



Ozone Season Summary

2011

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MWAQC-TAC Meeting, COG

September 13, 2011



Ozone Season Summary

[As of September 8, 2011]

Peak 8-Hour Ozone Concentrations (ppb)

Data based on the 8-hour standard set at 75 ppb. Since April 15, 2011, there have/has been:

2 Code Red Days

19 Code Orange Days

52 Code Yellow Days

73 Code Green Days

April						
Sun	Mon	Tues	Wed	Thurs	Fri	Sat
					1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
					57	46
17	18	19	20	21	22	23
53	59	52	60	53	44	36
24	25	26	27	28	29	30
45	55	35	32	53	50	44

June						
Sun	Mon	Tues	Wed	Thurs	Fri	Sat
			1	2	3	4
			74	72	60	73
5	6	7	8	9	10	11
69	75	76	95	93	100	71
12	13	14	15	16	17	18
63	54	47	59	55	59	76
19	20	21	22	23	24	25
69	64	61	56	44	58	53
26	27	28	29	30		
51	59	76	72	69		

August						
Sun	Mon	Tues	Wed	Thurs	Fri	Sat
	1	2	3	4	5	6
	87	69	49	63	60	47
7	8	9	10	11	12	13
55	66	64	61	63	76	50
14	15	16	17	18	19	20
53	55	50	64	66	71	74
21	22	23	24	25	26	27
54	48	56	60	47	68	31
28	29	30	31			
43	42	60	73			

May						
Sun	Mon	Tues	Wed	Thurs	Fri	Sat
1	2	3	4	5	6	7
39	55	52	40	53	58	55
8	9	10	11	12	13	14
56	54	53	65	61	41	35
15	16	17	18	19	20	21
48	53	50	45	42	49	60
22	23	24	25	26	27	28
59	55	51	75	73	58	49
29	30	31				
46	76	96				

July						
Sun	Mon	Tues	Wed	Thurs	Fri	Sat
					1	2
					80	90
3	4	5	6	7	8	9
70	71	85	67	94	55	66
10	11	12	13	14	15	16
73	75	72	67	61	52	50
17	18	19	20	21	22	23
54	80	75	86	78	90	85
24	25	26	27	28	29	30
68	65	72	65	81	77	70
31						
67						

September						
Sun	Mon	Tues	Wed	Thurs	Fri	Sat
				1	2	3
				64	50	50
4	5	6	7	8	9	10
60	41	35	24			
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	

•Analysis is based on draft data until September 8, 2011. Data is subject to change.



Summary – Meteorology on High Ozone Days

Strong high pressure over the region during high ozone days leading to:

- Limited vertical mixing of pollutants thereby not allowing ground level ozone to disperse
 - Clear skies allowing solar radiation to create ozone
 - Clear skies also allowing for maximum temperatures to reach record highs and so creating lot of ozone
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- West winds brought dirty air from the Ohio valley
 - Light winds allowed for stagnation



2011 vs. 2010 Ozone Season Comparison

- The avg max 8-hour ozone for days where the max temp $\geq 90^{\circ}\text{F}$ was 75.5 ppb, more than 4 ppb lower than the same statistic in 2010 (79.6 ppb).
- July 2011, the warmest month ever recorded at Dulles International Airport (92.8°F), had 11 exceedances; the same number as in August of 2010 when the average temp was 6°F lower at 86.8°F .



2011 Ozone Exceedances

Date	# of Monitors Exceeding	Highest Monitor	Highest Conc (ppb)
5/30/2011	1	Calvert County	76
5/31/2011	7	Franconia	96
6/7/2011	1	Beltsville	76
6/8/2011	11	Prince George's Equestrian Center	95
6/9/2011	8	Calvert County	93
6/10/2011	9	Alexandria Health & Aurora Hills	100
6/18/2011	1	Prince George's Equestrian Center	76
6/28/2011	1	Prince George's Equestrian Center	76
7/1/2011	2	Prince George's Equestrian Center	80
7/2/2011	13	Alexandria Health	90

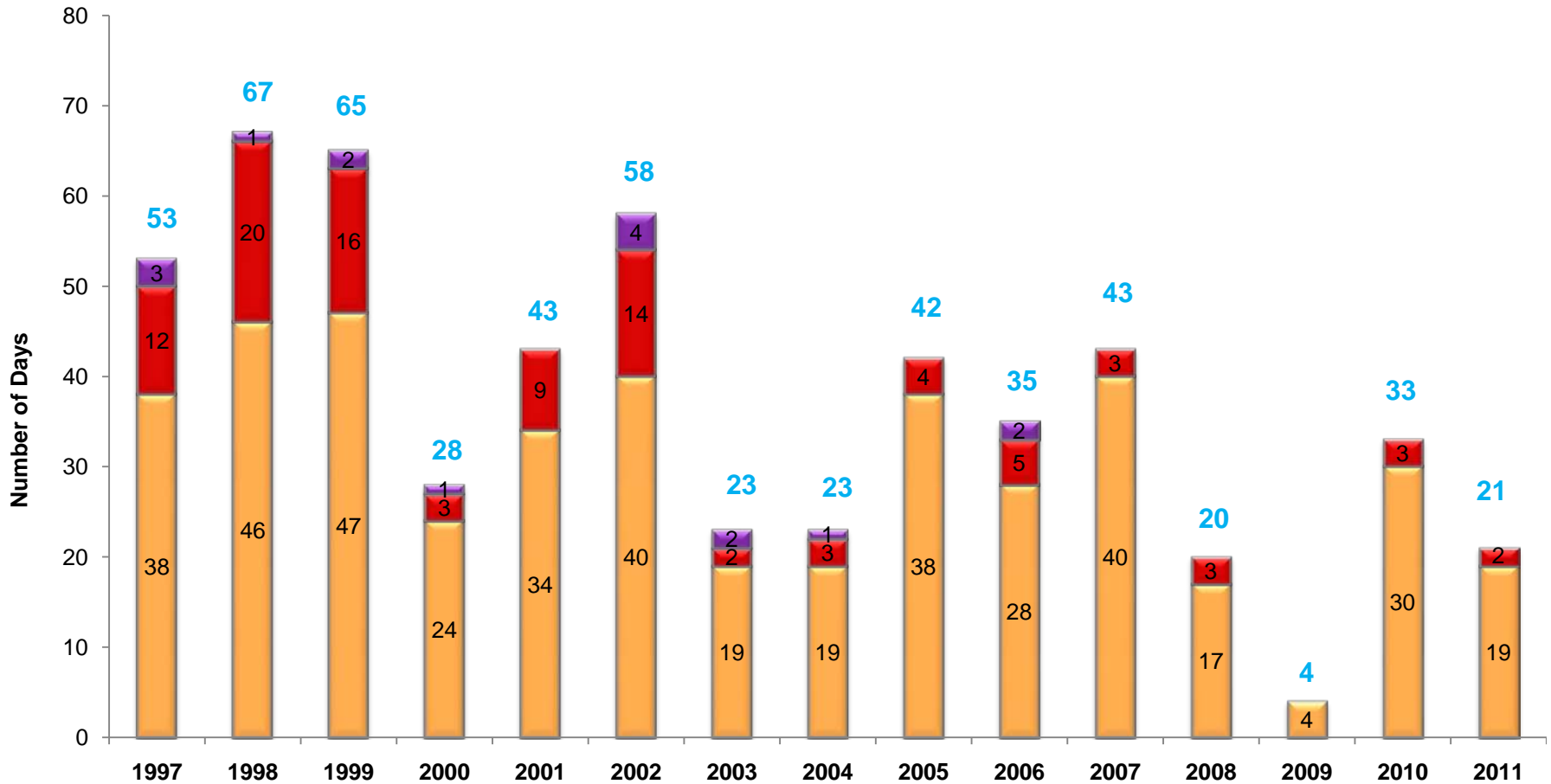
Date	# of Monitors Exceeding	Highest Monitor	Highest Conc (ppb)
7/5/2011	4	Prince George's Equestrian Center	85
7/7/2011	8	HU-Beltsville	94
7/18/2011	1	Prince George's Equestrian Center	80
7/20/2011	6	Ashburn	86
7/21/2011	1	Beltsville	78
7/22/2011	6	Prince George's Equestrian Center	90
7/23/2011	2	Southern Maryland	85
7/28/2011	2	McMillan Reservoir	81
7/29/2011	1	Prince George's Equestrian Center	77
8/1/2011	4	Southern Maryland	87
8/12/2011	1	Franconia	76

•Analysis is based on draft data until September 8, 2011. Data is subject to change.



Ozone Exceedance Trend

**Number of Exceedance Days - 2008 Ozone Standard (75 ppb)
Breakdown of Code Orange, Red, and Purple Days
1997 - 2011**

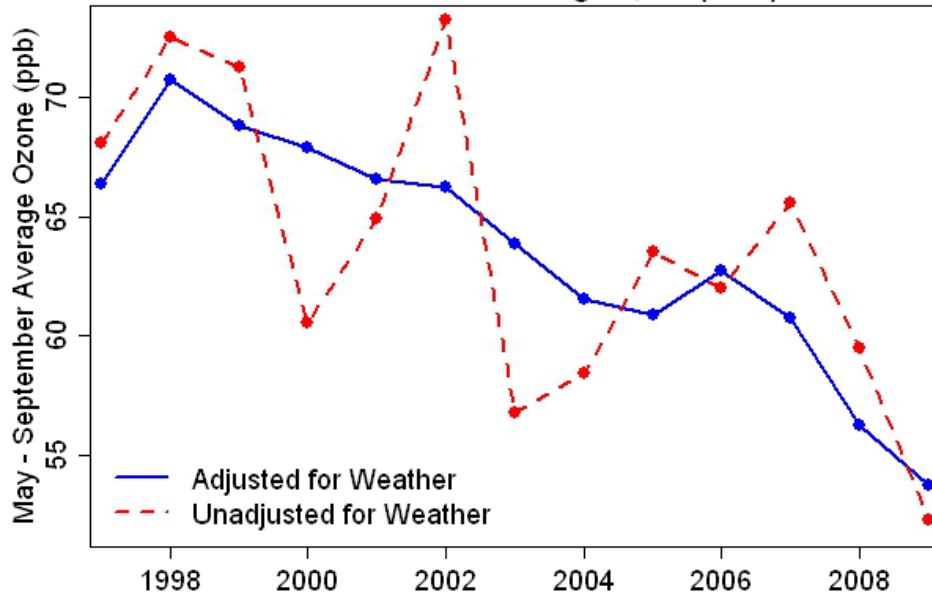


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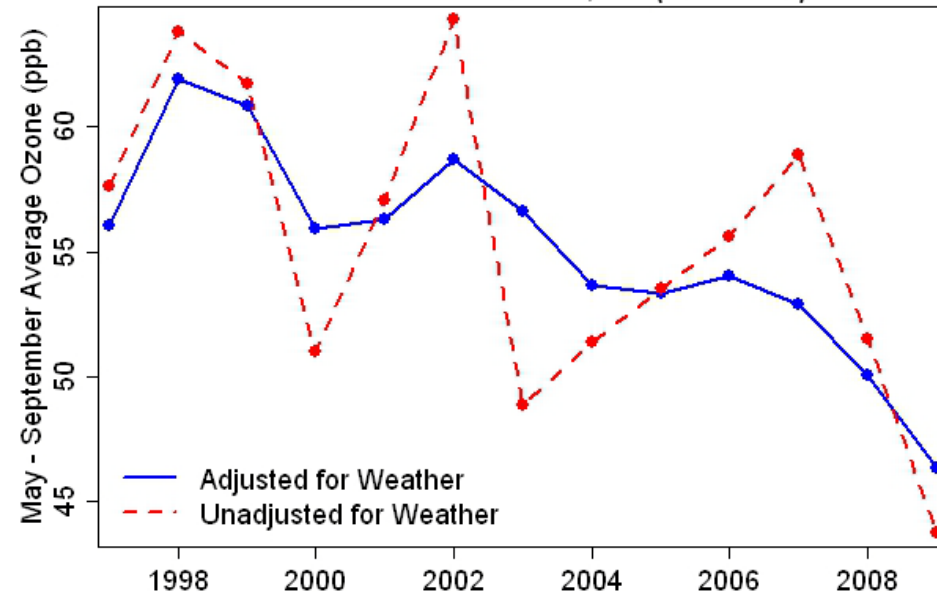


Meteorology Adjusted Ozone Trend

Ozone Trend for Washington, DC (AQS)



Ozone Trend for Beltsville, MD (CASTNET)

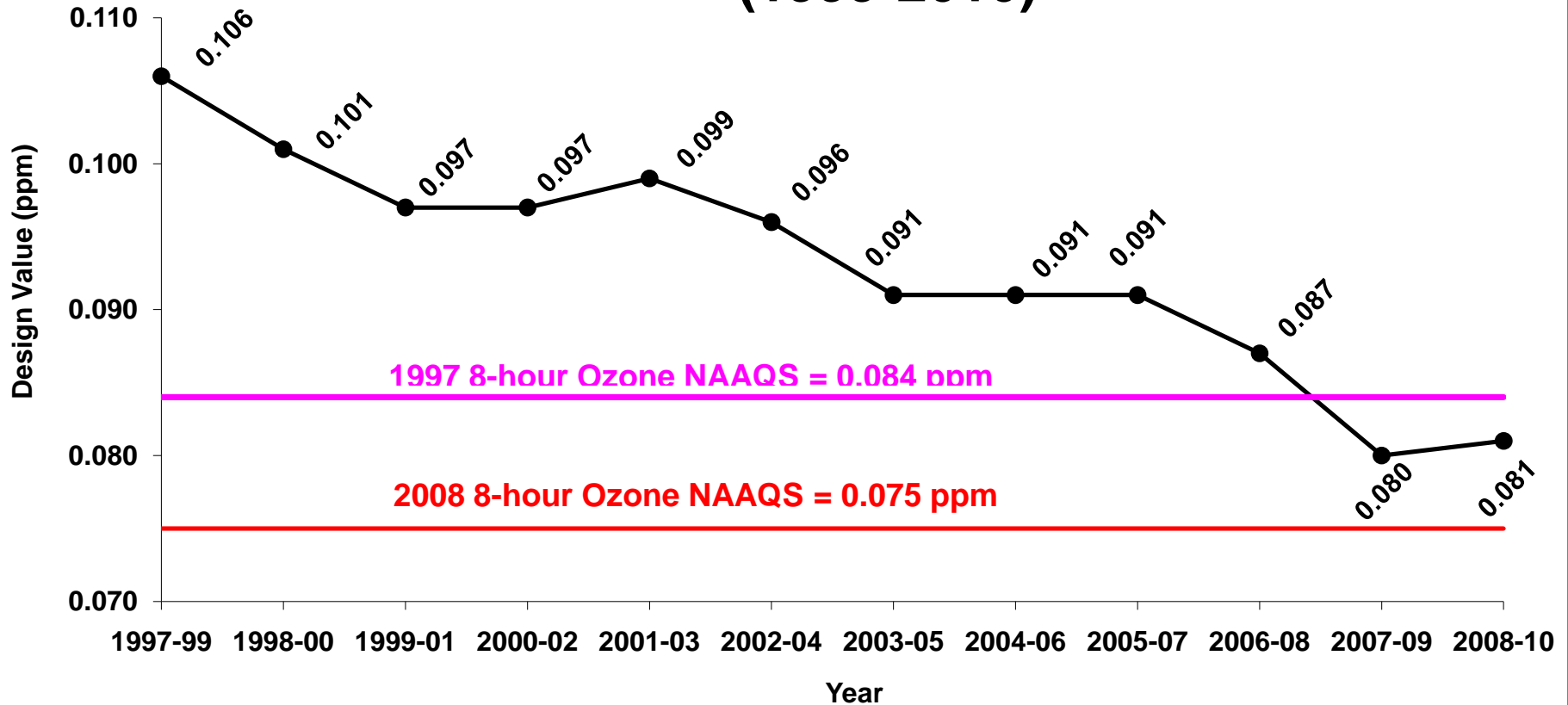


The timeseries for meteorology adjusted ozone shows a downward trend during 1998-2009. The downward trend in the urban area (Washington, DC) is more steady whereas the trend for a more rural site (Beltsville) shows more fluctuation along the downward trend.



Ozone Design Value Trend

8-hour Ozone Design Value Washington, DC-MD-VA Nonattainment Area (1999-2010)



* Design value = 3-year average of 4th highest daily maximum 8-hour average ozone concentrations. 2008-10 data is draft and may change.



Fine Particle Summary

[As of September 8, 2011]

Peak 24-hour PM_{2.5} (in µg/m³)

Data based on the 24-hour standard set at 35 µg/m³. Since April 15, 2011, there have been:

62 Code Yellow Days

84 Code Green Days

April						
Sun	Mon	Tues	Wed	Thurs	Fri	Sat
					1	2
3	4	5	6	7	8	9
					15	16
					11.3	7.3
17	18	19	20	21	22	23
6.3	12.8	17.3	13.8	8.3	7.7	8.7
24	25	26	27	28	29	30
14.1	13.9	8.9	8.2	10.4	7.8	6.7

June						
Sun	Mon	Tues	Wed	Thurs	Fri	Sat
			1	2	3	4
			33.3	9.5	6.5	12.2
5	6	7	8	9	10	11
18.1	19.0	21.8	28.8	31.5	30.7	25.5
12	13	14	15	16	17	18
16.0	7.6	8.3	7.3	15.5	10.5	12.6
19	20	21	22	23	24	25
18.6	15.1	17.8	15.3	13.3	7.2	11.9
26	27	28	29	30		
11.3	21.2	16.0	9.7	10.1		

August						
Sun	Mon	Tues	Wed	Thurs	Fri	Sat
	1	2	3	4	5	6
	17.2	15.0	31.2	22.5	13.7	16.1
7	8	9	10	11	12	13
20.4	20.2	24.3	16.1	16.9	16.1	25.2
14	15	16	17	18	19	20
14.2	5.2	12.0	13.3	16.5	14.0	14.0
21	22	23	24	25	26	27
13.5	6.0	7.2	12.9	16.3	16.2	14.2
28	29	30	31			
12.4	12.9	14.0	17.6			

May						
Sun	Mon	Tues	Wed	Thurs	Fri	Sat
1	2	3	4	5	6	7
9.7	12.0	14.1	6.1	7.8	10.1	10.4
8	9	10	11	12	13	14
12.2	9.1	8.0	9.6	14.5	15.1	10.2
15	16	17	18	19	20	21
9.8	11.8	10.7	9.2	8.4	14.4	10.3
22	23	24	25	26	27	28
15.3	20.5	16.1	17.5	24.4	15.2	9.1
29	30	31				
14.2	23.8	31.8				

July						
Sun	Mon	Tues	Wed	Thurs	Fri	Sat
					1	2
					11.4	18.4
3	4	5	6	7	8	9
21.0	16.8	21.1	23.3	20.9	19.8	16.3
10	11	12	13	14	15	16
19.3	20.5	16.2	20.6	7.4	7.6	8.1
17	18	19	20	21	22	23
10.7	20.6	26.7	28.2	35.3	28.6	23.2
24	25	26	27	28	29	30
24.8	17.4	12.0	9.1	19.8	24.7	12.9
31						
12.4						

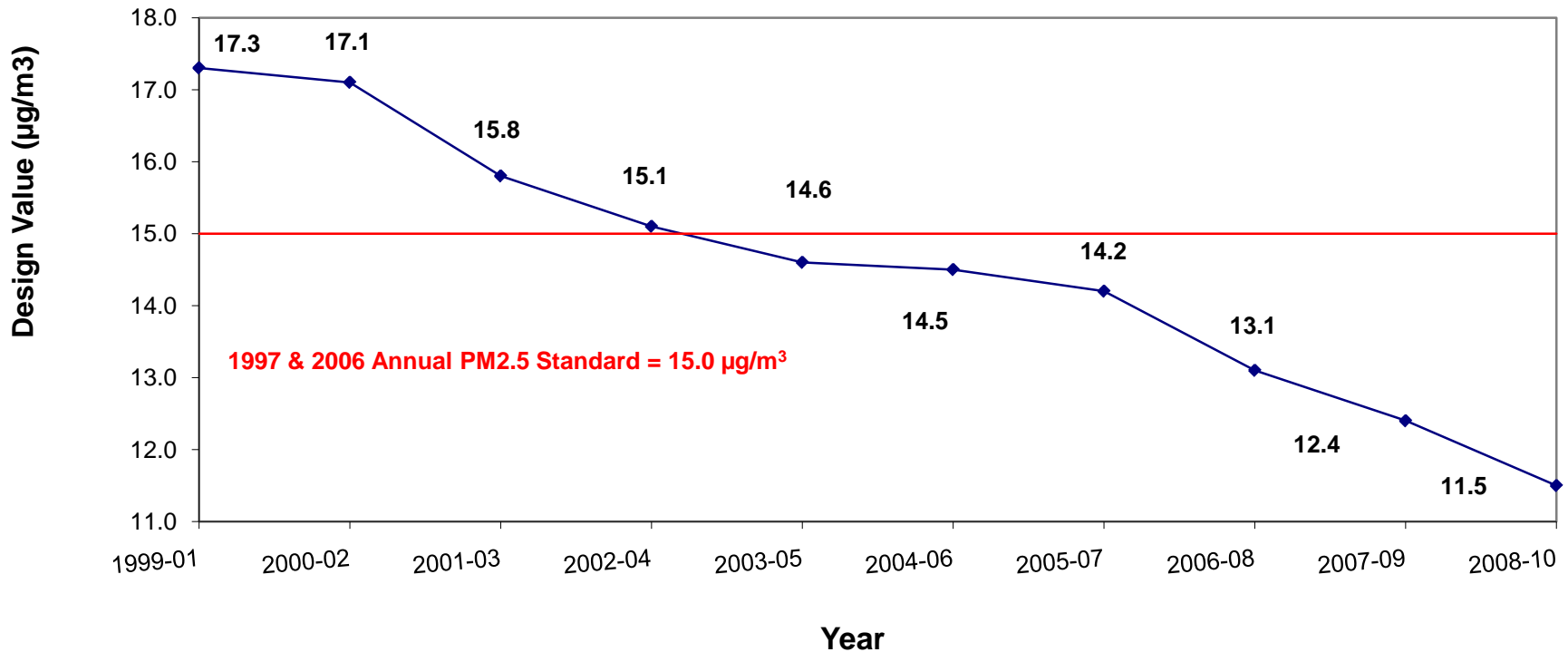
September						
Sun	Mon	Tues	Wed	Thurs	Fri	Sat
				1	2	3
				16.6	12.3	16.5
4	5	6	7	8	9	10
27.1	15.6	5.9	11.8			
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	

•Analysis is based on draft data until September 8, 2011. Data is subject to change.



Annual PM_{2.5} Design Value Trend

Annual PM_{2.5} Design Value
Washington, DC-MD-VA Nonattainment Area (1999-2010)



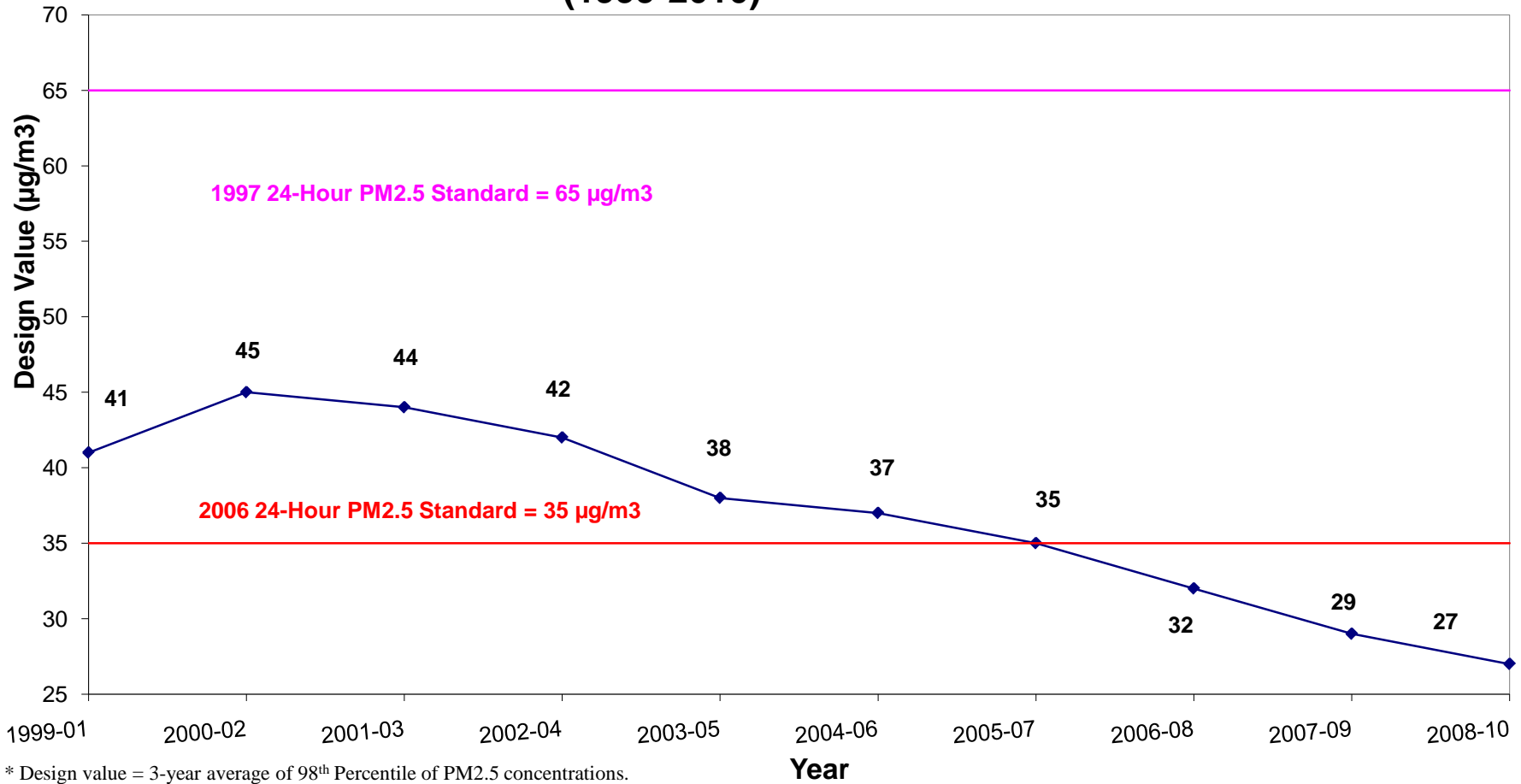
* Design value = 3-year average of annual mean PM_{2.5} concentrations.

* Design value = 3-year average of 98th Percentile of PM_{2.5} concentrations.



24-Hour PM_{2.5} Design Value Trend

**24-Hour PM_{2.5} Design Value
Washington, DC-MD-VA Nonattainment Area
(1999-2010)**



* Design value = 3-year average of 98th Percentile of PM_{2.5} concentrations.