

Evaluating Ozone Control Programs in the Eastern United States: Focus on the NO_x Budget Trading Program, 2004

State and Local Information for EPA Region 3

Delaware
Maryland
Pennsylvania
Virginia
Washington, DC
West Virginia

U.S. Environmental Protection Agency
Office of Air and Radiation
Office of Air Quality Planning and Standards

October 2005

Delaware

Emissions

State total emissions of NO_x and VOCs have decreased from 1997 to 2004.

Ozone Season (May-September) Emission Totals by Major Source Categories (tons)

Source Category	1997	2002	2004
NO_x Emissions			
Power Industry	9,679	5,595	5,069
Mobile On-Road	11,563	9,786	8,993
Other	8,606	9,583	8,289
VOC Emissions			
Mobile On-Road	7,486	5,417	4,865
Solvent Usage	4,644	3,445	3,292
Other	9,920	8,480	7,904

The emissions data used in the report are measured or estimated values from EPA's National Emissions Inventory (NEI). Starting in 1997, the NEI incorporated power industry data measured by the Continuous Emissions Monitoring System (CEMS). For 2002, the preliminary version of the NEI was used, which includes the 2002 CEMS data, but does not include 2002 data for other sources submitted by state, local, and tribal air agencies.

EPA used CEMS data for the power industry for 2003 and 2004. Emissions for other sources for that period were estimated by interpolating between the 2002 preliminary NEI data and a projected 2010 emission inventory developed to support the Clean Air Interstate Rule.

For additional information use the following online resources:

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Ozone

On average, ozone has declined between 1997 and 2004. These improvements in ozone are in response to both state and regional reductions in NO_x and VOC emissions. The level of ozone improvement varies from site to site.

Highest Fourth Daily Maximum 8-hour Ozone Concentration by Metropolitan Statistical Area, 1997, 2002 and 2004

Metropolitan Statistical Area	1997 O₃ 8-hr (ppm)	2002 O₃ 8-hr (ppm)	2004 O₃ 8-hr (ppm)
Wilmington--Newark, DE--MD PMSA	0.12	0.1	0.08
Dover, DE MSA	0.1	0.09	0.08

Level of the NAAQS is .08 ppm. Units are parts per million (ppm).

Notes:

- Data from exceptional events are not included.
- The reader is cautioned that this summary is not adequate in itself to numerically rank MSAs according to their air quality.
- The monitoring data represent the quality of air in the vicinity of the monitoring site and, for some pollutants, may not necessarily represent urban-wide air quality.

Maryland

Emissions

State total emissions of NO_x and VOCs have decreased from 1997 to 2004. After 2002 the largest emission reductions were NO_x emissions from power generating sources.

Ozone Season (May-September) Emission Totals by Major Source Categories (tons)

Source Category	1997	2002	2004
NO_x Emissions			
Power Industry	46,031	29,209	19,944
Mobile On-Road	67,227	57,748	52,858
Other	38,488	37,266	34,905
VOC Emissions			
Mobile On-Road	43,424	31,805	28,474
Solvent Usage	21,048	26,796	25,091
Other	32,057	31,182	28,697

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Ozone

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Highest Fourth Daily Maximum 8-hour Ozone Concentration by Metropolitan Statistical Area, 1997, 2002 and 2004

Metropolitan Statistical Area	1997 O ₃ 8-hr (ppm)	2002 O ₃ 8-hr (ppm)	2004 O ₃ 8-hr (ppm)
Baltimore, MD PMSA	0.12	0.11	0.09
Hagerstown, MD PMSA		0.1	0.08
Washington, DC--MD--VA--WV PMSA	0.11	0.11	0.09
Wilmington--Newark, DE--MD PMSA	0.12	0.1	0.08

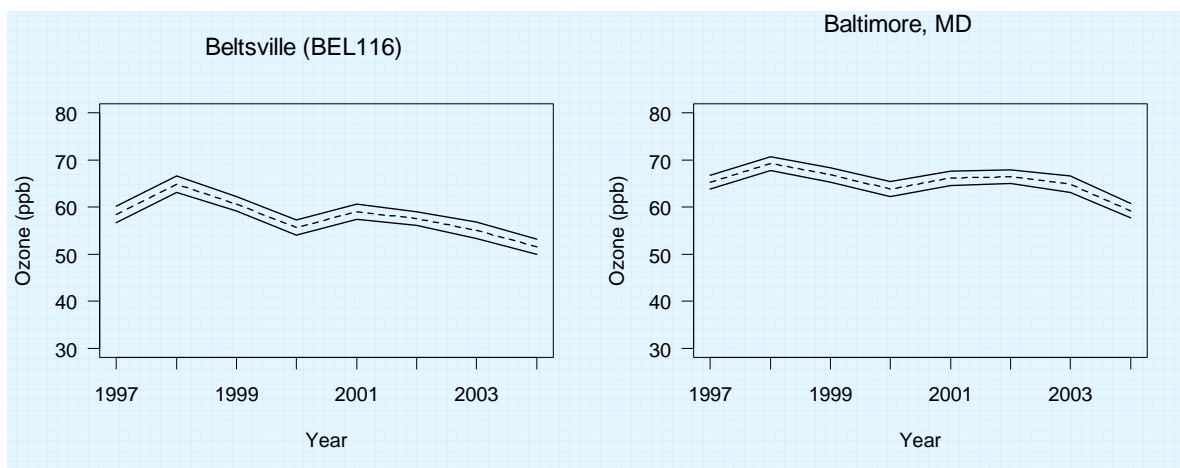
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Trends for 1997-2004 with 95 percent confidence limits are presented below. Ozone season averages of daily maximum 8-hour ozone were adjusted to remove the influence of year-to-year variability in meteorology.

Seasonal Average 8-hour Ozone Trends



Pennsylvania

Emissions

State total emissions of NO_x and VOCs have decreased from 1997 to 2004. After 2002 the largest emission reductions were NO_x emissions from power generating sources.

Ozone Season (May-September) Emission Totals by Major Source Categories (tons)

Source Category	1997	2002	2004
NO_x Emissions			
Power Industry	120,503	84,178	51,710
Mobile On-Road	149,830	123,343	113,060
Other	125,216	110,518	105,272
VOC Emissions			
Mobile On-Road	101,570	70,556	63,291
Solvent Usage	104,708	77,706	76,671
Other	93,583	83,897	80,804

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Ozone

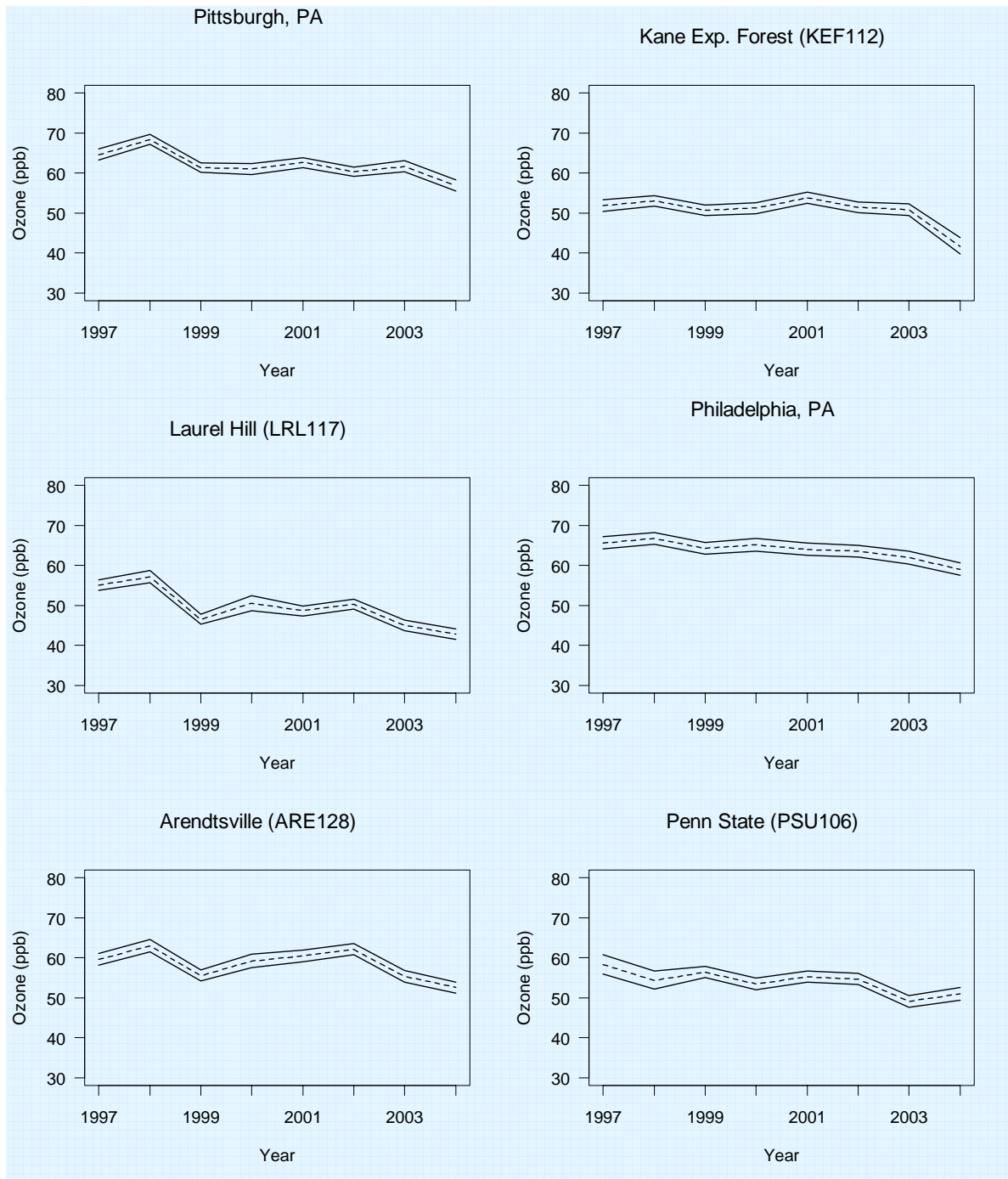
On average, ozone has declined between 1997 and 2004. These improvements in ozone are in response to both state and regional reductions in NO_x and VOC emissions. The level of ozone improvement varies from site to site.

Highest Fourth Daily Maximum 8-hour Ozone Concentration by Metropolitan Statistical Area, 1997, 2002 and 2004

Metropolitan Statistical Area	1997 O ₃ 8-hr (ppm)	2002 O ₃ 8-hr (ppm)	2004 O ₃ 8-hr (ppm)
Newburgh, NY--PA PMSA	0.09	0.09	0.08
Philadelphia, PA--NJ PMSA	0.12	0.11	0.09
Allentown--Bethlehem--Easton, PA MSA	0.1	0.09	0.09
Altoona, PA MSA	0.1	0.09	0.07
Erie, PA MSA	0.09	0.1	0.07
Harrisburg--Lebanon--Carlisle, PA MSA	0.09	0.1	0.08
Johnstown, PA MSA	0.09	0.09	0.07
Lancaster, PA MSA	0.1	0.1	0.08
Pittsburgh, PA MSA	0.11	0.11	0.08
Reading, PA MSA	0.1	0.1	0.08
Scranton--Wilkes-Barre--Hazleton, PA MSA	0.1	0.09	0.07
Sharon, PA MSA	0.09	0.1	0.08
State College, PA MSA	0.09	0.09	0.07
Williamsport, PA MSA	0.08	0.09	0.07
York, PA MSA	0.09	0.1	0.08
Level of the NAAQS is .08 ppm. Units are parts per million (ppm).			
Notes:			
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Trends for 1997-2004 with 95 percent confidence limits are presented below. Ozone season averages of daily maximum 8-hour ozone were adjusted to remove the influence of year-to-year variability in meteorology.

Seasonal Average 8-hour Ozone Trends



Virginia

Emissions

State total emissions of NO_x and VOCs have decreased from 1997 to 2004. After 2002 the largest emission reductions were NO_x emissions from power generating sources.

Ozone Season (May-September) Emission Totals by Major Source Categories (tons)

Source Category	1997	2002	2004
NO_x Emissions			
Power Industry	49,537	39,390	25,443
Mobile On-Road	109,016	75,336	69,097
Other	86,993	79,367	78,609
VOC Emissions			
Mobile On-Road	70,900	52,086	46,497
Solvent Usage	69,061	52,506	50,849
Other	69,980	64,907	61,483

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Ozone

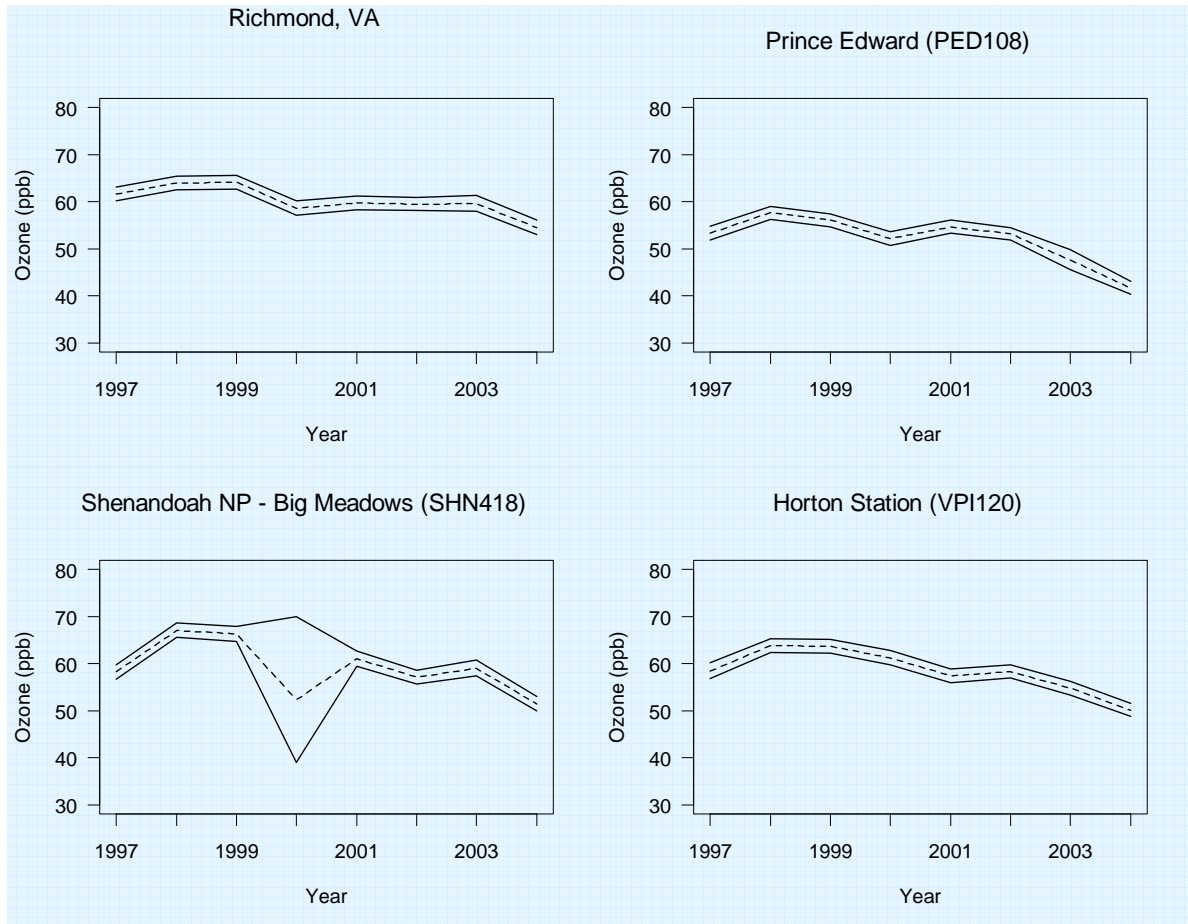
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Highest Fourth Daily Maximum 8-hour Ozone Concentration by Metropolitan Statistical Area, 1997, 2002 and 2004

Metropolitan Statistical Area	1997 O ₃ 8-hr (ppm)	2002 O ₃ 8-hr (ppm)	2004 O ₃ 8-hr (ppm)
Washington, DC--MD--VA--WV PMSA	0.11	0.11	0.09
Johnson City--Kingsport--Bristol, TN--VA MSA	0.09	0.09	0.08
Norfolk--Virginia Beach--Newport News, VA--NC MSA	0.1	0.1	0.08
Richmond--Petersburg, VA MSA	0.1	0.11	0.08
Roanoke, VA MSA	0.08	0.09	0.07
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Seasonal Average 8-hour Ozone Trends



Washington, DC

Emissions

Total emissions of NO_x and VOCs have decreased from 1997 to 2004. After 2002 the largest emission reductions were NO_x emissions from power generating sources.

Ozone Season (May-September) Emission Totals by Major Source Categories (tons)

Source Category	1997	2002	2004
NO_x Emissions			
Power Industry	93	611	35
Mobile On-Road	4,268	3,633	3,341
Other	2,281	2,225	2,172
VOC Emissions			
Mobile On-Road	3,356	2,425	2,161
Solvent Usage	4,031	3,068	3,198
Other	1,171	1,035	995

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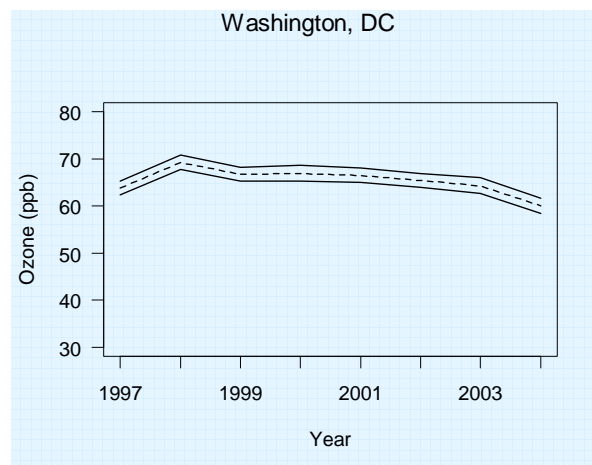
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Seasonal Average 8-hour Ozone Trends



West Virginia

Emissions

State total emissions of NO_x and VOCs have decreased from 1997 to 2004. After 2002 the largest emission reductions were NO_x emissions from power generating sources.

Ozone Season (May-September) Emission Totals by Major Source Categories (tons)

Source Category	1997	2002	2004
NO_x Emissions			
Power Industry	128,679	86,735	41,333
Mobile On-Road	30,538	22,189	19,365
Other	46,180	48,696	48,808
VOC Emissions			
Mobile On-Road	18,692	13,724	11,861
Solvent Usage	14,462	12,433	12,192
Other	28,826	26,247	25,784

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Metropolitan Statistical Area	1997 O ₃ 8-hr (ppm)	2002 O ₃ 8-hr (ppm)	2004 O ₃ 8-hr (ppm)
Washington, DC--MD--VA--WV PMSA	0.11	0.11	0.09
Charleston, WV MSA	0.08	0.09	0.07
Huntington--Ashland, WV--KY--OH MSA	0.09	0.1	0.07
Parkersburg--Marietta, WV--OH MSA	0.09	0.1	0.08
Steubenville--Weirton, OH--WV MSA	0.08	0.1	0.07
Wheeling, WV--OH MSA	0.08	0.1	0.06
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