1410 N. Hilton
Boise, ID 83706
DEPARTMENT OF ENVIRONMENTAL QUALITY **www.deq.idaho.gov**

2005 Air Quality Monitoring Data Summary

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The 2005 Air Quality Data Summary is available
for viewing or downloading on the internet at:

http://www.deq.state.id.us/air/

Links to additional documents for download are also available at the web site.

Introduction

This annual report is issued by the Idaho Department of Environmental Quality (DEQ) to inform the public of air quality throughout Idaho. The purpose of this report is to summarize regional ambient air quality while presenting air monitoring results for six criteria air pollutants. The U.S. Environmental Protection Agency (EPA) sets national ambient air quality standards (NAAQS) for these pollutants. These criteria air pollutants are:

- Particulate Matter (PM_{10} ≤10 micrometers, $PM_{2.5}$ ≤ 2.5 micrometers in diameter)
- Carbon Monoxide
- Sulfur Dioxide
- Nitrogen Dioxide
- Ozone
- Lead

In Idaho, monitoring for the criteria pollutants occurs primarily in areas of high population where the potential for human exposure is greatest. Particulate matter is currently the most common criteria pollutant of concern in Idaho because particulate sources are widespread throughout the state. Common sources include windblown dust, re-entrained road dust, smoke (residential, agricultural, and forest fires), industrial emissions, and motor vehicle emissions. The PM_{10} standard has been in effect since 1987 and it was historically the particulate size of concern. However, $PM_{2.5}$, or PM Fine, has been monitored in Idaho since 1998 and is now the pollutant of concern. Numerous studies have associated fine particulate matter with a variety of respiratory and cardiovascular problems, ranging from aggravated asthma, to irregular heartbeats, heart attacks, and early death in people with heart or lung disease. The PM NAAQS is currently under review by EPA and may be changed in the future.

Another historical pollutant of concern in Idaho is carbon monoxide (CO). The primary source of CO is incomplete fossil fuel combustion. CO concentrations have the potential to be high in the urbanized areas where automobile traffic is heavy and cars frequently idle at stoplights. The Boise area (Northern Ada County) was the only CO nonattainment area in the state. When the SIP and Maintenance Plan were accepted by EPA, it was reclassified as a maintenance area on December 27, 2002. No violations of the 1-hour or 8-hour CO NAAQS have occurred since 1991.

Sulfur dioxide (SO_2) and nitrogen dioxide (NO_2) sources are few and very localized because these pollutants come primarily from large industrial sources (transportation sources also contribute to NO_2). There is little heavy industry in Idaho and elevated SO_2 and NO_2 concentrations in ambient air are typically not found. However, due to concerns of some localized sources, DEQ has monitored for one or both of these pollutants in Boise, Pocatello, Moyie Springs, Mountain Home, and Soda Springs. In the past 10 years of targeted monitoring, DEQ has not measured significant concentrations of these pollutants at these monitoring sites. DEQ initiated NO_2 monitoring near Coeur d'Alene on January 1, 2005 to characterize emissions in the area.

The fifth criteria pollutant monitored by DEQ is ozone. Ozone (O_3) has been monitored in the Treasure Valley since 2001, and in Coeur d'Alene beginning in 2005. Ozone is created when combustion by-products near the ground react with nitrogen oxides and other compounds to create photochemical smog. These reactions are stimulated on days of intense sunlight and warm temperatures. Ozone has become a pollutant of concern since many summertime days are classified as moderate for ozone on the Air Quality Index (AQI).

Lead (Pb) is the sixth criteria pollutant and is not currently being monitored by DEQ. Lead (Pb) was monitored in the Shoshone County town of Kellogg, near the Bunker Hill superfund site, because lead was a by-product of the smelting process that occurred in the area for decades. Although a significant problem in the 1970's and early 1980's, airborne Pb concentrations at this monitoring site were very low through the 1990's. DEQ discontinued monitoring for lead in 2002.

Real-time air monitoring data are available on the Internet at http://www.tcsn.net/family/Idaho/index.html. We encourage you to visit our Web site at http://www.deq.state.id.us/ to find more extensive air quality data, educational materials, and discussions of current topics.

We are expanding and refining our Internet site to better serve the residents of Idaho. We want your feedback on our air quality data and program. Please submit your comments via email to Bruce Louks; Monitoring, Modeling, & Emissions Inventory Manager, at Bruce.Louks@deq.idaho.gov or call at 208-373-0294.

Executive Summary for 2005

DEQ continued to monitor Idaho's air quality in 2005. While Idaho generally enjoys good air quality, in many ways our airsheds are faced with new challenges. Some of these challenges are related to economic and population growth, particularly in terms of vehicles on roadways and growth in new construction.

Monitoring data collected by DEQ indicates air pollutant levels have generally decreased over the last decade to levels below the federal standards. This general improvement in air quality is likely due to better control of air pollution sources; however, two pollutants remain a concern – $PM_{2.5}$ and ozone. Idaho will need to keep a close watch on $PM_{2.5}$ levels statewide. New $PM_{2.5}$ monitoring sites were established in Franklin and Preston at the end of 2004 and beginning of 2005. Ozone levels in the Treasure Valley, while not violating federal standards, are not far below the standard.

DEQ monitored for toxic air pollutants in the Treasure Valley from 2003 to the beginning of 2005 to determine if concentrations are at levels that could have adverse health affects. These health effects include, but are not limited to, increased cancer risk and respiratory, cardiovascular, and neurological effects. EPA, through their National Air Toxics Assessment (NATA) program, predicts cancer and non-cancer risk values across Idaho's airsheds using emissions estimates of certain air toxic compounds. Monitoring for these compounds has enabled DEQ to reconcile the NATA predictions.

DEQ is taking action with many partners to face these challenges. These actions include developing emissions reduction strategies, working with planning agencies, and implementing voluntary programs that achieve emissions reductions. Please visit our Web site at http://www.deq.state.id.us/air/prog_issues.cfm for more information about these projects.

There are multiple ways to measure the quality of our air. Some are summarized in the following pages for 2005.

Air Quality Index (AQI)

The AQI is a nationwide index developed by the U S EPA that incorporates the criteria pollutants, and is used to report daily air quality. The AQI for Idaho's counties are summarized below, and discussed in more detail in the section directly following the executive summary.

2005 AQI Ratings

		AQI Rating (% of Year)				
County	# AQI Days	Good	Moderate	Unhealthy for Sensitive Groups	Unhealthy	Highest AQI
Ada	365	84%	16%	0.3%		103
Bannock	365	91%	9%	0.3%	0.3%	152
Benewah	362	94%	5%	0.6%		111
Boise	361	83%	17%			97
Bonner	364	90%	10%			72
Bonneville	349	99%	1%			70
Butte	357	100%				41
Canyon	365	83%	15%	1.9%		138
Caribou	362	99%	1%			56
Elmore	154	99%	1%			51
Franklin	314	83%	11%	4.1%	1.3%	162
Idaho	363	92%	7%		0.3%	161
Kootenai	365	81%	19%			85
Latah	353	100%	0%			63
Lemhi	325	79%	20%	0.9%		132
Nez Perce	365	99%	1%			72
Power	363	87%	12%	0.6%	0.6%	161
Shoshone	356	69%	29%	2.0%	0.3%	171
Twin Falls	326	94%	6%	0.3%		101
Valley	328	90%	9%	0.6%		116

The number of "good" AQI days continues to dominate regionally in Idaho; however, there were brief periods when the air quality degraded into "moderate," "unhealthy for sensitive groups," or "unhealthy." The table above shows the AQI breakdown by percentage in each category for the year where air quality is monitored. In 2005, the highest AQI value of 171 was recorded in Shoshone County on January 18 for $PM_{2.5}$. This value was in the unhealthy range.

There were no NAAQS violations in 2005 for any pollutants. In most cases, pollutant concentrations fell well below standards.

Burn Bans

Each day, DEQ measures the concentration of certain air pollutants throughout the state. Based on local ordinances, DEQ may issue a burn ban when concentrations of these air pollutants reach or exceed the health-based standards or limits established by state law or regulation. Concerned citizens may tune in to the news on their local radio or television station to find out if a burn ban has been issued, or login to DEQ's Internet web site at http://www.deq.state.id.us/air/aqindex.cfm. DEQ issues a news bulletin to local news media, law enforcement, and fire officials each time a burn ban is imposed. There were a number of voluntary and mandatory bans issued in 2005.

Air Emissions Inventory

An emissions inventory for criteria air pollutants was conducted for the state for calendar year 2002 and is included in this report. The 2005 data for large industrial sources was included. An emissions inventory summarizes the quantities of air pollutants reported by large industrial sources, as well as pollutants from other sources estimated using EPA methods. Emissions inventory information is presented in detail for carbon monoxide, particulate matter (10 micron diameter), sulfur dioxide, nitrogen dioxide, and volatile organic compounds (VOCs).

The inventory demonstrates that on-road vehicles are the most significant contributors to criteria pollutant emissions in Idaho. Stationary area sources (home heating, small industrial sources, outdoor burning, etc.) are the major contributor of PM_{10} emissions.

Air Quality Index

The AQI is reported according to a 500-point scale for each of the major criteria air pollutants: ozone, particulate matter ($PM_{2.5}$ & PM_{10}), carbon monoxide, nitrogen dioxide, and sulfur dioxide. The “worst denominator” determines the ranking. For example, if an area has a carbon monoxide value of 132 on a given day and all other pollutants are below 50, the AQI for that day would be 132. The AQI scale breaks down into six categories, listed below. Each category has a corresponding color, shown with pollution concentration breakpoints for each category, also shown in the definitions section of this document.

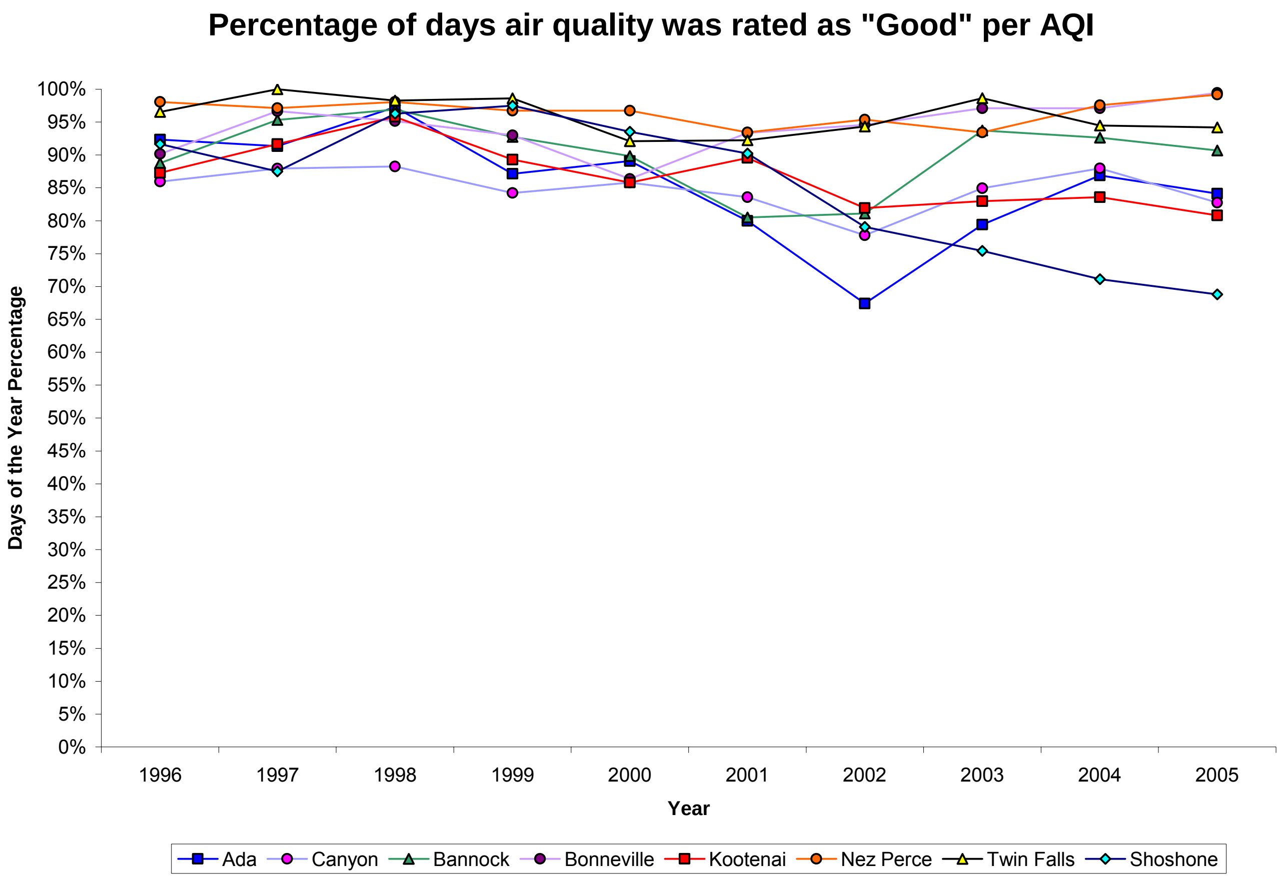
Levels of Health Concern	Numeric Value	Meaning
Good	0-50	Air quality is considered satisfactory, and air pollution poses little or no risk.
Moderate	51-100	Air quality is acceptable; however, for some pollutants there may be a moderate health concern for a very small number of people who are unusually sensitive to air pollution.
Unhealthy for Sensitive Groups	101-150	Members of sensitive groups may experience health effects. The general public is not likely to be affected.
Unhealthy	151-200	Everyone may begin to experience health effects; members of sensitive groups may experience more serious health effects.
Very Unhealthy	201-300	Health alert: everyone may experience more serious health effects.
Hazardous	300-500	Health warnings of emergency conditions. The entire population is more likely to be affected.

The AQI is a national index, so the values and colors used to show local air quality and the associated level of health concern will be the same everywhere in the U.S.A.

The number of “good” air quality days continues to dominate regionally in Idaho. However, there were brief periods when the air quality degraded into “moderate,” “unhealthy for sensitive groups,” and “unhealthy.” The table presented in the executive summary shows the AQI breakdown by percentage in each category for the year.

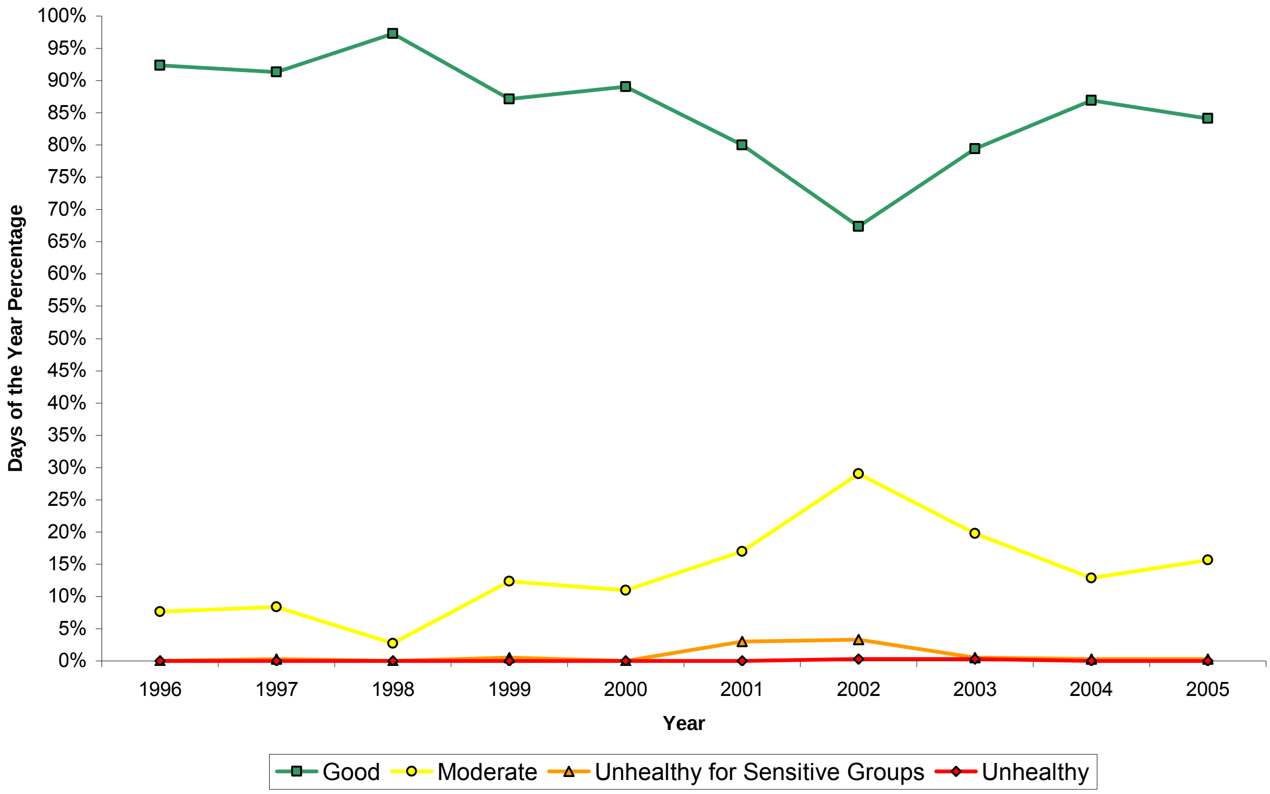
The graph on page 7 presents the annual number of “good” days for several Idaho counties. The number of “good” days has remained relatively high over the last few years for each county. Current reduction in the number of “good” days cannot be directly compared with the numbers before 1999. In that year, $PM_{2.5}$ was added to the index and the “unhealthy” category was divided into “unhealthy” and “unhealthy for sensitive groups,” or for 2001 in the Treasure Valley with ozone causing a number of moderate days.

The AQI Graphs on pages 8-14 present the distribution of AQI categories recorded for seven Idaho counties. The AQI data summaries for each county that support the graphs are located in the Appendix.

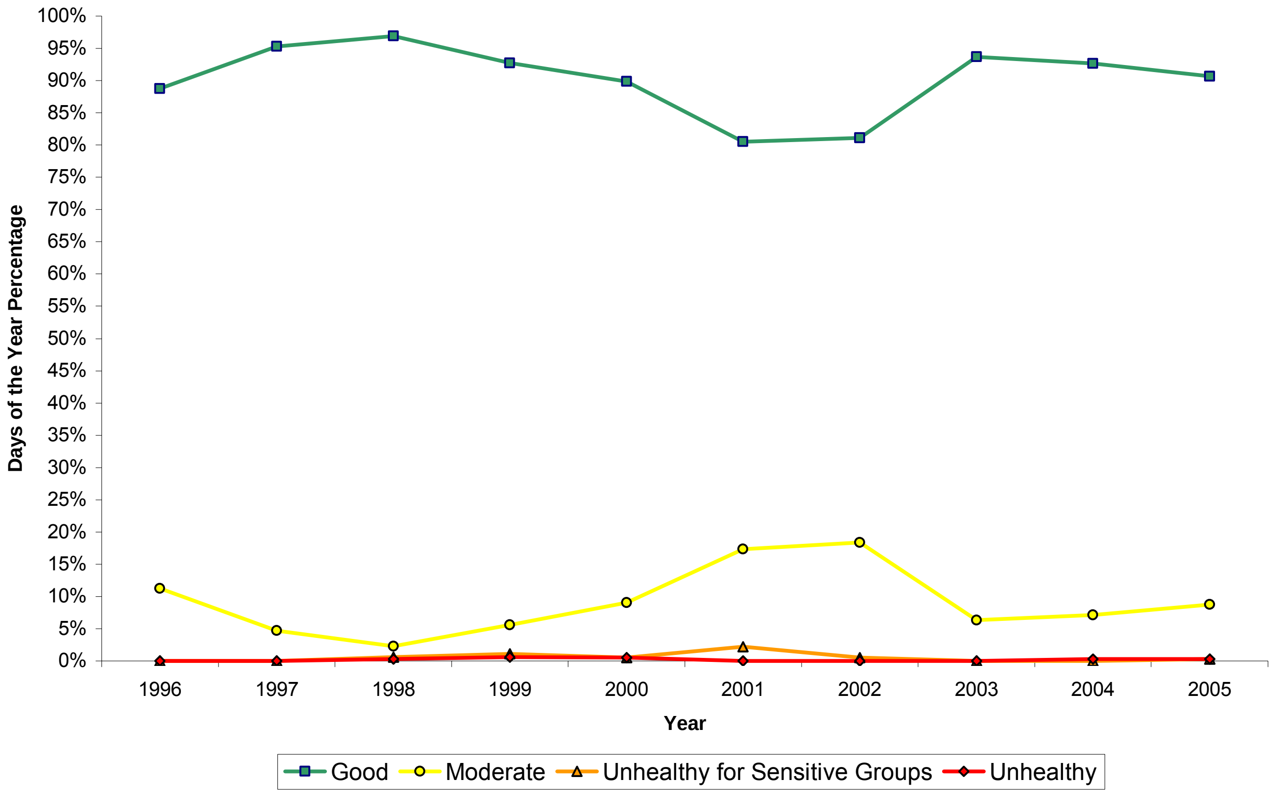


Percentage of days air quality was rated as "Good" per AQI
Days of the Year Percentage
100%
95%
90%
85%
80%
75%
70%
65%
60%
55%
50%
45%
40%
35%
30%
25%
20%
15%
10%
5%
0%
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
Year
Ada
Canyon
Bannock
Bonneville
Kootenai
Nez Perce
Twin Falls
Shoshone

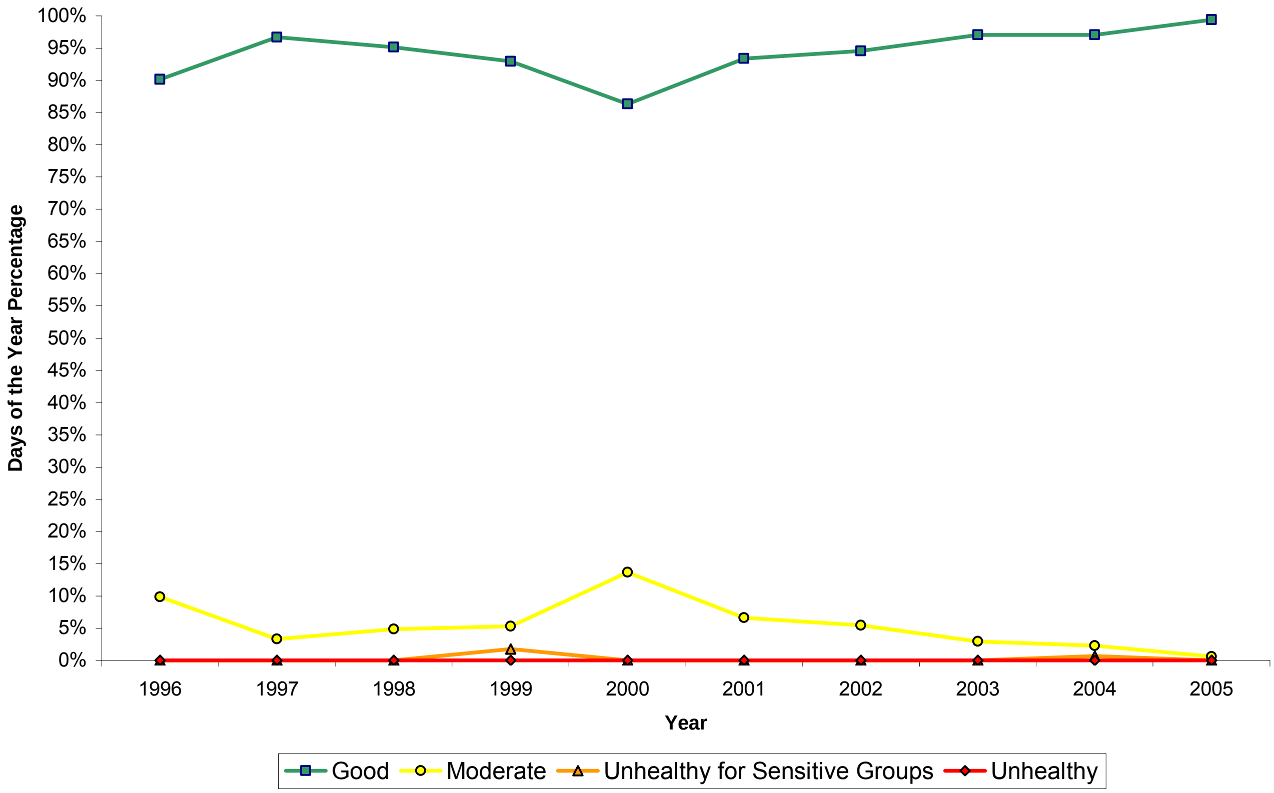
Air Quality for Ada County



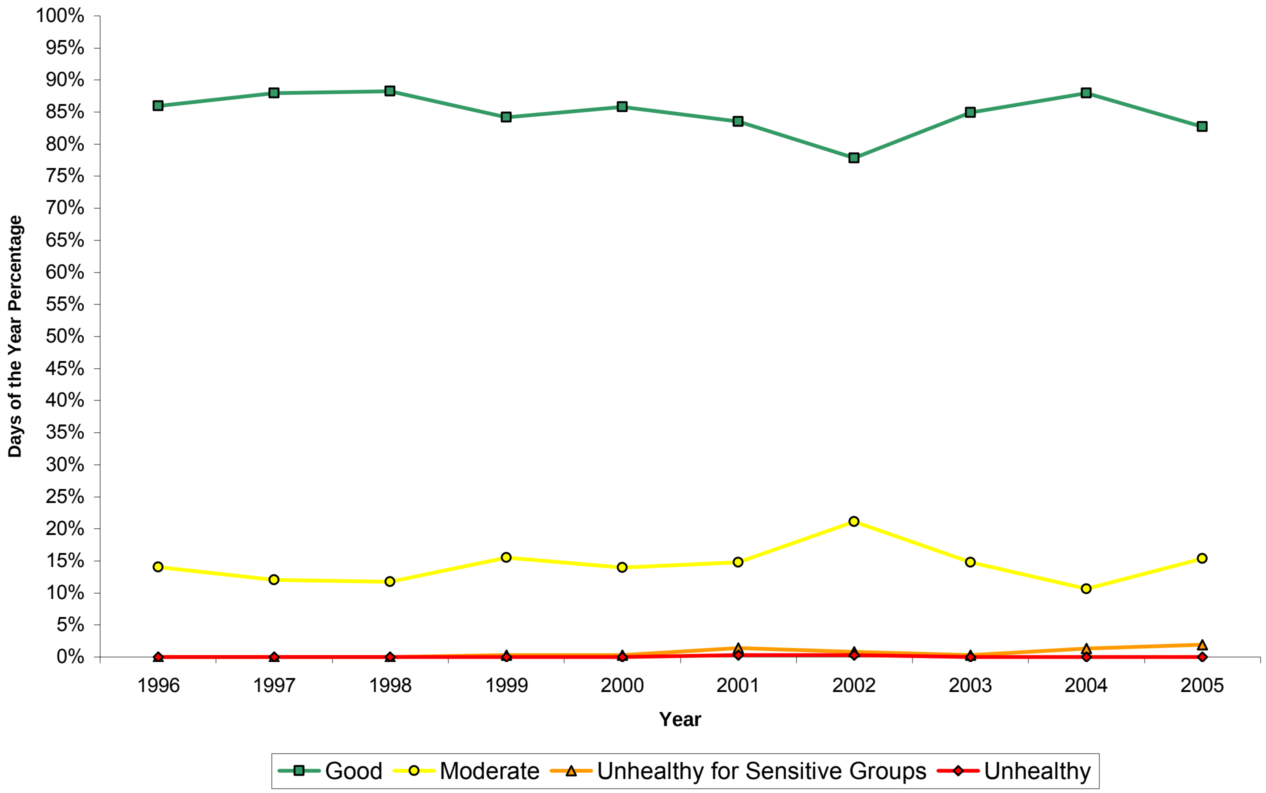
Air Quality for Bannock County

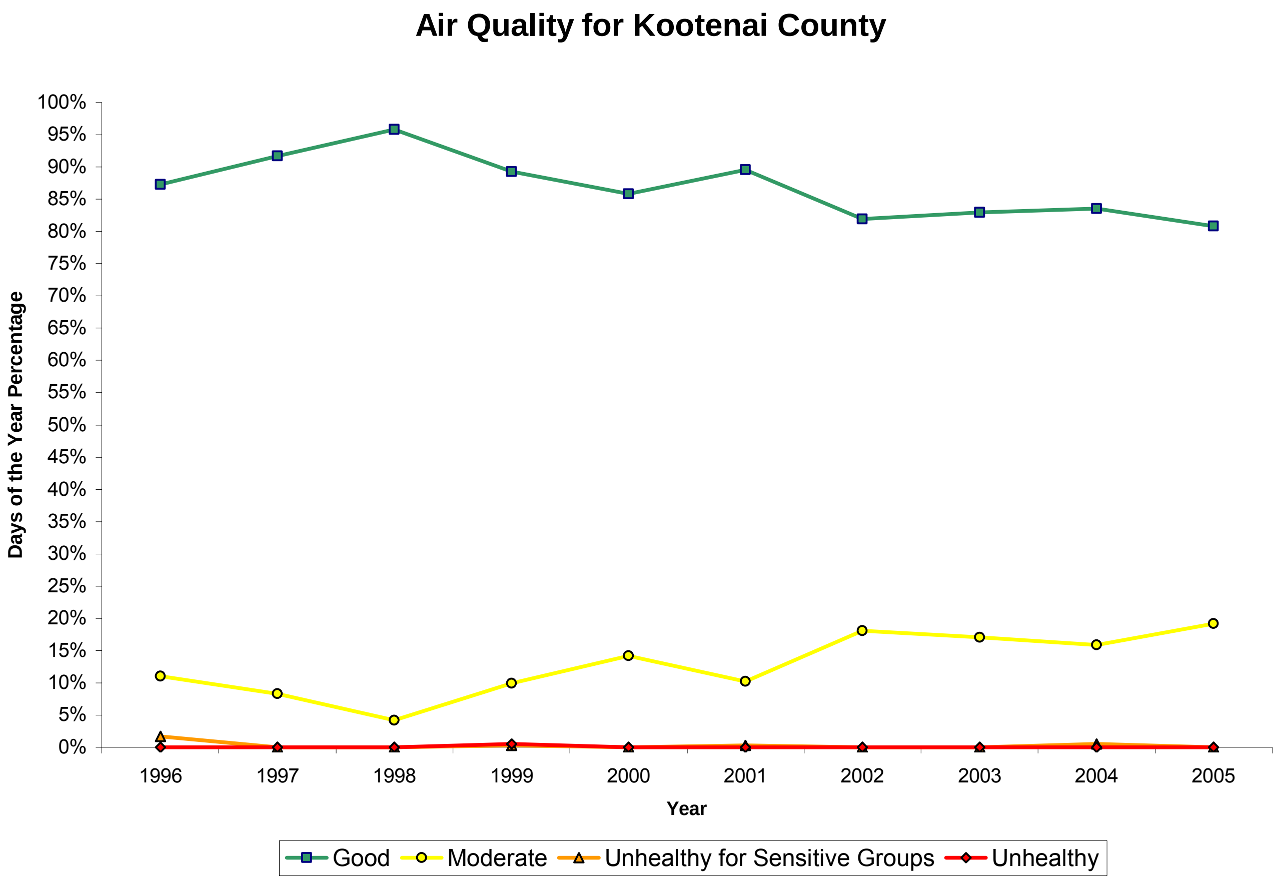


Air Quality for Bonneville County

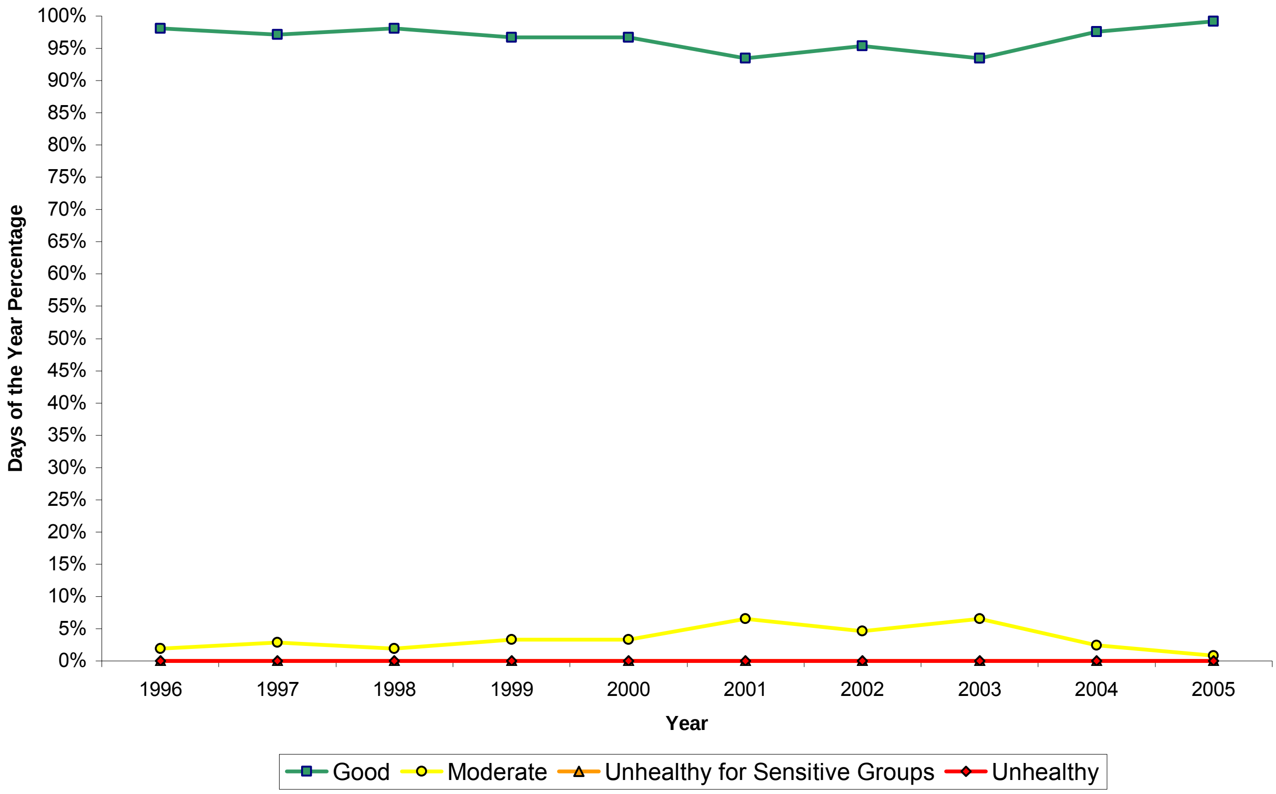


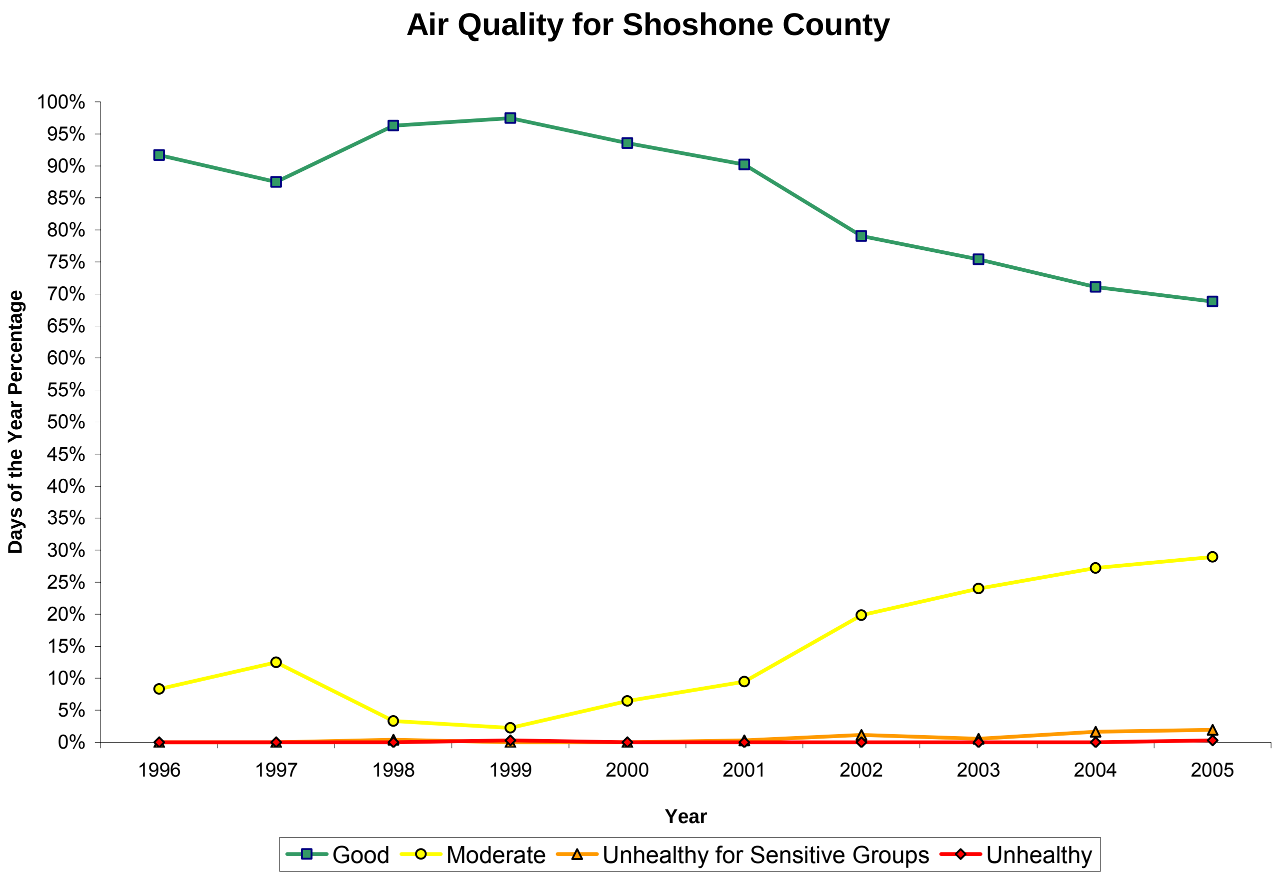
Air Quality for Canyon County

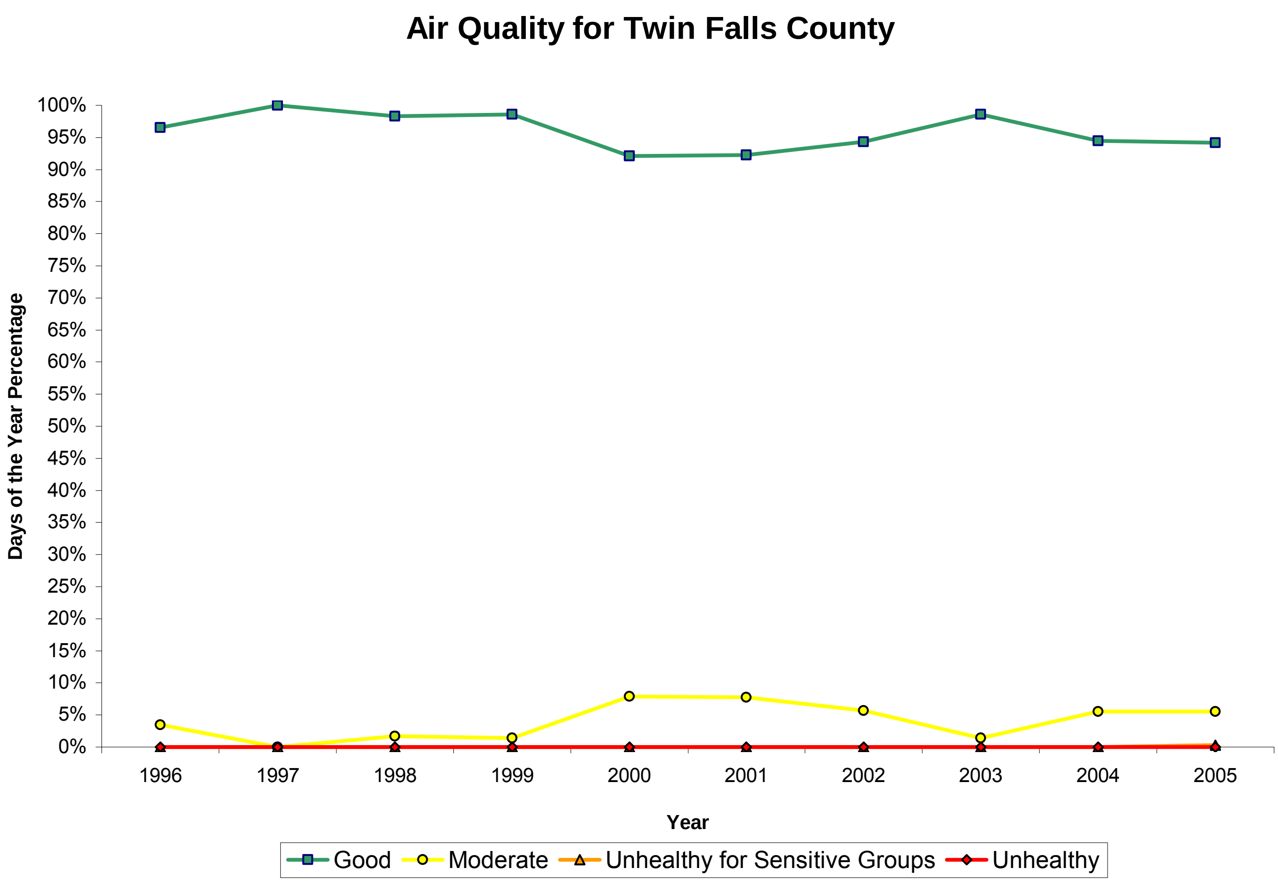



Air Quality for Kootenai County
Days of the Year Percentage
100%
95%
90%
85%
80%
75%
70%
65%
60%
55%
50%
45%
40%
35%
30%
25%
20%
15%
10%
5%
0%
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
Year
Good
Moderate
Unhealthy for Sensitive Groups
Unhealthy

Air Quality for Nez Perce County




Air Quality for Shoshone County
Days of the Year Percentage
100%
95%
90%
85%
80%
75%
70%
65%
60%
55%
50%
45%
40%
35%
30%
25%
20%
15%
10%
5%
0%
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
Year
Good
Moderate
Unhealthy for Sensitive Groups
Unhealthy


Air Quality for Twin Falls County
Days of the Year Percentage
100%
95%
90%
85%
80%
75%
70%
65%
60%
55%
50%
45%
40%
35%
30%
25%
20%
15%
10%
5%
0%
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
Year
Good
Moderate
Unhealthy for Sensitive Groups
Unhealthy

Monitoring Network

The Idaho monitoring network is a composite of meteorological and pollutant-specific monitoring equipment. DEQ operates most of the monitors while several tribes operate monitors on tribal lands. Data from the network are either collected manually by field staff or sent directly to engineers and scientists through a telemetry network.

The table on the next page presents a summary of the monitoring stations used and parameters monitored during 2005. Some parameters were monitored for only part of the year. For 2005, there were meteorology sites added in Boise and Grangeville. DEQ also closed monitoring sites in Salmon (PM_{10} and $PM_{2.5}$ FRMs), and $PM_{2.5}$ FRMs in Idaho Falls, and Sandpoint.

The map on page 18 shows monitoring stations that were active in 2005. Monitoring stations are mainly located in high population areas; however, DEQ does monitor air quality in some rural areas. Some sites are selected to focus on the emissions of a single pollutant or group of sources (for example, near a high traffic volume or residential wood burning area). Monitor siting and monitoring objectives are discussed in the pollutant-specific sections of this report.

Criteria pollutants are measured using methods approved by EPA, to assess Idaho's compliance with National Ambient Air Quality Standards (NAAQS). In addition, some pollutants of particular interest are measured using more than one method. These additional methods help engineers and scientists to better understand the presence and behavior of these pollutants. The table on the next page lists the methods used for the various pollutants. It is noteworthy that the tapered element oscillating microbalance (TEOM) method (for particulate matter) is continuous. A TEOM measures mass concentrations at pre-set time intervals (e.g. hourly). The TEOM can also be accessed through telemetry for instantaneous PM concentrations. TEOMs enable real-time data interpretation and are discussed further in the particulate matter section of this report. Additional information on measurement methods is available at EPA's Web site: http://www.epa.gov/ttn/amtic/.

In addition to the criteria air pollutants described in this report, air toxics were monitored in 2005 at a Nampa site. Monitoring was terminated at this site on March 11. DEQ intends to resume air toxics monitoring at a new location in 2007. For details on air toxics and chemical toxicity, visit the EPA web site at www.epa.gov/ttn/atw/index.html.

Fine Particulate Monitoring

Particulate (PM_{10}) and fine particulate ($PM_{2.5}$) are measured using a variety of methods in Idaho. EPA considers the federal reference method (FRM) to be the most accurate way to determine PM_{10} and $PM_{2.5}$ concentrations. This method involves pulling in air (at a given flow rate) and trapping particles of a certain size (PM_{10} or $PM_{2.5}$) on a pre-weighed filter. The filter is then weighed again and the resulting mass is divided by volume (determined from flow rate and amount of time) to provide concentration. Particles on the filter can be later chemically analyzed and modeled for more information about the sources of particulate matter. Unfortunately, the FRM does not provide continuous or timely information. The TEOM continuous method is considered an equivalent method for PM_{10}, but is not an equivalent method for $PM_{2.5}$.

DEQ uses the FRM as well as the TEOM continuous method to provide more time-resolved data (i.e. hourly averages).

Monitoring Network for 2005

Name	Location	PM_{10} FRM	PM_{10} TEOM	$PM_{2.5}$ FRM	$PM_{2.5}$ TEOM	O_3	SO_2	NO_x	CO	Met	Tox
Boise	Boise, various locations	●	●	●	●	●			●	●	
Coeur d'Alene	930 N 15th , Lakes Middle School		●		●						
Emmett	2195 Schiller Road, Emmett				●						
Franklin	Preston, Idaho			●							
Garden Valley	946 Banks Lowman Road, Garden Valley				●						
Grangeville	USFS Compound, East Edge of Grangeville				●					●	
Idaho City	851 Highway 21, Idaho City				●						
Idaho Falls	North Holms and Pop Kroll, Idaho Falls				●						
Inkom	Inkom			●							
Lancaster	Lancaster Road near Coeur d'Alene					●		●			
Lewiston	Sunset Park, Lewiston				●					●	
McCall	500 North Mission, McCall				●						
Middleton	Middleton				●	●				●	
Moscow	1025 Plant Sciences Road				●					●	
Nampa	Nampa, various locations		●	●	●				●		●*
P4/Monsanto	Soda Springs						●				
Parma	Parma				●						
Pinehurst	106 Church Street, Pinehurst		●	●	●					●	
Pocatello	Pocatello, various locations	●	●	●	●		●			●	
Post Falls	1353 1/2 Syringa, Post Falls				●						
Preston	Preston			●							
Rathdrum	Rathdrum Prairie									●	
Salmon	Salmon, various locations				●					●	
Sandpoint	Sandpoint		●		●					●	
St. Maries	St. Maries			●							
Tilli	251 W. Tilli Road, 20 miles east of Boise					●					
Twin Falls	Smith's Food Store, Twin Falls				●						

Notes:

PM_{10} FRM	Particulate Matter 10 micrometers (reference)	CO	Carbon Monoxide
PM_{10} TEOM	Particulate Matter 10 micrometers (teom continuous)	NO_x	Nitrogen Oxide
$PM_{2.5}$ FRM	Particulate Matter 2.5 micrometers (reference)	O_3	Ozone (May through September)
$PM_{2.5}$ TEOM	Particulate Matter 2.5 micrometers (teom continuous)	SO_2	Sulfur Dioxide
Tox	Urban Air Toxics	*	Monitor Terminated 3/11/05

Monitoring Methods Used in 2005 in Idaho

Pollutant Code	Measurement	Method	Units
CO	Carbon Monoxide	Gas Nondispersive Infrared Radiation	Parts per Million
NO_x	Nitrogen Oxides (NO_x)	Chemiluminescence	Parts per Million
O_3	Ozone	UV Absorption	Parts per Million
PM_{10} FRM	PM_{10} Reference	Reference - Hi Vol Andersen/ GMW 1200	Micrograms per Cubic Meter
PM_{10} TEOM	PM_{10} Teom	R&P Mass Transducer	Micrograms per Cubic Meter
$PM_{2.5}$ FRM	$PM_{2.5}$ Reference	Reference—R&P Partisol 2025	Micrograms per Cubic Meter
$PM_{2.5}$ TEOM	$PM_{2.5}$ Teom	R&P Mass Transducer	Micrograms per Cubic Meter
Tox	Urban Air Toxics	Various Methods	Parts per Billion and $\mu g/m^3$
SO_2	Sulfur Dioxide	UV Fluorescence	Parts per Million

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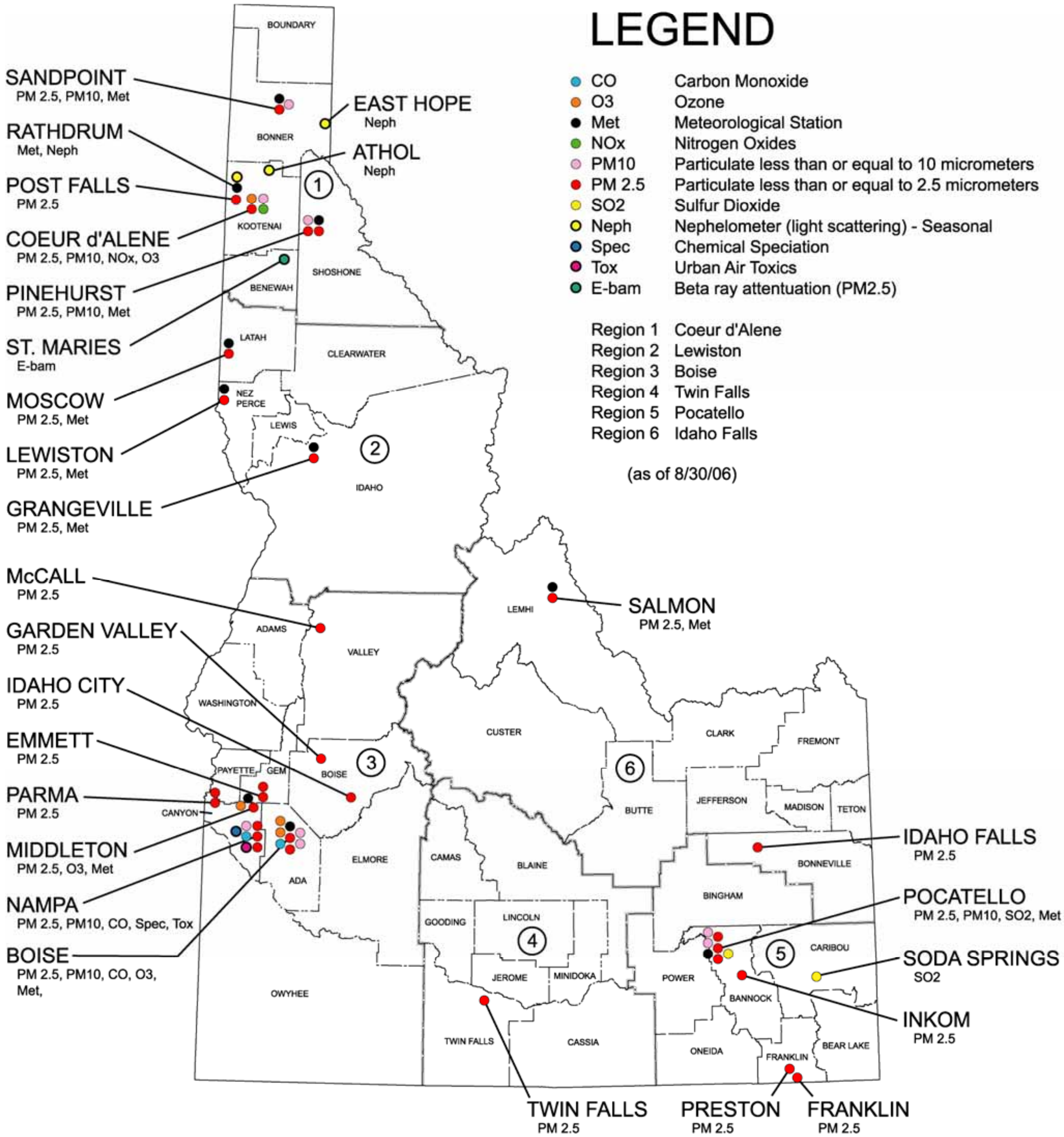
2005 Air Monitoring Network



Impaired Air Quality

Winter Burn Bans

Idaho has a winter-impaired air quality program primarily targeting sources of particulate matter from wood stoves and fireplaces. Idaho's program is generally implemented through local ordinances in those areas that have historically had winter inversion problems. Generally, these ordinances specify that a wood burning ban will be declared whenever DEQ reports an AQI value of 74 or greater for any pollutant measured by an approved monitor and air stagnation conditions are forecasted to continue for at least 24-hours. In some areas, open burning (even if a valid permit has been issued) is prohibited when DEQ reports an AQI value of 60 or higher for any pollutant measured in the city/region/airshed.

The DEQ online Current Air Quality Report lists the daily air quality in many cities and regions in Idaho. Each report will list the pollutant being monitored, the AQI, and burn restrictions, if any, for the day. Anyone wanting to know if they can burn can go to this site to see what the forecast is for their area.

From November 1 through March 31, when the air quality is forecasted to be poor, DEQ will issue an air quality alert between 2:00 and 4:00 p.m. each day to notify the local community of the following day's air quality condition forecasted for their airshed. If conditions are expected to be poor for the weekend, alerts will continue to be issued at the regular time on Saturday and Sunday. These alerts will be reported to local media outlets and to others through an email notification list.

Summer Ozone Alerts

DEQ forecasts pollution conditions for ozone in the Treasure Valley Monday through Friday (and weekends when needed) using pollutant monitoring data and meteorological information. Because ozone needs heat and sunlight to form, it is considered a summertime problem and is only monitored from May 1 through September 30. Ozone pollution can rise to very high levels when the valley experiences hot days with few clouds in the sky. The Treasure Valley tends to see daily ozone levels that begin to rise in the late morning and peak in the late afternoon and early evening. This phenomenon follows very closely with the time of day that the temperatures are the hottest and the sun is the highest in the sky. Since we have no control over our weather characteristics, we have to focus on controlling what we put into our air. Under yellow or moderate alerts, the public is requested to keep vehicles maintained, limit driving, combine trips, comply with open burning restrictions, refuel after 7:00 p.m. and to not top off the tank, mow lawns in the evening, and don't use lighter fluid on the barbecue. These alerts will be reported to local media outlets and to others through an email notification list. The plan can be viewed at: http://www.deq.state.id.us/air/data_reports/reports/ada_co/pollution_response_plan_summer.pdf.

Regional Air Emissions Inventory

This section presents an air emissions inventory summary for four of the six criteria pollutants (CO, NO_X, PM_{10}, SO_2) and volatile organic compounds (VOC), a precursor compound for ozone. The two criteria pollutants not covered in this section are lead and ozone. Lead is no longer an issue in Idaho and DEQ has only recently started to collect ozone monitoring data. An emissions inventory is useful because it helps to identify the source of pollutants. Identified sources can then be addressed in an effort to reduce emissions through improved technologies, campaigns, community programs, and education to change behaviors, and economic incentives. The National Emission Inventory (NEI) is prepared by EPA every three years, with input from local and state agencies. The inventory discussed below includes data from the 2002 Idaho statewide emissions inventory, as well as 2005 large facility data that were collected by DEQ.

Source Categories

There are four general categories that are used to characterize emissions sources, and virtually hundreds of subcategories. The four general categories include the following:

- Point Sources
- Mobile On-Road Sources
- Non-Road Sources
- Stationary Area Sources

Point sources are those that many people think of when thinking of air pollution. These include large industries that emit several tons of pollution or more per year from a single location. A description of the thresholds associated with these sources is included in the definitions section of this document.

Mobile on-road sources include cars, trucks, and buses, both commercial and private. This category includes vehicles that run on both gasoline and diesel fuel. As with stationary area sources, on-road mobile sources contribute significantly to air pollution in Idaho.

Non-road sources include, for example, farm vehicles, construction vehicles, aircraft, trains, locomotives, and garden equipment.

Area sources are stationary and typically do not individually emit as much tonnage as point sources. Area sources include commercial businesses such as dry cleaners, printers, and small construction, as well as everyday activities such as burning in a wood stove or fireplace. Although area sources on an individual basis emit far less than point sources, the large numbers of these activities can make them a significant contributor to air pollution in Idaho.

Criteria Air Pollutants

An emissions inventory was performed by DEQ for calendar year 2002 that summarized the quantities of criteria air pollutants for the four categories described above. This inventory covers only anthropogenic (man made) sources; biogenic sources of volatile organics such as vegetation and crops are not included. 2005 information is used for the point sources since this is the latest complete inventory year of data. The 2005 point sources are those large facilities with greater than 100 tons per year of any criteria pollutant. The inventory covered the entire state and was based on the following sources of information:

- 2005 large facility annual emissions inventory reports (point sources)
- Emission factor and activity level derived estimates (area and mobile sources)
- Mobile source models (on-road and non-road mobile sources)

Point sources are the most straightforward source of information for the emissions inventory. Facilities are required to report the tonnage of emissions that they release each year. The area source emissions estimates may have more uncertainty associated with them, as they must take into account activity levels (for example, the amount that people perform an activity such as burning wood in a fireplace, or driving to work). Area source information is gathered through surveys, census reports, etc. In addition to the uncertainty associated with activity levels, there is also uncertainty regarding the emission factors themselves. These values are typically developed by EPA, in consultation with state and local air agencies and industry. Additional information on emission factors and how they are derived is available at http://www.epa.gov/oar/oaqps/efactors.html.

The following table presents the ton per year contributions from each source category for criteria pollutants. For particulate matter, only PM_{10} is listed.

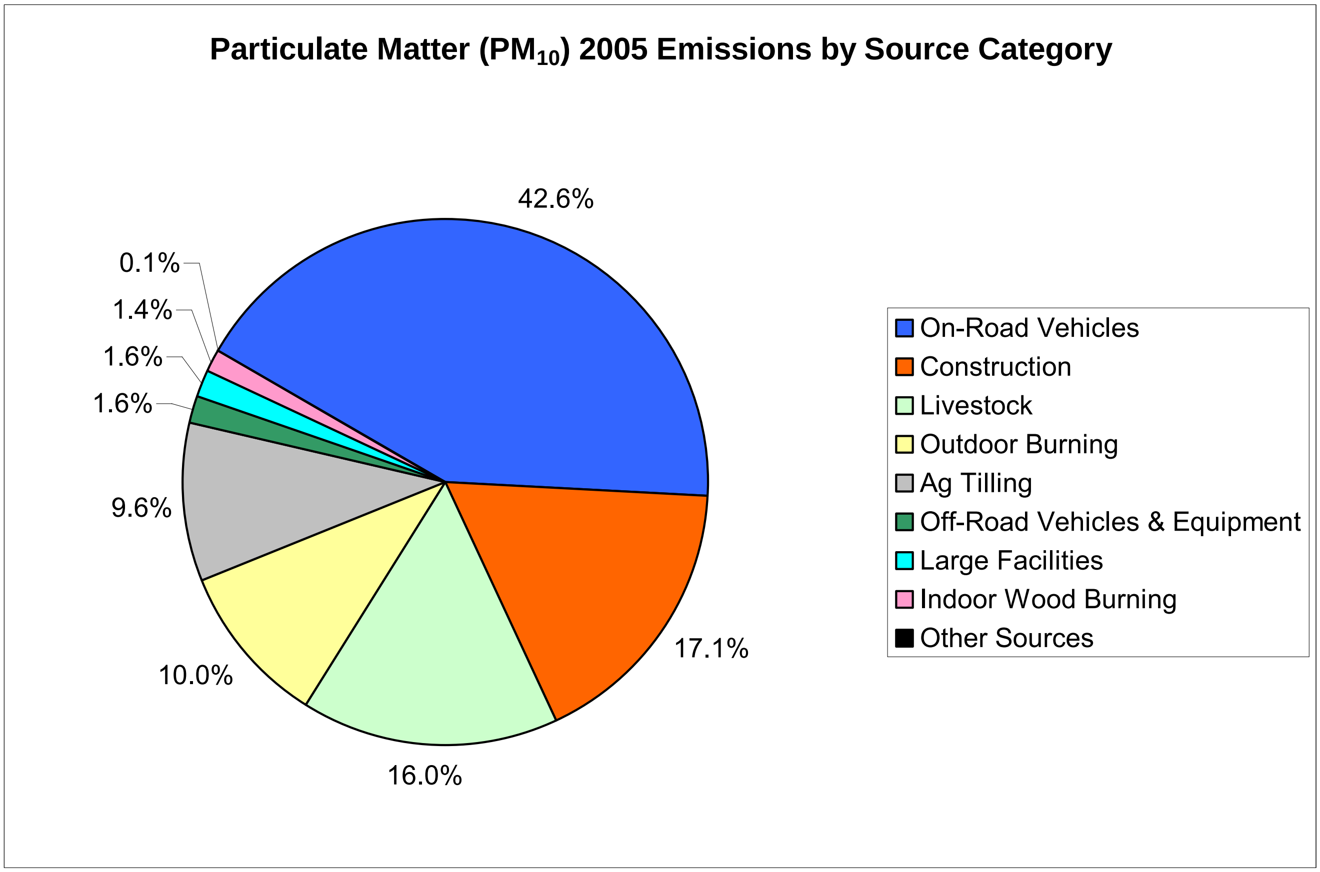
Idaho 2002/2005 Estimated Criteria Air Pollutant Emissions Inventory Summary

Source Category	CO	PM10	NOx	SO2	VOC
Point Sources (Large Facilities)	**21,052**	**2,509**	**9,646**	**15,951**	**1,377**
On-Road Mobile Sources	**436,906**	**67,529**	**43,080**	**1,575**	**35,343**
Road Dust		**66,548**			
Gasoline Vehicles	433,248	472	26,067	1,100	34,606
Diesel Vehicles	3,658	508	17,014	475	737
Stationary Area Sources	**245,439**	**86,014**	**32,113**	**1,051**	**120,781**
Outdoor Burning	225,553	15,850	2,717	153	1,310
Indoor Wood Burning	16,523	2,263	170	26	14,979
Other Sources	3,363	67,901	29,226	872	104,492
Non-Road Mobile Sources	**132,498**	**2,580**	**27,972**	**480**	**23,261**
Totals	**835,896**	**158,631**	**112,811**	**19,057**	**180,763**

This statewide inventory demonstrates that on-road vehicles are the most significant contributor to criteria pollutant emissions in Idaho. Area sources are the major contributor of PM_{10} emissions**.** Each pollutant is discussed briefly below, and information in the table above is presented graphically.

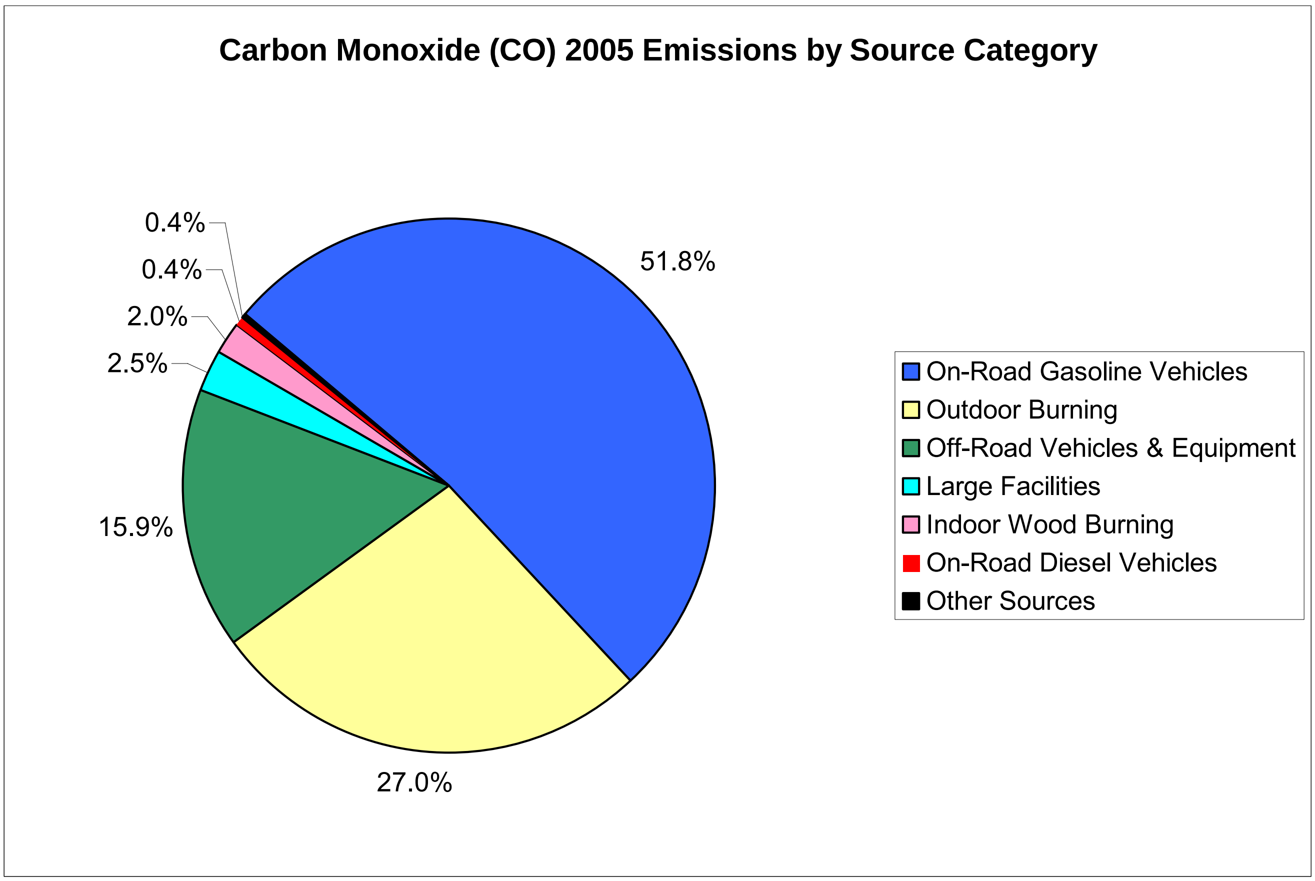
Particulate Matter (PM_{10})

Area sources are the largest contributor of PM_{10}, with 55% of the contribution shown below. The largest area source contributing subcategories are construction, livestock operations, outdoor burning and agricultural tilling. These four combined contribute over 53% of the contribution of area sources. Another large contributor is from on-road vehicles with 43% of the PM_{10} contribution, mostly from road dust.



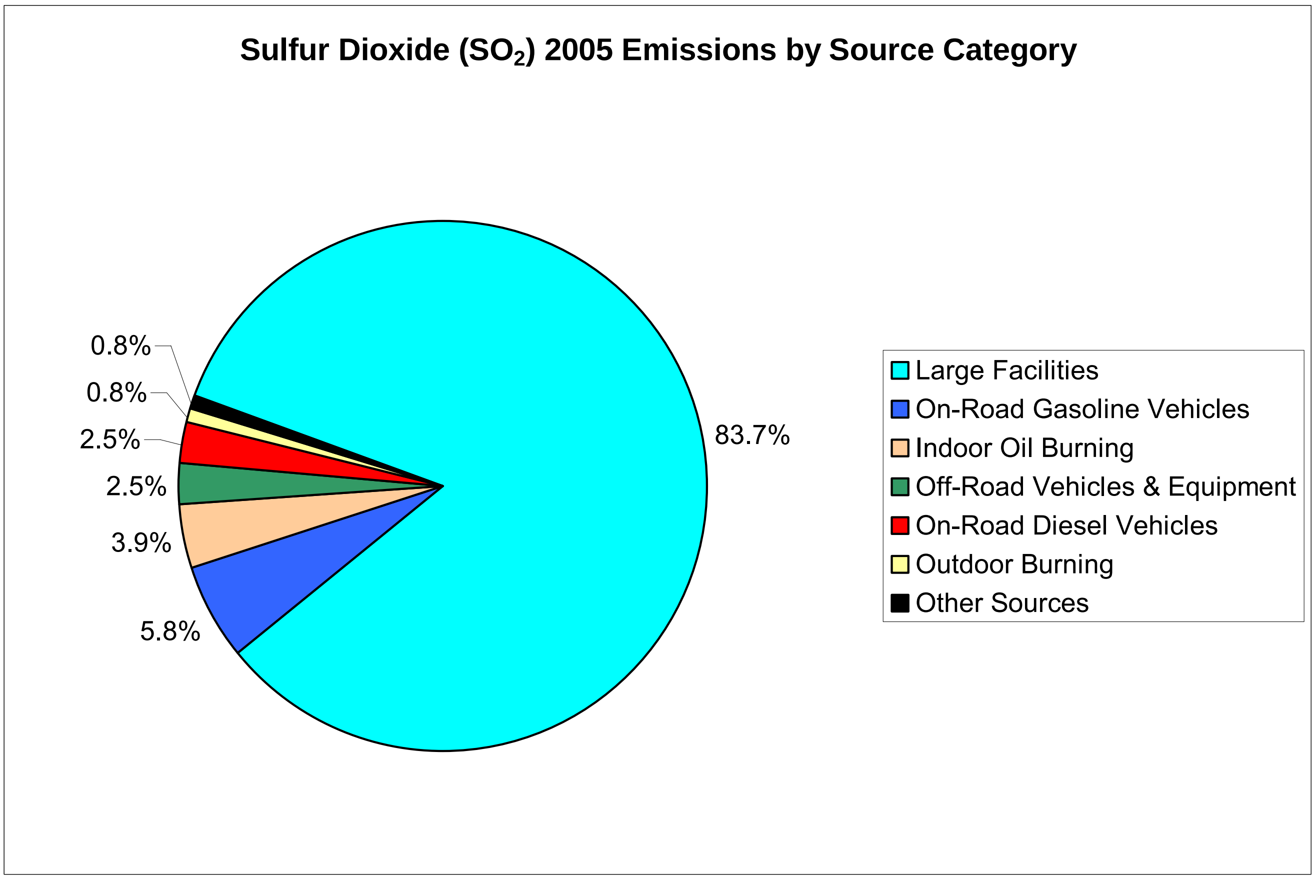
Carbon Monoxide (CO)

On-road vehicles are clearly the greatest contributor of CO to the atmosphere in the state at 51.8%. If off-road vehicles and equipment are added in with the on-road vehicles, 68% of the CO is from vehicles and equipment. In the graph below, point sources are barely visible as contributors, as they emit less than 3% of the total CO. The second greatest CO contributor is outdoor burning.



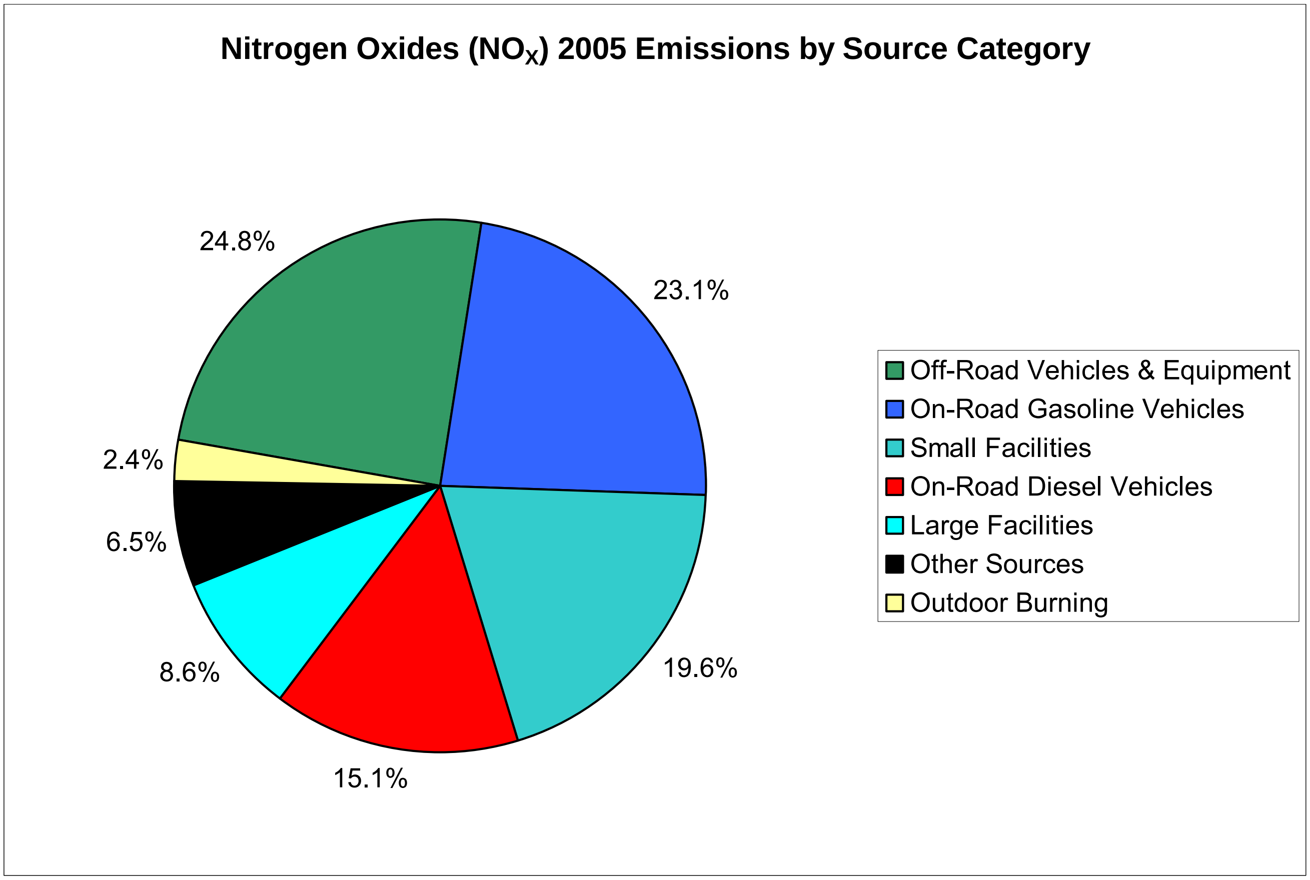
Sulfur Dioxide (SO_2)

The large facility point sources comprise the greatest portion of SO_2 emissions, with 86% of the contribution. All vehicles and motorized equipment account for most of the remaining SO_2 emissions with a total contribution of 9.3%. The largest contributing subcategory for point sources is the elemental phosphorous industry.



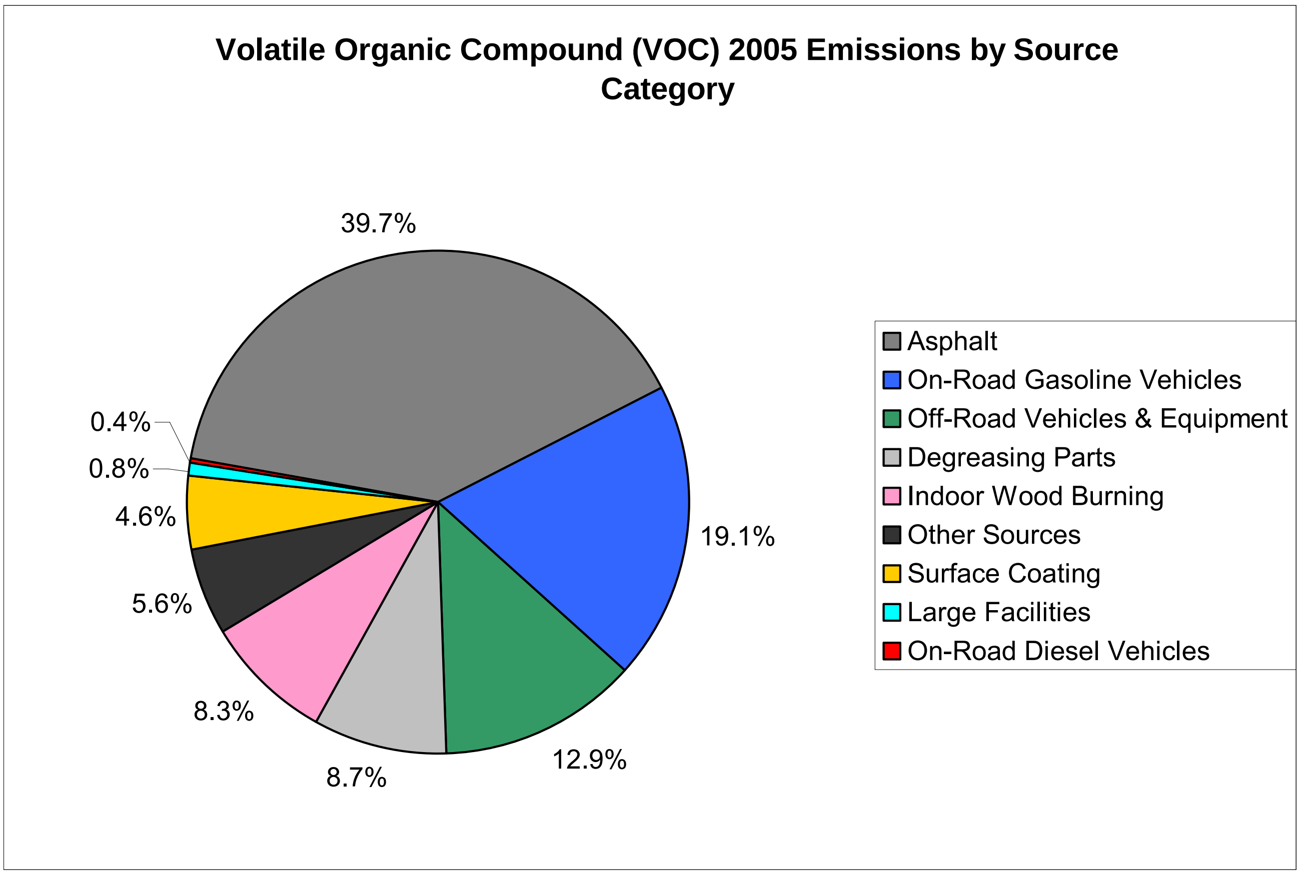
Nitrogen Oxides (NO_X)

The combination of all vehicles and motorized equipment is the greatest source of emissions of NO_X, with 64.3% of the total source contribution. The largest subcategories for these contributors for NO_X are off-road vehicles and equipment, and on-road gasoline vehicles. The small area source facilities (<100 tpy of any criteria pollutant) make up the bulk of the remaining contribution with 20%.



Volatile Organic Compounds

VOCs are included in the criteria air pollutant emissions inventory discussion as they are a primary precursor for ozone and a significant precursor of $PM_{2.5}$, criteria pollutants. The graph below shows that area source asphalt paving applications contribute the greatest portion of VOCs to the atmosphere with 39.9% of the total. All vehicles and equipment also contribute a significant amount, with 32.5% of the total. The largest contributing subcategories for area sources are asphalt applications, part degreasing, indoor wood burning, and surface coating (mainly furniture and vehicle).



Air Quality Standards

The federal Clean Air Act (CAA) requires EPA to set National Ambient Air Quality Standards (NAAQS) for pollutants considered harmful to public health and the environment. The standards are designed to primarily protect the general public, including sensitive populations such as asthmatics, children, and the elderly. They are also intended to safeguard public welfare by reducing effects such as decreased visibility and damage to animals, crops, vegetation, and buildings. EPA has established standards for six criteria pollutants. The list below contains seven pollutants, which include two size ranges of particulate matter.

The state of Idaho has adopted these standards. For more information, the US EPA air quality standards and supporting rationale are available at http://epa.gov/air/criteria.html.

EPA is also currently in the process of potentially revising the fine particulate NAAQS. Preliminary recommendations for a new standard propose daily and annual averages lower than current federal standards. (See http://www.epa.gov/ttn/naaqs/standards/pm/data/pmstaffpaper_20050630.pdf and http://www.epa.gov/sab/pdf/casac_pmrp_mtg_april_6-7_2005_2nd_draft_pm_staff_paper-ra_draft_report_v2.pdf). Based on these recommendations, EPA has proposed a lower fine particulate NAAQS, a NAAQS for PMcoarse ($PM_{10-2.5}$), and is proposing to revoke PM_{10}.

Air Quality Standards for Criteria Pollutants

Pollutant	Standard	Level
Ozone	The 3-year average of the 4th highest daily maximum 8-hour average concentration cannot exceed the level measured at each monitor within an area over each year.	0.084 ppm
Particulate Matter (10 micrometers)	The 3-year annual average of the weighted annual mean concentration at each monitor within an area must not exceed the level	54 µg/m^3
	The 24-hour average cannot exceed the level more than once per year	154 µg/m^3
Particulate Matter (2.5 micrometers)	The 3-year annual average of the weighted annual mean concentrations cannot exceed the level	15.4 µg/m^3
	The 3-year average of the 98th percentile (based on the number of samples taken) of the daily concentrations must not exceed the level	65 µg/m^3
Carbon Monoxide	The 1-hour average cannot exceed the level more than once per year	35 ppm
	The 8-hour average cannot exceed the level more than once per year	9.4 ppm
Sulfur Dioxide	Annual arithmetic mean of 1-hour averages cannot exceed the level	0.03 ppm
	24-hour average cannot exceed the level more than once per year	0.14 ppm
	The 3-hour average cannot exceed the level more than once per year	0.50 ppm
Lead	The quarterly average (by calendar) cannot exceed the level	1.5 µg/m^3
Nitrogen Dioxide	The annual mean of 1-hour averages cannot exceed the level	0.053 ppm

Note: Daily concentration is the 24-hour average, measured from midnight to midnight.

In some instances, comparison of numbers in this table with sources listed above may appear to be slightly off (for example, ozone 8-hour standard 0.084 ppm listed in the table versus 0.08 ppm on the EPA Web site). These slight differences are due to a rounding convention adopted by EPA and the number of significant figures. The numbers shown on the table above are those used to determine if an area is in compliance, and are reflected in the graphs on the following pages.

The NAAQS for each pollutant may have different averaging times (for example, hourly and 8-hour averages). These different forms of the standard are created and enforced to address varied health impacts that happen as a result of a shorter, high-level exposure versus longer, low-level exposures. These differences are addressed pollutant-by-pollutant in the following sections, and additional information is on the EPA Web site. A distinction exists between “exceeding” and “violating” a standard; the two are not equivalent. This distinction is due to the nature of the standards. In most instances it is allowable for an area to exceed the standard a few times, to allow for possible meteorological aberrances. For example, a carbon monoxide 8-hour average of 10 ppm clearly exceeds the standard; however it does not violate the standard if it is the only exceedance that year (the standard allows for one exceedance).

The EPA standards typically apply to an ‘area’, which may be defined in different ways. Data are often presented for individual monitoring stations in the following sections because this provides more insight into regional differences in Idaho’s ambient air quality. The summaries that follow show how Idaho’s airsheds compared to the standards discussed above for the year 2005 and in many instances also incorporate the AQI and other measures of air quality where appropriate. The AQI color code shading is shown to aid interpretation of air quality, but does not imply whether or not standards were actually met for each pollutant. An airshed must satisfy the conditions in the above table to ensure compliance with the NAAQS.

Ozone

Ozone is a summertime air pollution problem and is directly emitted by pollutant sources, or it forms when photochemical pollutants from cars and industrial sources (paints, solvents, gas vapors) react with sunlight. These pollutants are called ozone precursors and include VOCs and NO_X. Ozone levels are usually highest in the afternoon because of the intense sunlight, warm temperatures, and the time required for ozone to form. Ozone levels are highly affected by weather. DEQ monitored ozone from April through October in 2005, as this is the time period of concern for high ozone levels.

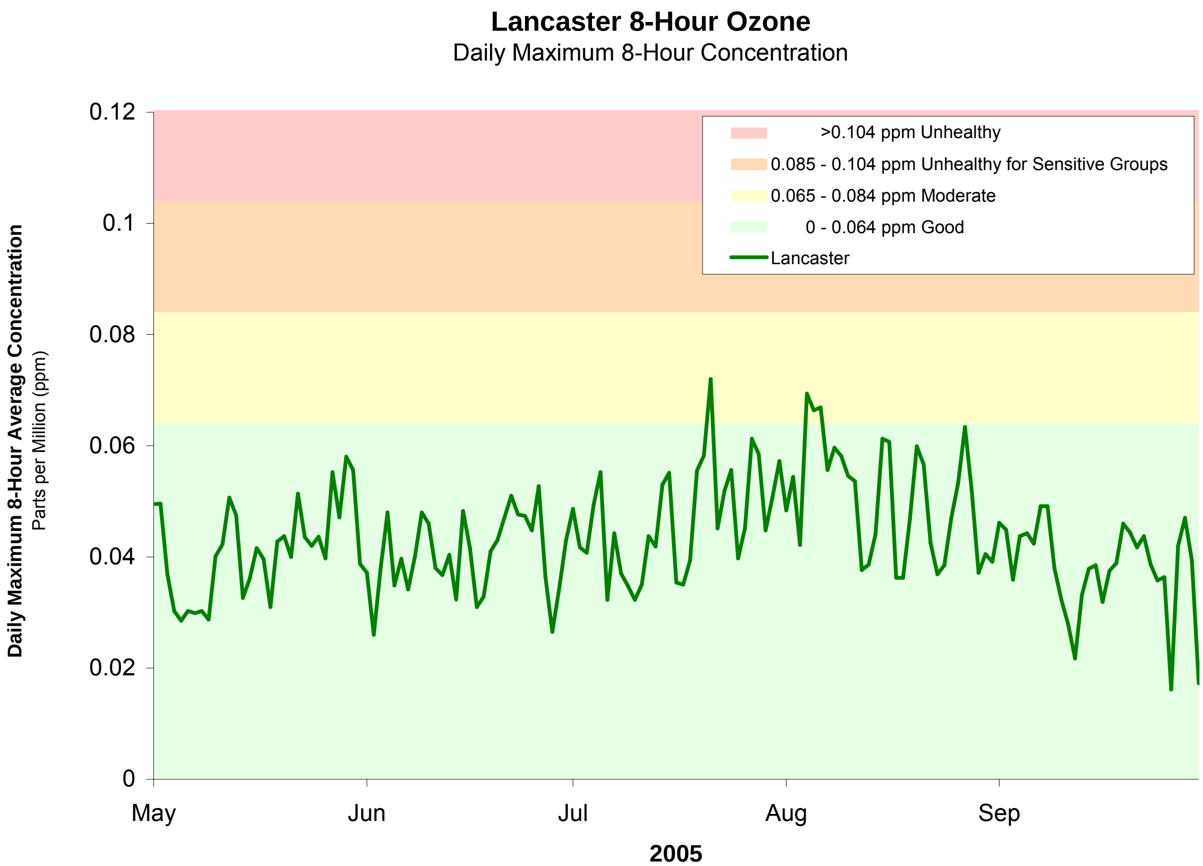
People frequently hear of ozone in the upper atmosphere. In this context, ozone is considered beneficial because it helps to protect the earth from the sun's rays. In contrast, ozone formed at ground level is unhealthy. Elevated concentrations of ground-level ozone can cause reduced lung function, respiratory irritation, and can aggravate asthma. Ozone has also been linked to immune system effects (http://www.epa.gov/ttn/oarpg/naaqsfin/o3health.html). The damage ozone causes to the lungs typically heals within a few days, but repeated or prolonged exposure may cause permanent damage. People with respiratory conditions should limit outdoor exertion if ozone levels are high. Even healthy individuals may experience respiratory symptoms on a high-ozone day. Ground-level ozone can also damage agricultural crops and forests, interfering with their ability to produce food and grow.

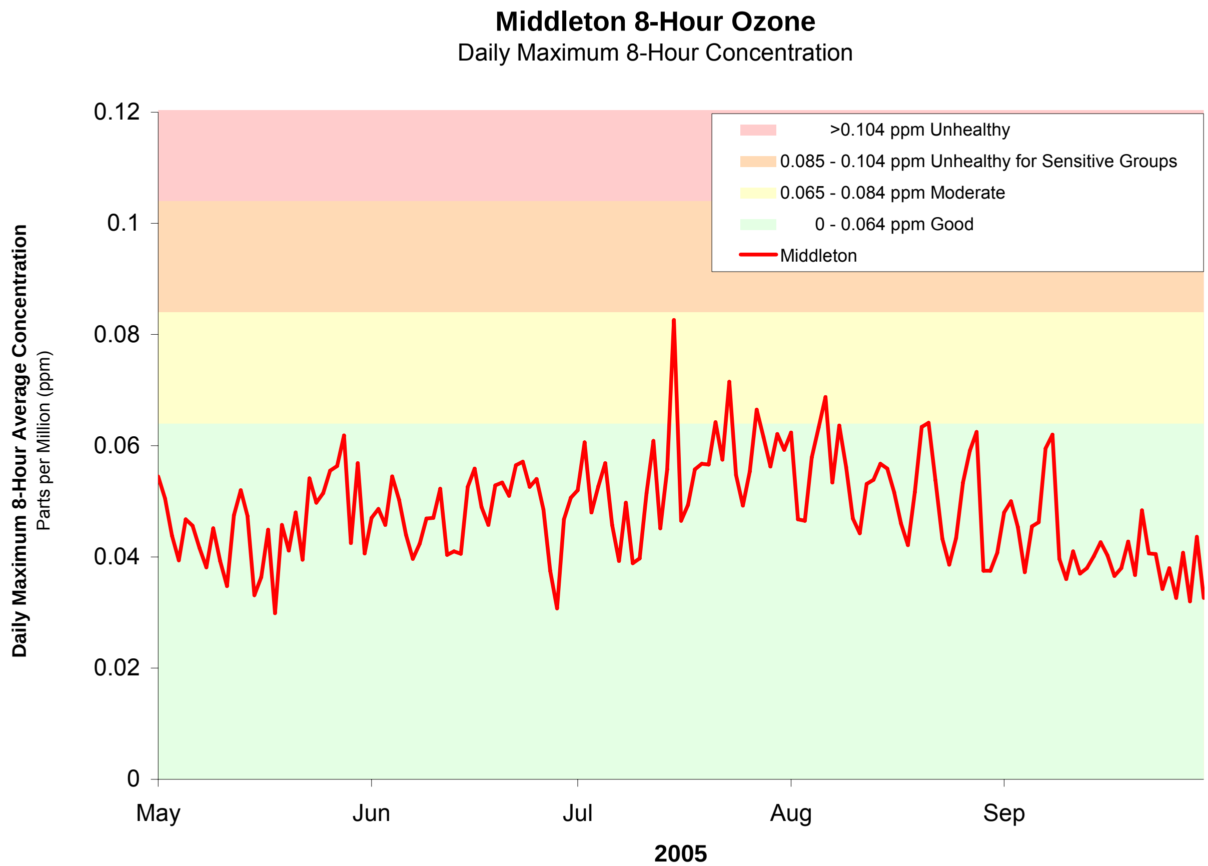
The monitoring stations measuring ozone are located in both urban and rural areas, although the precursor chemicals that react with sunlight to produce ozone are generated primarily in large metropolitan areas. Because summers in Idaho are normally hot and dry, some areas tend to see daily ozone levels that begin to rise in the late morning and then peak in the late afternoon and early evening. This phenomenon follows very closely with the time of day that the temperatures are the hottest and the sun is the highest in the sky.

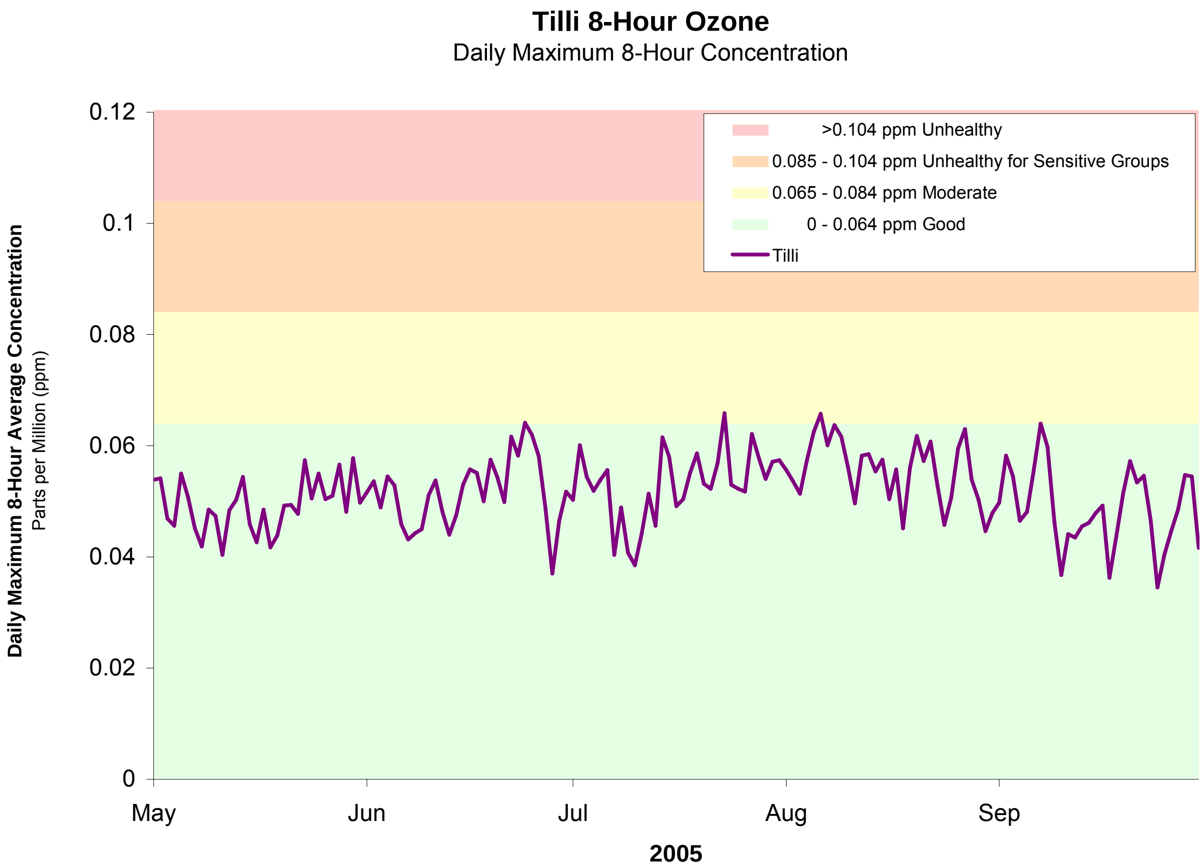
Graphs presented on the following pages show trends in ozone levels in Idaho, reflecting both the AQI and the NAAQS. The graphs on pages 31-34 present daily maximum 8-hour average data for the months of May through September, as these are the months where ozone levels are greatest. The shading on each graph corresponds to the AQI breakpoints for ozone, which is typically based on the 8-hour average.

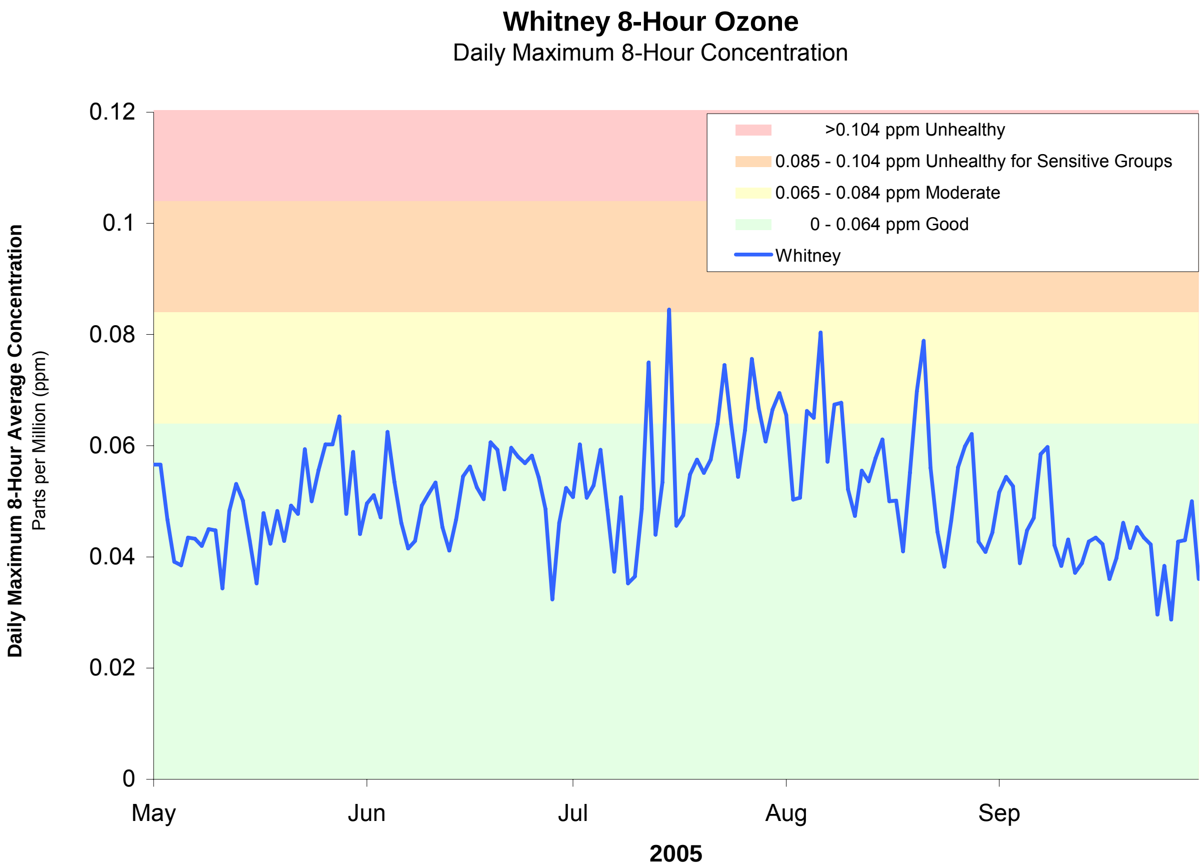
The graph on page 35 shows monitoring data for each ozone monitoring station against the federal standard, and shows that the region has remained below the standard since monitoring began. This means the three-year average of the 4th-highest 8-hour concentration has not violated the NAAQS standard of 0.08 ppm. The ozone standard is defined such that the three highest concentrations can exceed the level of the standard while still maintaining attainment. Values presented on the graph are 3-year averages (of 4^{th}-highest concentrations); the year on the x-axis represents the last year averaged. For example, concentrations shown for 2005 are an average of 2003, 2004, and 2005 concentrations.

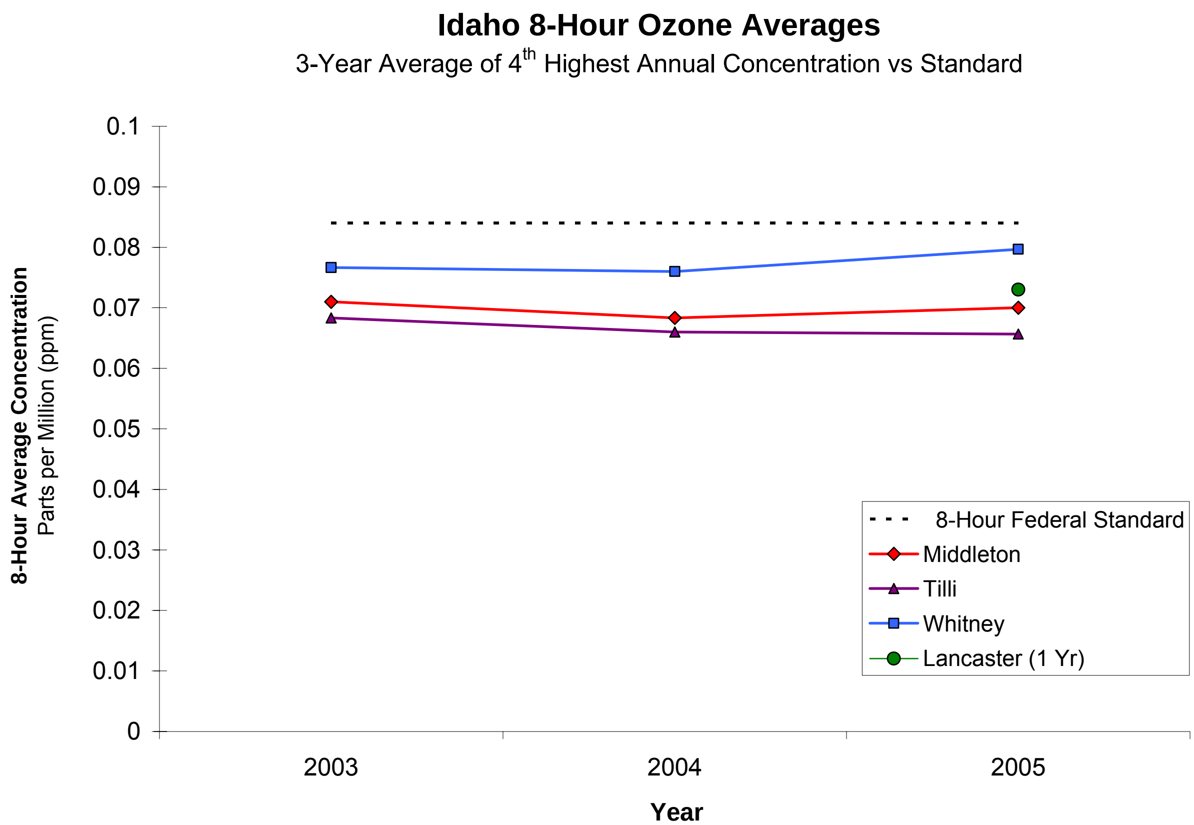
For additional information on ozone, visit www.epa.gov/air/urbanair/ozone/index.html. There is also additional information on ozone in question/answer format in the definitions section of this document.


Lancaster 8-Hour Ozone
Daily Maximum 8-Hour Concentration
Daily Maximum 8-Hour Average Concentration
Parts per Million (ppm)
0.12
0.1
0.08
0.06
0.04
0.02
0
>0.104 ppm Unhealthy
0.085 - 0.104 ppm Unhealthy for Sensitive Groups
0.065 - 0.084 ppm Moderate
0 - 0.064 ppm Good
Lancaster
May
Jun
Jul
Aug
Sep
2005


Middleton 8-Hour Ozone
Daily Maximum 8-Hour Concentration
Daily Maximum 8-Hour Average Concentration
Parts per Million (ppm)
0.12
0.1
0.08
0.06
0.04
0.02
0
May
Jun
Jul
Aug
Sep
2005
>0.104 ppm Unhealthy
0.085 - 0.104 ppm Unhealthy for Sensitive Groups
0.065 - 0.084 ppm Moderate
0 - 0.064 ppm Good
Middleton


Tilli 8-Hour Ozone
Daily Maximum 8-Hour Concentration
Daily Maximum 8-Hour Average Concentration
Parts per Million (ppm)
0.12
0.1
0.08
0.06
0.04
0.02
0
>0.104 ppm Unhealthy
0.085 - 0.104 ppm Unhealthy for Sensitive Groups
0.065 - 0.084 ppm Moderate
0 - 0.064 ppm Good
Tilli
May
Jun
Jul
Aug
Sep
2005


Whitney 8-Hour Ozone
Daily Maximum 8-Hour Concentration
Daily Maximum 8-Hour Average Concentration
Parts per Million (ppm)
0.12
0.1
0.08
0.06
0.04
0.02
0
>0.104 ppm Unhealthy
0.085 - 0.104 ppm Unhealthy for Sensitive Groups
0.065 - 0.084 ppm Moderate
0 - 0.064 ppm Good
Whitney
May
Jun
Jul
Aug
Sep
2005


Idaho 8-Hour Ozone Averages
3-Year Average of 4th Highest Annual Concentration vs Standard
8-Hour Average Concentration
Parts per Million (ppm)
0.1
0.09
0.08
0.07
0.06
0.05
0.04
0.03
0.02
0.01
0
2003
2004
2005
Year
8-Hour Federal Standard
Middleton
Tilli
Whitney
Lancaster (1 Yr)

Particulate Matter (10 micrometers)

Particulate matter (PM) includes both solid matter and liquid droplets suspended in the air. Particles smaller than 2.5 micrometers in diameter are called “fine” particles, or $PM_{2.5}$. Particles between 2.5 and 10 micrometers in diameter are called “coarse” particles. PM_{10} includes both fine and coarse particles. Coarse particles typically come from crushing or grinding operations and dust from roads. PM_{10} can aggravate respiratory conditions such as asthma. People with respiratory conditions should avoid outdoor exertion if PM_{10} levels are high.

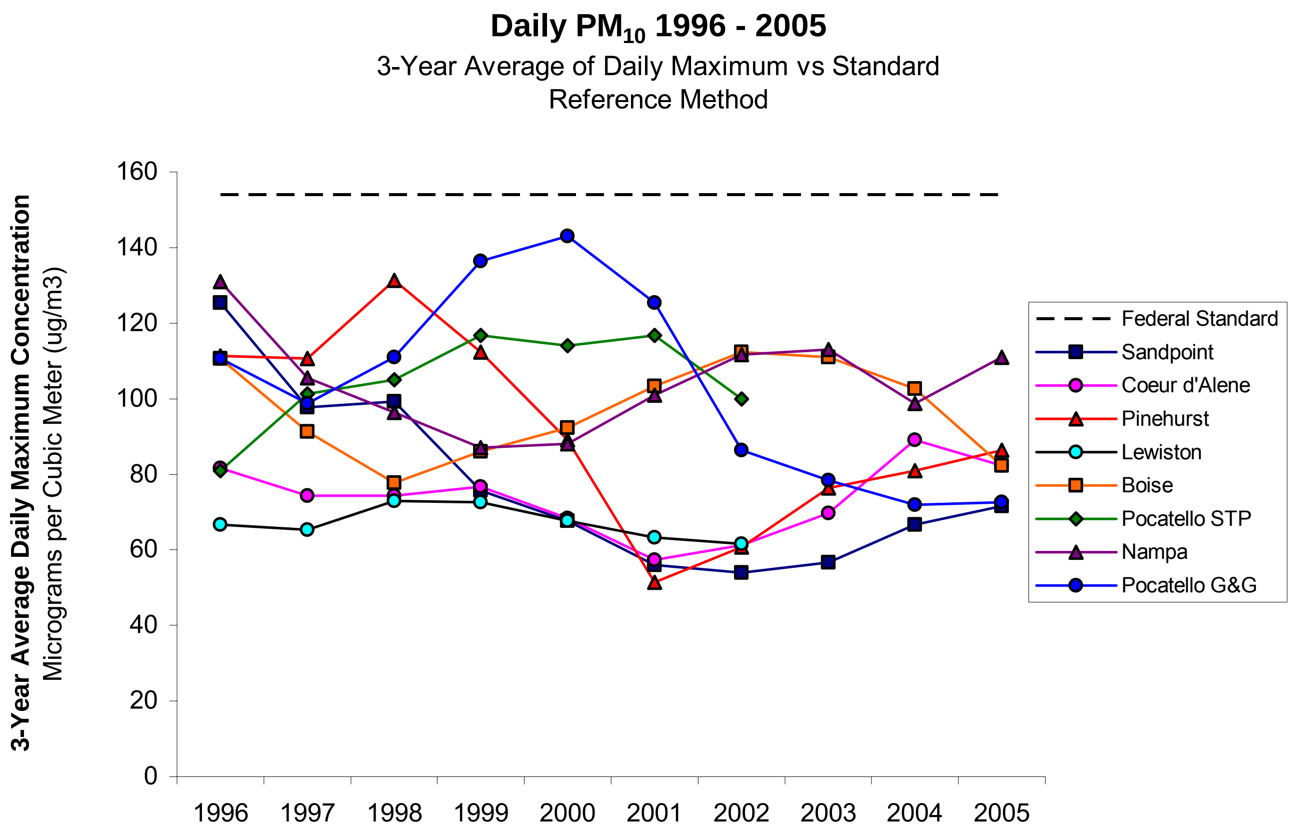
The federal PM_{10} standard is currently being reviewed along with the fine particulate standard. EPA may choose to replace the PM_{10} standard in the future with a $PM_{10-2.5}$ (PMcoarse) standard, ranging from diameters 2.5-10 micrometers. In 2005 Idaho had three areas that had previously exceeded federal PM_{10} standards. These nonattainment areas are in Sandpoint, Pinehurst and Pocatello. Northern Ada County was formerly a nonattainment area but is now considered to be a maintenance area for PM_{10}.

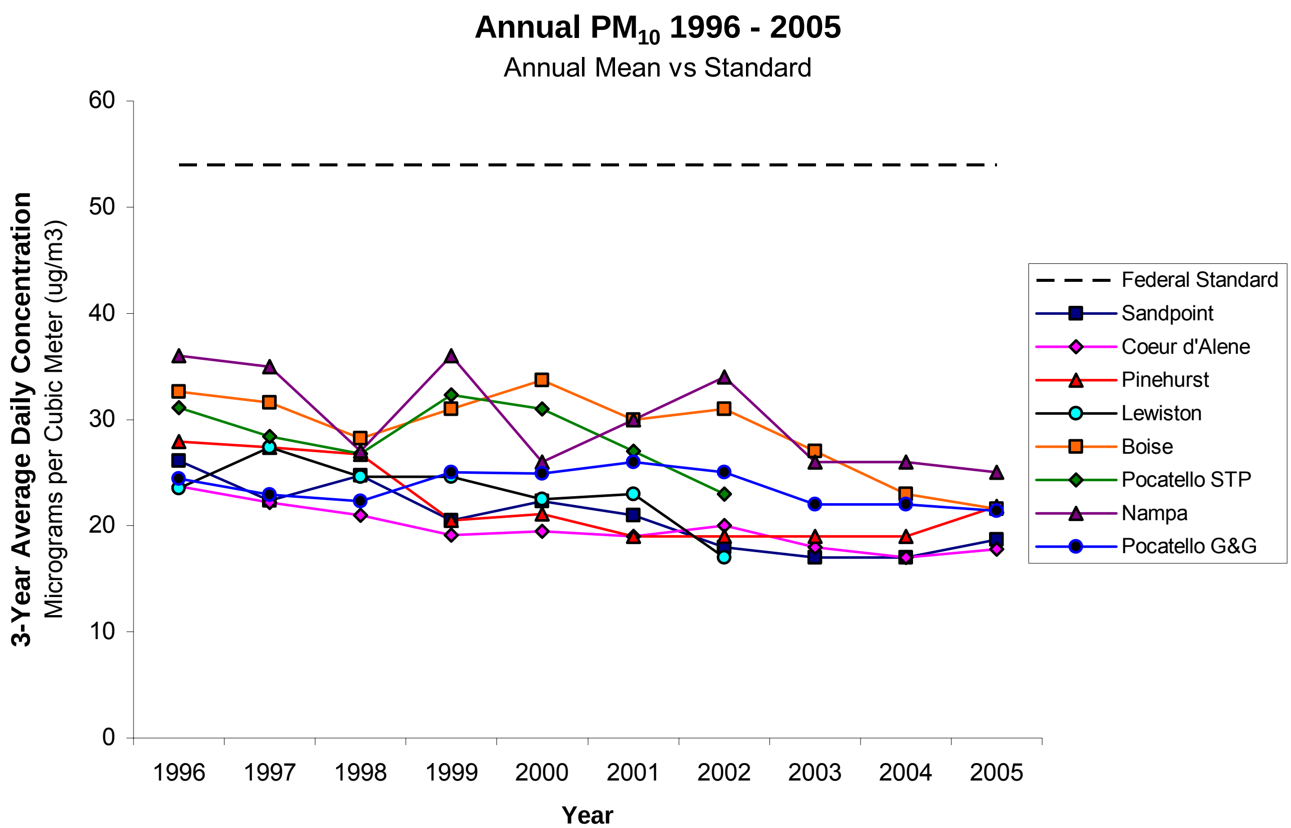
Idaho monitors PM_{10} using both reference and continuous methods. The PM_{10} TEOM is a federal equivalent method. TEOM data is also used to determine compliance to the PM_{10} NAAQS. Reference and equivalent method results are shown in the following graphs. TEOM data is also used to determine the daily AQI and to inform the public of air quality values in near real time via DEQ Web pages.

The graphs on the following pages demonstrate that Idaho’s airsheds were in compliance for both the annual and daily NAAQS standards for PM_{10}. Most concentrations were measured using the reference method while Sandpoint, Pinehurst, Coeur d’Alene, the Boise Fire Station, and Nampa were measured with TEOMs, the federal equivalent method. The graphs on pages 37 and 38 show PM_{10} at individual monitoring stations for each monitoring location. It is clear that all concentrations are below the NAAQS. Years shown on the x-axis are actually the last year that was averaged. For example, data points for 2005 are actually data points reflecting the three-year average of 2003, 2004, and 2005.

The annual standard for 24-hour PM_{10} requires that the three-year average not exceed the standard of 54 $\mu g/m^3$. Again, years shown on the x-axis are actually the last year that was averaged, as the standard requires a three-year average. Maximum daily values (24-hour average) confirm that Idaho has shown a fairly slight decrease since 1996. Statistical summaries of reference and continuous method PM_{10} concentrations are provided in tables in the Appendix. The maximum PM_{10} measured in 2005 was 172 $\mu g/m^3$ at the Nampa monitor (high-wind event with blowing dust), measured by a continuous equivalent method analyzer. This value is slightly above the 24 hour standard allowing each monitor one value above 154 $\mu g/m^3$ per year. (The 24-hour daily PM NAAQS is violated if the expected number of exceedances over three consecutive years is greater than one. So you can have 2/0/1 exceedances in three consecutive years and not violate the NAAQS.)

For additional information on PM_{10}, visit www.epa.gov/air/urbanair/pm/index.html. More information on PM_{10} is also presented in question/answer format in the definitions section of this document.


Daily PM_{10} 1996 - 2005
3-Year Average of Daily Maximum vs Standard Reference Method
3-Year Average Daily Maximum Concentration
Micrograms per Cubic Meter (ug/m3)
160
140
120
100
80
60
40
20
0
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
Federal Standard
Sandpoint
Coeur d'Alene
Pinehurst
Lewiston
Boise
Pocatello STP
Nampa
Pocatello G&G


Annual PM10 1996 - 2005
Annual Mean vs Standard
3-Year Average Daily Concentration
Micrograms per Cubic Meter (ug/m3)
0
10
20
30
40
50
60
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
Year
Federal Standard
Sandpoint
Coeur d'Alene
Pinehurst
Lewiston
Boise
Pocatello STP
Nampa
Pocatello G&G

Particulate Matter (2.5 micrometers)

Particles smaller than 2.5 micrometers in diameter are called “fine” particles, or $PM_{2.5}$. DEQ considers $PM_{2.5}$ one of the major air pollution concerns affecting a number of airsheds in Idaho. $PM_{2.5}$ generally comes from wood burning, agricultural burning and other area sources, as well as vehicle exhaust including cars, diesel trucks, and buses. Fine particulate can also be formed secondarily in the atmosphere by chemical reactions of pollutant gases.

Exposure to $PM_{2.5}$ can have serious health effects. Fine particles are most closely associated with increased respiratory disease, decreased lung function, and even premature death. Children, older adults, and people with some illnesses are more sensitive and more likely to develop heart or lung problems associated with $PM_{2.5}$. People with respiratory or heart disease, older adults, and children should avoid outdoor exertion if $PM_{2.5}$ levels are high. $PM_{2.5}$ also significantly affects visibility.

$PM_{2.5}$ is primarily measured using two different methods in Idaho, the federal reference method and the Tapered Element Oscillating Method (TEOM). The federal reference method is considered by EPA to be the most accurate way to determine $PM_{2.5}$ concentrations. This method involves pulling in air (at a given flow rate) and trapping particles of a certain size (in this case $PM_{2.5}$) on a filter. The filter is then weighed and divided by volume (determined from flow rate and amount of time) to provide the concentration. Unfortunately, the reference method does not provide continuous or timely information. Thus, Idaho uses another method to provide more time-relevant data: the Tapered Element Oscillating Microbalance. The TEOM method uses measurement of mass to determine particulate matter present. A third method of $PM_{2.5}$ measurement is used during agricultural burning season; the nephelometer. These instruments help DEQ estimate $PM_{2.5}$ concentrations during these activities.

The graphs in this section use data primarily from the federal reference method. The continuous data are from the TEOMs. The continuous methods are compared to the reference method values for a one year period and calculations are made to determine the degree of difference from the reference method. The differences are then applied to the current continuous values in an attempt to make them “reference method -like.” Continuous methods are not designated as equivalent methods for $PM_{2.5}$ and data cannot be used for NAAQS determinations.

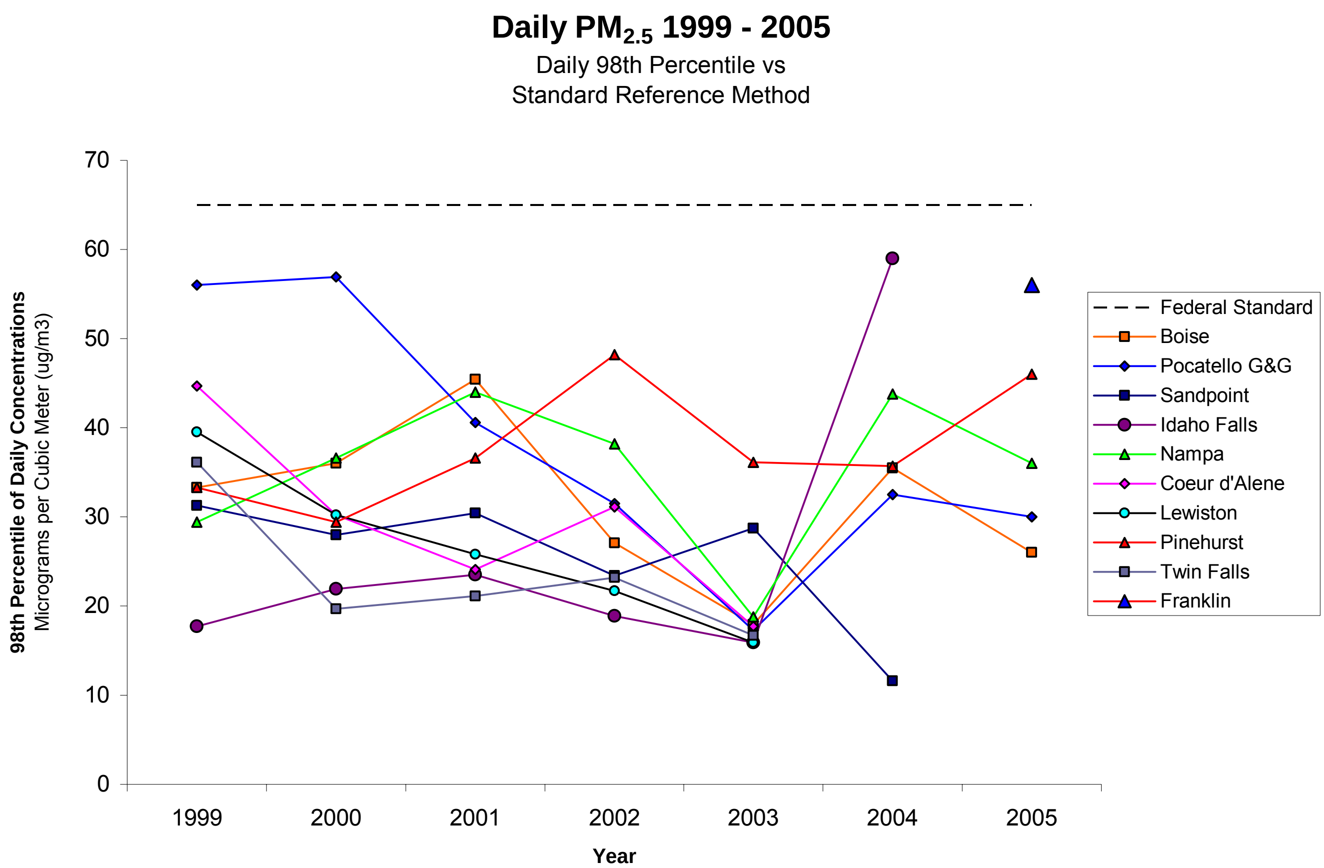
The graphs on pages 41 through 42 show that $PM_{2.5}$ meets both annual and daily NAAQS using the standard reference method. All of Idaho was designated attainment/unclassifiable for $PM_{2.5}$ in 2005. The graphs on pages 43 through 49 use data from the continuous samplers to display $PM_{2.5}$ with the AQI. Both types of graphs are discussed below.

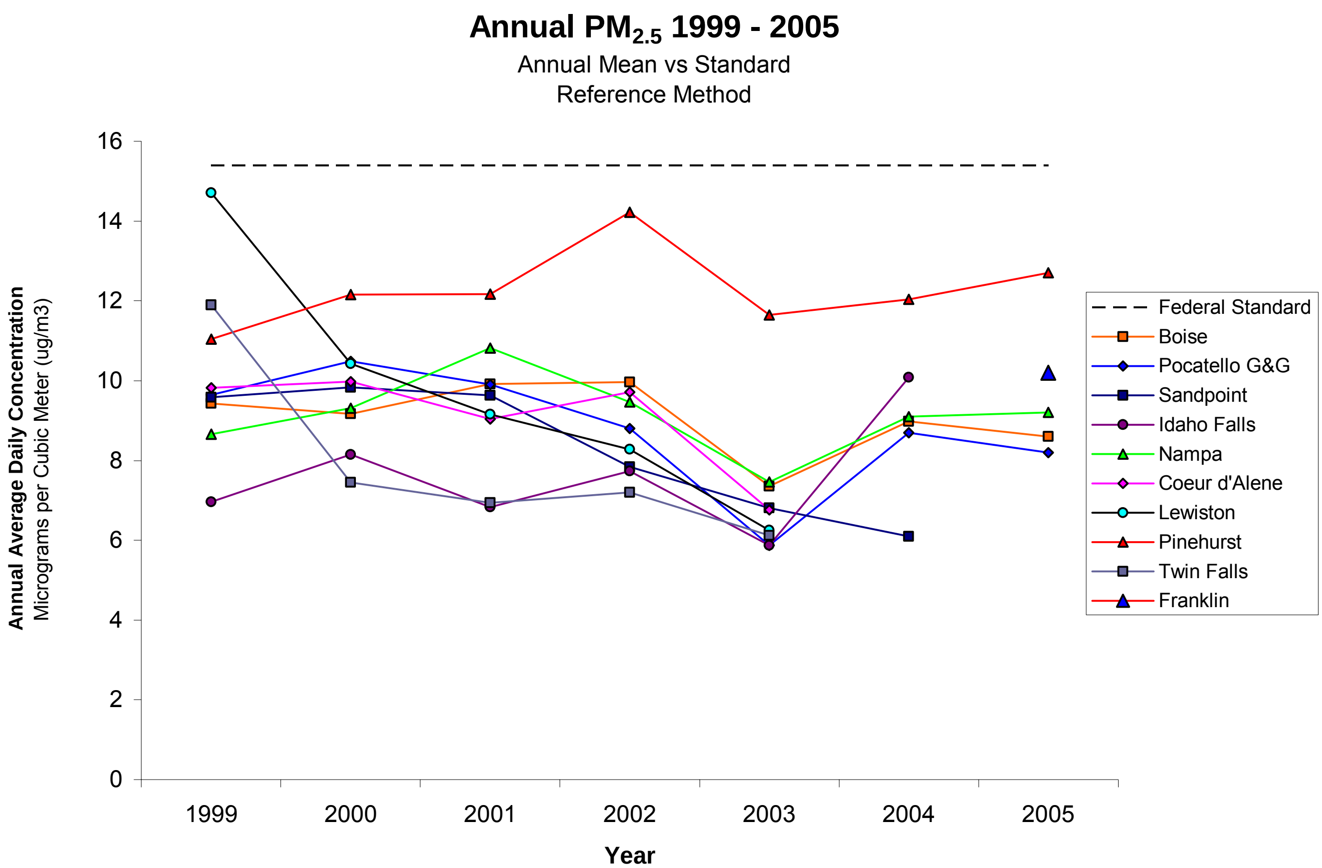
The graph on page 41 shows the 2005 98th percentile 24-hour (daily) averages at each monitoring station against the federal standard. As shown in the standards table, the 98th percentile is actually for a three-year average. For purposes of these graphs, however, the three-year average is not taken because there are so few years to show (there would be only two or three points on each graph). It is easy to see, however, that data for all years fell well below the standard of 65 $\mu g/m^3$, and the three-year average would also fall below**.**

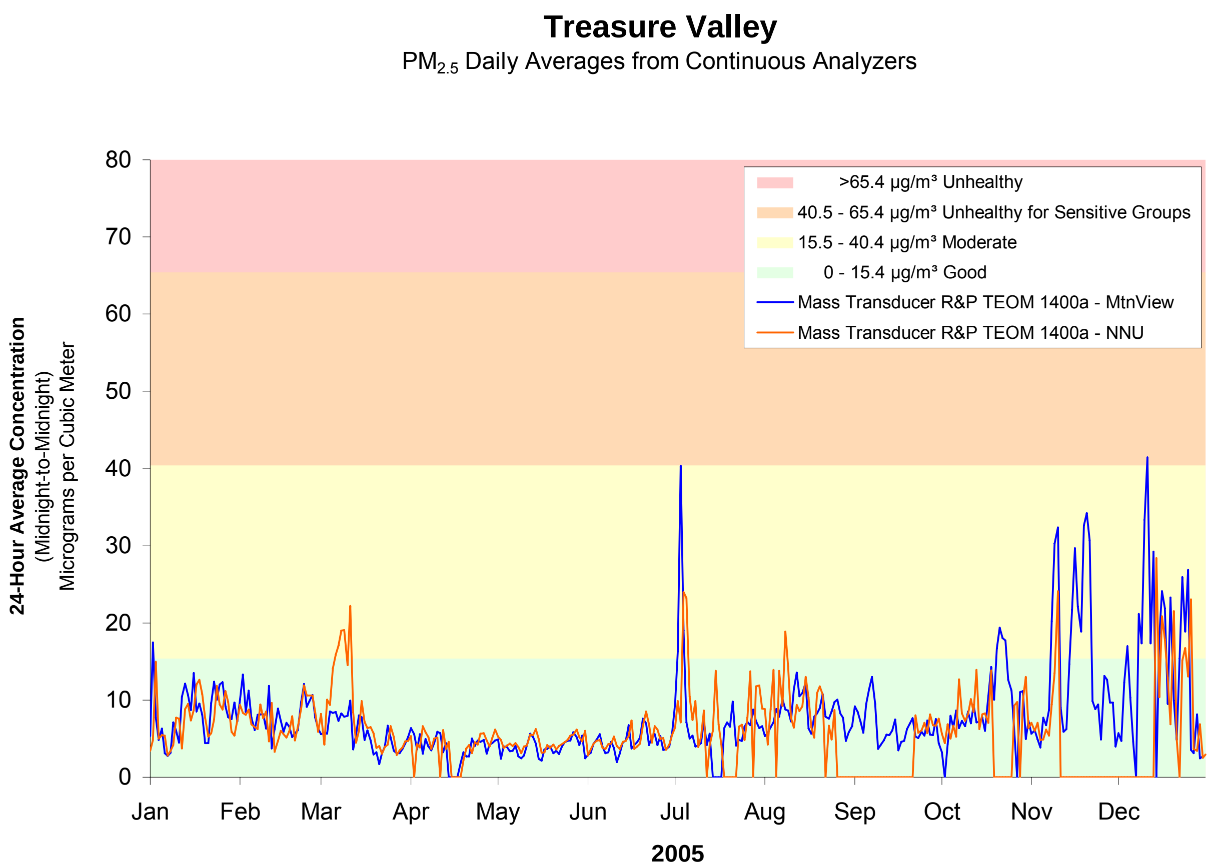
The graph on page 42 shows annual averages at each monitoring station, against the federal standard. The standard calls for a three-year average; however, annual averages are plotted on these graphs because three-year averages would result in only a few data points. Nonetheless, it is easily seen that the annual standard of 15.4 µg/m^3 was not exceeded at any of the monitoring stations (nor would a three-year average).

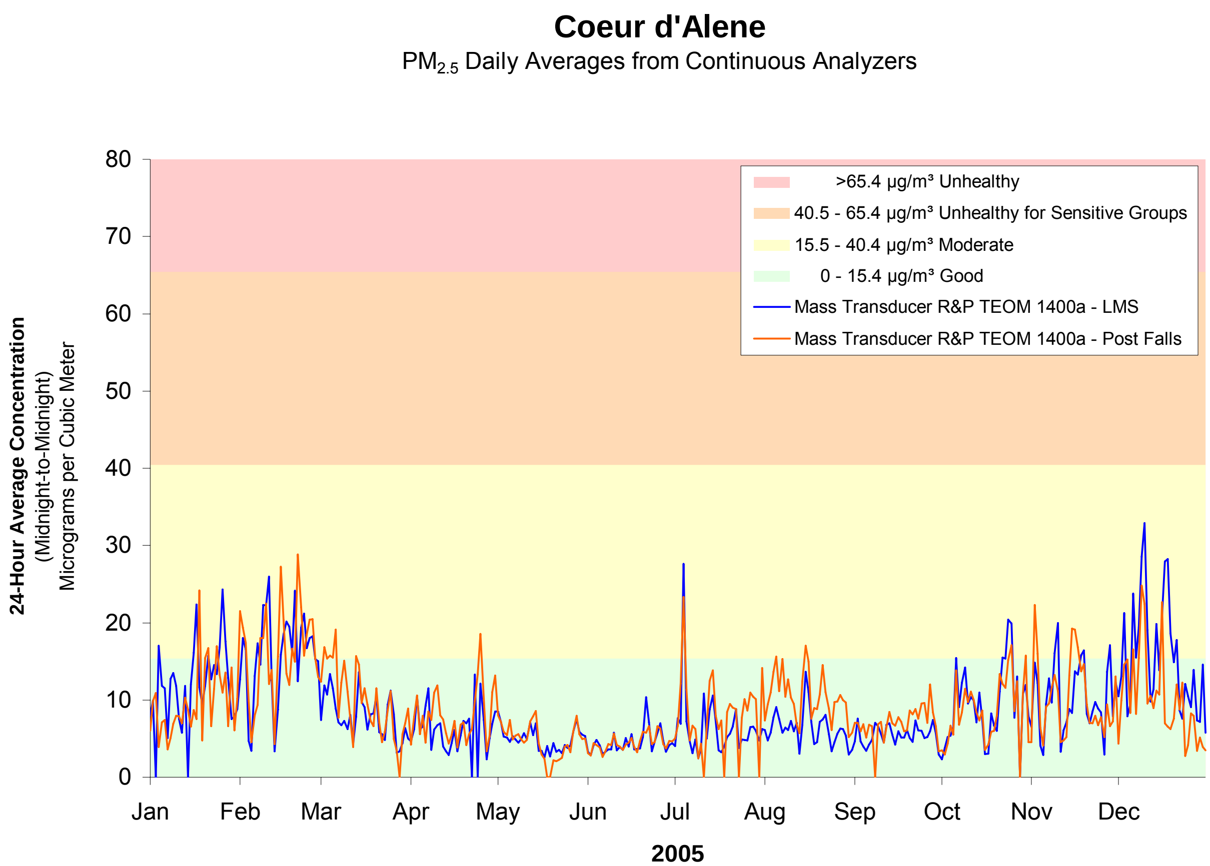
Graphs on pages 43 through 49 show daily $PM_{2.5}$ concentrations measured at Idaho sites during 2005 using the TEOM continuous analyzers against a backdrop of AQI breakpoints. The highest concentration of $PM_{2.5}$ measured in 2005 was 75 µg/m^3, measured at Preston (Franklin County) using the reference method. A few of the graphs show some extended periods of zero concentrations. These are times when a TEOM was not functioning due to mechanical malfunctions.

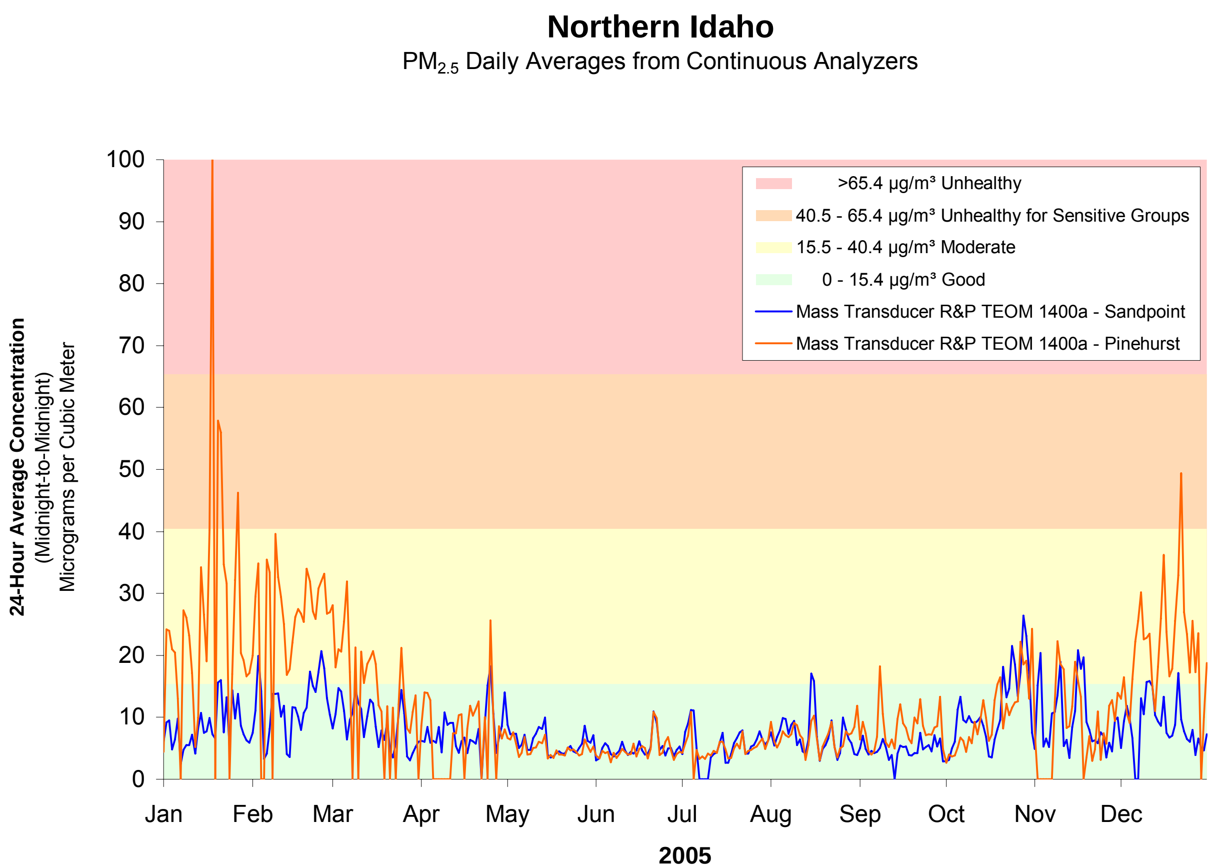
For additional information on particulate matter, visit www.epa.gov/air/urbanair/pm/index.html. Information on $PM_{2.5}$ is also presented in a question/answer format in the definitions section of this document.

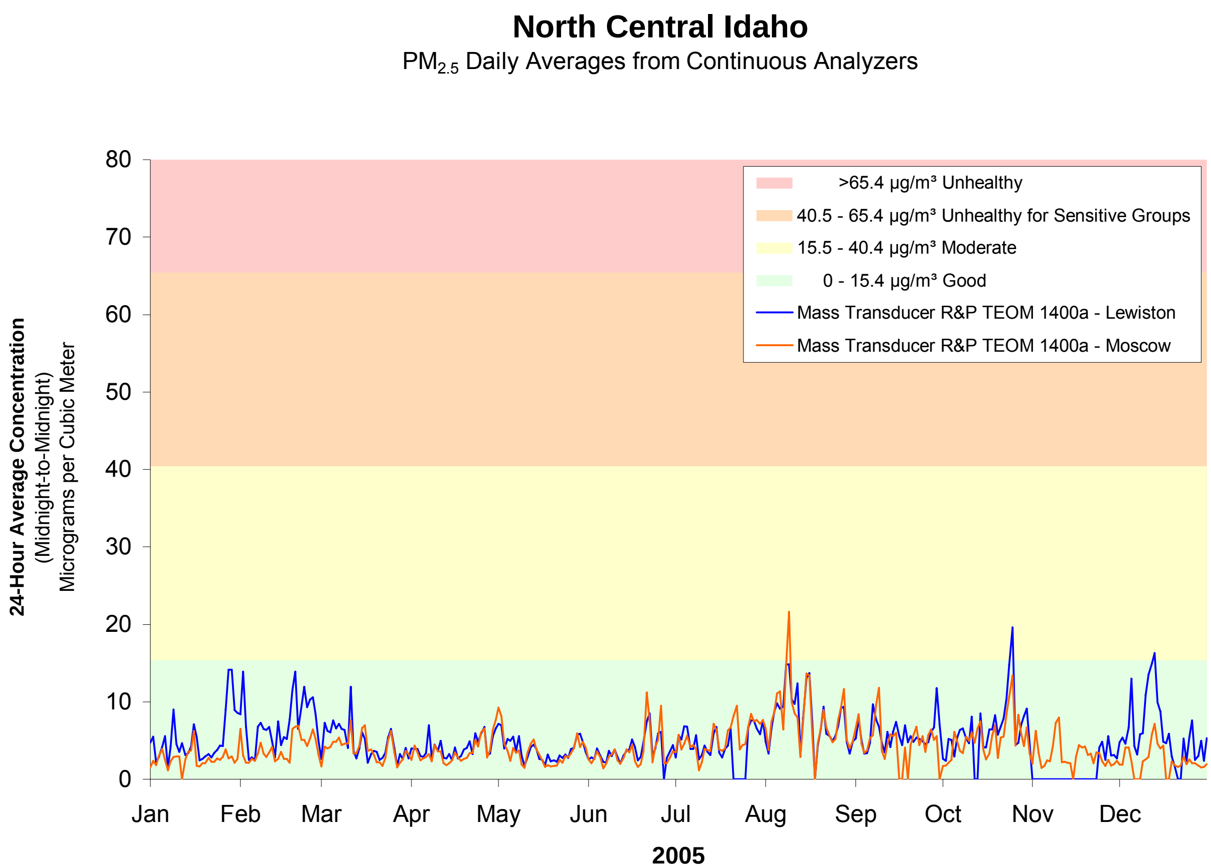

Daily PM2.5 1999 - 2005
Daily 98th Percentile vs
Standard Reference Method
98th Percentile of Daily Concentrations
Micrograms per Cubic Meter (ug/m3)
70
60
50
40
30
20
10
0
1999
2000
2001
2002
2003
2004
2005
Year
Federal Standard
Boise
Pocatello G&G
Sandpoint
Idaho Falls
Nampa
Coeur d'Alene
Lewiston
Pinehurst
Twin Falls
Franklin


Annual PM2.5 1999 - 2005
Annual Mean vs Standard
Reference Method
Annual Average Daily Concentration
Micrograms per Cubic Meter (ug/m3)
16
14
12
10
8
6
4
2
0
1999
2000
2001
2002
2003
2004
2005
Year
Federal Standard
Boise
Pocatello G&G
Sandpoint
Idaho Falls
Nampa
Coeur d'Alene
Lewiston
Pinehurst
Twin Falls
Franklin


Treasure Valley
PM2.5 Daily Averages from Continuous Analyzers
>65.4 µg/m³ Unhealthy
40.5 - 65.4 µg/m³ Unhealthy for Sensitive Groups
15.5 - 40.4 µg/m³ Moderate
0 - 15.4 µg/m³ Good
Mass Transducer R&P TEOM 1400a - MtnView
Mass Transducer R&P TEOM 1400a - NNU
24-Hour Average Concentration
(Midnight-to-Midnight)
Micrograms per Cubic Meter
80
70
60
50
40
30
20
10
0
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
2005

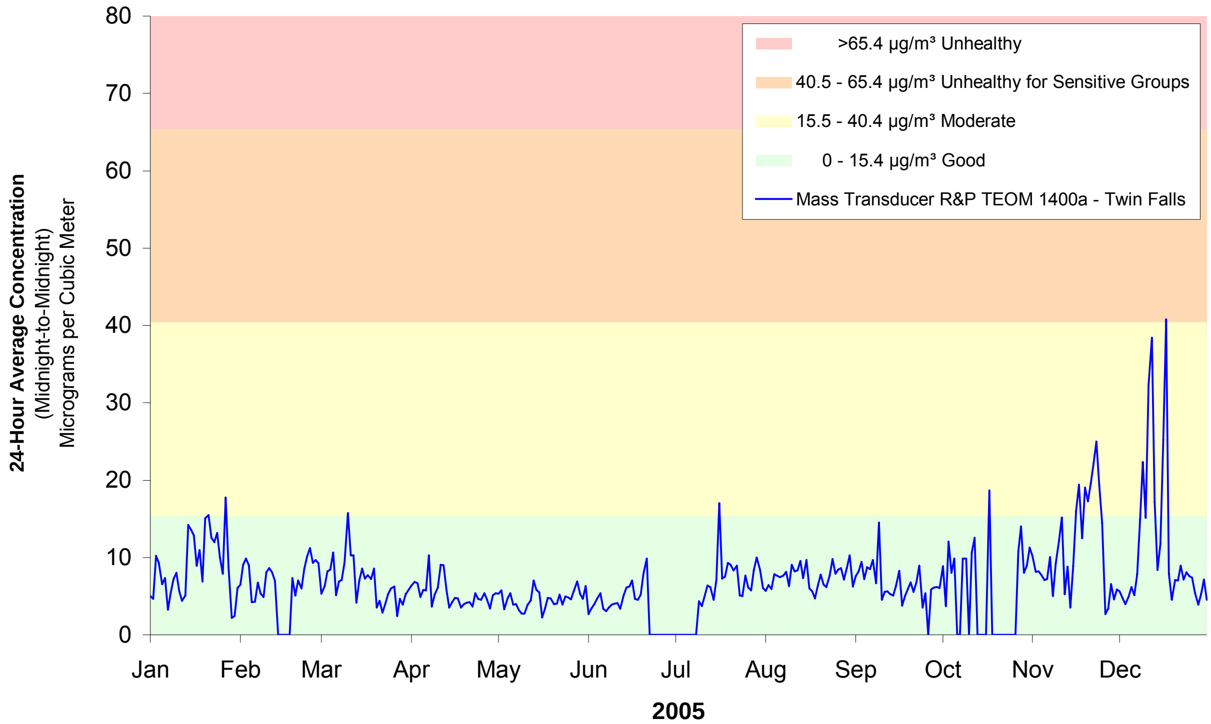

Coeur d'Alene
PM2.5 Daily Averages from Continuous Analyzers
>65.4 µg/m³ Unhealthy
40.5 - 65.4 µg/m³ Unhealthy for Sensitive Groups
15.5 - 40.4 µg/m³ Moderate
0 - 15.4 µg/m³ Good
Mass Transducer R&P TEOM 1400a - LMS
Mass Transducer R&P TEOM 1400a - Post Falls
24-Hour Average Concentration
(Midnight-to-Midnight)
Micrograms per Cubic Meter
0
10
20
30
40
50
60
70
80
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
2005

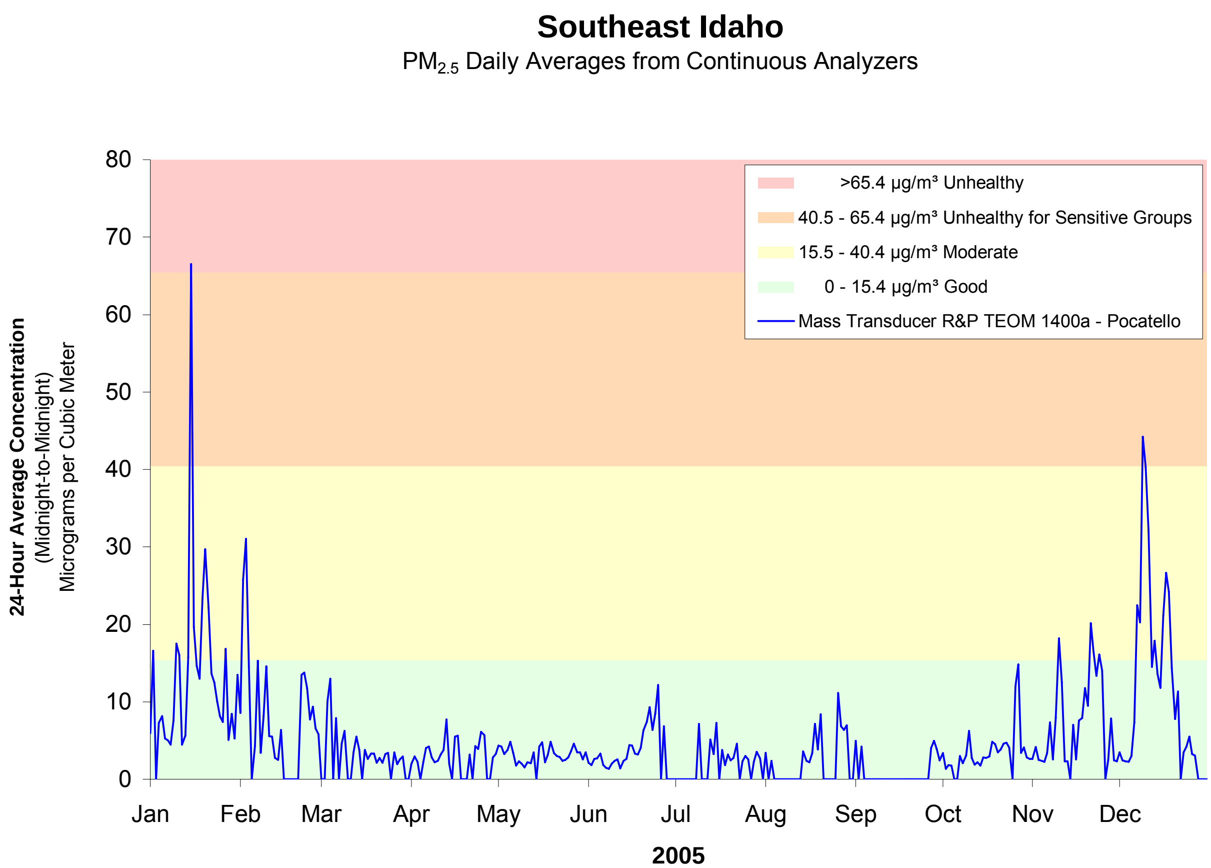

Northern Idaho
PM2.5 Daily Averages from Continuous Analyzers
>65.4 µg/m³ Unhealthy
40.5 - 65.4 µg/m³ Unhealthy for Sensitive Groups
15.5 - 40.4 µg/m³ Moderate
0 - 15.4 µg/m³ Good
Mass Transducer R&P TEOM 1400a - Sandpoint
Mass Transducer R&P TEOM 1400a - Pinehurst
24-Hour Average Concentration
(Midnight-to-Midnight)
Micrograms per Cubic Meter
100
90
80
70
60
50
40
30
20
10
0
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
2005

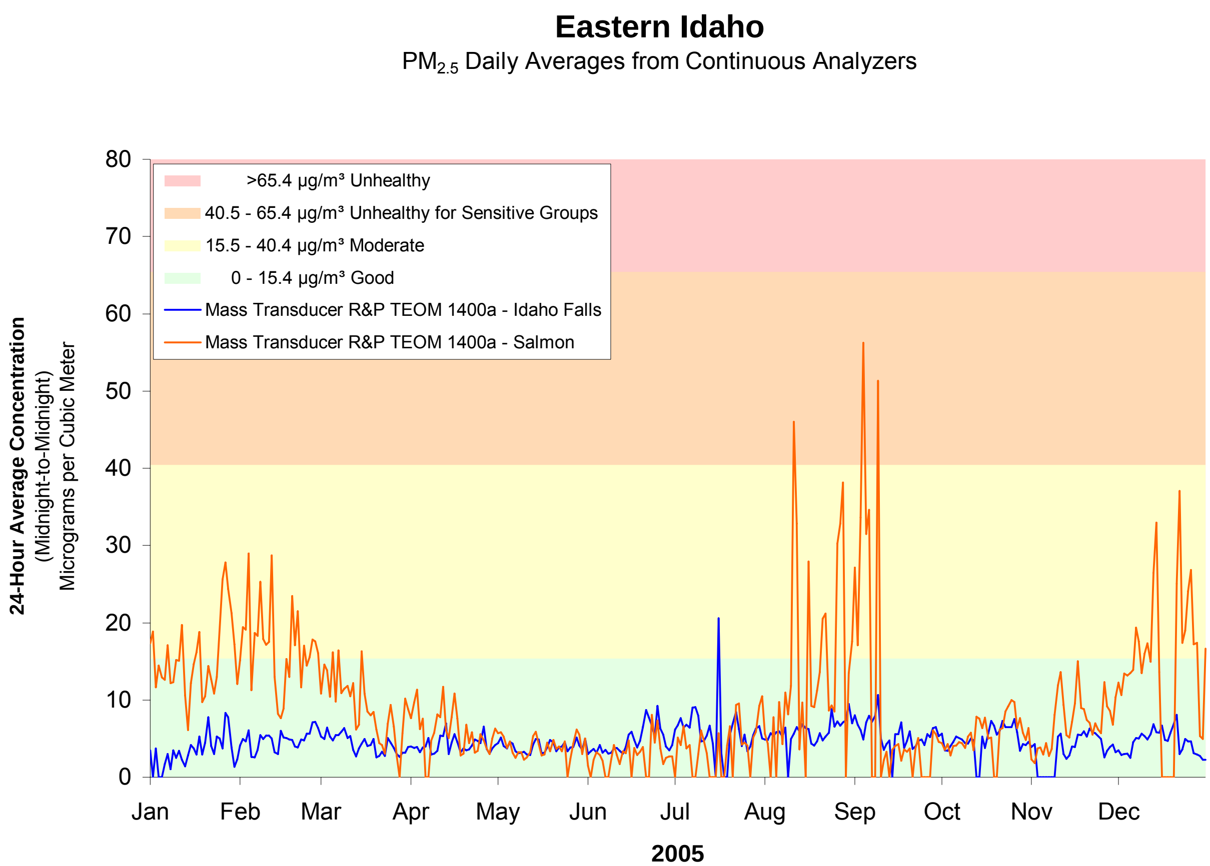

North Central Idaho
PM2.5 Daily Averages from Continuous Analyzers
80
70
60
50
40
30
20
10
0
24-Hour Average Concentration
(Midnight-to-Midnight)
Micrograms per Cubic Meter
>65.4 µg/m³ Unhealthy
40.5 - 65.4 µg/m³ Unhealthy for Sensitive Groups
15.5 - 40.4 µg/m³ Moderate
0 - 15.4 µg/m³ Good
Mass Transducer R&P TEOM 1400a - Lewiston
Mass Transducer R&P TEOM 1400a - Moscow
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
2005

Twin Falls

$PM_{2.5}$ Daily Averages from Continuous Analyzers




Southeast Idaho
PM2.5 Daily Averages from Continuous Analyzers
>65.4 µg/m³ Unhealthy
40.5 - 65.4 µg/m³ Unhealthy for Sensitive Groups
15.5 - 40.4 µg/m³ Moderate
0 - 15.4 µg/m³ Good
Mass Transducer R&P TEOM 1400a - Pocatello
24-Hour Average Concentration
(Midnight-to-Midnight)
Micrograms per Cubic Meter
0
10
20
30
40
50
60
70
80
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
2005


Eastern Idaho
PM2.5 Daily Averages from Continuous Analyzers
>65.4 µg/m³ Unhealthy
40.5 - 65.4 µg/m³ Unhealthy for Sensitive Groups
15.5 - 40.4 µg/m³ Moderate
0 - 15.4 µg/m³ Good
Mass Transducer R&P TEOM 1400a - Idaho Falls
Mass Transducer R&P TEOM 1400a - Salmon
24-Hour Average Concentration
(Midnight-to-Midnight)
Micrograms per Cubic Meter
0
10
20
30
40
50
60
70
80
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
2005

Carbon Monoxide

Carbon Monoxide (CO) is an odorless, colorless gas that can enter the bloodstream through the lungs and reduce the amount of oxygen that reaches organs and tissues. Carbon monoxide forms when the carbon in fuels doesn't burn completely. The majority of CO comes from vehicle exhaust. In cities, 85-95% of all CO emissions may come from motor vehicle exhaust.

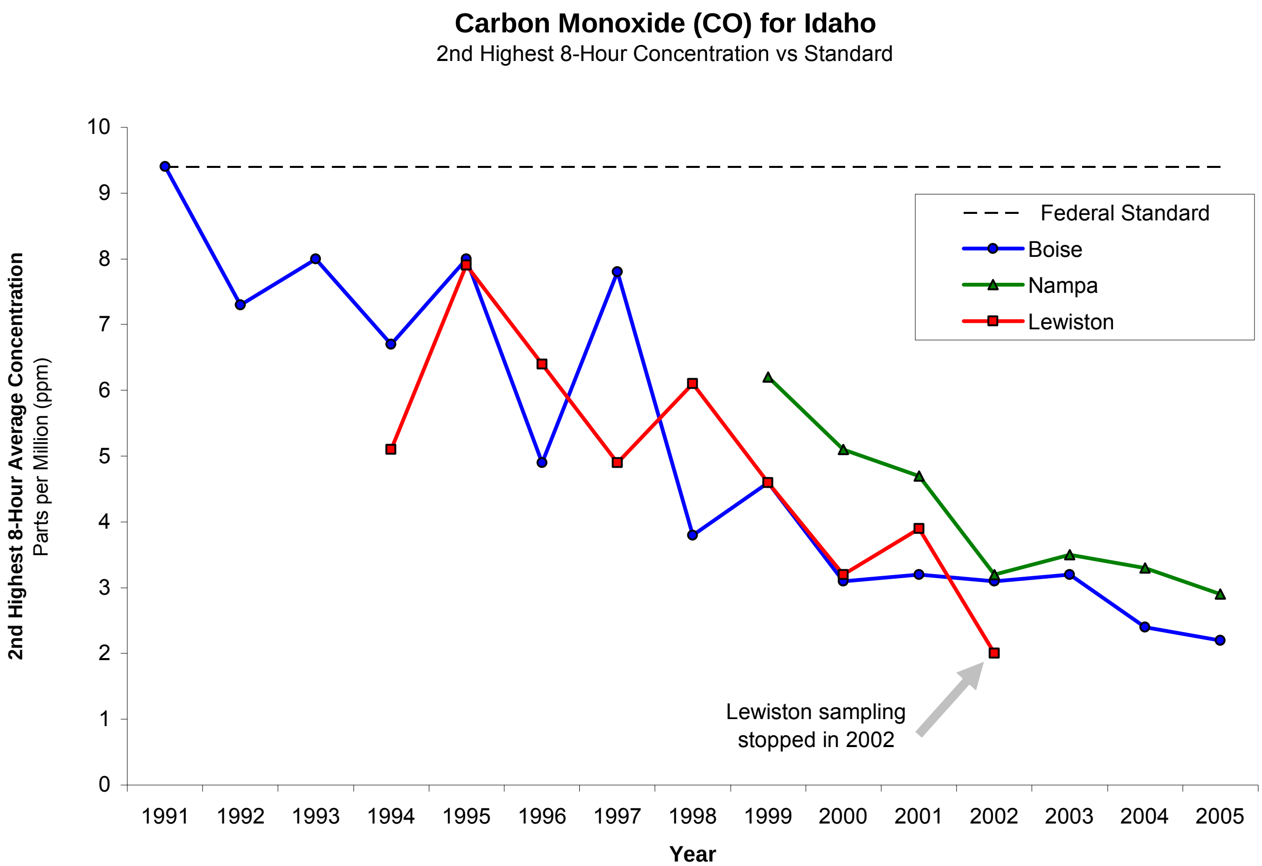
Elevated levels of CO in the ambient air can occur in urban canyon areas with heavy traffic congestion. The highest levels of CO in the outside air typically occur during the colder months of the year when temperature inversions are more frequent. People with cardiovascular disease or respiratory problems might experience chest pain and increased cardiovascular symptoms, particularly while exercising, if CO levels are high. High levels of CO can affect alertness and vision even in healthy individuals.

CO monitoring stations are generally located in urban canyon areas with heavy traffic congestion. These include central business areas, roadsides, and shopping malls.

The graph on page 51 shows the second highest 8-hour concentrations at Idaho's monitoring sites versus the NAAQS standard. The second-highest concentration is displayed on these graphs because, under the federal rule, the 8-hour average can not be exceeded more than once per year (thus, choosing the second highest). These graphs confirm the general downward trend that CO is taking from the early 1990s to present. There were no 8-hour concentrations measured at any sites that exceeded the NAAQS standard of 9.4 ppm**.** The maximum 8-hour concentration for CO in 2005 was 2.9 ppm, well below the 8-hour standard. These data are provided in the Appendix.

The NAAQS also includes a 1-hour standard for CO of 35 ppm (can not be exceeded more than once a year). Measured 1-hour concentrations in Idaho are historically much lower than the 35 ppm standard, and therefore 1-hour CO trends were not graphed. The maximum and second-highest measured 1-hour CO in 2005 are 5.7 and 5.1 ppm. Additional 1-hour average CO data are provided in the Appendix.

For additional information on CO, visit www.epa.gov/air/urbanair/co/index.html. CO information is also provided in question/answer format in the definitions section of this document.


Carbon Monoxide (CO) for Idaho
2nd Highest 8-Hour Concentration vs Standard
2nd Highest 8-Hour Average Concentration
Parts per Million (ppm)
10
9
8
7
6
5
4
3
2
1
0
Federal Standard
Boise
Nampa
Lewiston
Lewiston sampling stopped in 2002
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
Year

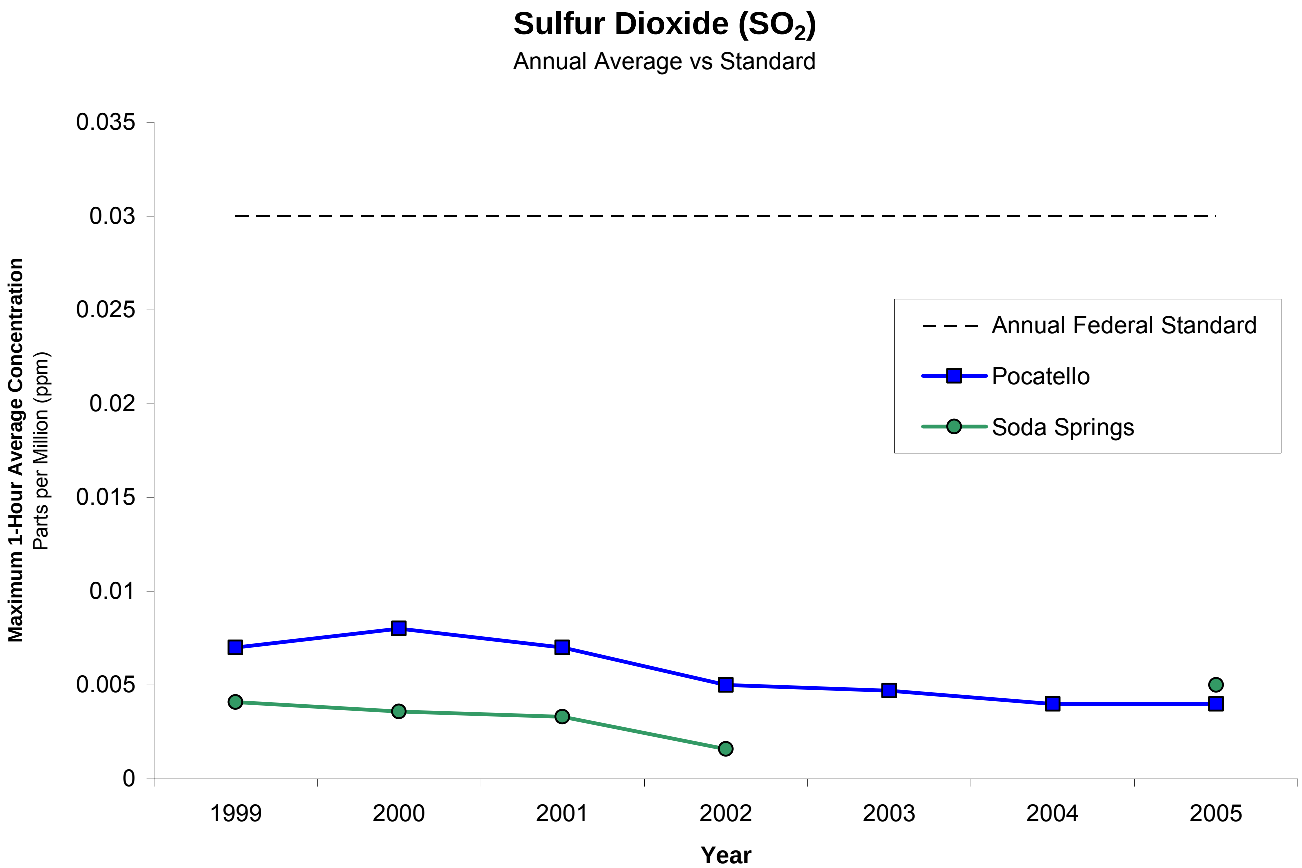
Sulfur Dioxide

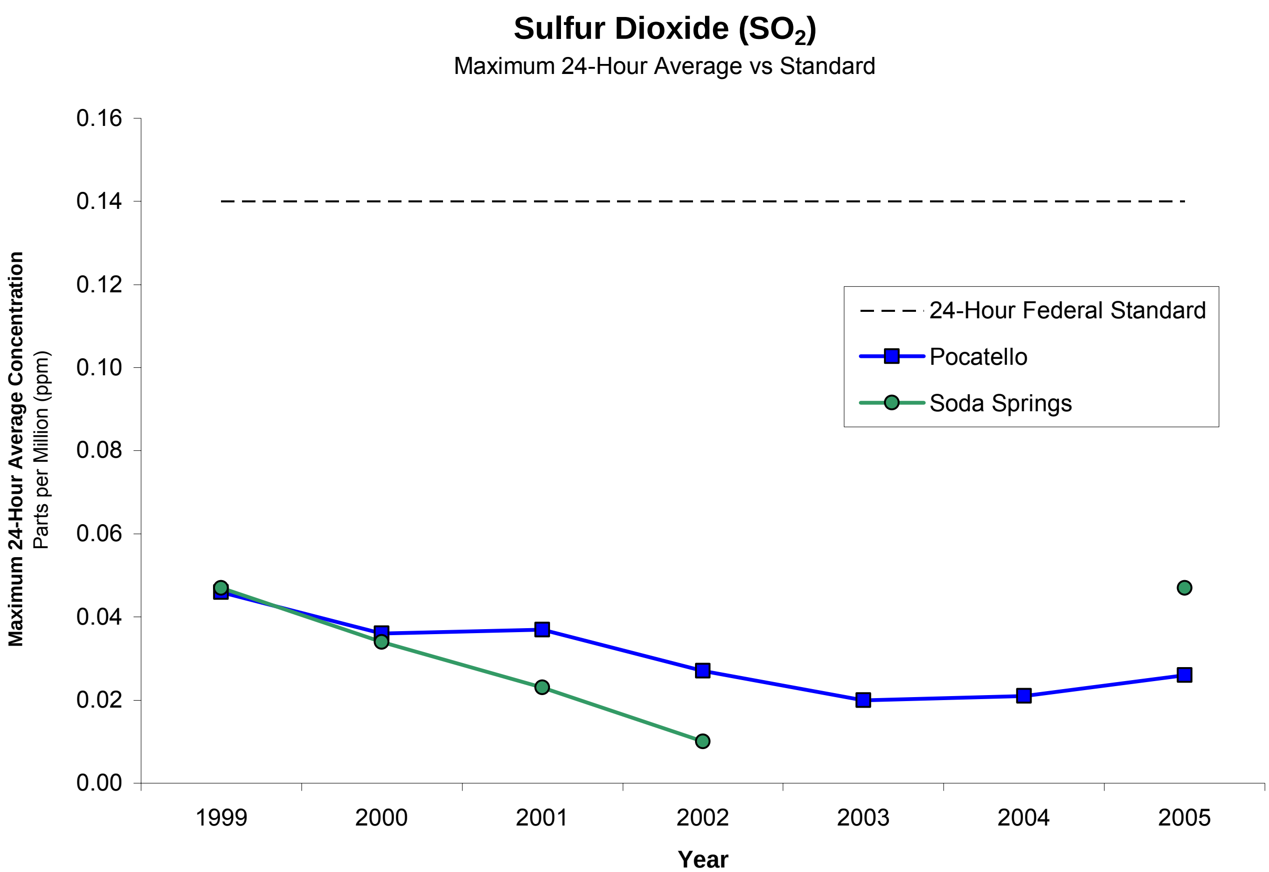
Sulfur dioxide (SO_2) is a colorless, reactive gas produced by burning fuels containing sulfur, such as coal and oil, and by industrial processes. Historically, the greatest sources of SO_2 were industrial facilities that derived their products from raw materials like metallic ore, coal, and crude oil, or that burned coal or oil to produce process heat (petroleum refineries, cement manufacturing, and metal processing facilities). Currently, on-road vehicles, marine craft, and diesel construction equipment also release significant SO_2 emissions to the air.

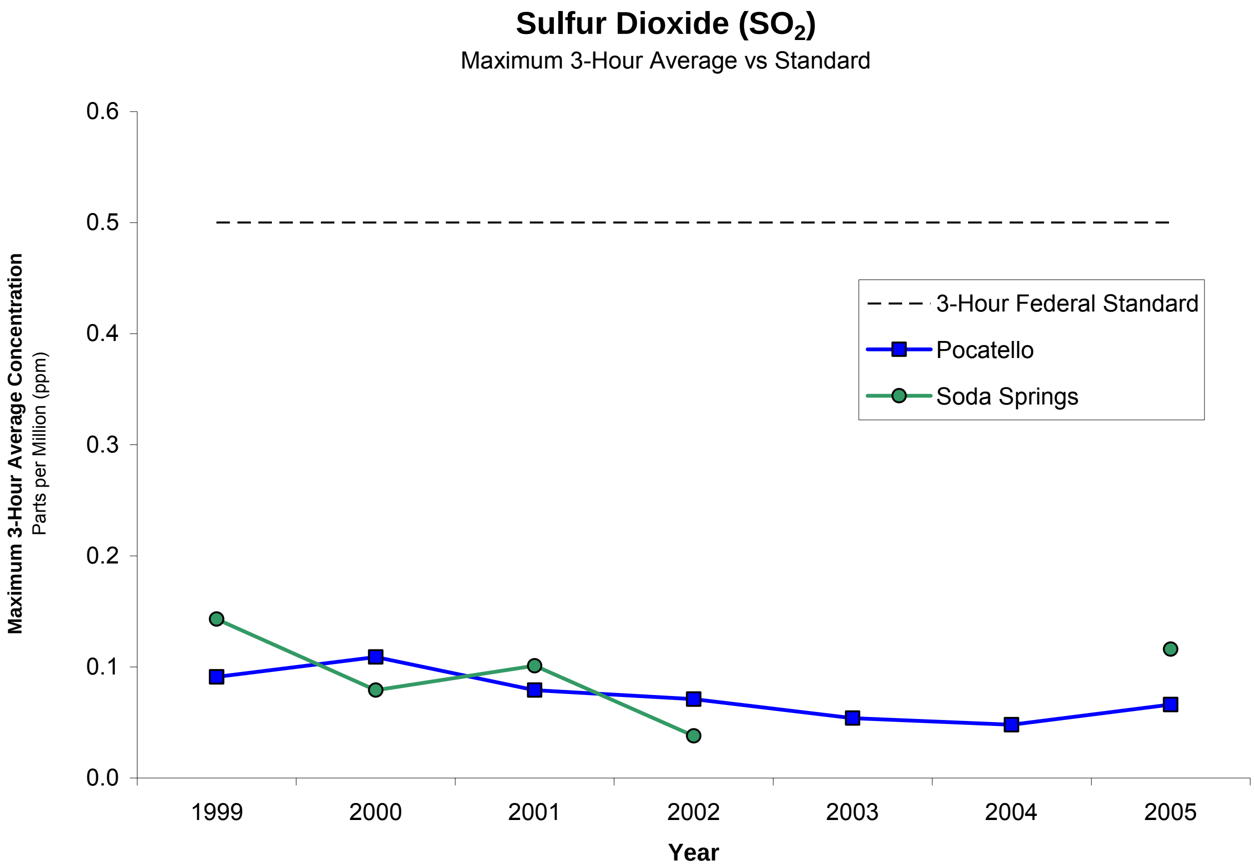
People with asthma who are active outdoors may experience bronchoconstriction, where symptoms include wheezing, shortness of breath, and tightening of the chest. People should limit outdoor exertion if SO_2 levels are high.

The maximum measured SO_2 concentrations in 2005 were significantly below the federal standards. The graphs on pages 54 and 55 show the maximum 24-hour and 1-hour concentrations, respectively, at Idaho's monitoring sites. The maximum 24-hour and 1-hour averages were 0.047 ppm and 0.101 ppm, respectively. Note that the 2005 Soda Springs monitor is at a different location than it was in 1999-2002.

Additional SO_2 data are located in the Appendix, and information on SO_2 is available at www.epa.gov/air/urbanair/so2/index.html. SO_2 information is also provided in question/answer format in the definitions section of this document.


Sulfur Dioxide (SO2)
Annual Average vs Standard
Maximum 1-Hour Average Concentration
Parts per Million (ppm)
0.035
0.03
0.025
0.02
0.015
0.01
0.005
0
1999
2000
2001
2002
2003
2004
2005
Year
Annual Federal Standard
Pocatello
Soda Springs


Sulfur Dioxide (SO_2)
Maximum 24-Hour Average vs Standard
Maximum 24-Hour Average Concentration
Parts per Million (ppm)
0.16
0.14
0.12
0.10
0.08
0.06
0.04
0.02
0.00
24-Hour Federal Standard
Pocatello
Soda Springs
1999
2000
2001
2002
2003
2004
2005
Year


Sulfur Dioxide (SO_2)
Maximum 3-Hour Average vs Standard
Maximum 3-Hour Average Concentration
Parts per Million (ppm)
0.6
0.5
0.4
0.3
0.2
0.1
0.0
3-Hour Federal Standard
Pocatello
Soda Springs
1999
2000
2001
2002
2003
2004
2005
Year

Lead

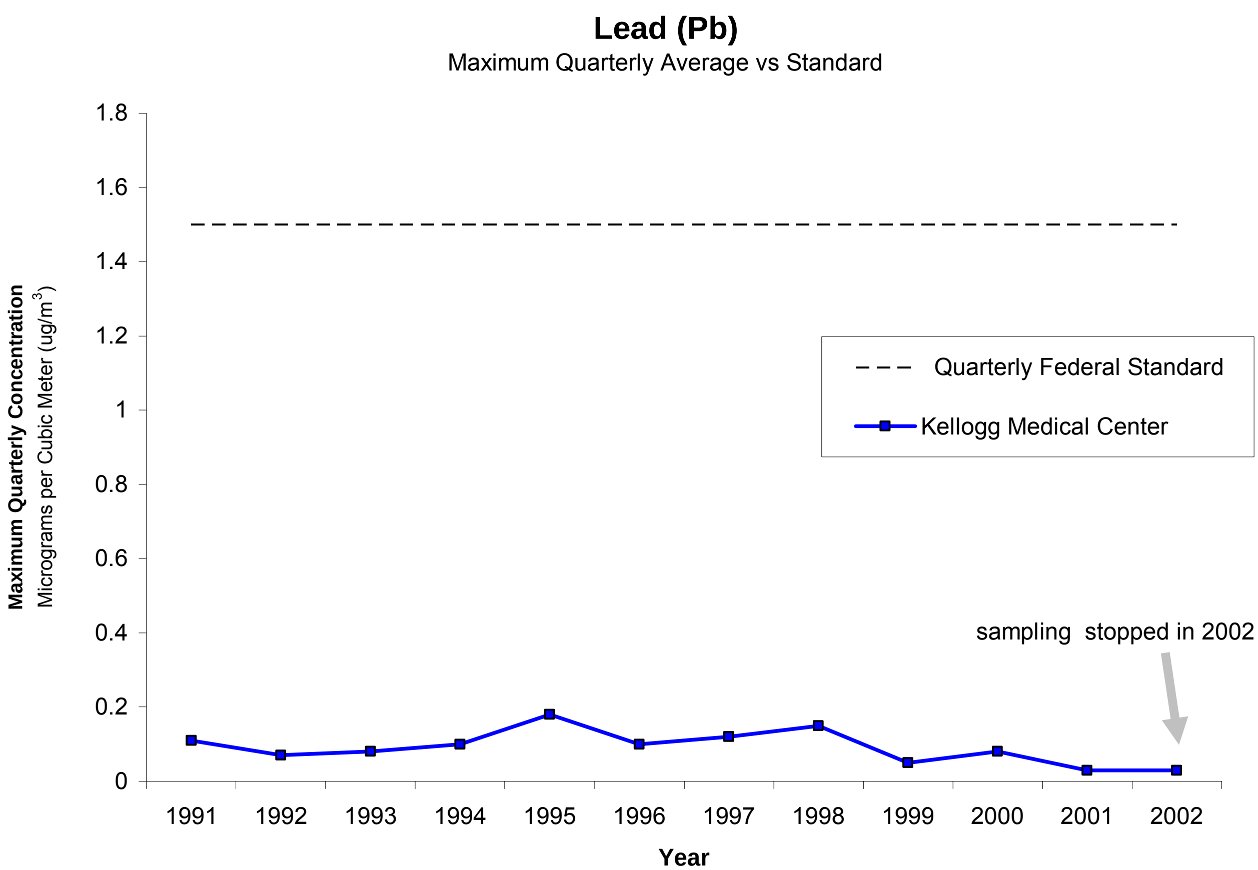
Lead is a highly toxic metal that was used for many years in household products, automobile fuel, and industrial chemicals. Airborne lead was associated primarily with automobile exhaust and lead smelters. The large reductions in lead emissions from motor vehicles have changed the nature of the air quality lead problem in the United States. Industrial processes, particularly primary and secondary lead smelters and battery manufacturers, are now responsible for most of the lead emissions.

People, animals, and fish are mainly exposed to lead by breathing and ingesting it in food, water, soil, or dust. Lead accumulates in the blood, bones, muscles, and fat. Infants and young children are especially sensitive to even low levels of lead. Lead can have health effects ranging from behavioral problems and learning disabilities to seizures and death.

According to EPA, the primary sources of lead exposure are lead-based paint, lead-contaminated dust, and lead-contaminated residual soils. Refer to the EPA Web site www.epa.gov/ttnatw01/hlthef/lead.html for ways to limit your exposure to these lead sources.

Lead has not been monitored in Idaho since 2002. With the phase-out of lead in fuel and the closure of the Bunker Hill lead smelter in Kellogg, airborne lead is no longer a public health concern in Idaho. The graph on page 57 is included to show the historical monitoring of airborne lead in Kellogg.

For additional information on lead, visit www.epa.gov/air/urbanair/lead/index.html. Lead information is also available in a question/answer format in the definitions section of this document.


Lead (Pb)
Maximum Quarterly Average vs Standard
Maximum Quarterly Concentration
Micrograms per Cubic Meter (ug/m3)
1.8
1.6
1.4
1.2
1
0.8
0.6
0.4
0.2
0
Quarterly Federal Standard
Kellogg Medical Center
sampling stopped in 2002
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
Year

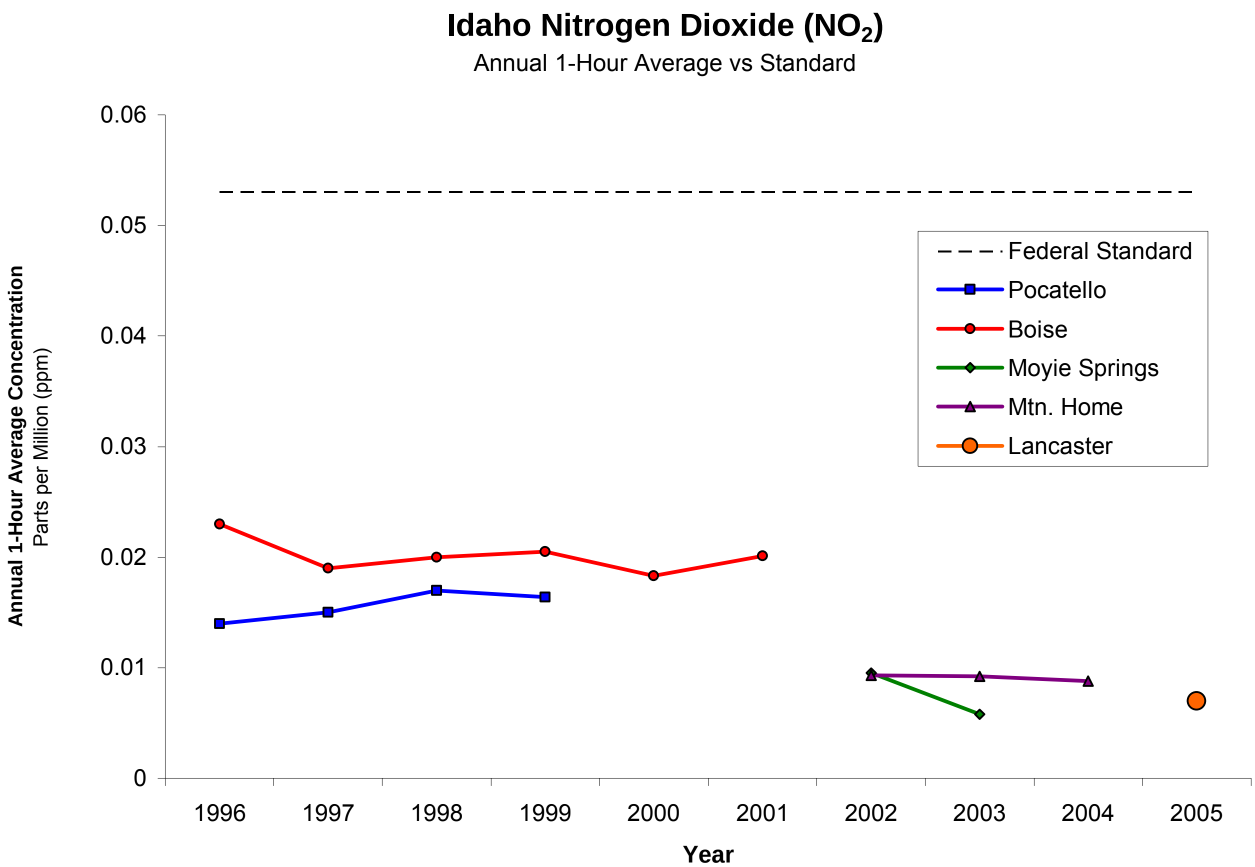
Nitrogen Dioxide

Nitrogen dioxide (NO_2) is a reddish brown, highly reactive gas that forms from the reaction of nitrogen oxide (NO) and oxygen in the atmosphere. The term “NO_X”, which is frequently used, refers to both NO and NO_2. NO_2 will react with VOCs and can result in the formation of ozone. On-road vehicles like trucks and automobiles are the major sources of NO_X. Industrial boilers and processes, home heaters, and gas stoves can also produce NO_X. NO_2 pollution is greatest in cold weather.

NO_2 can cause respiratory symptoms such as coughing, wheezing, and shortness of breath in people with respiratory diseases such as asthma. Long-term exposure can lead to respiratory infections.

Motor vehicle manufacturers have been required to reduce NO_X emissions from cars and trucks since the 1970s. NO_X is not considered a significant pollution problem in Idaho. In 2005, DEQ only maintained one monitoring site for nitrogen dioxide at the Lancaster site near Coeur d’Alene. The monitoring objective is primarily to assess ambient NO_X concentrations for evaluating ozone formation processes. The annual average for each year has consistently been less than half of the NAAQS standard, as shown in the graph on page 59 and in data in the Appendix. The maximum 1-hour average of NO_2 measured in 2005 was 0.044 ppm.

For additional information on NO_2, visit www.epa.gov/air/urbanair/nox/index.html.


Idaho Nitrogen Dioxide (NO_2)
Annual 1-Hour Average vs Standard
Annual 1-Hour Average Concentration
Parts per Million (ppm)
0.06
0.05
0.04
0.03
0.02
0.01
0
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
Year
Federal Standard
Pocatello
Boise
Moyie Springs
Mtn. Home
Lancaster

Visibility

There are no federal or state standards established for visibility. This parameter is presented (without comparison to a standard) as an easily-understood indicator of air quality. Visibility is often explained in terms of visual range and light extinction. *Visual range* is the maximum distance—usually miles or kilometers—that you can see a black object against the horizon. *Light extinction* is the sum of light scattering and light absorption by fine particles and gases in the atmosphere. The more light extinction you have, the shorter your visual range will be. Visual range as measured by nephelometer instruments utilizing light-scattering methodology provides an objective approach to measuring visibility at a specific location, but does not address individual perceptions regarding the "quality" of a view on a given day.

Reduced visibility (or visual range) is caused by weather (clouds, fog, and rain) and air pollution (fine particles and gases). The major pollution contributors are fine particulate matter ($PM_{2.5}$) emissions and photochemical smog, which are transported aloft and may remain suspended for a week or longer. Fine particles have a greater impact than coarse particles at locations far from the emitting source because they remain suspended in the atmosphere longer and travel farther. $PM_{2.5}$ also presents some of the most serious health hazards to the public, so you can roughly assume that the worse the visibility due to particulate matter, the unhealthier the air is to breathe.

For additional information on visibility, visit http://www.epa.gov/air/visibility/index.html. Visibility information is also available in a question/answer format in the definitions section of this document.

DEFINITIONS

Calculation and Breakpoints for the Air Quality Index (AQI)

Breakpoints for Criteria Pollutants							AQI Categories	
0_3 (ppm) 8-hour	0_3 (ppm) 1-hour[a]	$PM_{2.5}$ (µg/m^3)	PM_{10} (µg/m^3)	CO (ppm)	SO_2 (ppm)	NO_2 (ppm)	AQI value	Category
0.000–0.064	—	0.0–15.4	0–54	0.0–4.4	0.000–0.034	(b)	0–50	Good
0.065–0.084	—	15.5–40.4	55–154	4.5–9.4	0.035–0.144	(b)	51–100	Moderate
0.085–0.104	0.125–0.164	40.5–65.4	155–254	9.5–12.4	0.145–0.224	(b)	101–150	Unhealthy for sensitive groups
0.105–0.124	0.165–0.204	65.5–150.4	255–354	12.5–15.4	0.225–0.304	(b)	151–200	Unhealthy
0.125–0.374	0.205–0.404	150.5–250.4	355–424	15.5–30.4	0.305–0.604	0.65–1.24	201–300	Very unhealthy
(c)	0.405–0.504	250.5–350.4	425–504	30.5–40.4	0.605–0.804	1.25–1.64	301–400	Hazardous
(c)	0.505–0.604	350.4–500.4	505–604	40.5–50.4	0.805–1.004	1.65–2.04	401–500	

a Areas are generally required to report the AQI based on 8-hour ozone values. However, there are a small number of areas where an AQI based on 1-hour ozone values would be safer. In these cases, in addition to calculating the 8-hour ozone value, the 1-hour ozone value may be calculated, and the greater of the two values reported.

b NO_2 has no short-term National Ambient Air Quality Standard (NAAQS) and can generate an AQI only above a value of 200.

c 8-hour O_3 values do not define higher AQI values (above 300). AQI values above 300 are calculated with 1-hour 0_3 concentrations.

For more detailed information about the AQI and the pollutants it measures, go to www.epa.gov/airnow/aqibroch

General Definitions

Air Toxics

Air toxics are broadly defined as almost 700 pollutants that DEQ considers potentially harmful to human health and the environment. These pollutants are listed in the Idaho's air rules in IDAPA 58.01.01.585 and 586 (http://adm.idaho.gov/adminrules/rules/idapa58/0101.pdf). Hazardous air pollutants (see below) are included in this list to identify them as a subset of air toxics.

Criteria Air Pollutant (CAP)

The Clean Air Act of 1970 defined six *criteria pollutants* and established ambient concentrations to protect public health. EPA periodically has revised the original concentration limits and methods of measurement, most recently in 1997.

Hazardous Air Pollutant (HAP)

A *hazardous air pollutant* is an air contaminant identified as toxic in the Federal Clean Air Act, Section 112(b). 188 pollutants are currently listed as HAPs. They are listed by EPA at http://www.epa.gov/ttn/atw/188polls.html.

Temperature Inversions

The earth gains and loses most of its energy at its surface. It is warmed by solar heating during the day and cooled by radiation emissions at night. During the late morning and afternoon hours, the air near the surface is warmer than the air aloft and allows for good pollutant dispersion (vertical mixing may be 1,500 meters or more). At night with clear skies, the surface radiates heat into outer space, creating cooler air at the surface and warmer air aloft. Warmer air above cooler air (temperature inversion) is a stable condition and limits the upward movement of pollution because the warmer air acts as a barrier. With little or no wind, pollutants are trapped near the surface (vertical mixing may be 200 meters or less) and can reach high levels of concentration.

Volatile Organic Compound (VOC)

An organic compound that participates in atmospheric photochemical reactions. This excludes all compounds determined to have negligible photochemical reactivity by EPA and listed in 40 CFR 51.100(s) in effect July 1, 1998.

Visibility/Regional Haze

Visibility is often explained in terms of visual range and light extinction. *Visual range* is the maximum distance—usually miles or kilometers—that you can see a black object against the horizon. *Light extinction* is the sum of light scattering and light absorption by fine particles and gases in the atmosphere. The more light extinction you have, the shorter your visual range will be. Reduced visibility (or visual range) is caused by weather (clouds, fog, and rain) and air pollution (fine particles and gases). The major pollution contributor is fine particulate matter ($PM_{2.5}$) emissions, which are transported aloft and may remain suspended for a week or longer. Fine particles have a greater impact than coarse particles at locations far from the emitting source because they remain suspended in the atmosphere longer and travel farther. $PM_{2.5}$ also presents some of the most serious health hazards to the public, so you can roughly assume that the worse the visibility, the unhealthier the air is to breathe.

Criteria Air Pollutants

Ozone (O_3)

- **What is it?**
  Ozone, a bluish-colored gas molecule with a strong odor, is composed of three atoms of oxygen. In the upper atmosphere ozone occurs naturally and partially absorbs the sun's harmful ultraviolet rays. Ozone at ground level is a summertime air pollution problem.
- **How is it caused?**
  Ozone forms when photochemical pollutants from cars, trucks, and industrial sources react with sunlight. Ozone-forming pollutants include NO_X and VOCs. Even gasoline-powered yard equipment, paints, solvents, and off-road vehicle motors contribute.
- **When does it happen?**
  Ozone pollution is most common in the summer months, when sunlight and stable atmospheric conditions occur. Ozone levels are usually highest in the afternoon, as sunlight photochemically transforms NO_X and VOCs into ozone.
- **Who is affected?**
  Adults and children who are active outdoors, people with respiratory disease such as asthma, and people with unusual sensitivity to ozone. During physical activity, ozone penetrates deeper into the lungs and can do more damage.

  Ozone is a very reactive gas. For this reason, high concentrations of ozone can cause respiratory distress and disease in humans, decreased yields of agricultural crops and forests, and damage to some rubber products, plastics, and paints used outdoors. National crop losses from ozone exposure are estimated at $3 billion to $5 billion annually. Forest losses are harder to estimate.
- **What are the health effects?**
  Ozone can cause coughing and throat irritation, make deep vigorous breathing more difficult, and increase the chance of respiratory infections. It increases sensitivity to allergens and can trigger asthma attacks. The damage it causes to the lungs heals within a few days, but repeated or prolonged exposure may cause permanent damage.
- **What can I do about it?**
  If ozone levels are high and you have a respiratory condition or are normally active outdoors, try to limit your outdoor exertion.

  In the United States, management of ozone and other photochemical oxidants has been a major goal of federal and state clean air legislation (Clean Air Act). Although many of the pollution control efforts required by the CAA have been implemented, efforts to decrease ozone pollution have been only partially successful.

In the Treasure Valley airshed the ozone trend is flat and is marginally within the Federal standards.

- **Where is it measured?**
Unlike other pollutants monitored here in Idaho, ozone is formed when precursor compounds react in the atmosphere. Winds transport ozone and precursor emissions from one area to another. For the Treasure Valley, ozone precursors are emitted into the air in urban areas of the airshed and subsequently travel southeasterly to more rural areas as they react to form ozone. As a result, for the Treasure Valley airshed, DEQ has monitors in various locations. Another ozone monitor ran in the Coeur d'Alene area in 2005.

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

- **What is it?**
Particulate matter (PM) includes both solid matter and liquid droplets suspended in the air. Particles smaller than 2.5 micrometers in diameter are called "fine" particles, or $PM_{2.5}$. Particles between 2.5 and 10 micrometers in diameter are called "coarse" particles. PM_{10} includes both fine and coarse particles. DEQ considers $PM_{2.5}$ one of the major air pollution concerns affecting our state.

- **How is it caused?**
  - $PM_{2.5}$ comes from all types of combustion, including cars, diesel trucks, power plants, and wood burning, and from some industrial processes. It can also be formed in the atmosphere by chemical reactions of pollutant gases.
  - The "coarse" particles in PM_{10} typically come from crushing or grinding operations and dust from roads.

- **When does it happen?**
Daily peaks in $PM_{2.5}$ in urbanized areas suggest that $PM_{2.5}$ levels peak in association with traffic flow and rush hour.

- **Who is affected?**
People with asthma and heart or lung diseases, the elderly, and children. $PM_{2.5}$ also significantly affects visibility.

- **What are the health effects?**
Fine particulates ($PM_{2.5}$) pose a greater risk to human health than coarse particulates, because they penetrate deeper into the respiratory system.
  - $PM_{2.5}$ exposure can have serious health effects. People with heart or lung diseases are at increased risk of attacks or premature death. Children and the elderly are more likely to develop heart or lung problems.
  - PM_{10} can aggravate respiratory conditions such as asthma.

- **What can I do about it?**
  - If $PM_{2.5}$ levels are high, people with respiratory or heart disease, the elderly, and children should avoid outdoor exertion.
  - If PM_{10} levels are high, people with respiratory conditions should avoid outdoor exertion.

- **Where is it measured?**
  Due to the health risks associated with PM, both $PM_{2.5}$ and PM_{10} are monitored in various population-oriented locations throughout Idaho.

Carbon Monoxide (CO)

- **What is it?**
  CO is an odorless, colorless gas that can enter the bloodstream through the lungs and reduce the amount of oxygen that reaches organs and tissues.
- **How is it caused?**
  Carbon monoxide forms when the carbon in fuels doesn't burn completely. Vehicle exhaust contributes 60% of all CO, and in cities that can reach 95%.
- **When does it happen?**
  CO pollution is at its worst in cold weather because fuels burn less efficiently in low temperatures. It usually peaks during morning and evening rush hours.
- **Who is affected?**
  People with cardiovascular disease, such as angina, or cardiovascular or respiratory problems; also fetuses and young infants.
- **What are the health effects?**
  Chest pain and increased cardiovascular symptoms, particularly while exercising. High levels of CO can affect alertness and vision even in healthy individuals.
- **What can I do about it?**
  If CO levels are high, limit exertion and avoid sources of CO such as heavy traffic.
- **Where is it measured?**
  CO monitoring stations are located in urban canyon areas with heavy traffic congestion. These include central business areas, roadsides, and shopping malls.

Sulfur Dioxide (SO_2)

- **What is it?**
  Sulfur dioxide is a colorless, reactive gas.
- **How is it caused?**
  SO_2 is produced by burning sulfur-containing fuels such as coal and oil, and by industrial processes.
- **Where does it happen?**
  The highest concentrations of SO_2 are usually near large industrial sources.
- **Who is affected?**
  People with asthma who are active outdoors.
- **What are the health effects?**
  Bronchoconstriction, which can cause wheezing, shortness of breath, and tightening of the chest. When exposure to SO_2 ends, the symptoms should clear up within an hour.

- **What can I do about it?**
If SO_2 levels are high, limit your outdoor exertion.
- **Where is it measured?**
Because the large primary sources of SO_2 in Idaho are industrial, DEQ monitors for SO_2 near large facilities with high SO_2 emissions. The only monitors running in 2005 were in Pocatello and Soda Springs.

Lead (Pb)

- **What is it?**
Lead is a highly toxic metal that was used for many years in household products, automobile fuel, and industrial chemicals.
- **How is it caused?**
Locally, airborne lead is associated primarily with automobile exhaust and lead smelters. Since the phase-out of lead in fuels, however, cars and trucks are no longer a significant source of lead. Also, the Kellogg Bunker Hill Mine ceased operations in 1981.
- **When does it happen?**
Lead concentrations are likely to be highest near sources where current or former lead smelting/processing operations caused particle fallout, especially in nearby soils such as unpaved parking lots.
- **Who is affected?**
Everyone. Children 6 years and younger are most at risk.
- **What are the health effects?**
Lead can have health effects ranging from behavioral problems and learning disabilities to seizures and death.
- **What can I do about it?**
According to EPA, the primary sources of lead exposure are lead-based paint, lead-contaminated dust, and lead-contaminated residual soils. Refer to EPA's Web site at http://www.epa.gov/ttn/atw/hlthef/lead.html for ways to limit your exposure to these lead sources.
- **Where is it measured?**
Due to the phase-out of leaded fuels and the closure of Idaho's only lead smelter in 1981, DEQ no longer monitors for airborne lead. Historical monitoring was continued until 2002 but was discontinued due to the low levels being measured.

Nitrogen Dioxide (NO_2)

- **What is it?**
Nitrogen dioxide (NO_2) is a reddish brown, highly reactive gas that forms from the reaction of nitrogen oxide (NO) and oxygen in the atmosphere. NO_2 will react with VOCs and can result in the formation of ozone.

- **How is it caused?**
  High temperature combustion sources such as power plants and automobiles are major producers of NO. Home heaters and gas stoves can also produce NO.
- **When does it happen?**
  NO_2 pollution is greatest in cold weather. It follows a similar trend to CO.
- **Who is affected?**
  People with respiratory diseases such as asthma; also children.
- **What are the health effects?**
  NO_2 can cause respiratory symptoms such as coughing, wheezing, and shortness of breath. Long-term exposure can lead to respiratory infections.
- **What can I do about it?**
  Since the 1970s, motor vehicle manufacturers have been required to reduce NO emissions from cars and trucks. It is not a significant pollution problem in Idaho.
- **Where is it measured?**
  Because NO_2 is not a major concern in Idaho, it was measured during 2005 at the Lancaster site near Coeur d'Alene.

Pollution Sources

Area Sources

Countywide categories of pollution sources, in which each individual source emits pollutants below the thresholds for a point source facility designation.

Biogenics

Natural sources such as trees, plants, grass, crops, and soils. The worldwide emissions rate of these natural hydrocarbons has been estimated to exceed that of non-methane hydrocarbons originating from human sources. Isoprene, one of the major constituents of biogenic emissions, is very photoreactive, and would seem to make biogenic VOC a contributor in the formation of ozone. The study of hydrocarbon emissions from plants is therefore of key importance to our understanding of the global effects of naturally produced hydrocarbons.

Emission Factor

A value derived from source tests, material balance calculations, or engineering comparisons with similar processes. Used to estimate emissions from process quantities.

Non-road Mobile Sources

Farm vehicles, on-site construction/industrial vehicles, logging equipment, small marine craft, aircraft, trains, lawn and garden equipment.

On-road Mobile Sources

Cars, trucks, sport utility vehicles, and buses.

Point Sources

For the every third year statewide emissions inventory, point sources are defined as facilities that have annual air contaminant emissions equal to or exceeding 1000 tons per year of CO; 100 tons per year of NO_X, PM_{10}, $PM_{2.5}$, SO_x, or VOCs.

Registered Facility

The total of all pollutant-emitting activities located on adjacent or contiguous properties owned or operated by one person or corporate entity. It includes all of the pollutant-emitting buildings, processes, structures, equipment, control apparatuses, and storage areas at a facility.

Stationary Area Sources

Also called area sources. Pollution sources where each individual source emits pollutants below the thresholds for a point source facility. Sources include wood stoves/fireplaces, outdoor burning, architectural surface coating, automobile painting, commercial/consumer solvents, dry cleaning, printing, stationary diesel engines, small utility engines, small industrial facilities, and construction activities.

1410 N. Hilton
Boise, ID 83706
DEPARTMENT OF ENVIRONMENTAL QUALITY **www.deq.idaho.gov**

2005 Air Quality Monitoring Data Summary Appendix

US EPA - AirData Air Quality Index Report
Friday, 21-Oct-2005 at 10:42:3 AM (USA Eastern time zone)
Geographic Area: Idaho
Year: 2005

Data Year	# AQI data days	Number of Days AQI was:				Max AQI	90th % AQI	Median AQI	Number of Days Main AQI Pollutant was:						County
		Good	Mod	Unhealthy Sensitive Groups	Un-healthy				CO	NO2	O3	SO2	PM2.5	PM10	
2005	365	307	57	1		103	56	34	17		147		136	65	Ada
2005	365	331	32	1	1	152	49	16				64	184	117	Bannock
2005	362	341	19	2		111	40	22					362		Benewah
2005	26	24	2			62	48	19						26	Bingham
2005	361	301	60			97	57	25					361		Boise
2005	364	328	36			72	49	22					304	60	Bonner
2005	349	347	2			70	22	16					349		Bonneville
2005	53	49	4			72	36	16					53		Boundary
2005	357	357				41	34	26			357				Butte
2005	365	302	56	7		138	59	35	19		109		203	34	Canyon
2005	362	359	3			56	21	3				362			Caribou
2005	154	152	2			51	47	40			154				Elmore
2005	314	261	36	13	4	162	68	18					314		Franklin
2005	283	242	38	3		122	54	26					283		Gem
2005	363	335	27		1	161	43	18					363		Idaho
2005	365	295	70			85	58	35			122		236	7	Kootenai
2005	353	352	1			63	24	12					353		Latah
2005	325	257	65	3		132	59	25					325		Lemhi
2005	365	362	3			72	29	15					365		Nez Perce
2005	363	317	42	2	2	161	52	30					304	59	Power
2005	356	245	103	7	1	171	75	29					313	43	Shoshone
2005	326	307	18	1		101	40	21					326		Twin Falls
2005	328	296	30	2		116	50	23					328		Valley

*** US EPA - AirData Monitor Values Report - Criteria Air Pollutants**
*** Wednesday, 30-Aug-2006 at 1:45:43 PM (USA Eastern time zone)**
*** Geographic Area: Idaho**
*** Pollutant: Particulate (size < 2.5 micrometers)**
*** Year: 2005**

	24-Hour PM2.5													
Data Year	# Obs	1st Max	2nd Max	3rd Max	4th Max	98th Pct	# Ex-ceed	Annual Mean	Annual # Exceed	Monitor Number	Site ID	Site Address	City	County
2005	56	30	26	25	24	26	0	8.6	0	1	160010011	Mtn View School/3500 Carbarton Lane	Boise (Corpo	Ada
2005	52	39	34	29	24	34	0	9.5	0	2	160050015	G&G/Corner Of Garret & Gould	Pocatello	Bannock
2005	60	35	30	25	25	30	0	8.2	0	1	160050015	G&G/Corner Of Garret & Gould	Pocatello	Bannock
2005	51	24	23	19	18	23	0	7.2	0	1	160050018	Highway 30 - Inkom, Idaho		Bannock
2005	118	46	41	34	32	34	0	9.5	0	1	160090010	9th And Center		Benewah
2005	66	21	19	17	14	19	0	6.6	0	1	160090011	850 A Street, Plummer		Benewah
2005	53	26	20	18	17	20	0	6.2	0	1	160210002	County Road 38a	Bonners Ferr	Boundary
2005	55	51	34	25	25	34	0	9.9	0	2	160270004	Northwest Nazarine College (Nnc)	Nampa	Canyon
2005	118	52	47	36	33	36	0	9.2	0	1	160270004	Northwest Nazarine College (Nnc)	Nampa	Canyon
2005	54	56	44	24	23	44	0	9.3	0	1	160270008	Off Of Sinclair Avenue - At The Wastewat	Parma	Canyon
2005	306	84	83	76	63	56	0	10	0	1	160410001	Franklin - Water Treatment Facility At E	Franklin	Franklin
2005	57	75	46	44	29	46	0	10.2	0	1	160410002	Preston Jr. High - 450 E. Valley View Dr	Preston	Franklin
2005	60	49	33	28	25	33	0	9.5	0	1	160450001	2195 Schiller Road - Emmett, Idaho	Emmett	Gem
2005	44	28	23	21	21	28	0	9.6	0	2	160490003	Intersection Of Apple And Pine, Kamiah		Idaho
2005	51	24	22	21	18	22	0	9	0	1	160490003	Intersection Of Apple And Pine, Kamiah		Idaho
2005	25	41	28	25	23	41	0	9	0	2	160770011	S Of Hwy 30 And E Of Weaver Rd		Power
2005	24	41	26	25	23	41	0	9.2	0	1	160770011	S Of Hwy 30 And E Of Weaver Rd		Power
2005	120	57	47	46	38	46	0	12.7	0	1	160790017	Pinehurst/Pinehurst School, Pinehurst		Shoshone

*** US EPA - AirData Monitor Values Report - Criteria Air Pollutants**
*** Wednesday, 30-Aug-2006 at 3:39:5 PM (USA Eastern time zone)**
*** Geographic Area: Idaho**
*** Pollutant: Particulate (size < 10 micrometers)**
*** Year: 2005**

	24-Hour PM10												
Data Year	# Obs	1st Max	2nd Max	3rd Max (24-Hr PM10)	4th Max (24-Hr PM10)	# Exceed-Actual (24-Hr PM10)	Annual Mean (PM10)	Annual # Exceed (PM10)	Mon #	Site ID	Site Address	City	County
2005	357	89	88	63	55	0	22	0	3	160010009	Fire Station #5/16th & Front	Boise	Ada
2005	56	71	45	41	34	0	22	0	1	160010011	Mtn View School/3500 Carbarton Lane	Boise	Ada
2005	113	68	58	55	50	0	21	0	1	160050015	G&G/Corner Of Garret & Gould	Pocatello	Bannock
2005	319	113	58	53	51	0	14	0	2	160050015	G&G/Corner Of Garret & Gould	Pocatello	Bannock
2005	26	78	57	52	49	0	25	0	1	160110002	Ross Fork Rd And Interstate 15		Bingham
2005	339	78	71	70	67	0	19	0	1	160170004	310 South Division Street	Sandpoint	Bonner
2005	352	172	94	82	72	1	25	0	2	160270002	Nampa Fire Stn/923 1st St	Nampa	Canyon
2005	358	77	69	55	54	0	18	0	3	160550006	Lakes Middle School/930 N 15th St	Coeur D'Alene	Kootenai
2005	114	66	58	51	47	0	19	0	1	160770011	S Of Hwy 30 And E Of Weaver Rd		Power
2005	57	52	47	47	40	0	21	0	2	160770011	S Of Hwy 30 And E Of Weaver Rd		Power
2005	329	182	134	117	104	1	27	0	3	160770011	S Of Hwy 30 And E Of Weaver Rd		Power
2005	318	94	85	75	65	0	22	0	3	160790017	Pinehurst/Pinehurst School, Pinehurst		Shoshone

*** US EPA - AirData Monitor Values Report - Criteria Air Pollutants**
*** Thursday, 31-Aug-2006 at 10:44:42 AM (USA Eastern time zone)**
*** Geographic Area: Idaho**
*** Pollutant: Ozone**
*** Year: 2005**

Data Year	8-Hour Ozone 1st Max	2nd Max	3rd Max	4th Max	Days >Std	Required Days	# Days	% Days	Monitor Number	Site ID	Site Address	City	County
2005	0.084	0.08	0.078	0.075	0	153	152	99	1	160010030	Whitney Elementary School	Boise (	Ada
2005	0.052	0.049	0.048	0.048	0	153	152	99	1	160230101	Craters Of The Moon National Mon, Idaho		Butte
2005	0.082	0.071	0.068	0.066	0	153	152	99	1	160270007	5 South 3rd Avenue West		Canyon
2005	0.065	0.065	0.064	0.064	0	153	152	99	1	160390010	251 W. Tilli Road		Elmore
2005	0.072	0.069	0.066	0.066	0	153	150	98	1	160550003	North Of Lancaster Road - Near Hayden, I		Kootenai

*** US EPA - AirData Monitor Values Report - Criteria Air Pollutants**
*** Thursday, 31-Aug-2006 at 10:29:49 AM (USA Eastern time zone)**
*** Geographic Area: Idaho**
*** Pollutant: Carbon Monoxide**
*** Year: 2005**

Data Year	1-Hour CO # Obs	1-Hour CO 1st Max	1-Hour CO 2nd Max	1-Hour CO # Exceed	8-Hour CO 1st Max	8-Hour CO 2nd Max	8-Hour CO # Exceed	Monitor #	Site ID	Site Address	City	County
2005	8635	5.3	4.6	0	2.5	2.2	0	1	160010014	Eastman Bldg/166 N. 9th St	Boise	Ada
2005	8731	5.7	5.1	0	2.9	2.9	0	1	160270006	101 1st. Street	Nampa	Canyon

*** US EPA - AirData Monitor Values Report - Criteria Air Pollutants**
*** Thursday, 31-Aug-2006 at 10:39:57 AM (USA Eastern time zone)**
*** Geographic Area: Idaho**
*** Pollutant: Nitrogen Dioxide**
*** Year: 2005**

Data Year	1-Hour NO2 # Obs	1-Hour NO2 1st Max	1-Hour NO2 2nd Max	Annual NO2 Mean	Annual NO2 # Exceed	Monitor #	Site ID	Site Address	City	County
2005	8240	0.044	0.043	0.007	0	1	160550003	North Of Lancaster Road - Near Hayden, I		Kootenai
2005	1176	0.071	0.052	0.007	0	1	160770011	S Of Hwy 30 And E Of Weaver Rd		Power

* US EPA - AirData Monitor Values Report - Criteria Air Pollutants
* Thursday, 31-Aug-2006 at 10:51:45 AM (USA Eastern time zone)
* Geographic Area: Idaho
* Pollutant: Sulfur Dioxide
* Year: 2005

Data Year	1-Hr SO2 # Obs	1st Max (1-hour	2nd Max (1-hour	Annual SO2 Mean	# Exceed	Monitor Number	Site ID	Site Address	City	County
2005	8712	0.101	0.075	0.004	0	2	160050004	Stp/Batiste & Chubbuck Rd	Pocatello	Bannock
2005	8662	0.13	0.117	0.005	0	1	160290031	5 Mile Road	Soda Springs	Caribou
2005	2125	0.022	0.016	0.001	0	1	160770011	S Of Hwy 30 And E Of Weaver Rd		Power

US EPA - AirData Monitor Values Report - Criteria Air Pollutants
Friday, 21-Oct-2005 at 11:25:31 AM (USA Eastern time zone)
Geographic Area: Idaho
Pollutant: Lead
Year: 1999 - 2002

Data Year	24-Hour Lead # Obs	1st Max	2nd Max	Qtr 1	Qtr 2	Qtr 3	Qtr 4	# Exceed	Monitor Number	Site ID	Site Address	City	County
1999	59	0.14	0.13	0.04	0.03	0.05	0.04	0	1	160790006	Medical Clinic/204 Oregon	Kellogg	Shoshone
2000	61	0.49	0.10	0.04	0.04	0.08	0.04	0	1	160790006	Medical Clinic/204 Oregon	Kellogg	Shoshone
2001	58	0.06	0.04	0.03	0.03	0.03	0.03	0	1	160790006	Medical Clinic/204 Oregon	Kellogg	Shoshone
2002	30	0.05	0.04	0.03	0.03			0	1	160790006	Medical Clinic/204 Oregon	Kellogg	Shoshone