

Data Summary *1997*



Puget Sound Air Pollution Control Agency

# Thank you

for your interest in air quality.  
At your request, we've enclosed  
the following information:

- Executive Overview
- Particulate Matter (PM<sub>10</sub>)
- Particulate Matter (PM<sub>2.5</sub>)
- Ozone (O<sub>3</sub>)
- Carbon Monoxide (CO)
- Lead (pb) and Sulfur Dioxide (SO<sub>2</sub>)
- Visibility
- Pollutant Standards Index (PSI)
- Monitoring Network
- Impaired Air Quality Periods
- Data Summary Evaluation





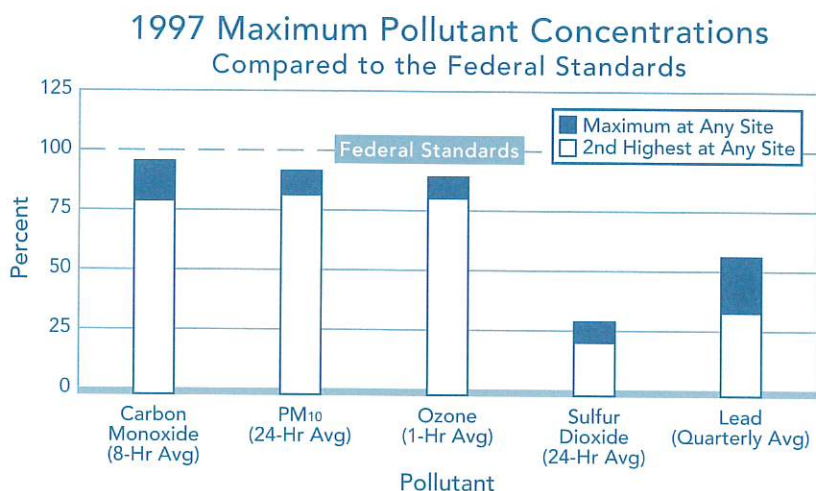
## Executive Overview

There's lots of good news for everyone who breathes in the Puget Sound region. For the seventh consecutive year, we measured no violations of the national ambient air quality standards – our standards for clean air. There were no days of unhealthy air quality measured on the Pollutant Standard Index, and the number of good air quality days continues to dominate regionally.

The only exceptions to this clear picture were several air stagnations in 1997 that briefly elevated pollution levels, prompting agency action to reduce particulate matter pollution.

We issued Air Pollution Watches for January 13-16 and February 6-11. The watches called for voluntary curtailment of wood burning. We issued stage 1 burn bans for November 13-15 and December 4-7. The burn bans prohibited burning in fireplaces and older, uncertified wood stoves. These bans were issued when real-time monitoring data showed "impaired air quality" as defined by state law.

The chart below compares 1997 maximum pollution levels to the federal standards.



### Air Quality Summary for 1997

**Carbon Monoxide (CO).** Levels of carbon monoxide at most monitoring sites stayed well below the federal standards in 1997. The highest 8-hour average level of carbon monoxide

at 8.6 ppm, just under the standard of 9 ppm, was monitored in downtown Bellevue during a mid-January air stagnation (January 13-16).

In 1997, the Northwest Regional Office of the Department of Ecology (NWRO) conducted a carbon monoxide monitoring study in Everett. The study showed that the current monitoring network still provides us with a representative picture of carbon monoxide pollution in the Everett area.

**Particulate Matter (PM<sub>10</sub> and PM<sub>2.5</sub>).** For the seventh consecutive year, we measured no exceedances of the PM<sub>10</sub> standards. Annual average concentrations at residential sites were less than a fifth of the federal standard. At industrial sites, these averages were only slightly higher.

The highest 24-hour PM<sub>10</sub> value recorded was 137 µg/m<sup>3</sup> – still below the 150 µg/m<sup>3</sup> average standard. This sample was collected in the Duwamish industrial valley on the last day of the mid-January air stagnation. On the same day, the second highest PM<sub>10</sub> value of 122 µg/m<sup>3</sup> was collected in the Duwamish valley at the Harbor Island site.

We undertook an important air monitoring project in 1997 – an innovative particulate matter survey in communities near the Duwamish industrial area using nephelometer technology. The purpose was to evaluate potential locations for a new permanent PM<sub>2.5</sub> monitor. Preliminary results indicate that fine particulate concentrations are relatively homogenous, and we found no "hot spots" in the area. We selected the South Park neighborhood for the new monitoring site.

EPA established a new fine particulate matter (PM<sub>2.5</sub>) standard and revised the PM<sub>10</sub> standards in September 1997 (see the table below).



## Executive Overview [cont.]

**Ozone (O<sub>3</sub>).** The flat regional trend for ozone continued. The ozone monitoring sites recorded no exceedances of the federal standard in 1997. EPA also established a new 8-hour average standard for ozone in September 1997 (see the table below). The Puget Sound region remained in attainment of both the old and new federal standards.

**Sulfur Dioxide (SO<sub>2</sub>).** Sulfur dioxide levels were once again well below the state and federal standards at all monitoring sites.

**Lead (Pb).** Concentrations of lead remained well below the federal standard.

**Visibility/Regional Haze.** Data indicate that visibility seems to be improving, though our region continues to experience degraded visual air quality during inversion weather patterns. Increased particulate matter pollution levels are also observed during these same patterns.

To more clearly demonstrate visibility as an indicator of air quality, this year's summary presents data in visual range instead of light scattering values. This data shows the same improving trend for visual air quality as for particulate matter pollution.

**Plans for Air Monitoring in 1998-99.** New PM<sub>2.5</sub> federal reference monitors are planned for installation at the following air monitoring sites:

- Marysville
- Lake Forest Park
- Seattle Duwamish Valley (East Marginal Way)
- South Park (new site)
- Beacon Hill (operated by NWRO of Dept. of Ecology)
- North Bend (NWRO)
- Redmond (NWRO)
- Kent
- Tacoma Tidelands (Alexander Avenue)
- Puyallup

In addition, we will conduct nephelometer surveys during winter 1998-99 in the Federal Way, North Seattle and South Tacoma communities. This new data will help us determine if we need additional PM<sub>2.5</sub> monitoring sites to characterize air pollution in those neighborhoods.

We encourage you to visit our web site at <[www.psapca.org](http://www.psapca.org)> to find more extensive air quality data, air quality education and current topics of

interest. We are expanding our Internet site with monthly air quality data summaries. We also now provide a link to real-time air monitoring data from the Washington State and Local Air Monitoring (SLAM) network.

We want to receive your feedback on our air quality data. Please submit comments via e-mail to:

[techserv@psapca.org](mailto:techserv@psapca.org)

or call us at 206-689-4006.

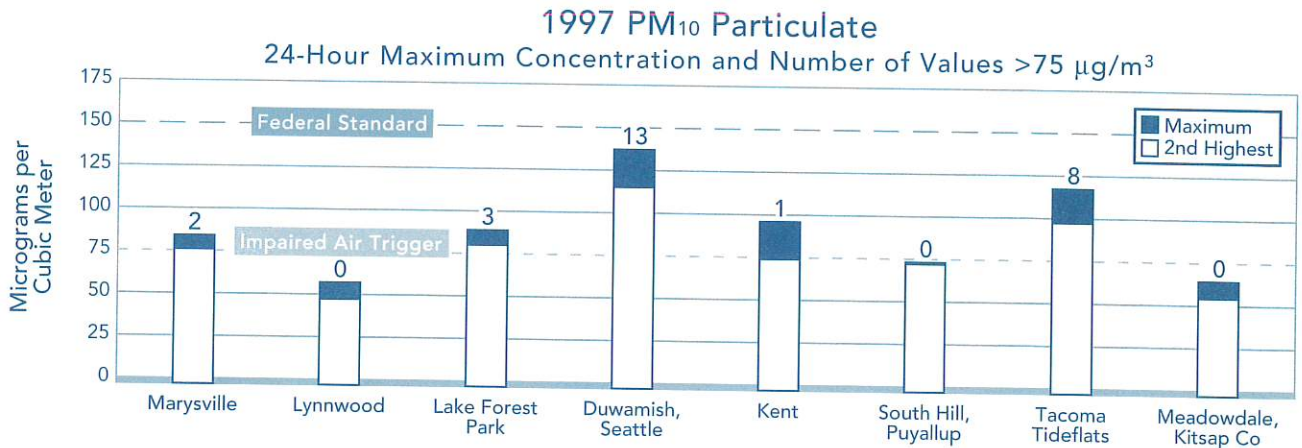
PARTICULATE MATTER & OZONE STANDARD CHANGES	Pollutant	Previous Federal Standard	New Federal Standard
	<b>Particulate</b>		
	PM <sub>10</sub>		
	24-hour standard	150µg/m <sup>3</sup>	150µg/m <sup>3</sup> , using 3-year average of 99th percentile
	Annual standard	50µg/m <sup>3</sup>	50µg/m <sup>3</sup>
	PM <sub>2.5</sub>		
	24-hour standard	No standard	65µg/m <sup>3</sup> , using 3-year average of 98th percentile
	Annual standard	No standard	15µg/m <sup>3</sup> , using 3-year average of 98th percentile from single or multiple monitoring sites
	<b>Ozone (O<sub>3</sub>)</b>		
	1-hour standard	0.12ppm	No standard
8-hour standard	No standard	0.08ppm, using 3-year average of fourth-highest daily 8-hour average	



## Particulate Matter (PM<sub>10</sub>)

Particulate matter (PM<sub>10</sub>) originates from a wide variety of sources, including car and truck exhaust, tire wear, indoor and outdoor burning, dusty industrial processes, and wind-blown soil. Our agency currently operates 14 monitoring sites within our jurisdiction: three industrial sites and 11 residential or commercial sites.

**Trends.** PM<sub>10</sub> levels show improving air quality over the past decade as measured by annual averages, maximum daily values and a fewer number of days above the Washington state impaired air trigger level. Even with variations due to seasonal weather, the general trend shows declining levels of PM<sub>10</sub>. There have been no exceedances of PM<sub>10</sub> standards at any site since 1990.



1997

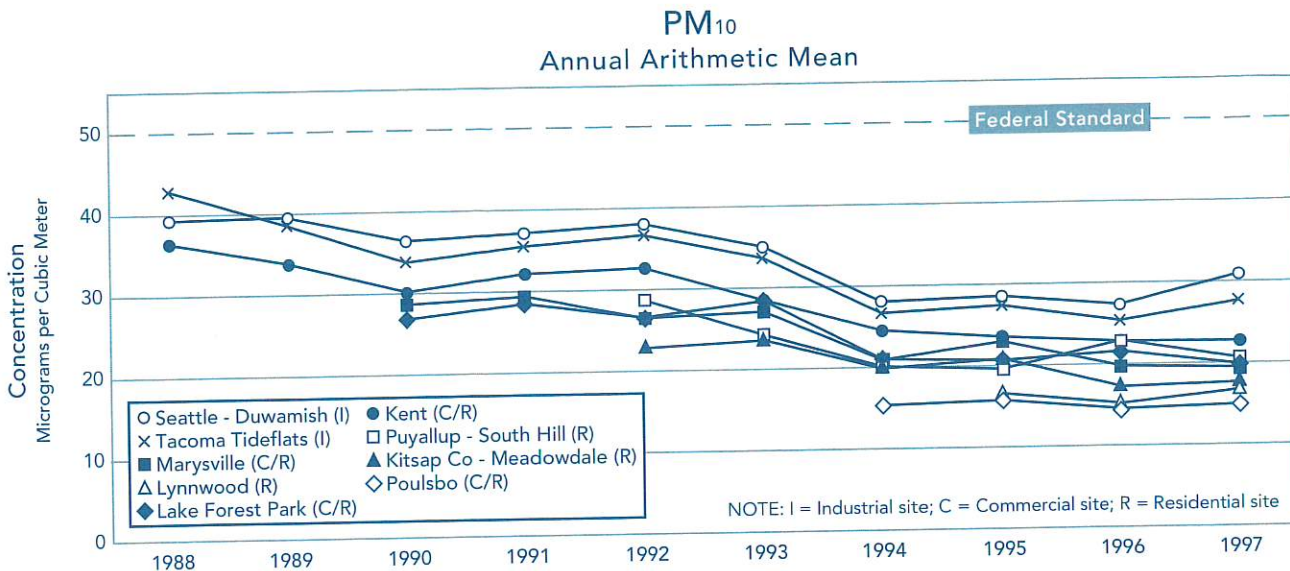
The federal PM<sub>10</sub> standard encompasses particles 10 micrometers or smaller. Since 1987, the 24-hour PM<sub>10</sub> standard has been 150 µg/m<sup>3</sup> and the annual standard has been 50 µg/m<sup>3</sup>. In 1997, the U.S. EPA changed the method of calculating compliance with the 24-hour standard. To meet the standard, the 99th percentile of the distribution of the 24-hour monitoring results over three years must not exceed 150 µg/m<sup>3</sup> at each monitoring site.

**In 1997.** No monitored values at any of the sites exceeded the federal 24-hour or annual standards. The highest PM<sub>10</sub> daily value of 137 µg/m<sup>3</sup> was measured on Thursday, January 16 at the Duwamish industrial site in Seattle. This was the highest value of all monitoring sites measured since January 1991. The second highest value of 122 µg/m<sup>3</sup> was measured at the Harbor Island industrial site on the same day.

Some areas of the Puget Sound region are still formally designated as non-attainment with the PM<sub>10</sub> standards, though we clearly have met all of the standards since 1990. In 1997, we submitted a plan for maintaining our successes to the Washington state Department of Ecology, in the aim of gaining attainment status. We use this maintenance plan locally to assure our compliance with the standards.

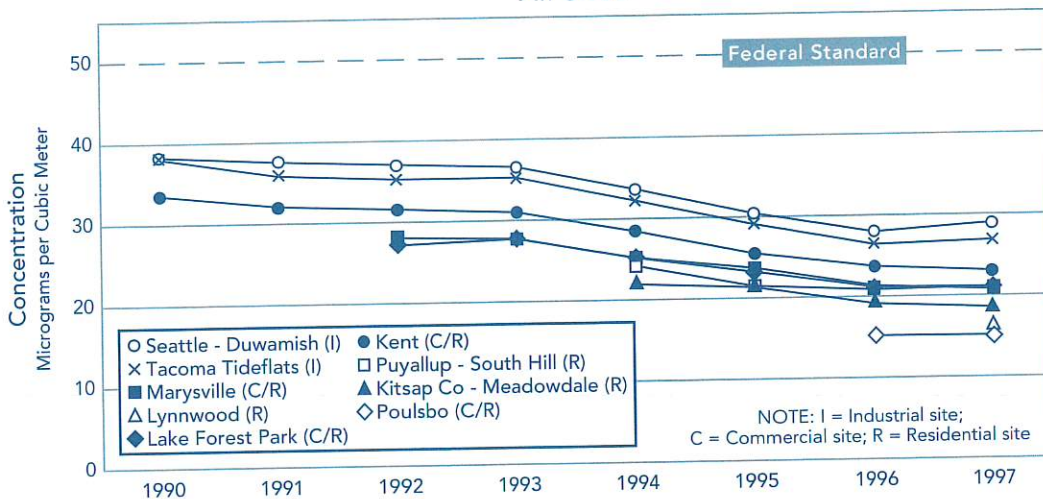
The U.S. EPA revised the PM<sub>10</sub> standards in 1997 and therefore intend to remove the region's non-attainment status for the old standard. Ecology has since recommended to EPA that our region be designated in attainment for the new PM<sub>10</sub> standards. We anticipate gaining formal attainment status at some time in the future.

Particulate Matter (PM<sub>10</sub>) [cont.]

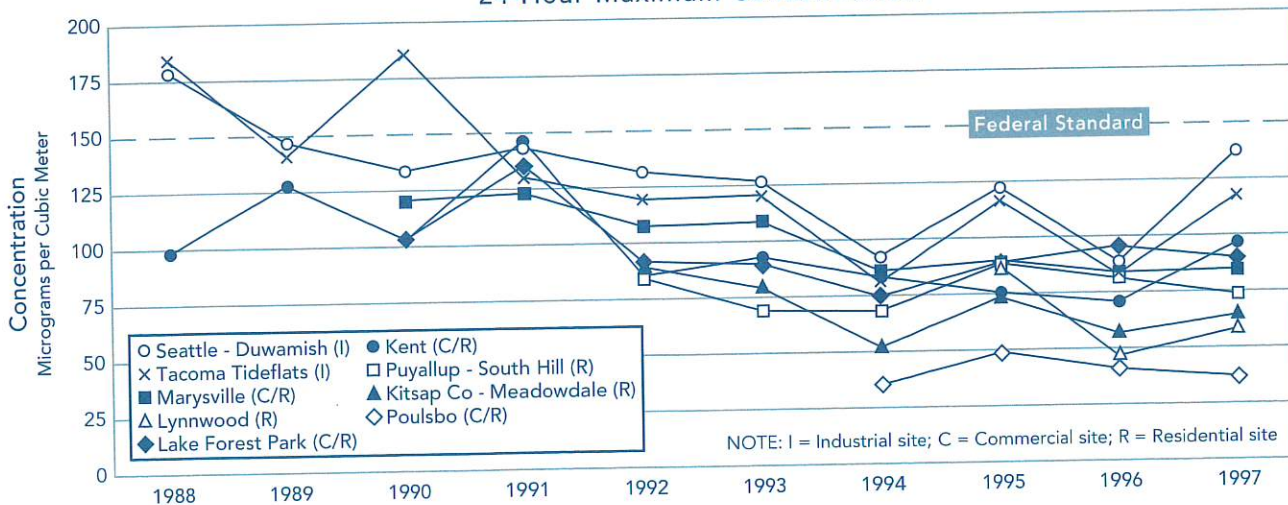


1997

### PM<sub>10</sub> 3-Year Average of Annual Arithmetic Mean All Sites



### PM<sub>10</sub> 24-Hour Maximum Concentration





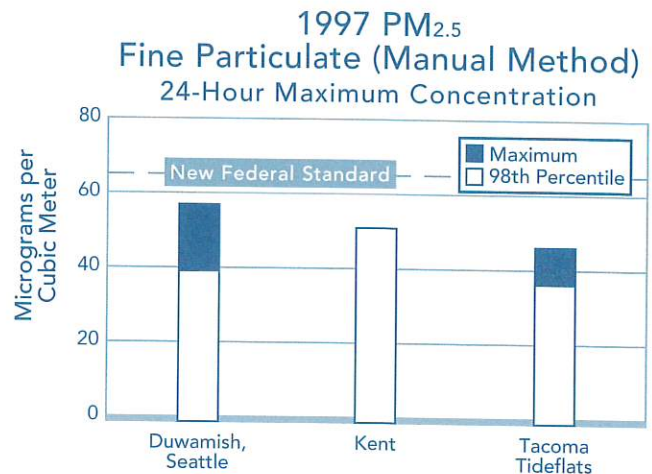
## Particulate Matter (PM<sub>2.5</sub>)

Fine particulate matter (PM<sub>2.5</sub>) originates primarily from combustion sources. These include car and truck exhaust (especially from diesel fuels), outdoor burning, fireplaces and wood stoves, and commercial/industrial processes. Fine particulate matter also forms in the atmosphere from the chemical reactions of pollutant gases. Fine particles are believed to have greater impact on human health because of their ability to penetrate deeper into the respiratory system. Our agency views fine particulate matter as the main regional air pollution issue impacting our communities. Fine particulate also is an important factor for regional visibility.

The U.S. EPA adopted a new standard for fine particulate in September 1997. There is a 65 µg/m<sup>3</sup> 24-hour standard and a 15 µg/m<sup>3</sup> annual standard.

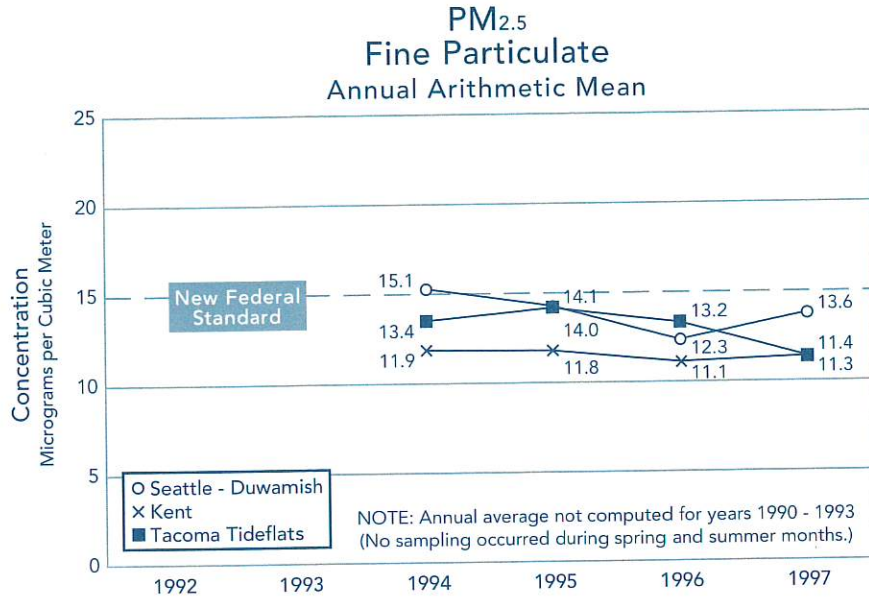
Since the late 80s, our agency has conducted PM<sub>2.5</sub> monitoring at three sites. This monitoring has provided us with a significant PM<sub>2.5</sub> data set. In addition, we are aggressively expanding our PM<sub>2.5</sub> monitoring network to measure our compliance with the new PM<sub>2.5</sub> standards.

In 1997, no monitored values exceeded the new federal standards for fine particulate. The highest 24-hour levels were measured at the Seattle Duwamish industrial site, still well below the standards. The higher 98th percentile values for Kent result from a smaller data set and the prescribed calculation techniques.

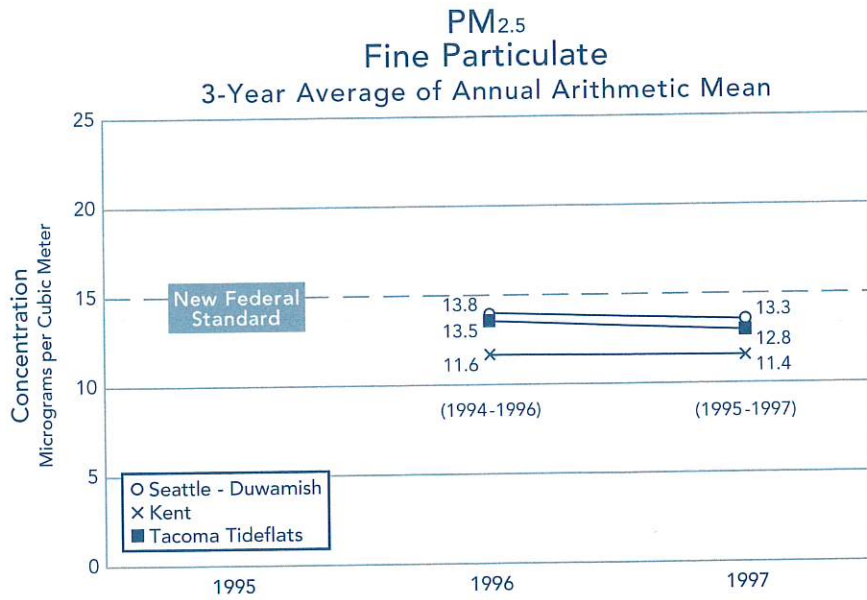


**Trends.** Fine particulate data show an improving air quality trend comparable to PM<sub>10</sub>. The bar charts at the end of this section explain how the new PM<sub>2.5</sub> standard may have importance for the characterization of our daily air quality on the Pollutant Standard Index. This federal air quality index – as well as proposed changes to the index – also are explained.

Particulate Matter (PM<sub>2.5</sub>) [cont.]

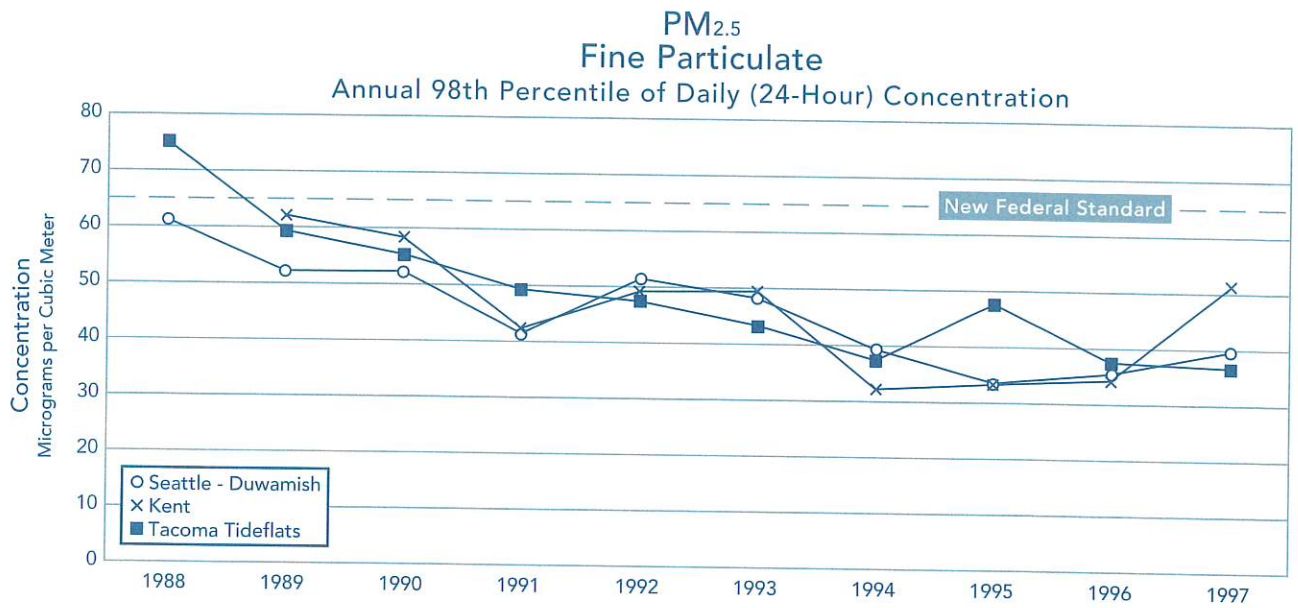


1997

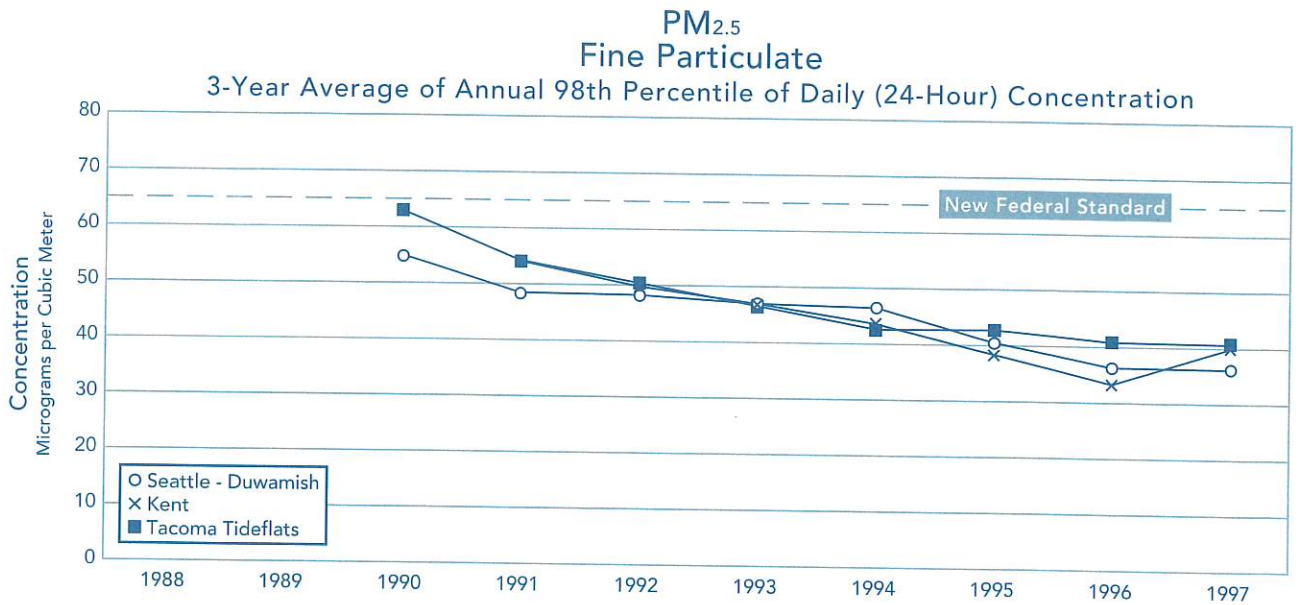




Particulate Matter (PM<sub>2.5</sub>) [cont.]

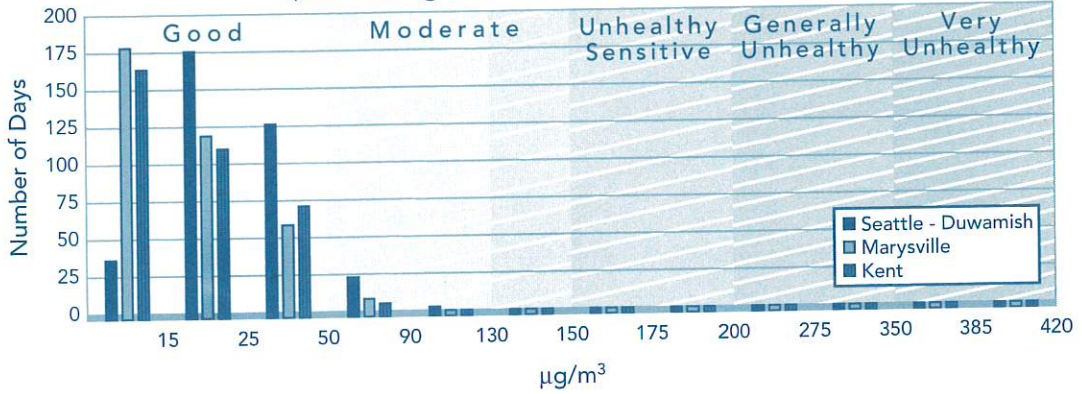


1997



Particulate Matter (PM<sub>2.5</sub>) [cont.]

PM<sub>10</sub> Daily 24-Hour Concentration (Continuous Method)  
1997 Frequency Distribution Related to Proposed PSI Category  
(at Existing Continuous Method PM<sub>2.5</sub> Sites)

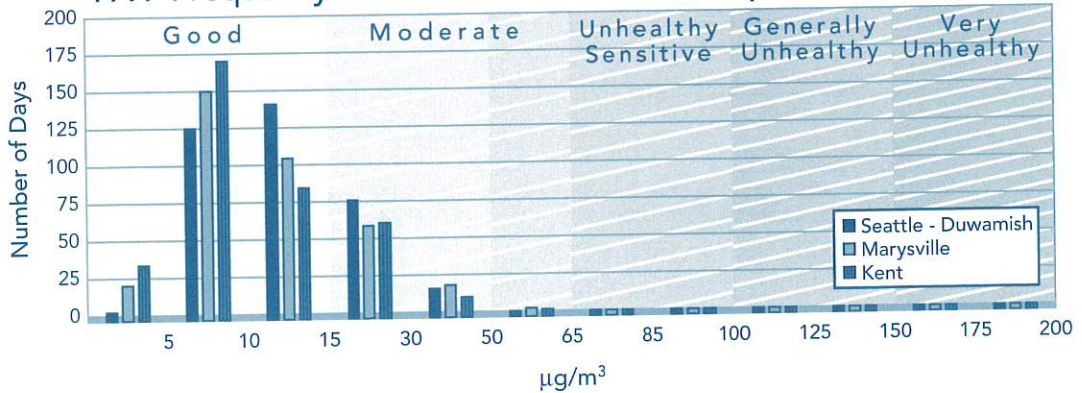


The effect of the new fine particulate standard is demonstrated by comparing the number of days that were in the “moderate” category in 1997 using PM<sub>10</sub> and PM<sub>2.5</sub> data. The increased number of “moderate” days due to this new standard supports the understanding that it is a more stringent standard.

1997

Station	Number of “Moderate” Days	
	PM <sub>10</sub>	PM <sub>2.5</sub>
Seattle - Duwamish	25	92
Marysville	8	79
Kent	5	72

PM<sub>2.5</sub> Daily 24-Hour Concentration (Continuous Method)  
1997 Frequency Distribution Related to Proposed PSI Category





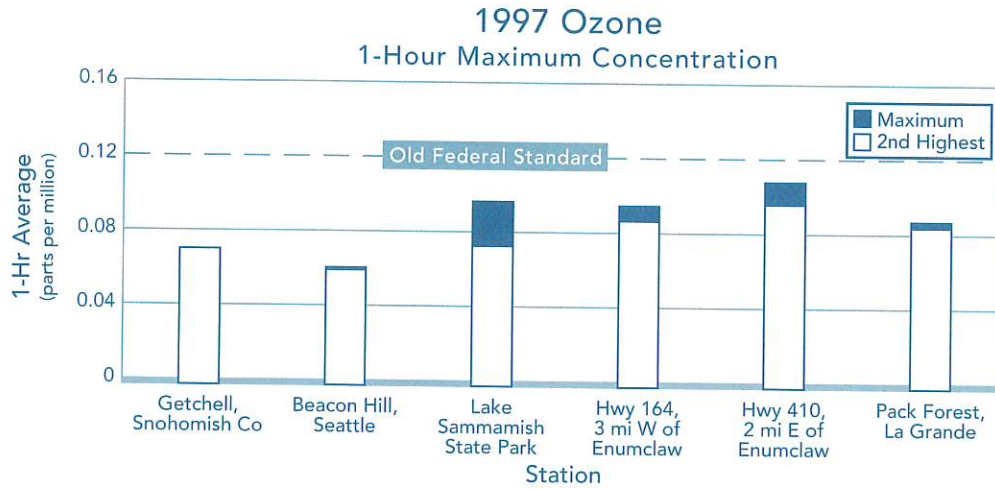
## Ozone (O<sub>3</sub>)

Ozone is the only criteria pollutant not emitted directly by pollution sources. It is a product of photochemical reactions in the atmosphere on hot, sunny days. Most of the pollutants that contribute to ozone come from cars and trucks. Even sources like gasoline-powered yard equipment and boat motors contribute.

In 1997, Ozone (or smog) is a summertime pollution problem. Fortunately for the Puget Sound area, onshore flows usually keep temperatures moderate, even in the height of summer. The summer of 1997 was mild with few temperatures reaching above the upper 80s. The highest 1-hour value of 0.107 ppm was measured the afternoon of

Sunday, July 20 at the site two miles east of Enumclaw. The second highest value of 0.096 ppm was measured the afternoon of Friday, July 4 at the Lake Sammamish site.

**Trends.** The regional ozone trend is flat and is marginally within



the new federal standard.

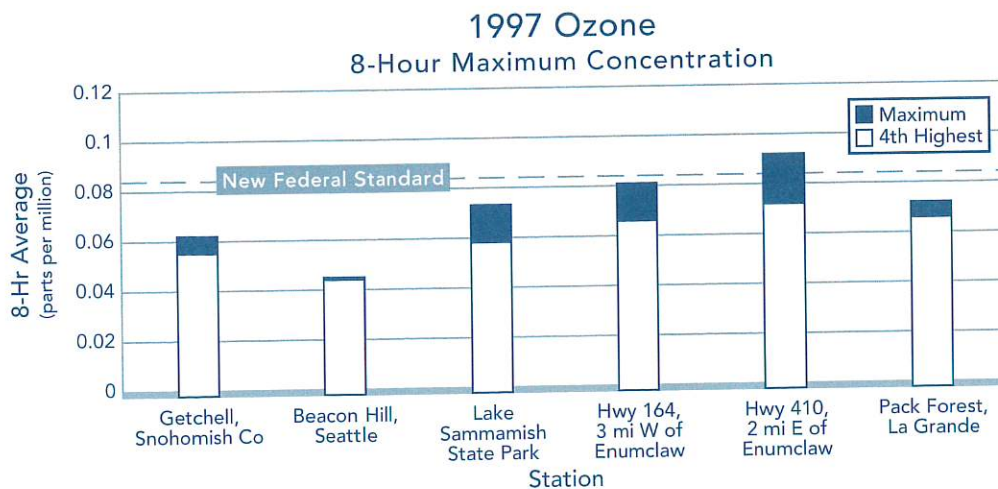
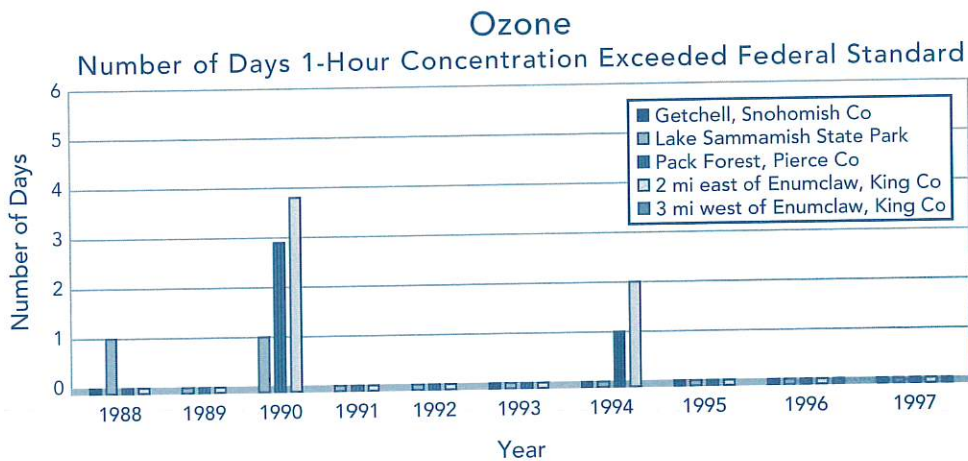
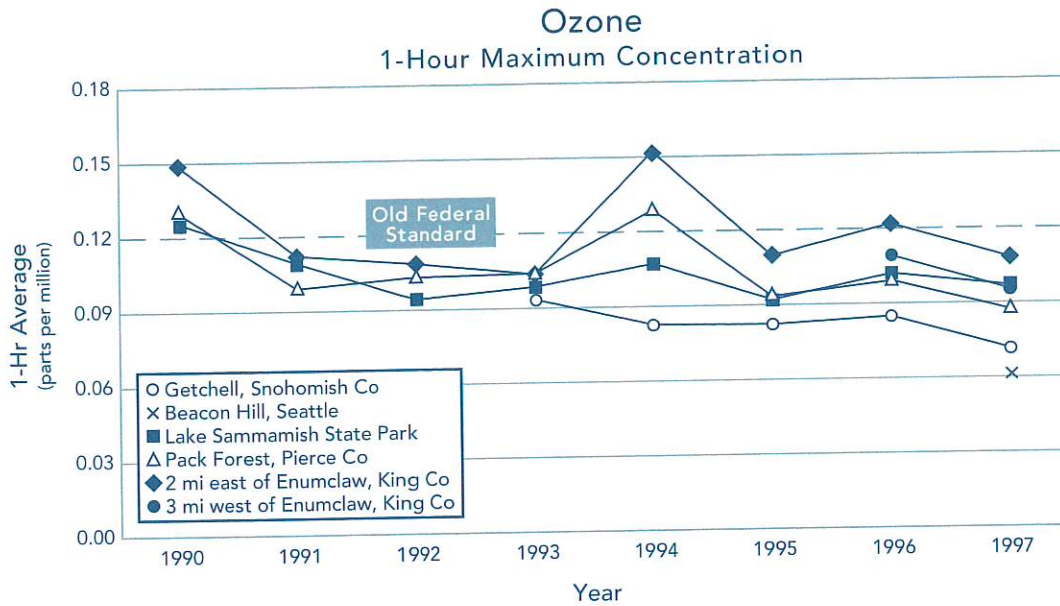
Puget Sound's mild summertime climate makes conditions for high levels of ozone relatively infrequent. In comparison to other parts of the country, ozone pollution is not as critical a problem for us, but it still presents a potential challenge with growth in the region. EPA designated the Puget Sound area in attainment for the 1-hour ozone standard in 1996.

1997

The Washington state Department of Ecology conducts all ozone monitoring in the Puget Sound area. Ecology operated five monitoring sites for ozone in 1997 – Lake Sammamish, Enumclaw (east and west), Getchell near Marysville and Pack Forest near Eatonville.

The U.S. EPA adopted a new federal standard for ozone in September 1997. The 1-hour standard of 0.12 ppm was changed to a more stringent 8-hour 0.08 ppm standard. Compliance is measured by averaging the fourth-highest monitored value per year over a three-year period. This standard was adopted based on scientific research demonstrating a more serious health impact of long-term exposure to ozone pollution than to short-term peak levels.

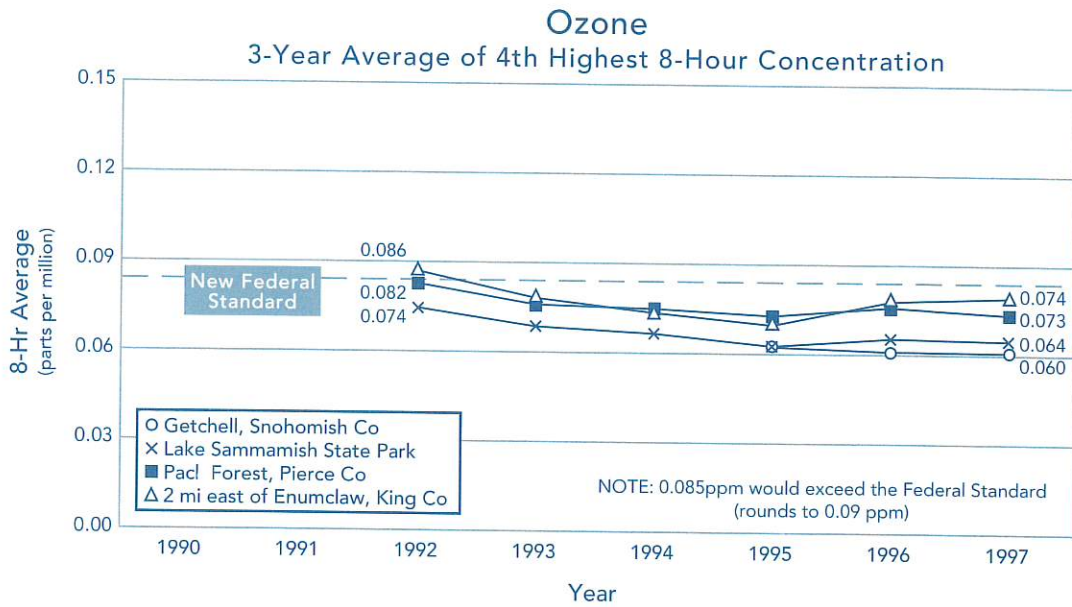
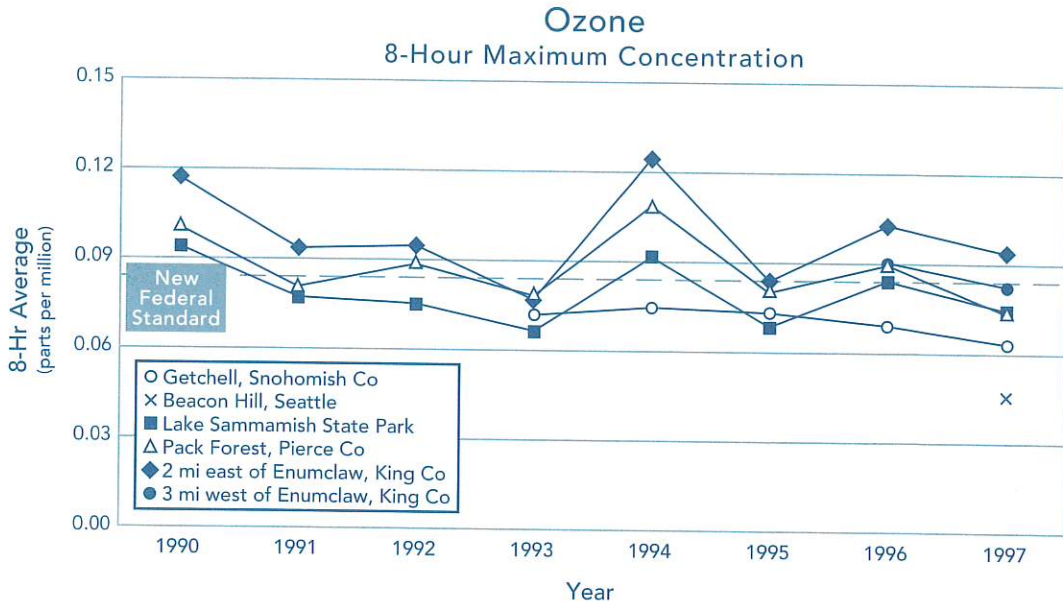
Ozone (O<sub>3</sub>) [cont.]



1997



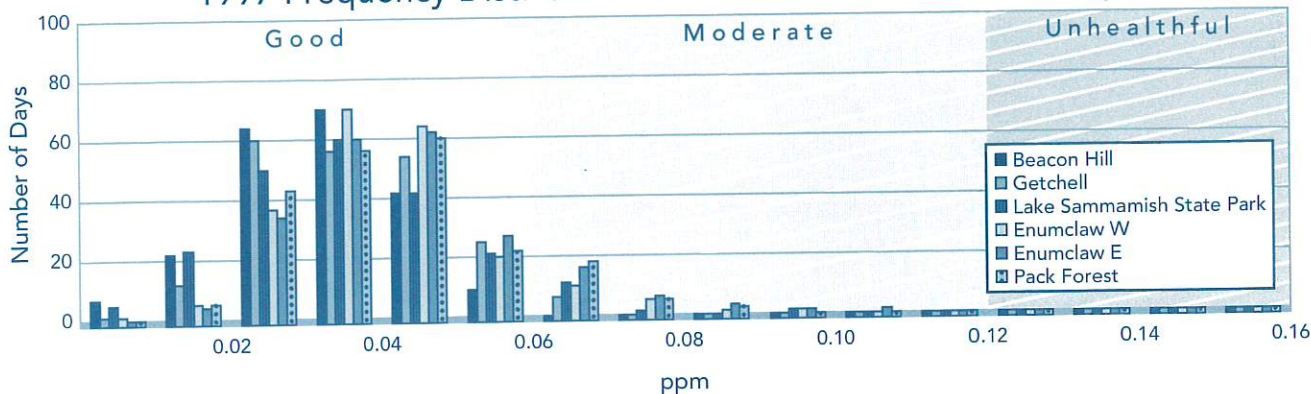
Ozone (O<sub>3</sub>) [cont.]



1997

Ozone (O<sub>3</sub>) [cont.]

Ozone Daily 1-Hour Maximum Concentration  
1997 Frequency Distribution Related to Current PSI Category

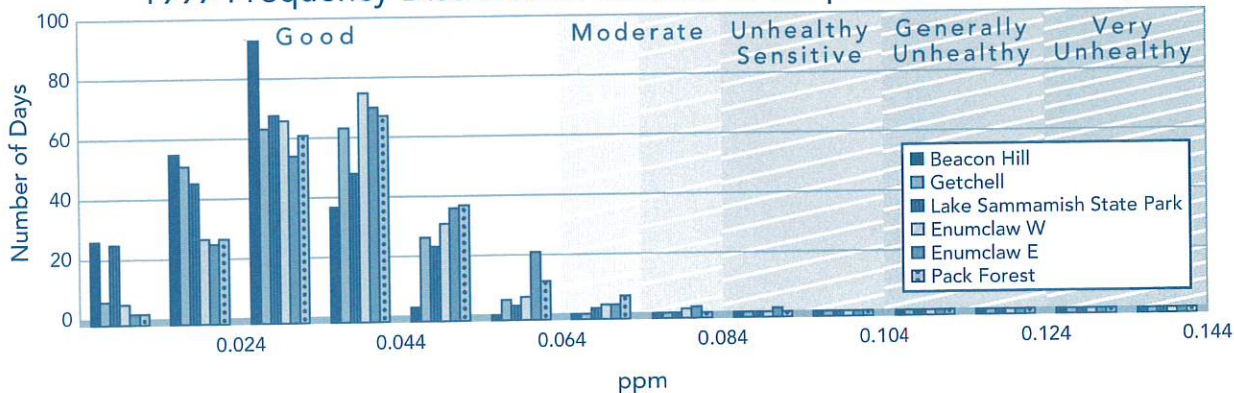


The effect of the new ozone 8-hour standard is demonstrated by comparing the number of days that were in the “moderate” or higher category in 1997 using 1-hour and 8-hour data. The decreased number of “moderate” days is due to a major change in the form of a new standard, which focuses more on extended exposures and should not be viewed as less stringent. This comparison provides an indication of the impact that ozone has in affecting air quality for the Puget Sound region.

1997

Station	Number of “Moderate” or Higher Days	
	1-Hr Avg	8-Hr Avg
Seattle - Beacon Hill	0	0
Getchell	6	0
Lk Sammamish State Park	13	2
Enumclaw W	17	4
Enumclaw E	27	6
Pack Forest	25	6

Ozone Daily 8-Hour Maximum Concentration  
1997 Frequency Distribution Related to Proposed PSI Category









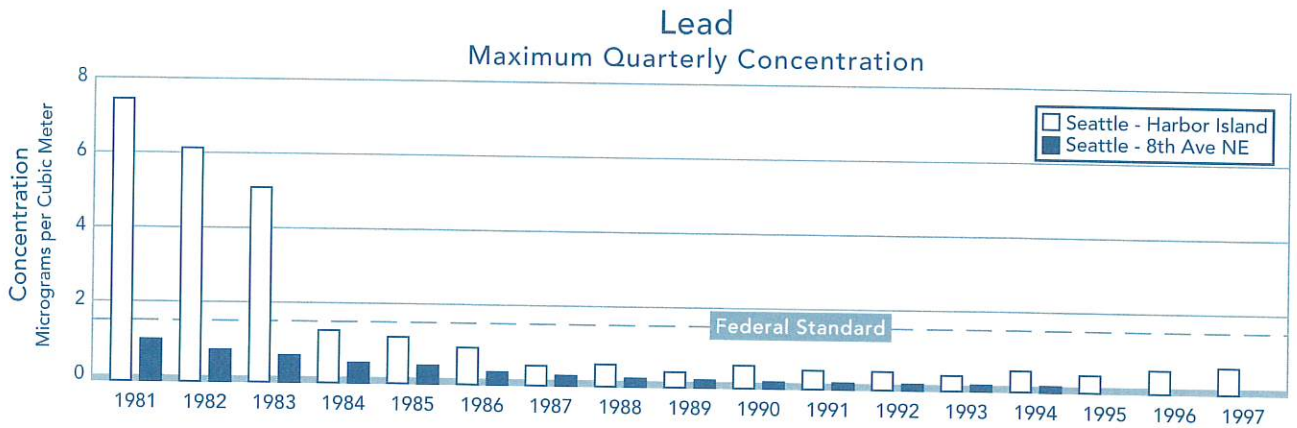


## Lead (pb)

Airborne lead typically has been associated with automobile exhaust and lead smelters. Since the phase-out of lead in fuel, exhaust from cars and trucks is no longer a source of lead. Seattle's lead smelter on Harbor Island ceased lead smelting over ten years ago, and will end all lead processing in 1998. Our only remaining lead monitoring site measures lead from this facility. Data from this site has very limited relevance to regional ambient air quality.

**In 1997.** Lead levels in 1997 reached less than 60 percent of the federal standard.

**Trends.** As lead levels declined, monitoring for lead has been scaled back regionally. Lead levels at Harbor Island dropped dramatically in 1984 when smelting operations ended. In fact, the last lead exceedance at Harbor Island was measured in 1983. The Puget Sound area remains in attainment for lead.



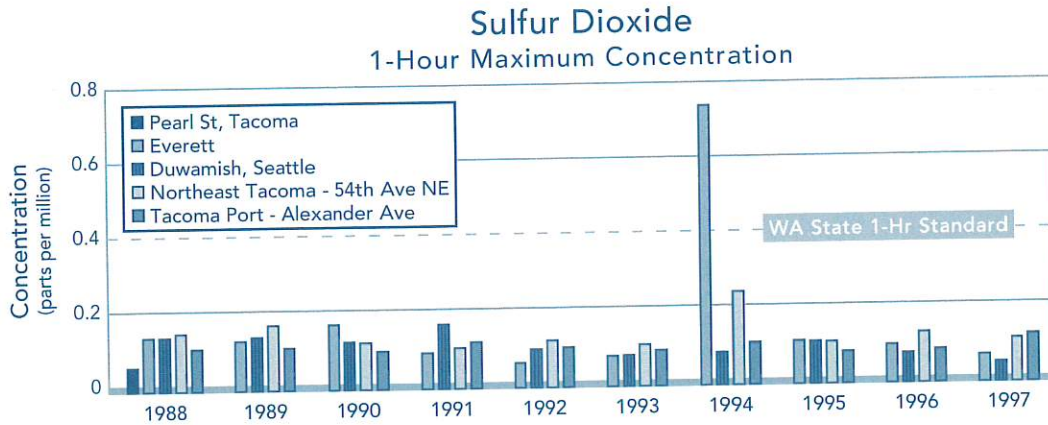
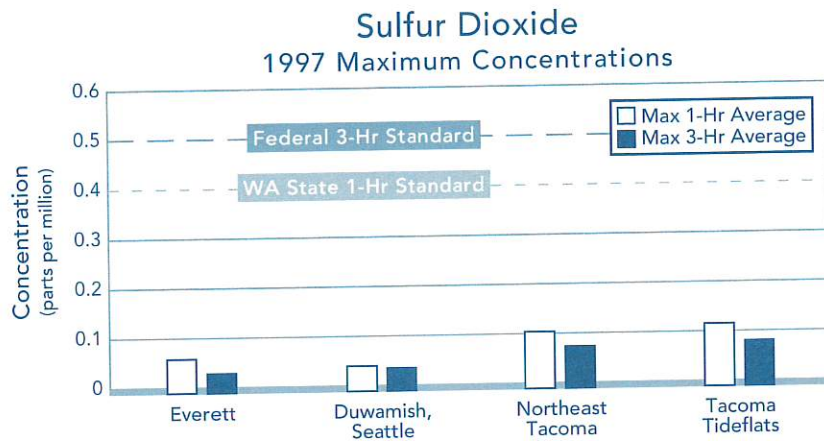
1997

## Sulfur Dioxide (SO<sub>2</sub>)

High levels of sulfur dioxide are the result of emissions from large coal or oil burning power plants, sulfuric acid production facilities, and other industrial operations such as pulp mills and cement plants. The dominant regional sulfur dioxide source was the ASARCO smelter in Tacoma, which closed in 1984. Four monitoring stations sited in the Everett, Seattle, and Tacoma industrial areas measure sulfur dioxide.

**In 1997.** Measured levels of sulfur dioxide continue to be low. No level of SO<sub>2</sub> reached even 30 percent of any of the state or federal standards.

**Trends.** The only SO<sub>2</sub> exceedance in the past ten years was attributed to an upset emission from an Everett pulp and paper mill in 1994. This single exceedance did not constitute a violation of the more stringent state 1-hour standard. The Puget Sound area remains in attainment for sulfur dioxide.



1997



## Visibility

Panoramic views are treasured as an important part of quality of life in the Northwest. Our agency also places a great importance on understanding what influences our regional visibility. We devote considerable resources to this area of exploration.

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 most important pollution contributor is fine particulate matter (PM<sub>2.5</sub>) emissions, which are transported aloft and may remain suspended for a week or longer. Fine particles seem to have a greater impact at locations far from the emitting source because they remain suspended in the atmosphere longer and travel farther than coarse particles.

Light extinction measurement is a scientific method of characterizing visibility. We use the nephelometer and the absorption photometer as instruments to measure light extinction caused

by particulate pollution. The nephelometer continuously measures light scattering, the main cause of light extinction. We operate nephelometers in Kent, Lake Forest Park, and in Seattle – in the Duwamish valley and on Beacon Hill. All have heated sample inlets to eliminate water vapor, and only measure dry particle scattering or pollution. By measuring light scattering this way, we get reproducible, real-time data that we can use for evaluating pollution control strategies and analyzing trends.

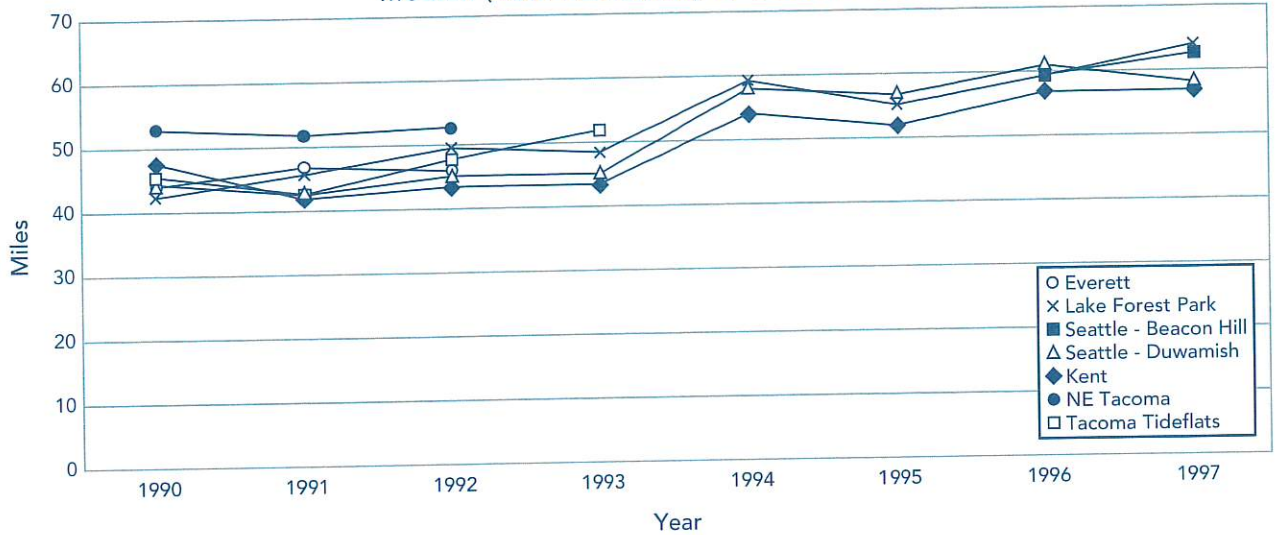
Nephelometers only measure light scattering at the monitoring site and may not accurately represent pollution and weather variations to a distant point. However, we believe that visual ranges derived from nephelometers are representative of visibility in the communities near the monitoring site.

Our newest visibility site on Beacon Hill in central Seattle measures both light scattering and light absorption. Site data is being evaluated and will be published in a future report.

The following graphs indicate steadily improving visibility since 1990, and is consistent with our overall improving air quality. Measurements using federal reference methods for all criteria pollutants show similar improving trends in air quality.

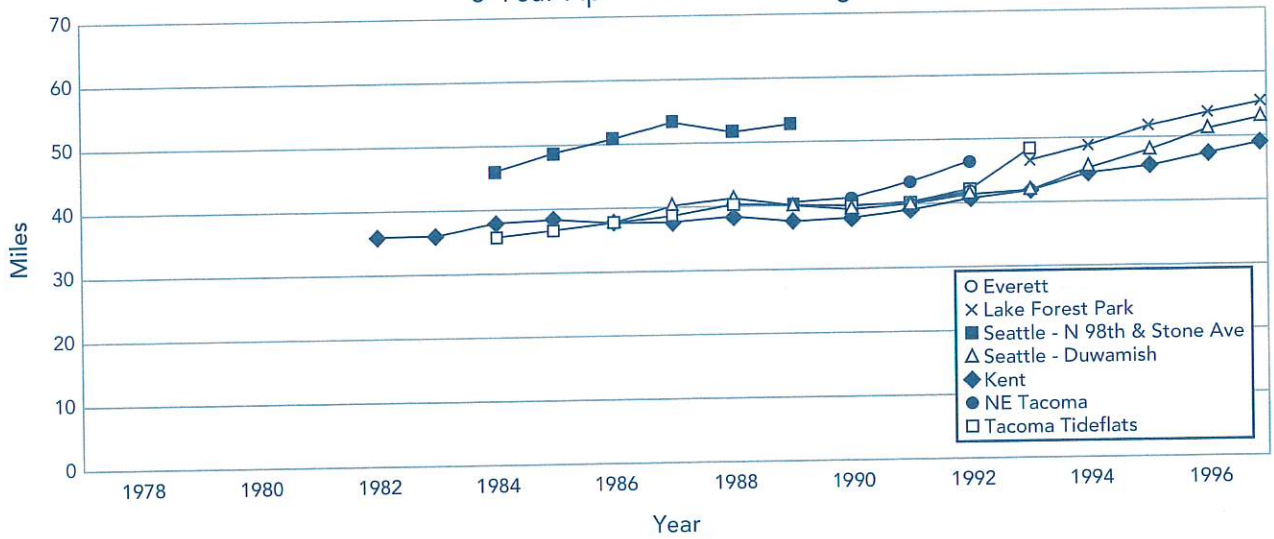
Visibility [cont.]

Visual Range by Nephelometer  
Median (50th Percentile) of Hours Measured



1997

Visual Range by Nephelometer  
5-Year April-October Average





## Pollutant Standards Index (PSI)

The Pollutant Standards Index (PSI) provides a nationally uniform method for reporting air quality as related to health effects. PSI values are calculated for every pollutant and reported daily. A numerical scale for PSI ranges from 0 to 500 with five different intervals or health categories:

- From 0 to 50 . . . . . Good
- From 51 to 100 . . . . . Moderate
- From 101 to 199 . . . . . Unhealthful
- From 200 to 299 . . . . . Very Unhealthful
- From 300 to 500 . . . . . Hazardous

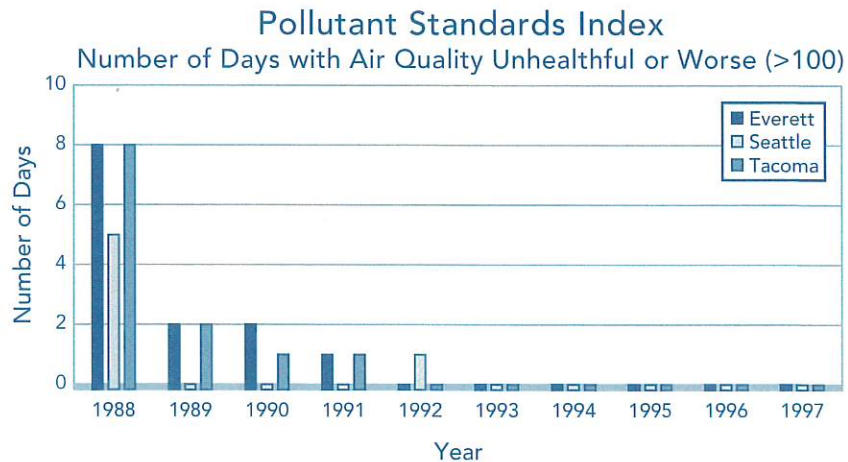
The U.S. EPA has proposed a revision to the Pollutant Standard Index. Under the proposal, EPA would create several new PSI categories. The new scale, if adopted, will be as follows:

- From 0 to 50 . . . . . Good
- From 51 to 75 . . . . . Moderate,  
no health effects
- From 76 to 100 . . . . . Moderate, possible  
health effects
- From 101 to 150 . . . . . Unhealthy for  
sensitive groups
- From 151 to 200 . . . . . Generally unhealthy
- From 201 to 300 . . . . . Very unhealthy
- From 301 to 500 . . . . . Hazardous

**In 1997.** No exceedances of air quality standards – or unhealthful PSI levels – were recorded in 1997. The urban areas of Seattle, Everett and Tacoma all recorded 300 days or better of good air quality.

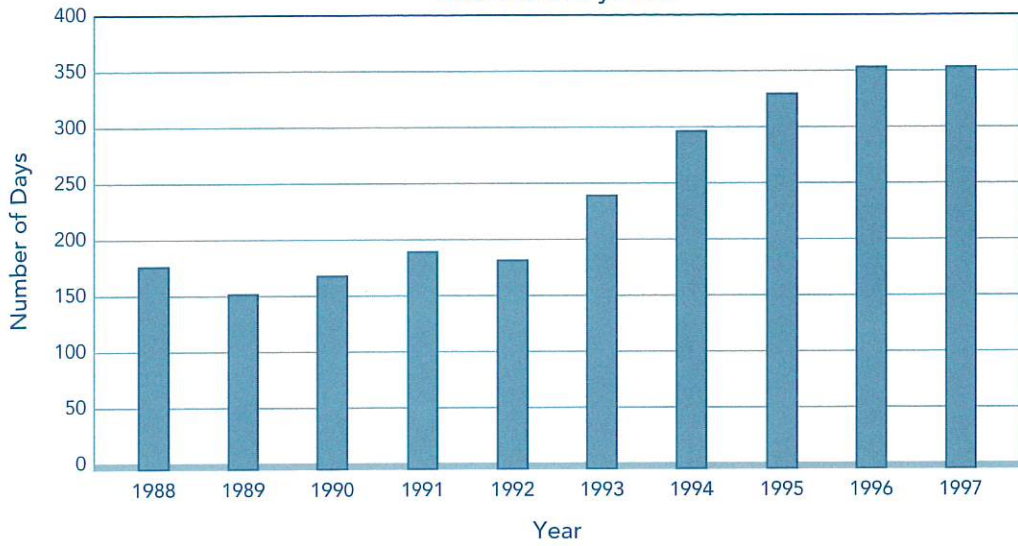
**Trends.** For the fifth year in a row, there were no unhealthful days recorded in the urban areas of Seattle, Everett and Tacoma. However, three unhealthful levels of ozone were measured in the rural area near Enumclaw and Pack Forest in 1994. The number of good days – the healthiest air quality – has been steadily increasing.

1997

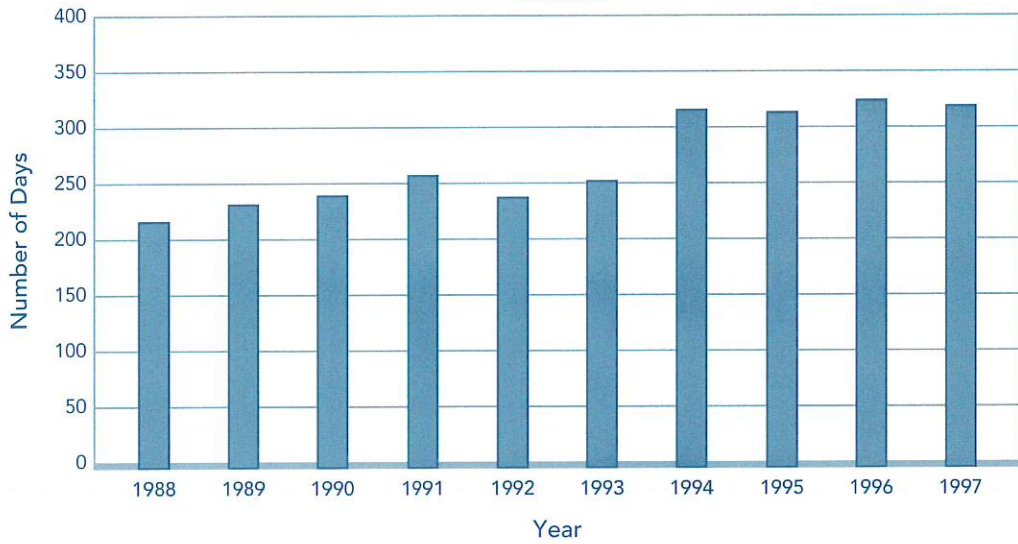


# Pollutant Standards Index (PSI) [cont.]

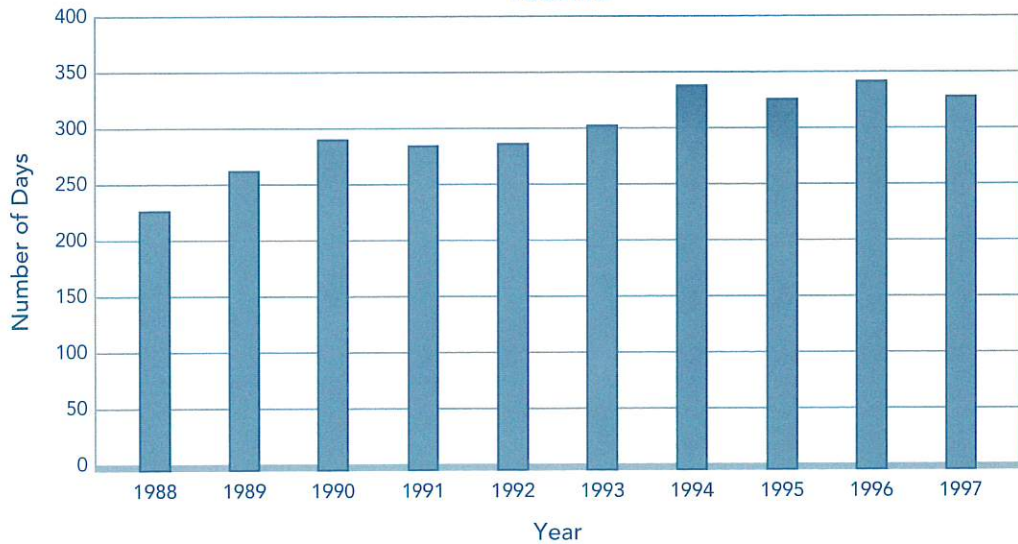
## Number of Days in Good PSI Category Everett/Marysville



## Number of Days in Good PSI Category Seattle



## Number of Days in Good PSI Category Tacoma



1997



## Monitoring Network

The Puget Sound air monitoring network is a composite of meteorological and pollutant-specific monitoring equipment. This equipment is both manual and automated – data measurements are collected by our field staff or sent directly via a telemetry network. Our agency and the Washington state Department of Ecology operate all monitoring sites. Air quality monitoring is conducted for PM<sub>10</sub>, PM<sub>2.5</sub>, lead, carbon monoxide, ozone, sulfur dioxide, oxides of nitrogen and visibility. Weather conditions are monitored for temperature, wind speed and direction.

Monitoring equipment siting is based on numerous parameters. The use of U.S. EPA siting criteria ensures a consistent and representative picture of air quality. However, some sites are selected to focus on the emissions of a single air pollution source or group of sources. Some sites are intended to be representative of an industrial area, while others may be oriented toward residential air pollution.

All 33 monitoring sites in our four-county area, their locations, and type of monitoring are listed below. The map on the reverse also shows how these sites are spread geographically throughout our area.

### 1997 Monitoring Network [Reference Map on Back]

Map ID	Location			Type of Sampling
1	8426 99th Avenue NE, Getchell <small>[ended Oct. 31, 1997]</small>			O <sub>3</sub>
2	Marysville JHS, 1605 7th Street, Marysville	PM <sub>10</sub>	PM <sub>10eq</sub>	PM <sub>2.5eq</sub> , Wind
3	Hoyt Avenue & 26th Street, Everett	PM <sub>10</sub>		SO <sub>2</sub> , Wind
4	Broadway & Hewitt Avenue, Everett			CO
5	20935 59th Place West, Lynnwood	PM <sub>10</sub>	PM <sub>10eq</sub>	Wind
6	17711 Ballinger Way NE, Lake Forest Park	PM <sub>10</sub>	PM <sub>10eq</sub>	bsp, Wind
7	Northgate, 310 NE Northgate Way, Seattle			CO
8	Sand Point, 7600 Sand Point Way NE, Seattle			Wind, Temp
9	University District, 1307 NE 45th Street, Seattle			CO
10	Queen Anne Hill, 400 West Garfield Street, Seattle			Vsby
11	1424 4th Avenue, Seattle			CO
12	5th Avenue & James Street, Seattle			CO
13	Beacon Hill, 15th South & Charlestown, Seattle			bsp, NO <sub>x</sub> , O <sub>3</sub> , Wind, Temp, bap, PM <sub>2.5</sub>
14	Harbor Island, 2555 13th Avenue SW, Seattle			TSP/Pb
15	Harbor Island, 3400 13th Avenue SW, Seattle <small>[ended Dec. 31, 1997]</small>	PM <sub>10</sub>		
16	Duwamish, 4752 East Marginal Way South, Seattle	PM <sub>10</sub>	PM <sub>10eq</sub>	PM <sub>2.5</sub> , PM <sub>2.5eq</sub> , bsp, SO <sub>2</sub> , Wind
17	South Park, 723 South Concord Street, Seattle	PM <sub>10</sub>		
18	NE 8th Street & 108th Avenue NE, Bellevue			CO
19	622 Bellevue Way NE, Bellevue			CO
20	504 Bellevue Way NE, Bellevue	PM <sub>10</sub>		
21	20050 SE 56th, Lake Sammamish State Park			O <sub>3</sub>
22	James Street & Central Avenue, Kent	PM <sub>10</sub>	PM <sub>10eq</sub>	PM <sub>2.5</sub> , PM <sub>2.5eq</sub> , bsp, Wind
23	43407 212th Avenue SE, 2 miles West of Enumclaw			O <sub>3</sub> , NO <sub>x</sub> , Wind, Temp
24	Highway 410, 2 miles East of Enumclaw			O <sub>3</sub>
25	Charles L Pack Forest, La Grande			O <sub>3</sub>
26	South Hill, 9616 128th Street East, Puyallup	PM <sub>10</sub>	PM <sub>10eq</sub>	Wind
27	5225 Tower Drive NE, Northeast Tacoma			Wind, Temp
28	27th Street NE & 54th Avenue NE, Northeast Tacoma	PM <sub>10</sub>		SO <sub>2</sub> , Wind
29	2301 Alexander Avenue, Tacoma	PM <sub>10</sub>		SO <sub>2</sub> , Wind
30	Fire Station #12, 2316 East 11th Street, Tacoma	PM <sub>10</sub>	PM <sub>10eq</sub>	PM <sub>2.5</sub> , Wind
31	1101 Pacific Avenue, Tacoma			CO
32	Meadowdale, 7252 Blackbird Drive NE, Kitsap County	PM <sub>10</sub>	PM <sub>10eq</sub>	Wind
33	Lions Park, 6th Avenue NE & Fjord Drive, Poulsbo	PM <sub>10</sub>		Wind

**NOTES**

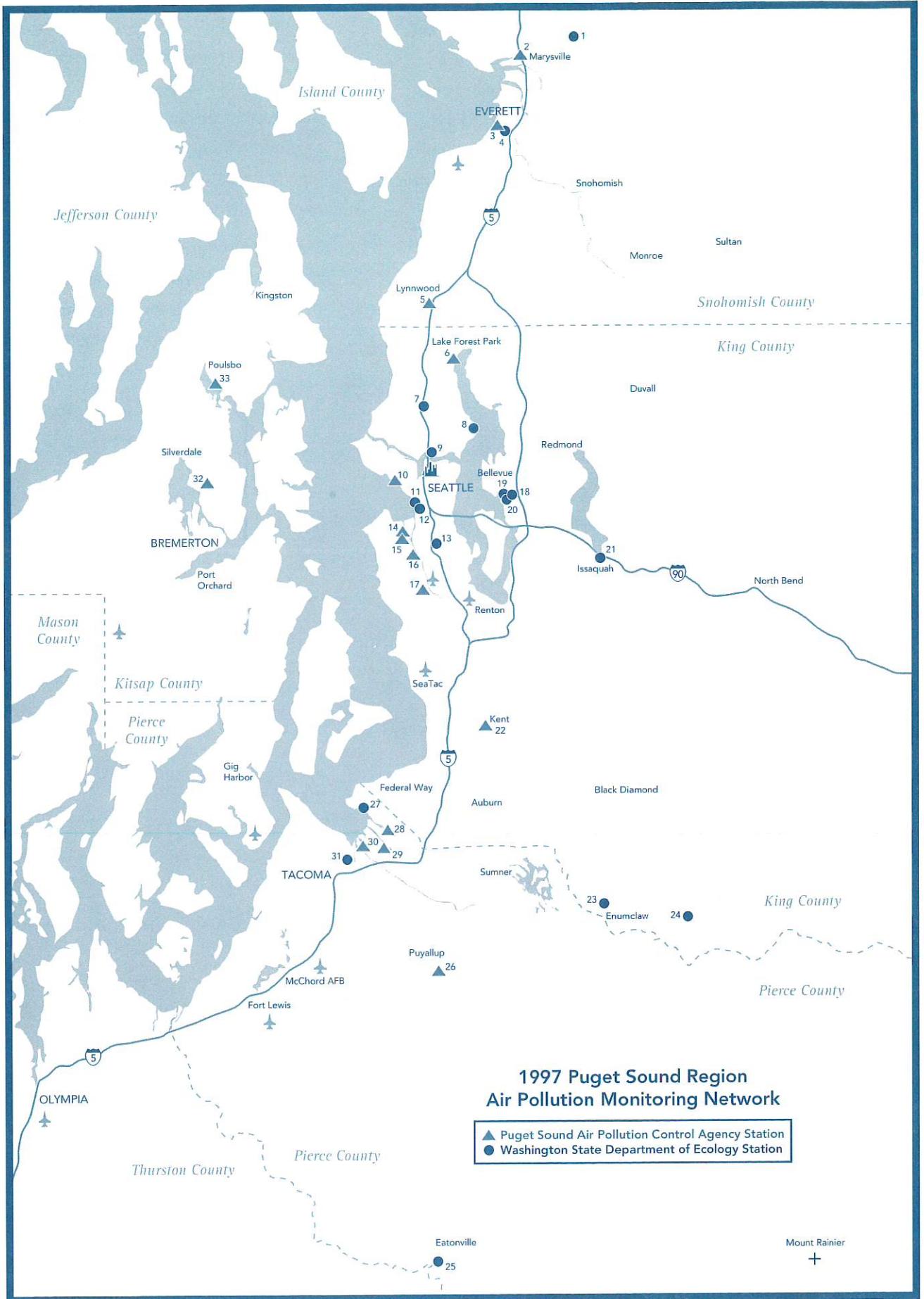
- |   |  |
|---|--|
| PM <sub>10</sub> = Particulate Matter ≤ 10 micrometers [reference method]       | bsp = Atmospheric Particles [by nephelometer]  |
| PM <sub>10eq</sub> = Particulate Matter ≤ 10 micrometers [equivalent method]    | Temp = Air Temperature                         |
| CO = Carbon Monoxide  | O <sub>3</sub> = Ozone                         |
| Wind = Wind Direction and Speed   | NO <sub>x</sub> = Nitrogen Oxides              |
| SO <sub>2</sub> = Sulfur Dioxide  | Vsby = Visibility [by camera]                  |
| PM <sub>2.5</sub> = Particulate Matter ≤ 2.5 micrometers [by dichot or IMPROVE] | TSP/Pb = Total Suspended Particulates and Lead |
| PM <sub>2.5eq</sub> = Particulate Matter ≤ 2.5 micrometers [continuous method]  | bap = Fine Particle Absorption                 |

SHADING INDICATES STATIONS OPERATED BY WASHINGTON STATE DEPARTMENT OF ECOLOGY.



# Monitoring Network [cont.]

1997





## Impaired Air Quality Periods

Washington state has in place a winter impaired air quality program targeted at sources of particulate matter, traditionally wood stoves and fireplaces. A first stage of impaired air quality is reached when  $PM_{10}$  concentrations rise to  $75\mu\text{g}/\text{m}^3$  measured on a 24-hour average. At this level, a first stage burn ban may be declared. Residential burning in fireplaces or uncertified wood stoves is prohibited (unless it is the only adequate source of heat). At  $PM_{10}$  levels of  $105\mu\text{g}/\text{m}^3$  on a 24-hour average, a second stage burn ban is issued, prohibiting the use of any kind of wood burning appliance. Our agency has not issued a second stage burn ban since January 1991.

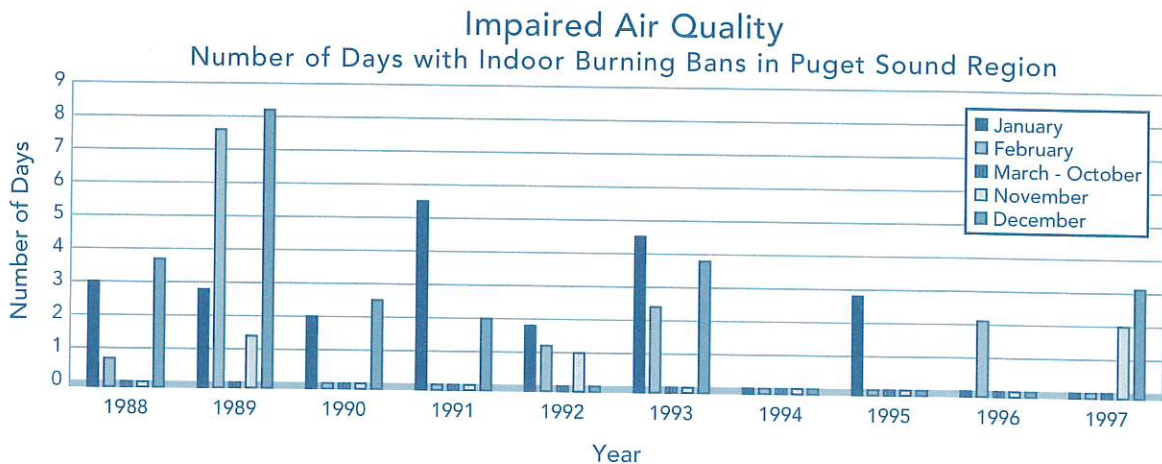
A number of values exceeded the Washington state 24-hour impaired air trigger of  $75\mu\text{g}/\text{m}^3$  in 1997. The Seattle Duwamish industrial site measured 13 values above this level, and the industrial site at Tacoma Tideflats reached above this level on eight occasions. The residential sites fared better with levels above  $75\mu\text{g}/\text{m}^3$  only at the Lake Forest Park (three occasions) and Marysville (two occasions) sites. A commercially located site in Kent registered one occasion above the trigger level. These values alone did not lead to burn bans. In 1998, the state Legislature passed a new, lower impaired air trigger of  $60\mu\text{g}/\text{m}^3$ . This trigger will go into effect for the winter of 1998-99. While it is not anticipated that the new trigger will lead to substantially more burn bans, it may lengthen burn bans if they are issued earlier in an air stagnation period than in the past.

Four stagnation periods in 1997 resulted in elevated particulate levels. Two stagnations resulted in an "Air Pollution Watch," asking for voluntary curtailment of wood burning and reduced driving. These periods were from January 13-16 and February 6-11.

The other two stagnations led to first stage burn bans in King, Pierce and Snohomish counties. The impaired air quality periods were from 3 p.m., Thursday, November 13 to 3 p.m., Saturday, November 15 and from 3 p.m., Thursday, December 4 to 6 p.m., Sunday, December 7.

Our agency also has in place a voluntary curtailment program, "Smog Watch," for the summer smog season (June through September). The purpose of the Smog Watch program is to advise residents of potential smog problems and recommend short-term actions. Smog Watch advisories are driven more by meteorology than monitored air quality data. A Smog Watch is called when forecasts call for temperatures in the upper 80s or higher with little or no wind for at least a 72-hour period. No Smog Watch advisories were issued in 1997 due to mild summer temperatures. In 1996, our agency issued four Smog Watch advisories.

1997



Data Summary

1997



### Air quality is important to us!

### That's why we measure our air quality all over the Puget Sound region.

It's just as important to us that you know about the state of our air. You can help us provide you with useful air quality information by answering a few questions.

Do you (or people you serve) use this publication?

- Yes
- No

If no, why not? (Please answer and return to us. We need to know!)

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How do you use this information?

- For air pollution research
- For client information (consulting)
- As reference material (in a library)
- Other: please describe \_\_\_\_\_

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How frequently do you use this information?

- Seldom
- Occasionally
- On a regular basis

Is there any specific information for which you turn to this publication?

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Is the information in this publication useful? Why or why not?

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Is there additional data or information that you would like to see here? Is there any data that is not necessary?

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Would you prefer to access this information on the Internet as an alternative to receiving it as a publication?

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Do you want to keep receiving the air quality data summary in the future? Do you know anyone who would like to receive this summary?

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Do you have any other comments?


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Thank you!

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