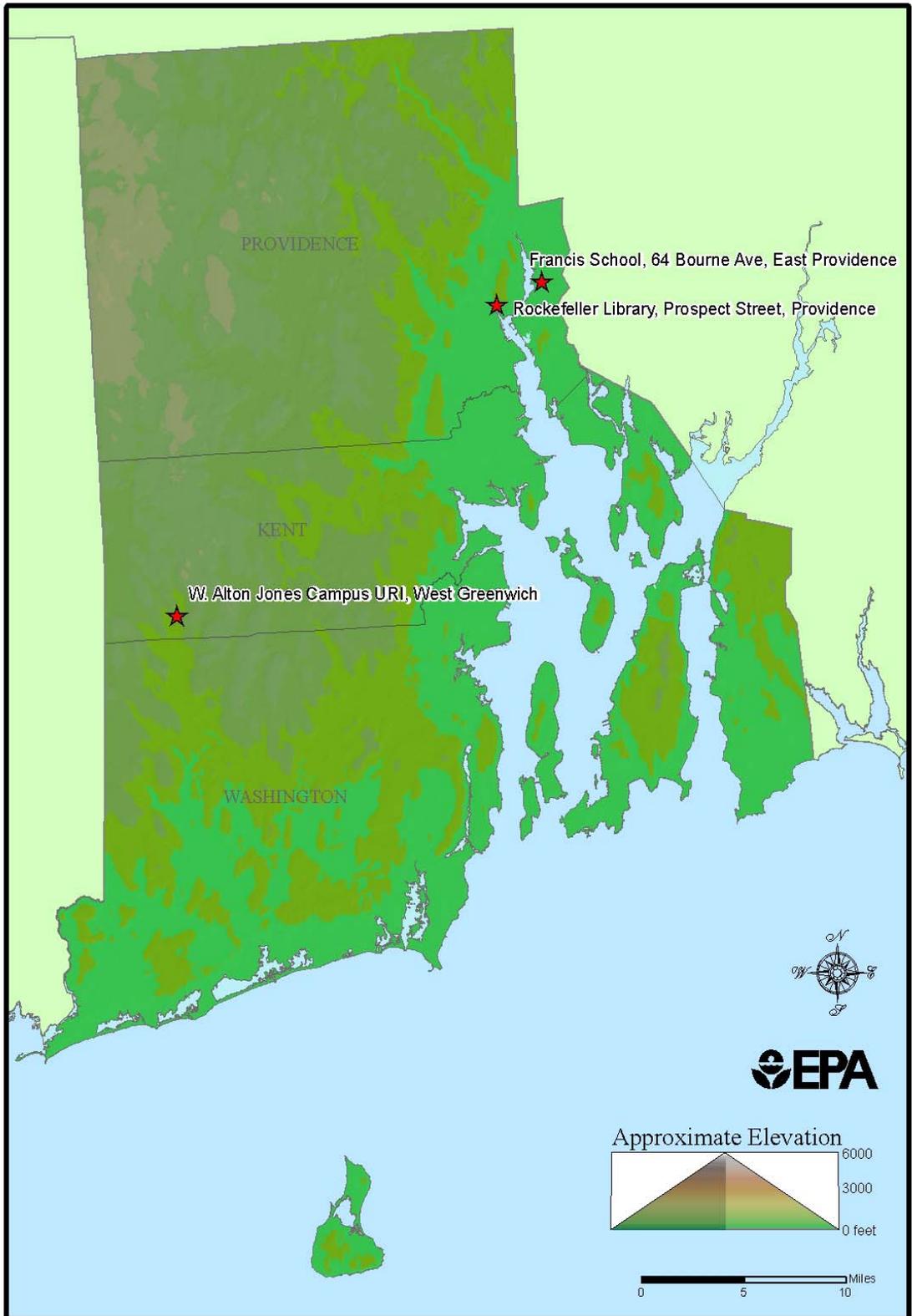
8-hour – 9 ppm, not to be exceeded more than one per year

1-hour – 35 ppm, not to be exceeded more than once per year.

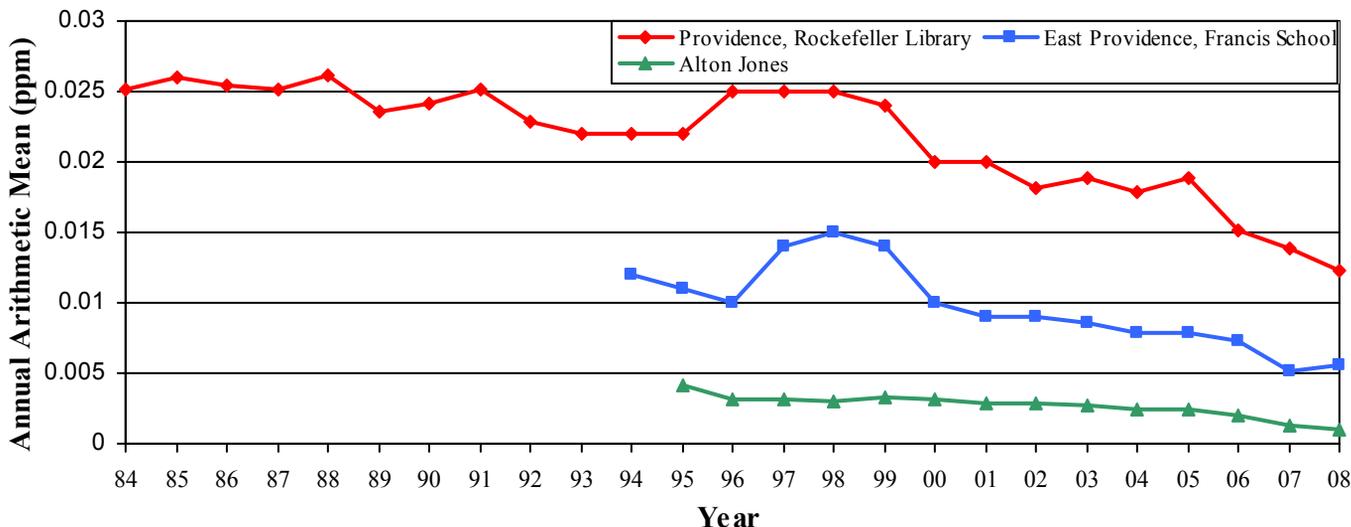
2008													
Rhode Island													
Carbon Monoxide													
All Values are in Units of Parts Per Million													
	P							1-hour	1-hour		8-hour	8-hour	
	O Org						#	Highest	Highest		Highest	Highest	
Site ID	C Type	City	County	Address	Method	Obs		Value	Value	# > 35	Value	Value	# > 9
44-007-1010	1	907 East Providence	Providence	FRANCIS SCHOOL, BOURNE AVE	54	7847		1.600	1.500	0	1.0	1.0	0

Rhode Island operates one carbon monoxide monitor. No exceedance or violation of the 1-hour or 8-hour carbon monoxide (CO) NAAQS was recorded in 2008. The highest 8-hour second maximum CO level recorded during 2008 was 1.0 ppm. Over the past seven years the highest 8-hour second maximum concentration of CO at this site was 2.6 ppm, which occurred in 2002. The 25 year trend of CO concentrations in Rhode Island show a downward trend with concentrations leveling off well below the NAAQS between 2003 and 2008.

Rhode Island Sites - 2008 - Nitrogen Dioxide



# Rhode Island Nitrogen Dioxide Data

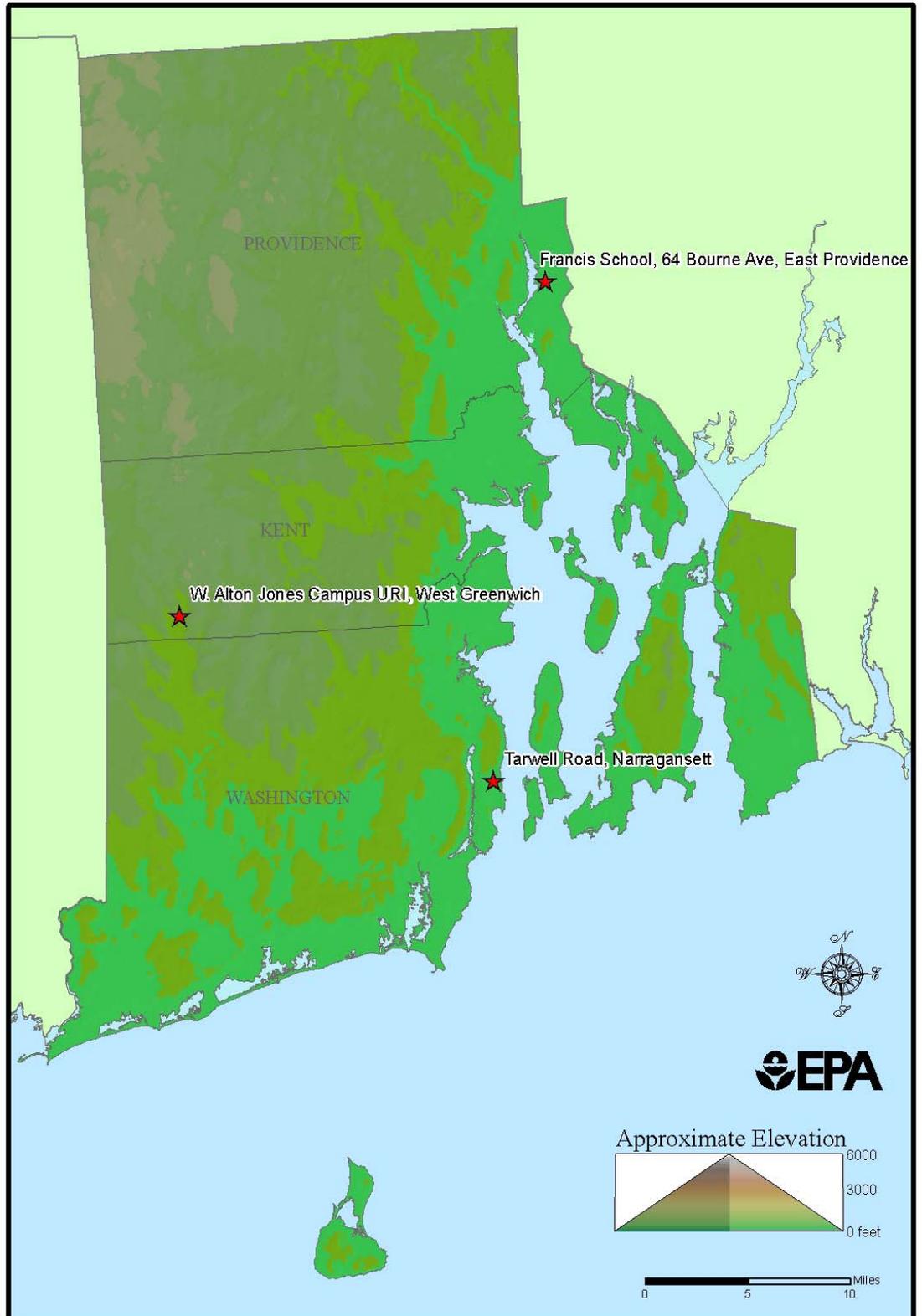


NAAQS for Nitrogen Dioxide:  
Annual Arithmetic Mean 0.053 ppm (100 µg/m<sup>3</sup>)

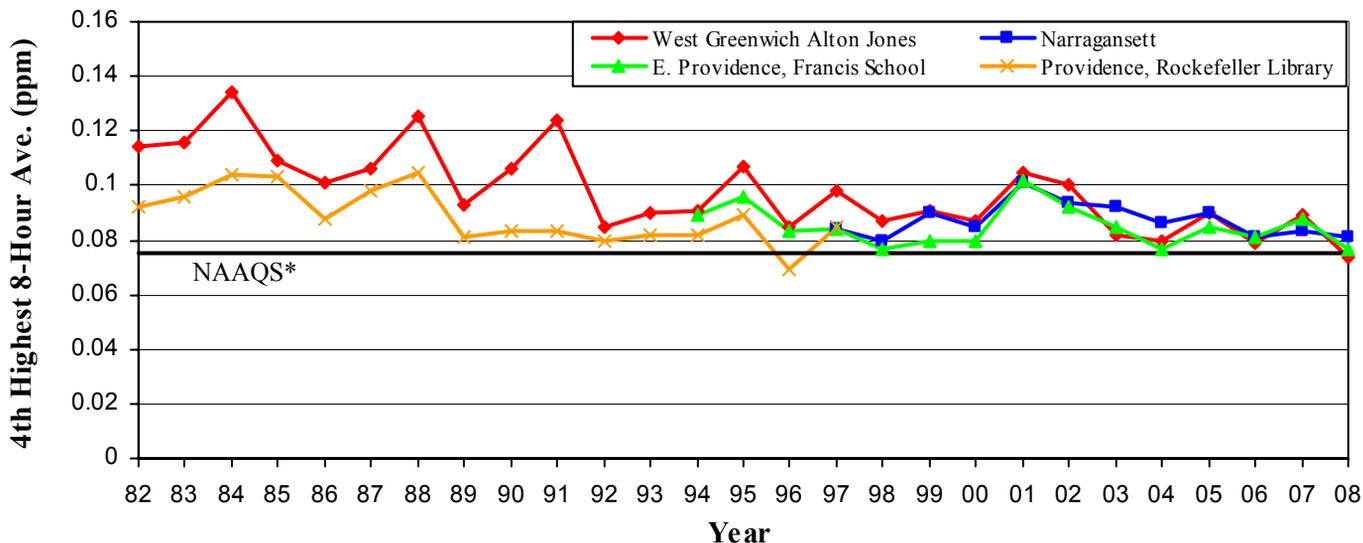
2008 NO <sub>2</sub>											
Rhode Island											
Parameter: Nitrogen Dioxide											
All Values are in Units of Parts Per Million											
								1-hour	1-hour	Annual	
	P										
	O	Rept.									
Site ID	C	Org.	City	County	Address	Method	#	Highest	Highest	Arith.	
							Obs	Value	Value	Mean	
44-003-0002	1	907	West Greenwich	Kent	W. ALTON JONES CAMPUS	URI	74	1797	0.007	0.006	0.0010 *
44-007-0012	1	907	Providence	Providence	ROCKEFELLER LIBRARY		74	8277	0.061	0.060	0.0123
44-007-1010	1	907	East Providence	Providence	FRANCIS SCHOOL		74	2074	0.031	0.031	0.0056 *
*Indicates that the mean does not meet summary criteria											

Rhode Island operated three nitrogen dioxide (NO<sub>2</sub>) monitoring sites during 2008. NO<sub>2</sub> monitors were located at two Photochemical Assessment Monitoring Stations (PAMS) Sites 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<sub>2</sub> concentration of 0.0123 ppm, only 23% of the NAAQS. The 25 year NO<sub>2</sub> concentration trend at the Rockefeller Library Site has remained relatively flat with a slight decreasing trend beginning in 2000. Each year, over the past nine years, the mean NO<sub>2</sub> concentration during the PAMS season has been three to five times higher at the Francis School Site (0.005 - 0.01ppm) compared to the Alton Jones Site (0.001 – 0.003 ppm).

Rhode Island Sites - 2008 - Ozone



# Rhode Island 8-Hour Ozone Data



\*NAAQS for Ozone:

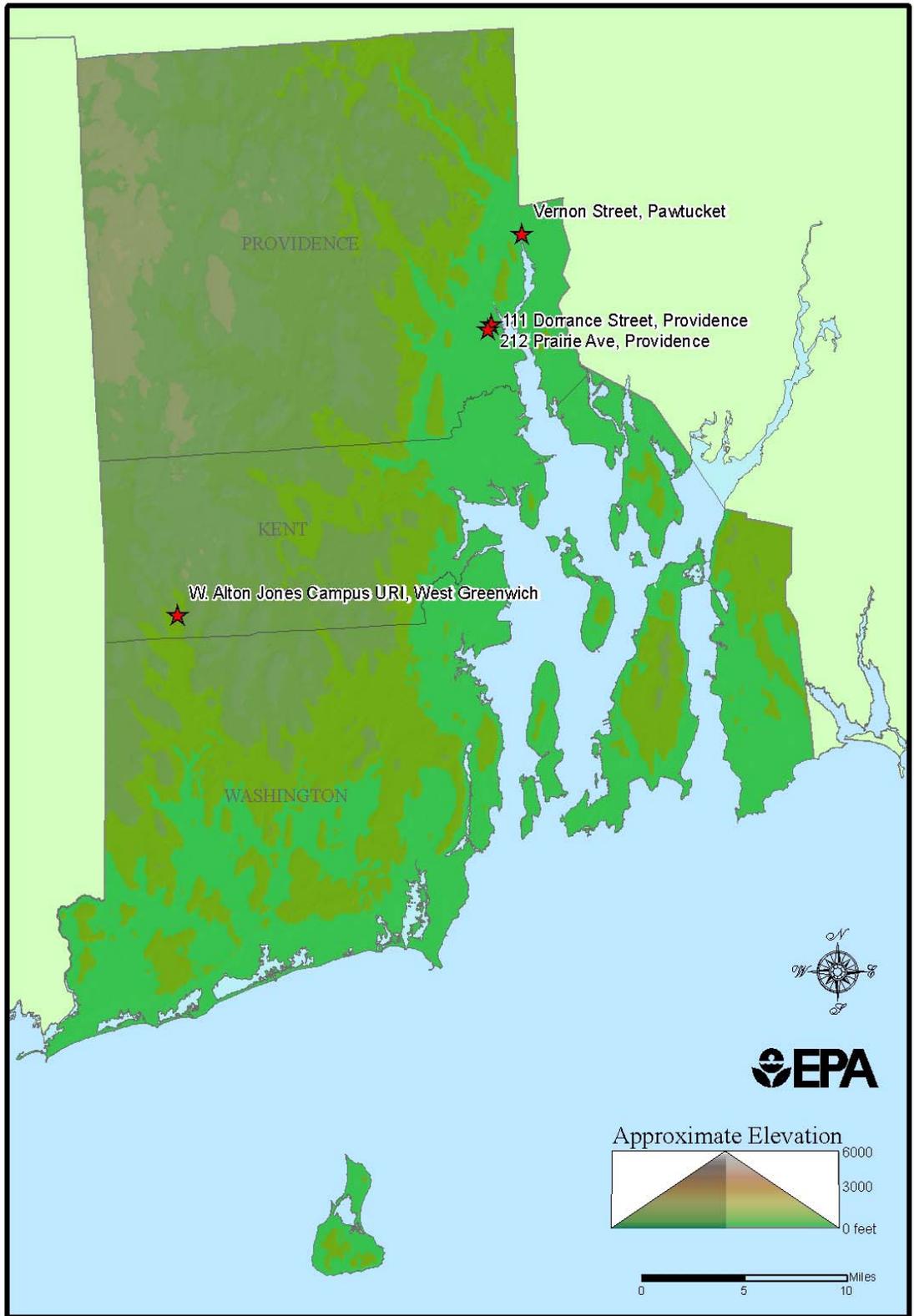
8-hour – 0.075 ppm (2008 std)

(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 0.075ppm. This graph represents the 4<sup>th</sup> 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.)

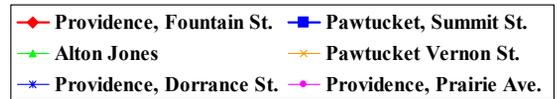
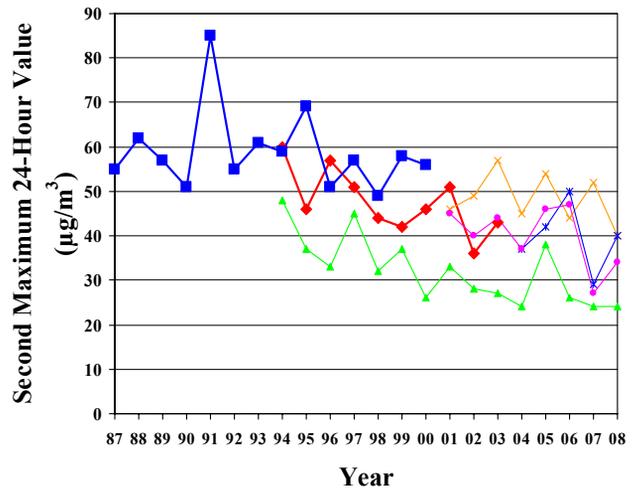
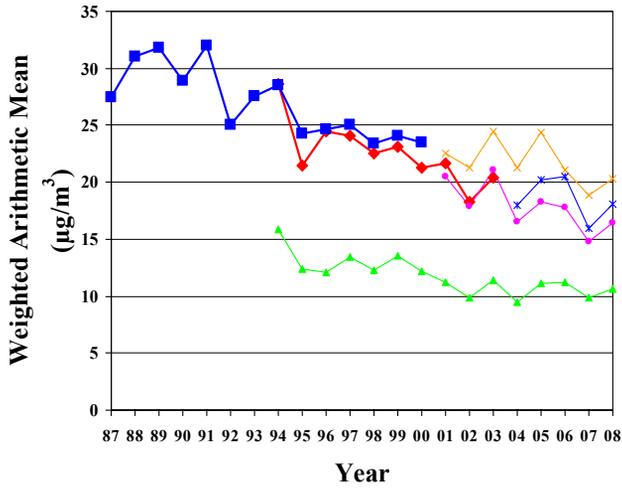
2008														
Rhode Island														
Parameter: Ozone (8-Hour)														
All Values are in Units of Parts Per Million														
	P													
	O	Rept.				Method	%	Valid	Num		2nd	3rd	4th	Days
Site ID	C	Org.	City	County	Address		Obs	Days	Required	Highest	Highest	Highest	Highest	Max >
									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	99	181	183	0.086	0.082	0.074	0.074	2
44-007-1010	1	907	East Providence	Providence	FRANCIS SCHOOL, 64 BOURNE AVE	47	96	175	183	0.088	0.086	0.085	0.077	4
44-009-0007	1	907	Narragansett	Washington	TARZWELL ROAD	47	98	179	183	0.089	0.086	0.082	0.081	4

In 2008, the Narragansett and the East Providence sites both reported a fourth highest 8-hour average O<sub>3</sub> concentration above the ozone standard at 0.081 ppm and 0.077 ppm, respectively. The Alton Jones site reported a fourth highest 8-hour average value of 0.074 ppm during 2008. Over the past twelve years, 2002 was the year with the most days above the 1997 Ozone Standard compared to other years. The Narragansett Site recorded the highest 8-hour average concentration of 0.089 ppm during 2008.

**Rhode Island Sites - 2008 - Particulate Matter < 10 Microns**



# Rhode Island Particulate Matter < 10 Microns (PM<sub>10</sub>) Data



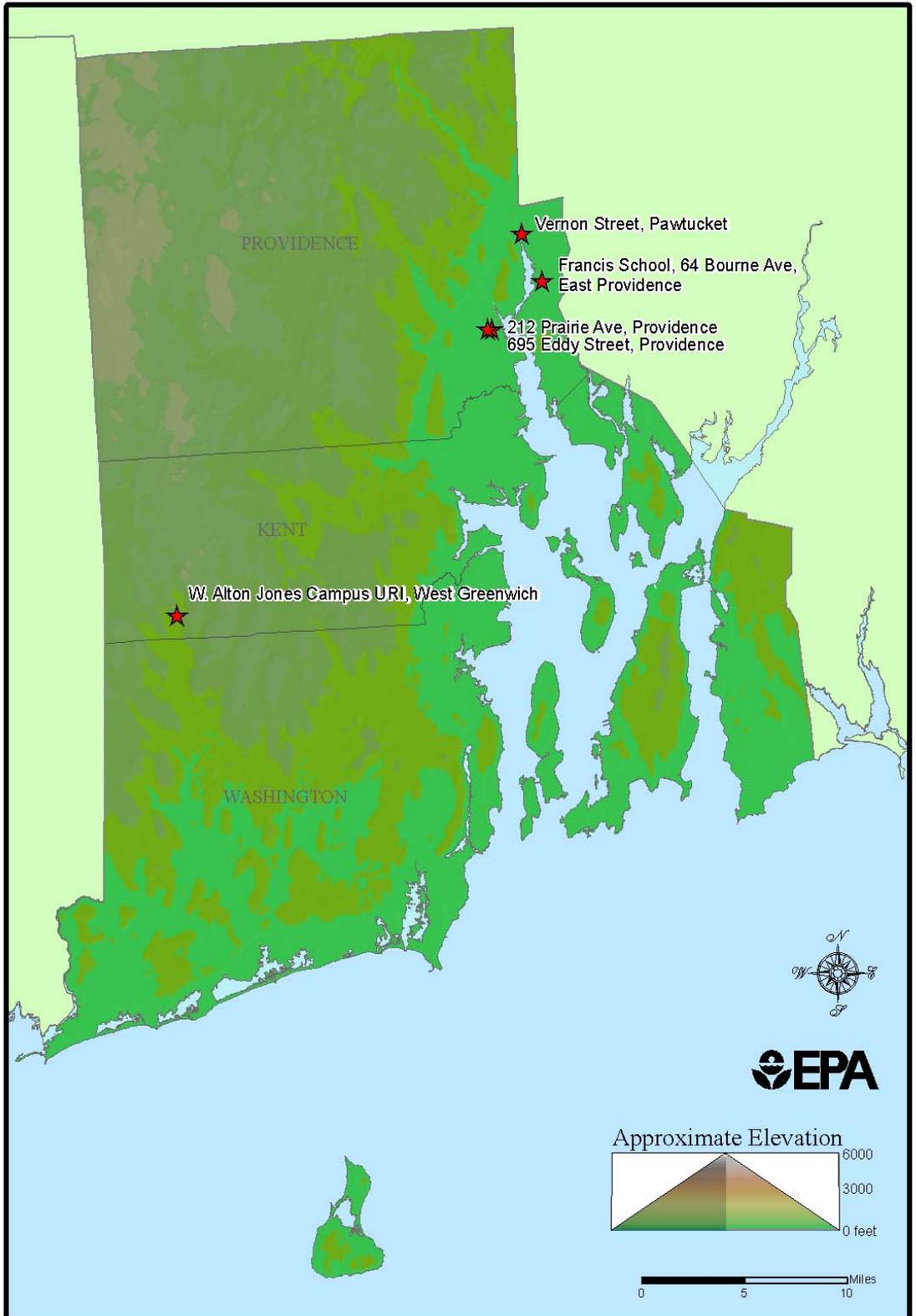
NAAQS for Particulate Matter less than 10 Microns:  
24-hour 150 µg/m<sup>3</sup>

2008																	
Rhode Island																	
Particulate Matter < 10 Microns																	
ug/m3																	
SITE ID	P O C	Rep. Org	City	County	Address	Methoc#	# Obs	# Req.	Days	% Obs	1st	2nd	3rd	4th	Days	Est. Day	Wtd.
											Highest Value	Highest Value	Highest Value	Highest Value	Max >150	Max >150	Arith. Mean
44-003-0002	1	907	West Greenwic	Kent	W. ALTON JONES CAMPUS UR	63	52	61	52	85	36	24	22	20	0	0	10.6
44-007-0022	1	907	Providence	Providence	212 PRAIRIE AVE,	63	56	61	56	92	41	34	26	25	0	0	16.4
44-007-0022	2	907	Providence	Providence	212 PRAIRIE AVE,	63	29	61	29	48	42	34	24	23	0	0	17.9
44-007-0026	1	907	Pawtucket	Providence	VERNON STREET	63	57	61	57	93	42	40	39	38	0	0	20.3
44-007-0027	1	907	Providence	Providence	111 DORRANCE STREET	63	53	61	53	87	42	40	39	28	0	0	18.1

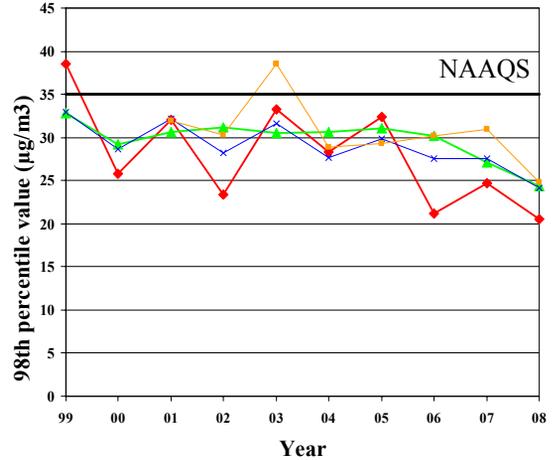
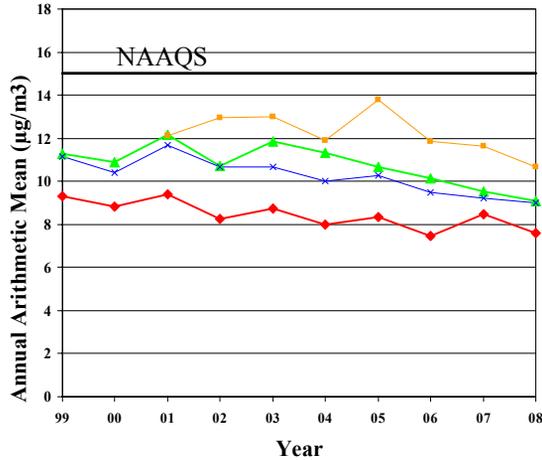
\*Indicates that the mean does not satisfy summary criteria

None of the particulate matter (PM<sub>10</sub>) sites in Rhode Island had any exceedances or violations of the 24-hour standards during 2008. Of the four PM<sub>10</sub> monitoring sites, the Vernon Street Site in Pawtucket and the Dorrance Street Sites reported the highest 24-hour second maximum value of 40 µg/m<sup>3</sup> during 2008. The other two monitoring sites reported the highest 24-hour second maximum values of 34 µg/m<sup>3</sup> and 24 µg/m<sup>3</sup> in 2008. The long range graphs for PM<sub>10</sub> show values varied up and down from year-to-year with a slight downward trend.

**Rhode Island Sites - 2008 - Particulate Matter < 2.5 Microns**



# Rhode Island Particulate Matter < 2.5 Microns (PM<sub>2.5</sub>) Data



Legend for Annual Arithmetic Mean (µg/m³):  
 - W. Alton Jones (Red diamond)  
 - Providence, Prairie Ave. (Green triangle)  
 - E. Providence, Francis Sch. (Blue cross)  
 - Pawtucket, Vernon St. (Orange square)

Legend for 98th Percentile Value (µg/m³):  
 - W. Alton Jones (Red diamond)  
 - Providence, Prairie Ave. (Green triangle)  
 - E. Providence, Francis Sch. (Blue cross)  
 - Pawtucket, Vernon St. (Orange square)

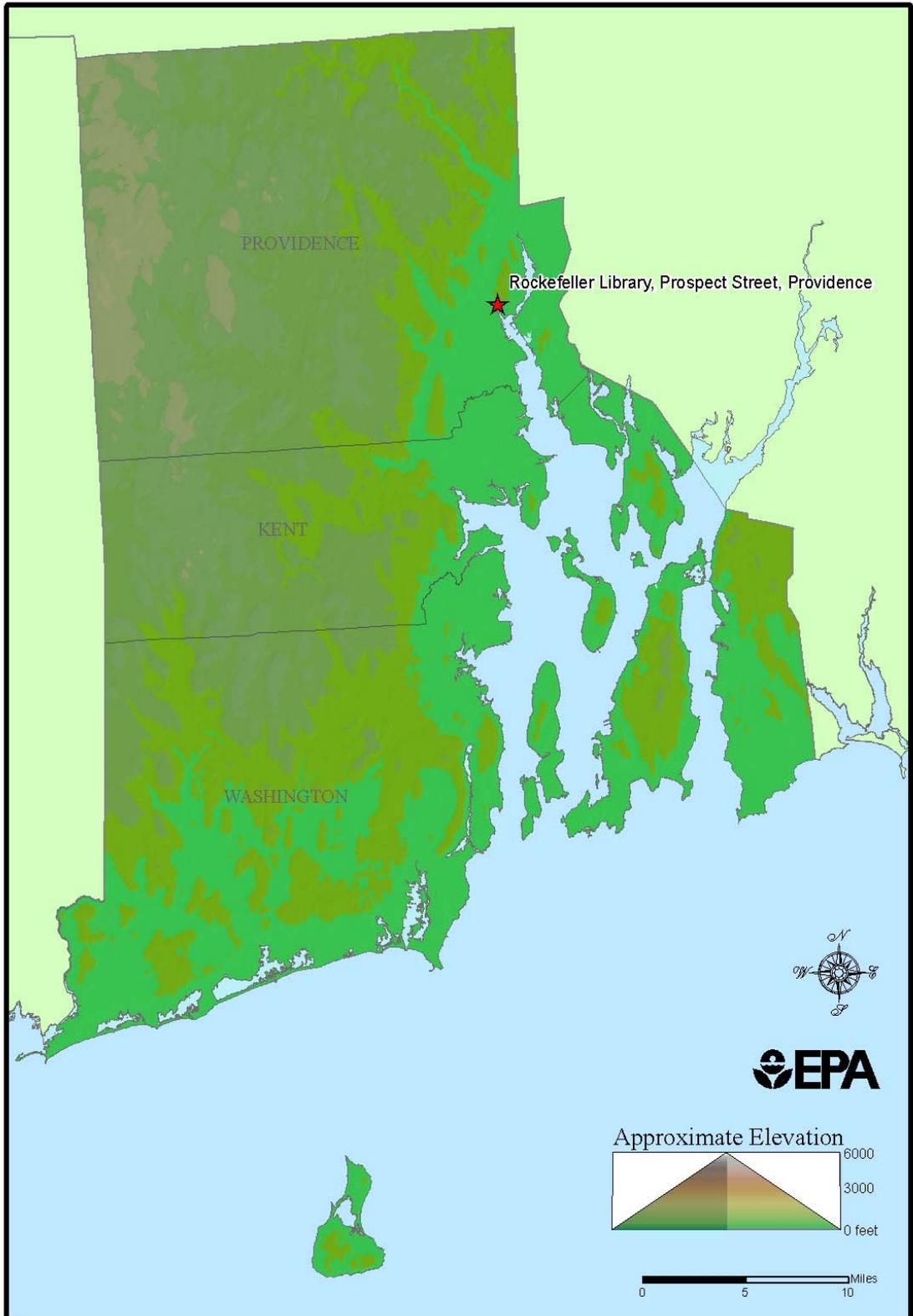
\*NAAQS for Particulate Matter less than 2.5 Microns:  
 Primary: Annual Arithmetic Mean - 15.0 µg/m<sup>3</sup>  
 Secondary: the 3-year average of the 98th percentile of 24-hour concentrations at each population-oriented monitor <35 µg/m<sup>3</sup>

Site ID	P	O	Rept.	C	Org.	City	County	Address	Method	# Obs	Highest Value	2nd Value	3rd Value	4th Value	98th Percentile Value	Wtd. Arith. Mean
44-003-0002	1	907	West Greenwich	Kent	W. ALTON JONES CAMPUS URI			120	96	30.7	20.5	20.0	19.6	20.5	7.61 *	
44-003-0002	2	907	West Greenwich	Kent	W. ALTON JONES CAMPUS URI			170	510	9.1	6.3	6.2	6.1	9.1	4.09 *	
44-007-0022	1	907	Providence	Providence	212 PRAIRIE AVE			0	338	33.3	31.5	31.2	30.1	24.4	9.07	
44-007-0022	2	907	Providence	Providence	212 PRAIRIE AVE			0	50	32.3	27.2	21.0	16.4	32.3	10.17 *	
44-007-0026	1	907	Pawtucket	Providence	VERNON STREET			120	117	27.9	27.5	24.8	23.8	24.8	10.66	
44-007-0028	1	907	Providence	Providence	695 EDDY STREET			120	104	29.3	29.2	23.9	21.6	23.9	9.61 *	
44-007-1010	1	907	East Providence	Providence	FRANCIS SCHOOL, 64 BOURNE AVE.			120	342	32.2	32.0	31.9	27.7	24.1	9.02	

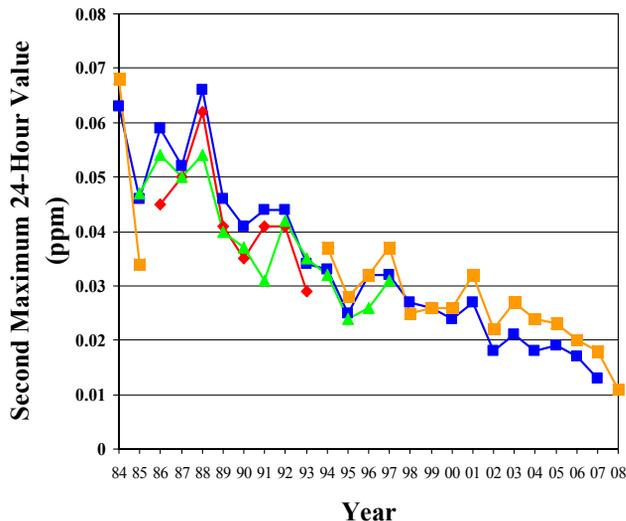
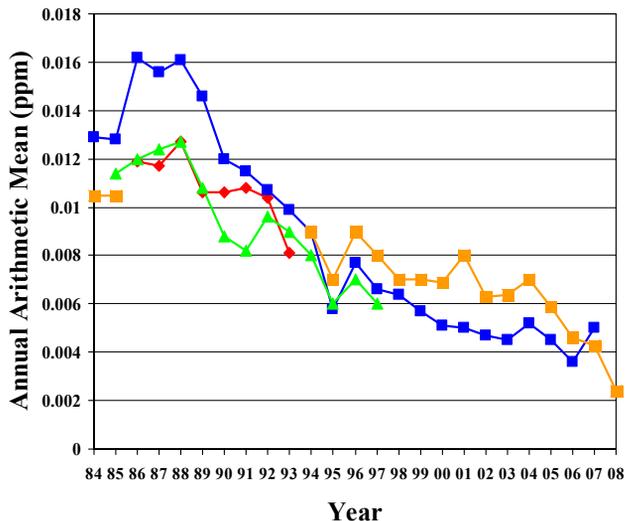
\*Indicates that the mean does not meet summary criteria

In 2008, Rhode Island operated a network of five fine particulate matter (PM<sub>2.5</sub>) sites, with 2 colocated monitors. During 2008, the annual arithmetic mean concentrations of PM<sub>2.5</sub> were higher at the Providence area sites (i.e. Francis School, Prairie Ave., Vernon St., and Eddy St.) compared to the rural site at Alton Jones. The ten year concentration trends for the Alton Jones, Francis School, Prairie Ave., and Vernon Street Sites have remained relatively flat, except for a slight increase at the Vernon Street Site during 2005. The 2006, 2007 and 2008 concentrations at the Vernon Street Site went back to similar or slightly lower levels seen in 2004.

Rhode Island Sites - 2008 - Sulfur Dioxide



# Rhode Island Sulfur Dioxide Data



◆ Providence DOH      ■ Providence Dorrance St.  
▲ Pawtucket Summit St.      ■ Providence Rockefeller Lib.

◆ Providence DOH      ■ Providence Dorrance St.  
▲ Pawtucket Summit St.      ■ Providence Rockefeller Lib.

NAAQS for Sulfur Dioxide:

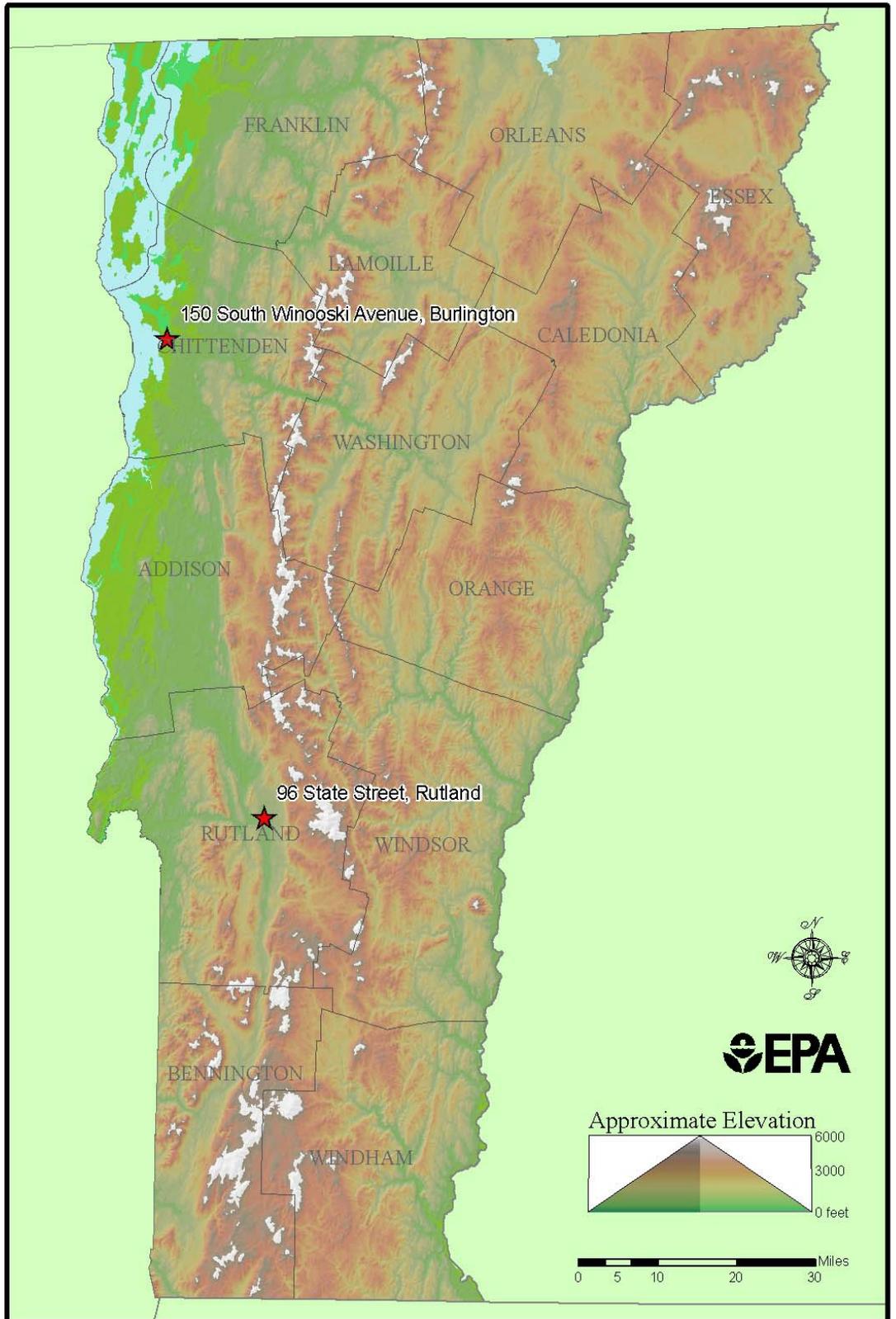
Primary: Annual Arithmetic Mean - 0.03ppm  
 24-hour 0.14ppm

Secondary: 3-hour 0.5ppm

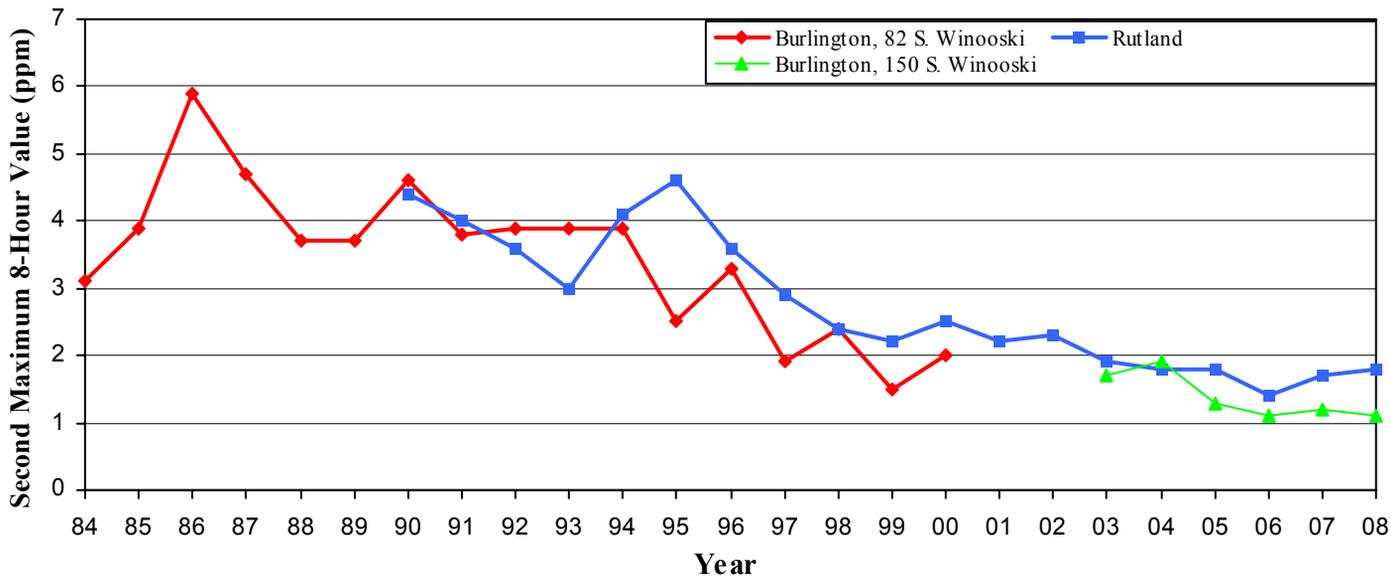
2008																
Rhode Island																
Parameter: Sulfur Dioxide																
All Values are in Units of Parts Per Million																
Site ID	P	O	C	Type	City	County	Address	Method	#	24-hour	24-hour	3-hour	3-hour	1-hour	1-hour	Arith.
										Obs	Highest	Highest	Obs	Highest	Highest	
44-007-0012	1	907	Providence	Providence	ROCKEFELLER LIBRARY	60	8047	0.014	0.011	0	0.022	0.021	0	0.0300	0.0280	0.00240

Only one sulfur dioxide (SO<sub>2</sub>) monitoring site operated throughout 2008 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<sub>2</sub> at 0.002 ppm, which is 7% of the NAAQS. The 24-hour second maximum concentration of 0.011 ppm and the 3-hour second maximum concentration of 0.021 ppm were also recorded at the Rockefeller Library Site in Providence. The long range trend for SO<sub>2</sub> concentrations in Rhode Island continually shows a downward trend.

Vermont Sites 2008 - Carbon Monoxide



# Vermont Carbon Monoxide Data



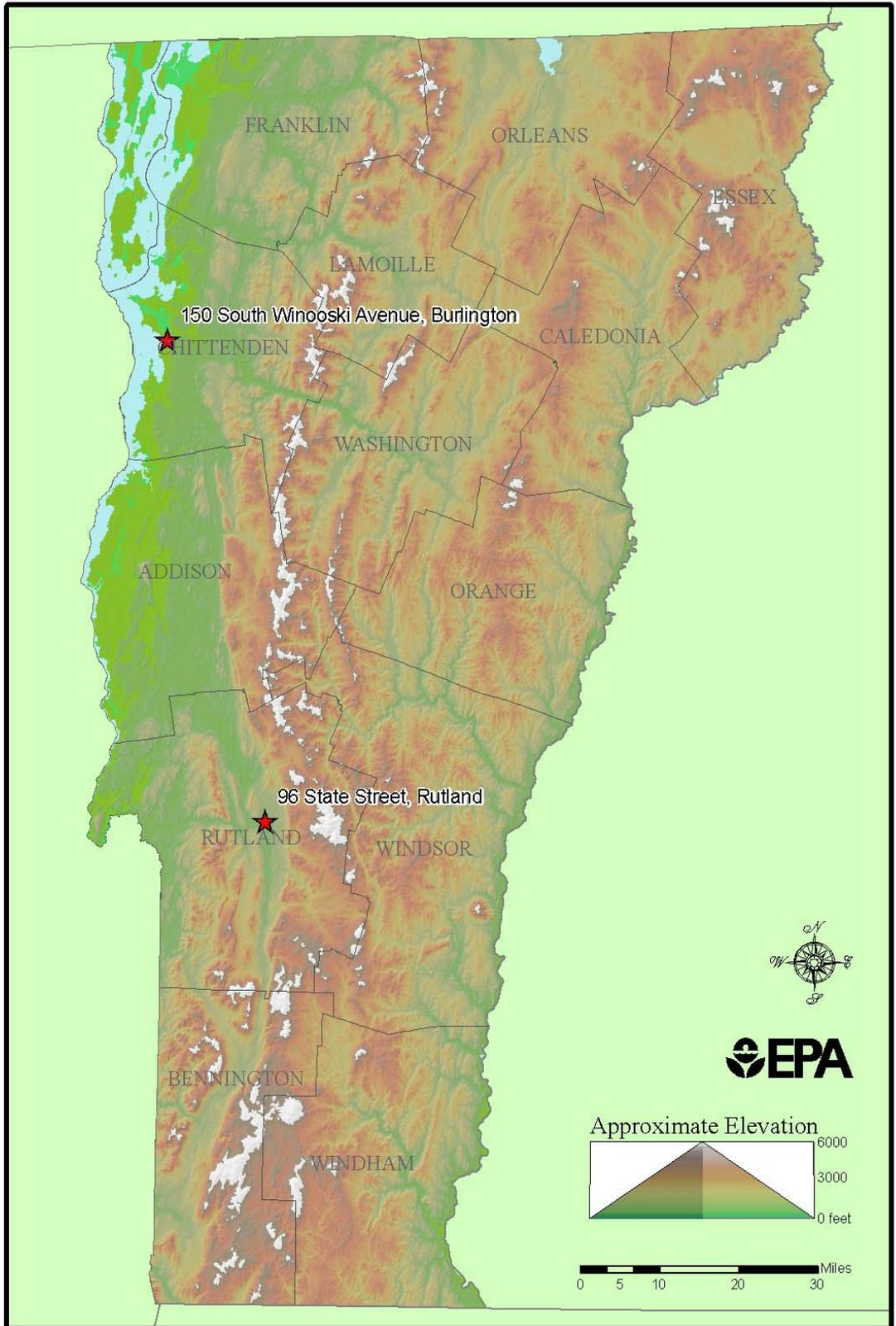
## NAAQS for Carbon Monoxide:

- 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.

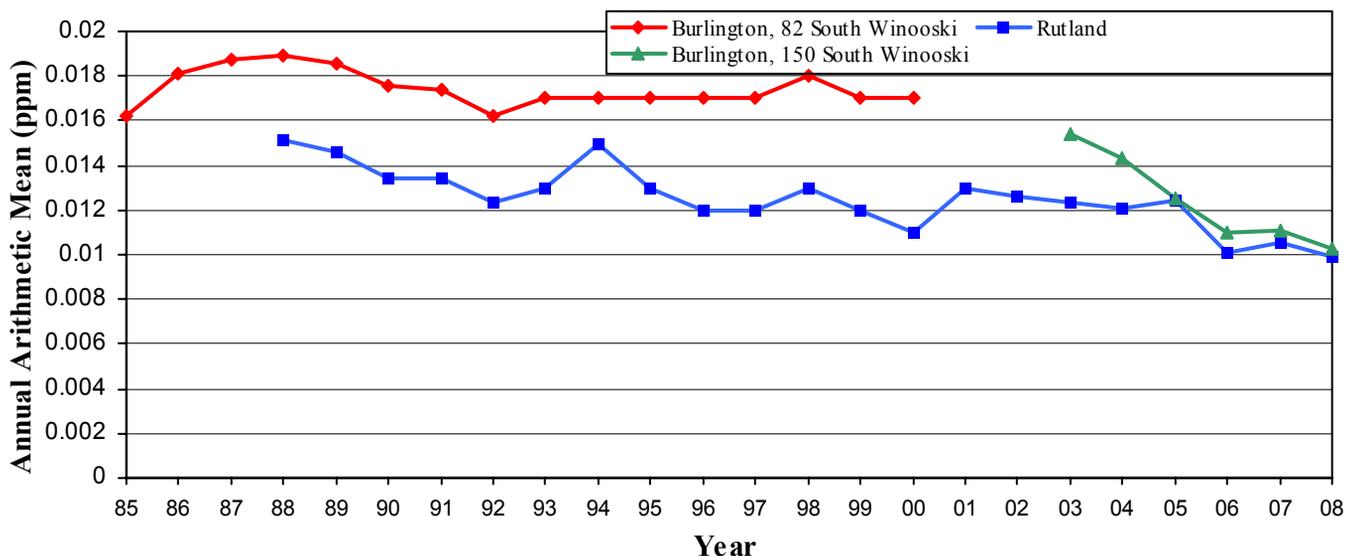
2008													
Vermont													
Carbon Monoxide													
All Values are in Units of Parts Per Million													
	P							1-hour	1-hour		8-hour	8-hour	
	O	Org						#	Highest	Highest	# > 35	Highest	Highest
Site ID	C	Type	City	County	Address	Method	Obs	Value	Value		Value	Value	# > 9
50-007-0014	1	1119	Burlington	Chittenden	150 SOUTH WINOOSKI AVENUE	54	8250	1.900	1.800	0	1.2	1.1	0
50-021-0002	1	1119	Rutland	Rutland	96 STATE STREET	54	8295	3.100	2.700	0	2.1	1.8	0

The State of Vermont operated two carbon monoxide (CO) ambient monitoring sites during 2008, 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 2008. The second highest 8-hour concentrations of 1.8 ppm of CO was recorded at the Rutland site. A general decline is shown in the 25 year trend of CO concentrations in Vermont.

**Vermont Sites 2008 - Nitrogen Dioxide**



# Vermont Nitrogen Dioxide Data



NAAQS for Nitrogen Dioxide:  
Annual Arithmetic Mean 0.053 ppm (100 µg/m<sup>3</sup>)

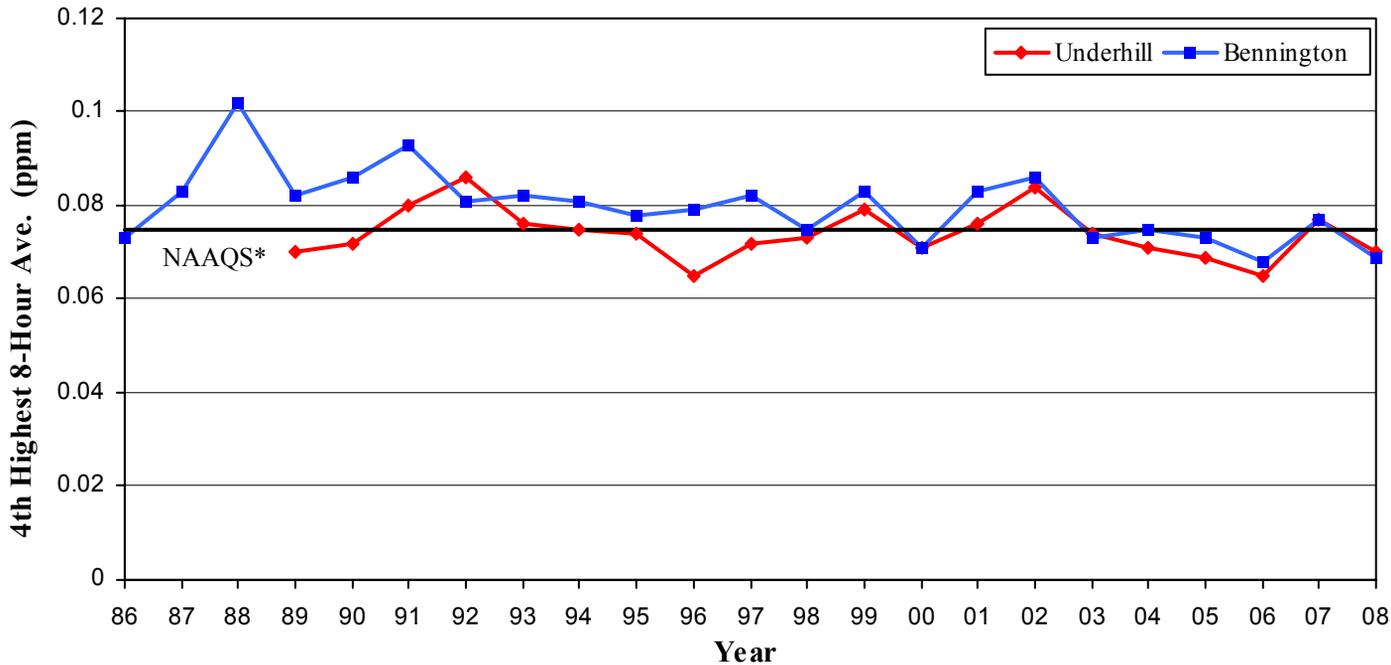
2008 NO <sub>2</sub>										
Vermont										
Parameter: Nitrogen Dioxide										
All Values are in Units of Parts Per Million										
								1-hour	1-hour	
	P							2nd	2nd	Annual
Site ID	O Rept.	C Org.	City	County	Address	Method	# Obs	Highest Value	Highest Value	Arith. Mean
50-007-0014	1	1119	Burlington	Chittenden	150 SOUTH WINOOSKI AVE	74	7702	0.066	0.061	0.0103
50-021-0002	1	1119	Rutland	Rutland	96 STATE STREET	74	8094	0.049	0.049	0.0099

Two nitrogen dioxide (NO<sub>2</sub>) monitoring sites (Rutland and Burlington) were operated by the state during 2008. The past 24 years of NO<sub>2</sub> data indicate that the concentrations of NO<sub>2</sub> have remained relatively steady with a slight decrease in the past few years. These concentrations are very low in comparison with the NAAQS. During 2008, the highest annual arithmetic mean concentration of NO<sub>2</sub> in Vermont was measured at the Burlington site. This value was 0.0103 ppm, which is approximately 19% of the NAAQS.

Vermont Sites 2008 - Ozone



# 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 0.075ppm. This graph represents the 4<sup>th</sup> 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.)

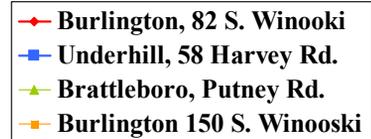
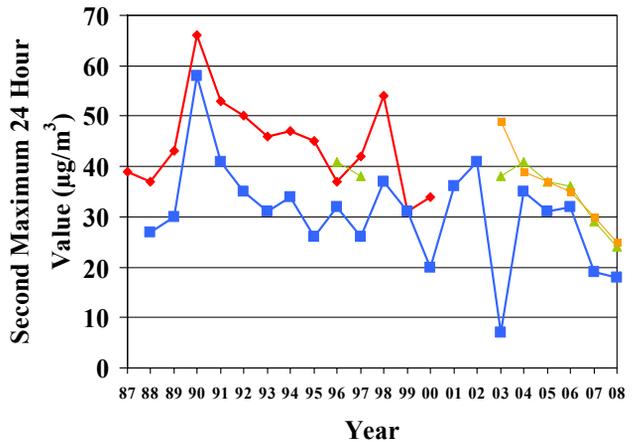
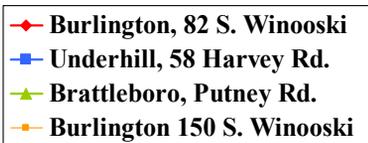
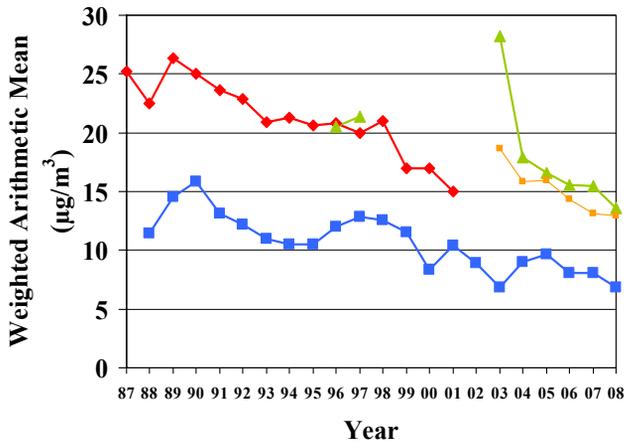
2008														
Vermont														
Parameter: Ozone (8-Hour)														
All Values are in Units of Parts Per Million														
	P													
	O	Rept.				%	Days	Required	Highest	2nd	3rd	4th	Days	
Site ID	C	Org.	City	County	Address	Method	Obs	Meas.	Days	8-Hr Value	8-Hr Value	8-Hr Value	8-Hr Value	Max >
50-003-0004	1	1119	Bennington	Bennington	AIRPORT RD	87	91	154	170	0.084	0.078	0.071	0.069	2
50-007-0007	1	1119	Underhill	Chittenden	58 HARVEY ROAD	87	93	170	183	0.083	0.076	0.072	0.070	2

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 2008. The highest 8-hour average ozone concentration in Vermont during 2008 was recorded at the Bennington site and was 0.084 ppm.

Vermont Sites 2008 - Particulate Matter < 10 Microns



# Vermont Particulate Matter < 10 Microns (PM<sub>10</sub>) Data



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

Rep. Org	City	County	Address	Methoc#	Obs #	Req. #	Days	Valid %	Highest Value	2nd Highest Value	3rd Highest Value	4th Highest Value	Days Max >150	Est. Day Max >150	Wtd. Arith. Mean
1119	Underhill	Chittenden	58 HARVEY ROAD	62	59	61	59	97	23	18	14	12	0	0	6.8
1119	Burlington	Chittenden	150 SOUTH WINOOSKI AVE	62	61	61	61	100	42	25	23	23	0	0	12.9
1119	Burlington	Chittenden	150 SOUTH WINOOSKI AVE	62	8	9	8	89	12	11	11	10	0	0	9.1 *
1119	Rutland	Rutland	96 STATE STREET	62	55	61	55	90	37	29	28	26	0	0	13.7
1119	Brattleboro	Windham	1277 PUTNEY ROAD	62	49	61	49	80	35	24	23	21	0	0	13.6 *
1119	Brattleboro	Windham	1277 PUTNEY ROAD	62	46	61	46	75	34	28	23	23	0	0	13.6 *

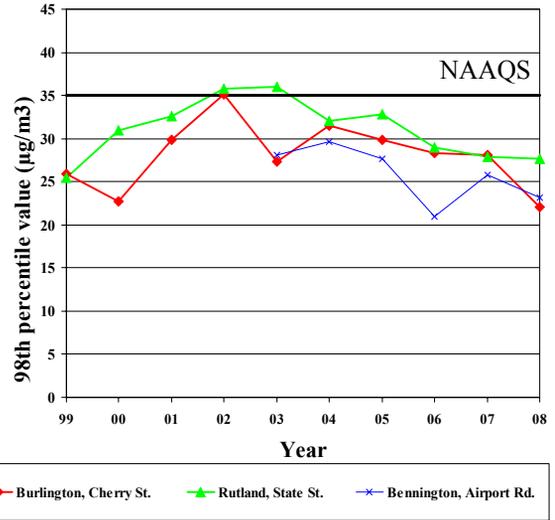
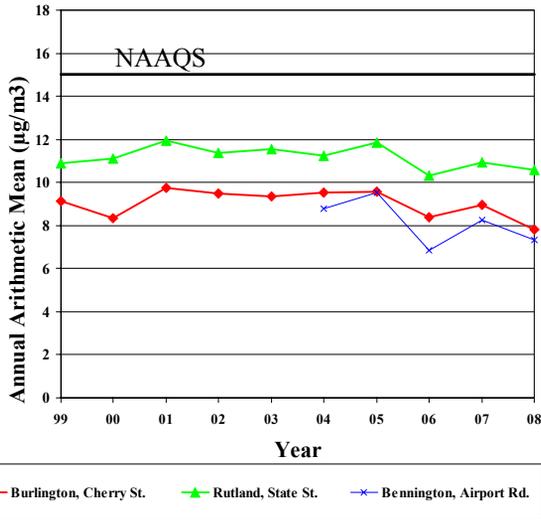
\* mean does not satisfy summary criteria

During 2008, Vermont maintained four ambient monitoring sites measuring particulate matter less than 10 microns (PM<sub>10</sub>). The sites include Underhill, Burlington, Rutland and Brattleboro. The Brattleboro site was terminated as of November 2008 and the collocated sample was moved to the Burlington site. Data for 2008 continued the 13 year trend of low PM<sub>10</sub> concentrations recorded by the Vermont monitoring sites. The second highest 24-hour PM<sub>10</sub> concentration in the state was recorded at the Rutland ambient monitoring site and measured 29 µg/m<sup>3</sup>. This concentration was well below the NAAQS for PM<sub>10</sub>.

**Vermont Sites 2008 - Particulate Matter < 2.5 Microns**



# Vermont Particulate Matter < 2.5 Microns (PM<sub>2.5</sub>) Data



\*NAAQS for Particulate Matter less than 2.5 Microns:  
 Primary: Annual Arithmetic Mean - 15.0 µg/m<sup>3</sup>  
 Secondary: the 3-year average of the 98th percentile of 24-hour concentrations at each population-oriented monitor <35 µg/m<sup>3</sup>

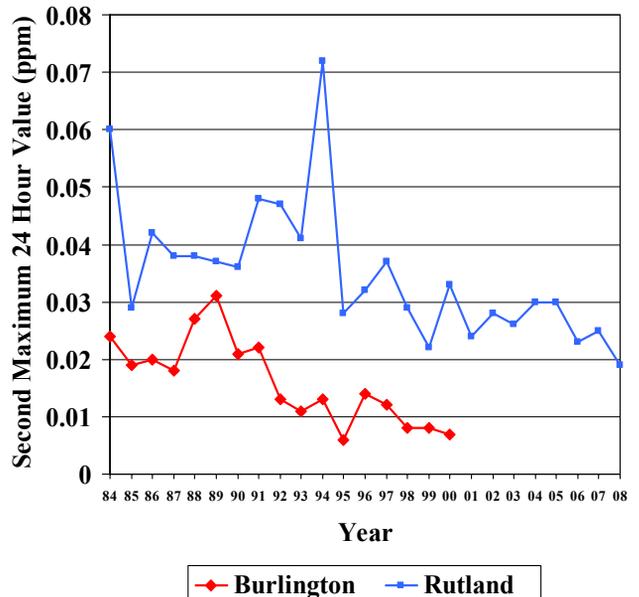
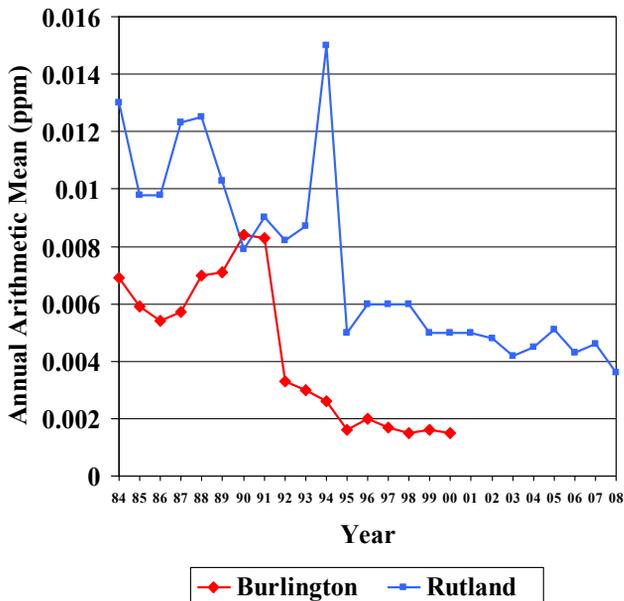
Site ID	P	O	Rept.	City	County	Address	Method	#	Obs	Highest Value	Highest Value	Highest Value	Highest Value	Percentile Value	Arith. Mean
50-003-0004	1	1119	Bennington	Bennington	AIRPORT RD	145	120	24.8	24.5	23.2	15.8	23.2	7.33		
50-007-0007	1	1119	Underhill	Chittenden	58 HARVEY ROAD	145	116	24.9	19.5	18.4	17.2	18.4	5.64		
50-007-0012	1	1119	Burlington	Chittenden	108 CHERRY STREET	145	116	29.5	27.2	22.1	21.9	22.1	7.80		
50-007-0012	2	1119	Burlington	Chittenden	108 CHERRY STREET	145	119	30.4	26.1	22.6	22.3	26.1	7.73		
50-021-0002	1	1119	Rutland	Rutland	96 STATE STREET	145	113	36.7	30.0	27.7	24.3	27.7	10.58		

Vermont operated a network of four fine particulate matter (PM<sub>2.5</sub>) ambient monitoring sites in 2008, with one colocated monitor. The sites include Bennington, Underhill, Burlington and Rutland. PM<sub>2.5</sub> concentrations in Vermont have historically been below the NAAQS. The Rutland site recorded the highest annual weighted arithmetic mean which was 10.58 µg/m<sup>3</sup>.

Vermont Sites 2008 - Sulfur Dioxide



# Vermont Sulfur Dioxide Data



NAAQS for Sulfur Dioxide:

- Primary: Annual Arithmetic Mean - 0.03ppm
- 24-hour 0.14ppm
- Secondary: 3-hour 0.5ppm

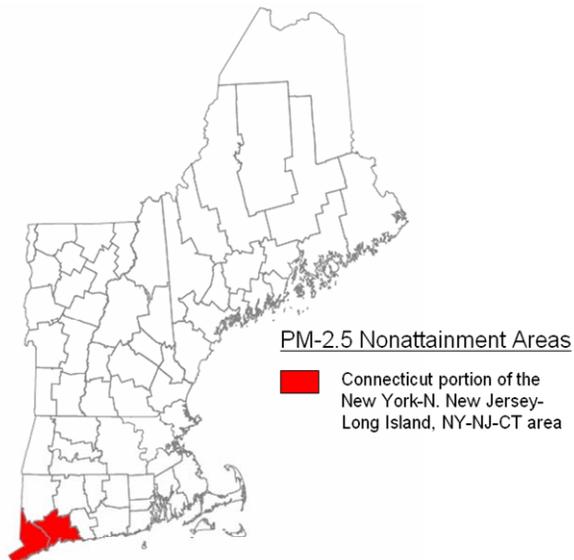
2008																
Vermont																
Parameter: Sulfur Dioxide																
All Values are in Units of Parts Per Million																
	P							24-	24-		3-hour	3-hour		1-hour	1-hour	
	O	Org					#	hour	hour	Obs	Highest	Highest	Obs	Highest	Highest	Arith.
Site ID	C	Type	City	County	Address	Method	Obs	Highest	Highest	> 0.14	Value	Value	> 0.5	Value	Value	Mean
50-021-0002	1	1119	Rutland	Rutland	96 STATE STREET	60	8284	0.021	0.019	0	0.030	0.027	0	0.0370	0.0350	0.00360

The state operated one sulfur dioxide (SO<sub>2</sub>) ambient monitoring site during 2008, located in Rutland. The second highest 3-hour SO<sub>2</sub> concentration at the site was 0.027 ppm. The highest 24-hour average SO<sub>2</sub> concentration was 0.021 ppm and the annual arithmetic mean was 0.00360 ppm. With the exception of 1994, the historical data indicate a general decline in the concentration of SO<sub>2</sub> in the state of Vermont, and is well below the NAAQS.

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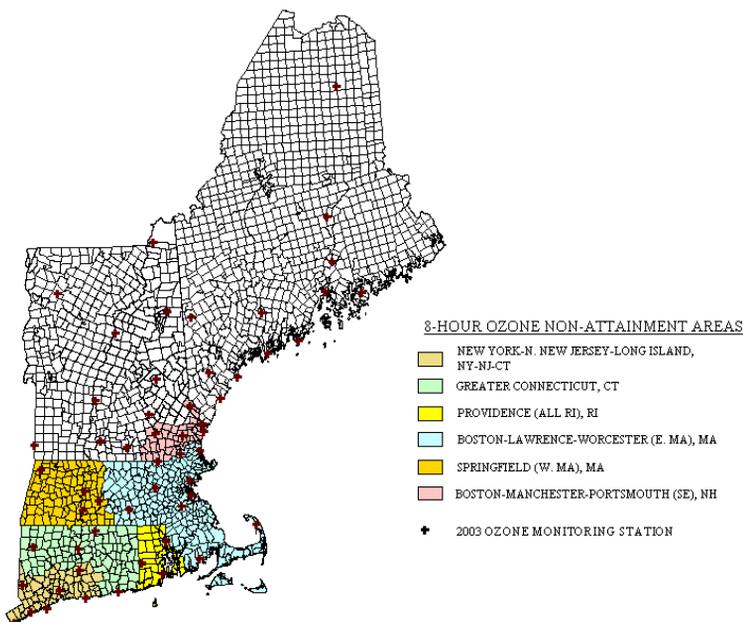
# Non-Attainment Areas

## Non-Attainment Areas for the 1997 PM<sub>2.5</sub> Annual Standard



(\*Nonattainment areas for PM<sub>2.5</sub> 24 hour standard expected to be effective in fall of 2009)

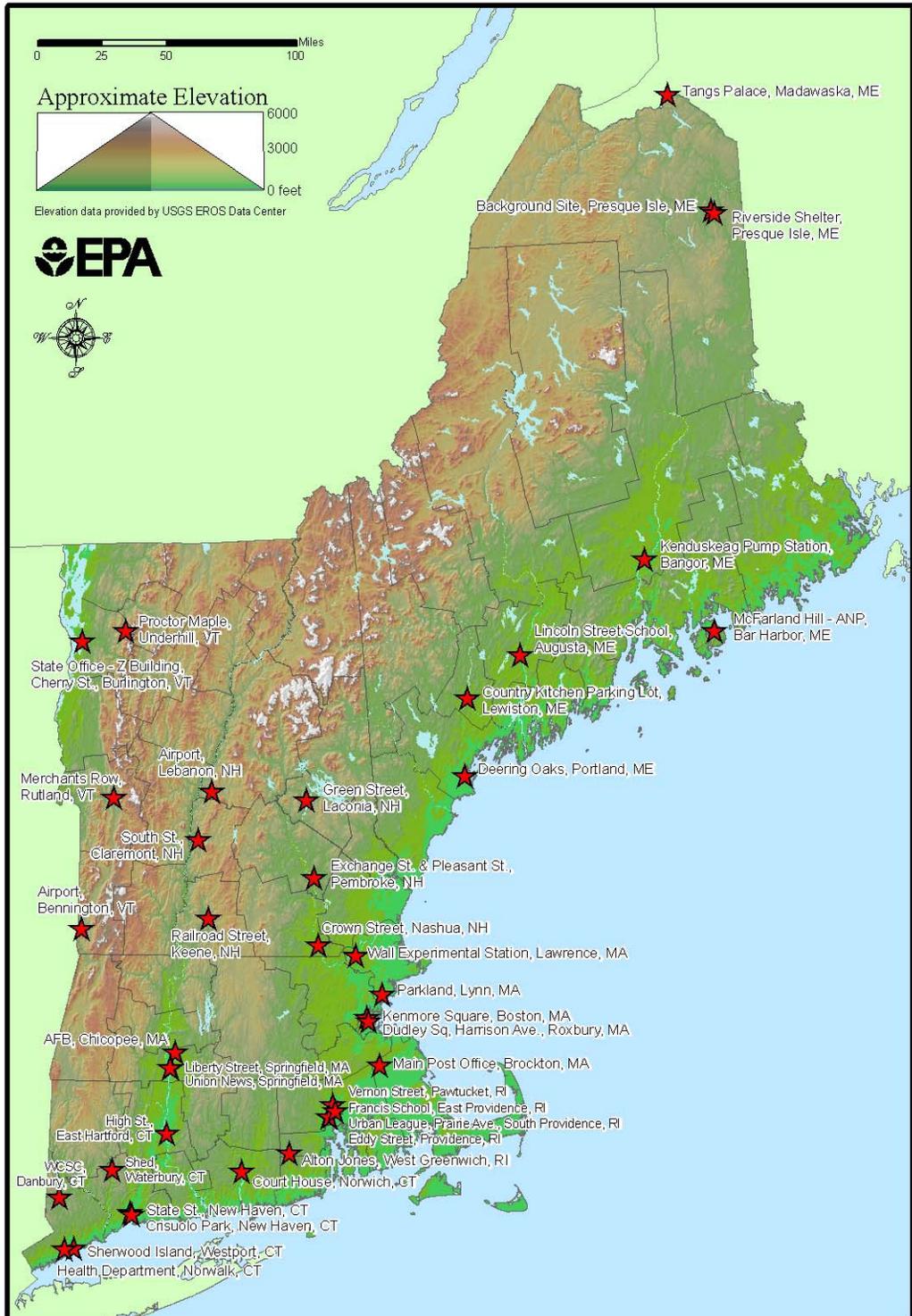
## Non-Attainment Areas for the 1997 8-Hour Ozone standard



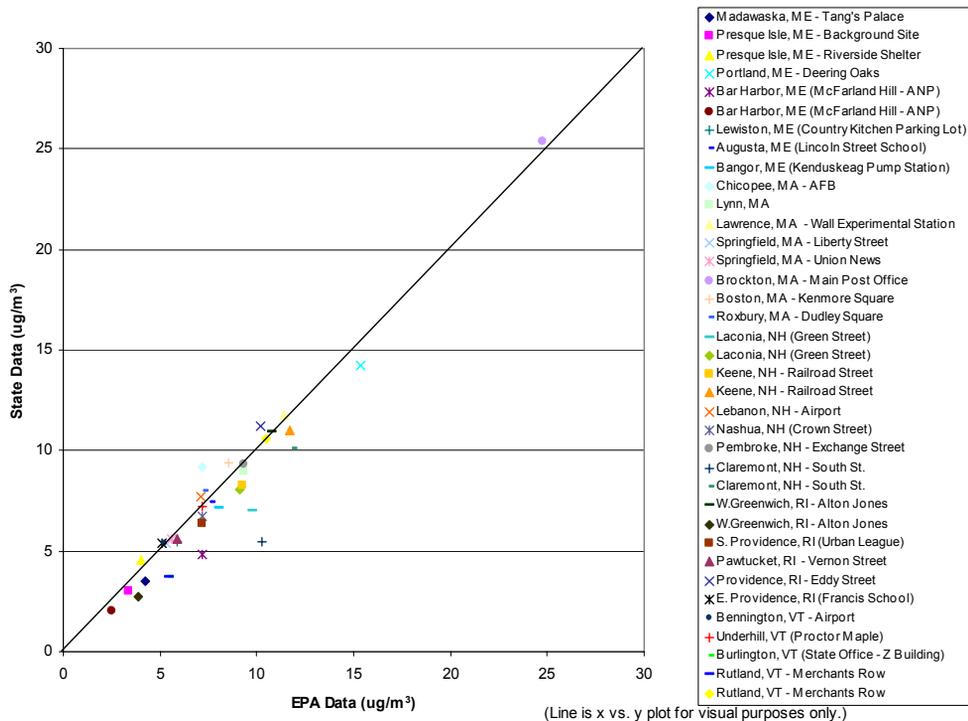
(\*Nonattainment areas for 2008 ozone 8- hour standard are scheduled to be issued in March of 2010.)

# PM 2.5 Performance Evaluation Program

## PM 2.5 Performance Evaluation Program (PEP) Sites - 2008



## 2008 PM<sub>2.5</sub> Performance Evaluation Program (PEP) Audits



The PM<sub>2.5</sub> Performance Evaluation Program (PEP) is part of a National Quality Assurance Program for PM<sub>2.5</sub>. Its purpose is to determine total bias for the PM<sub>2.5</sub> sample collection and laboratory analysis processes. EPA contractors collocate portable federally referenced PM<sub>2.5</sub> samplers adjacent to states' routine PM<sub>2.5</sub> samplers. The instruments run for a 24-hour period at the states' monitoring sites. Once the run is completed in Region I, the PM<sub>2.5</sub> PEP filters are sent to an independent EPA East Coast Weighing Laboratory in Region IV where PM<sub>2.5</sub> 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<sub>2.5</sub> monitoring sites are required to have five valid audits per year distributed across four quarters; PQAOs with more than five PM<sub>2.5</sub> 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<sub>2.5</sub> PEP audit isn't 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.

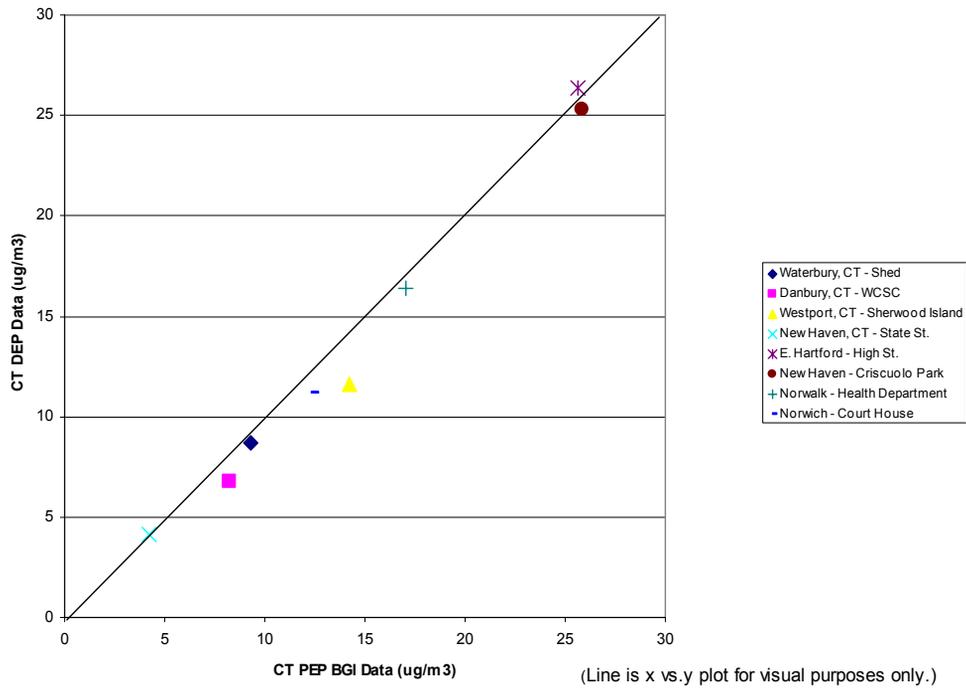
In 2008, CT DEP began implementing their own PM<sub>2.5</sub> PEP program. In order to do this, they had to demonstrate adequacy and independence as well as follow EPA's National PM<sub>2.5</sub> PEP guidance.

This year, CT DEP participated with the EPA contractors in both Regional semi-annual "parking lot collocation studies." All of the portable PM<sub>2.5</sub> samplers that were used in Region I to conduct the PM<sub>2.5</sub> PEP audits were collocated for three 24-hour sampling periods at EPA's North Chelmsford, MA facility. Region I conducted an additional "parking lot collocation study" for three 24-hour sampling periods in order to compare WINS and VSCC inlets. Only the EPA contractors participated in that study.

The 2008 PM<sub>2.5</sub> PEP graph shows that in general, all five states performed very well this year. There is a separate graph depicting CT DEP's 2008 PM<sub>2.5</sub> PEP audits. Overall, their performance was very good as well.

Additional information about the PM<sub>2.5</sub> PEP program can be found on the Ambient Monitoring Technology Information Center's web site: <http://www.epa.gov/ttn/amtic/>

### 2008 CT PM<sub>2.5</sub> Performance Evaluation Program (PEP) Audits



See previous page for discussion of Connecticut's  
PM<sub>2.5</sub> Performance Evaluation Program

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