



Ozone Season Summary

2015

Sunil Kumar

MWAQC Meeting

July 29, 2015



Ozone Season Summary

[As of July 23, 2015]

Peak 8-Hour Ozone Concentrations (ppb)

APRIL 2015						
MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY	SUNDAY
		1 51	2 62	3 46	4 46	5 53
6 57	7 45	8 39	9 37	10 42	11 58	12 60
13 60	14 43	15 53	16 58	17 51	18 65	19 58
20 48	21 52	22 54	23 50	24 55	25 48	26 52
27 47	28 50	29 61	30 60			

MAY 2015						
MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY	SUNDAY
				1 43	2 52	3 68
4 67	5 71	6 67	7 70	8 72	9 45	10 41
11 48	12 59	13 46	14 59	15 60	16 61	17 40
18 52	19 52	20 47	21 38	22 59	23 60	24 68
25 60	26 65	27 48	28 69	29 66	30 52	31 43

JUNE 2015						
MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY	SUNDAY
1 51	2 32	3 28	4 32	5 33	6 54	7 49
8 56	9 60	10 67	11 88	12 60	13 59	14 57
15 45	16 42	17 55	18 46	19 47	20 52	21 46
22 68	23 52	24 63	25 64	26 60	27 43	28 42
29 53	30 58					

JULY 2015						
MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY	SUNDAY
		1 60	2 46	3 62	4 54	5 52
6 39	7 62	8 41	9 39	10 60	11 57	12 71
13 50	14 54	15 56	16 60	17 48	18 55	19 62
20 68	21 54	22 56	23 67	24	25	26
27	28	29	30	31		

* Data based on the 8-hour standard set of 75 ppb. Since April 1, 2015, there have been

1 Code Orange Day, 36 Code Yellow Days, and 77 Code Green Days



Meteorology Factors on Exceedance Days

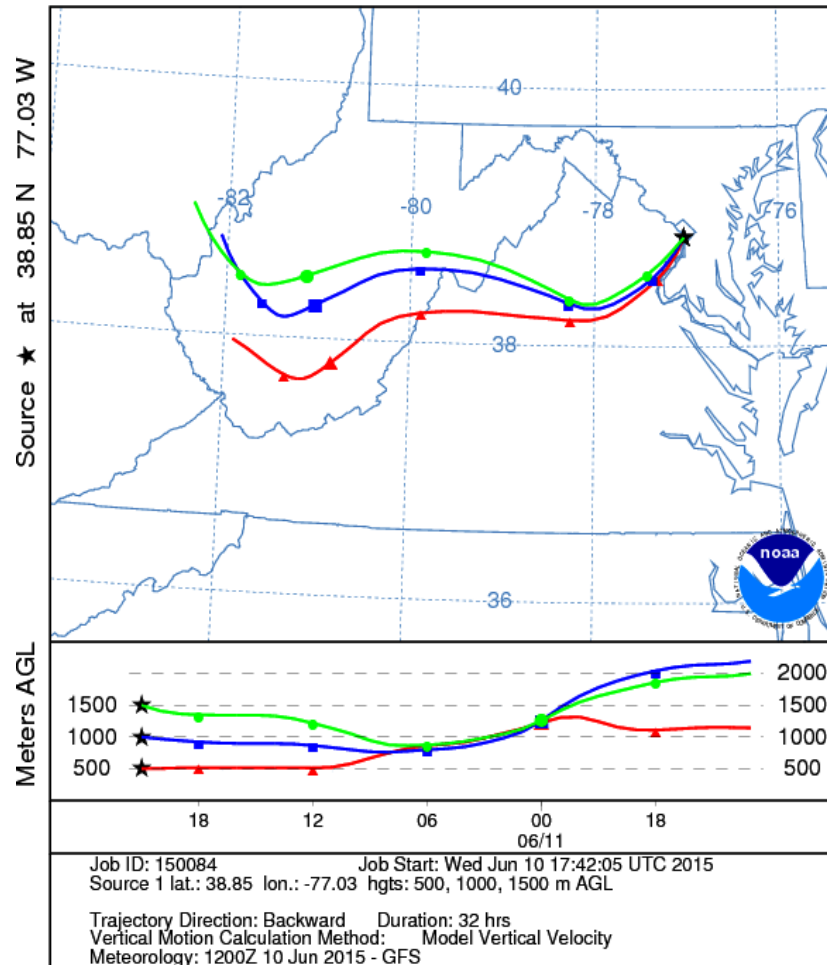
- June 10, 2015
 - High Temperature: 84°F
 - Light winds
 - Northwesterly winds brought ozone from the Ohio River Valley
 - Clear skies

- June 11, 2015
 - High Temperature: 93°F
 - Light winds
 - Westerly winds brought ozone from Ohio River Valley
 - Similar conditions during the prior two days caused ozone to build up
 - Clear skies
 - Canadian wildfire smoke



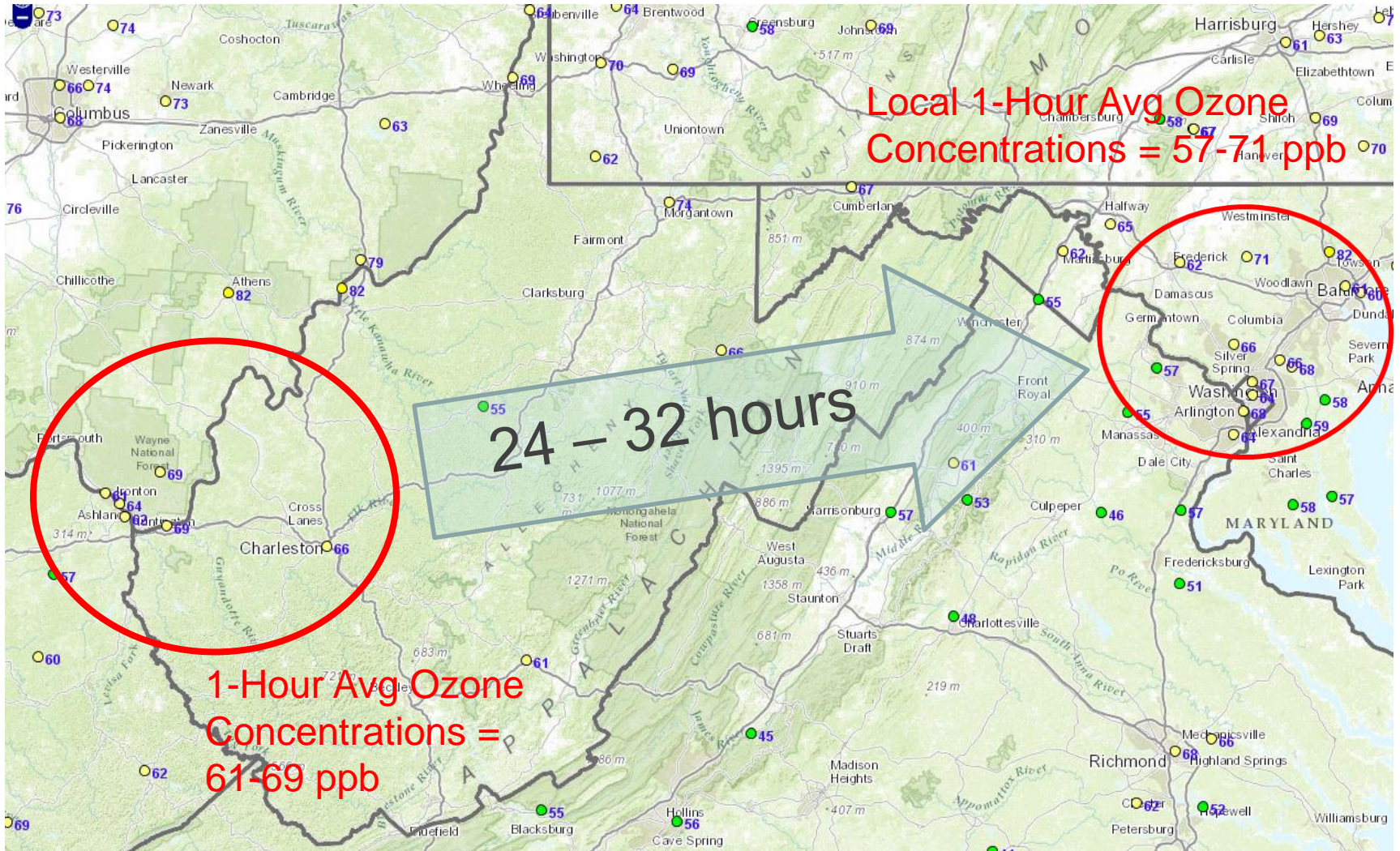
Wind Trajectories for 6/11

NOAA HYSPLIT MODEL
Backward trajectories ending at 2100 UTC 11 Jun 15
12 UTC 10 Jun GFSG Forecast Initialization





Ozone Concentration at 4 PM on June 10th





2014 Ozone Exceedances

Date	Monitors Exceeding	Highest Monitor	8-Hr Max (ppb)
6/11/15	6	HU-Beltsville	88

*Analysis is based on draft data as of July 23, 2015. Data is subject to change.

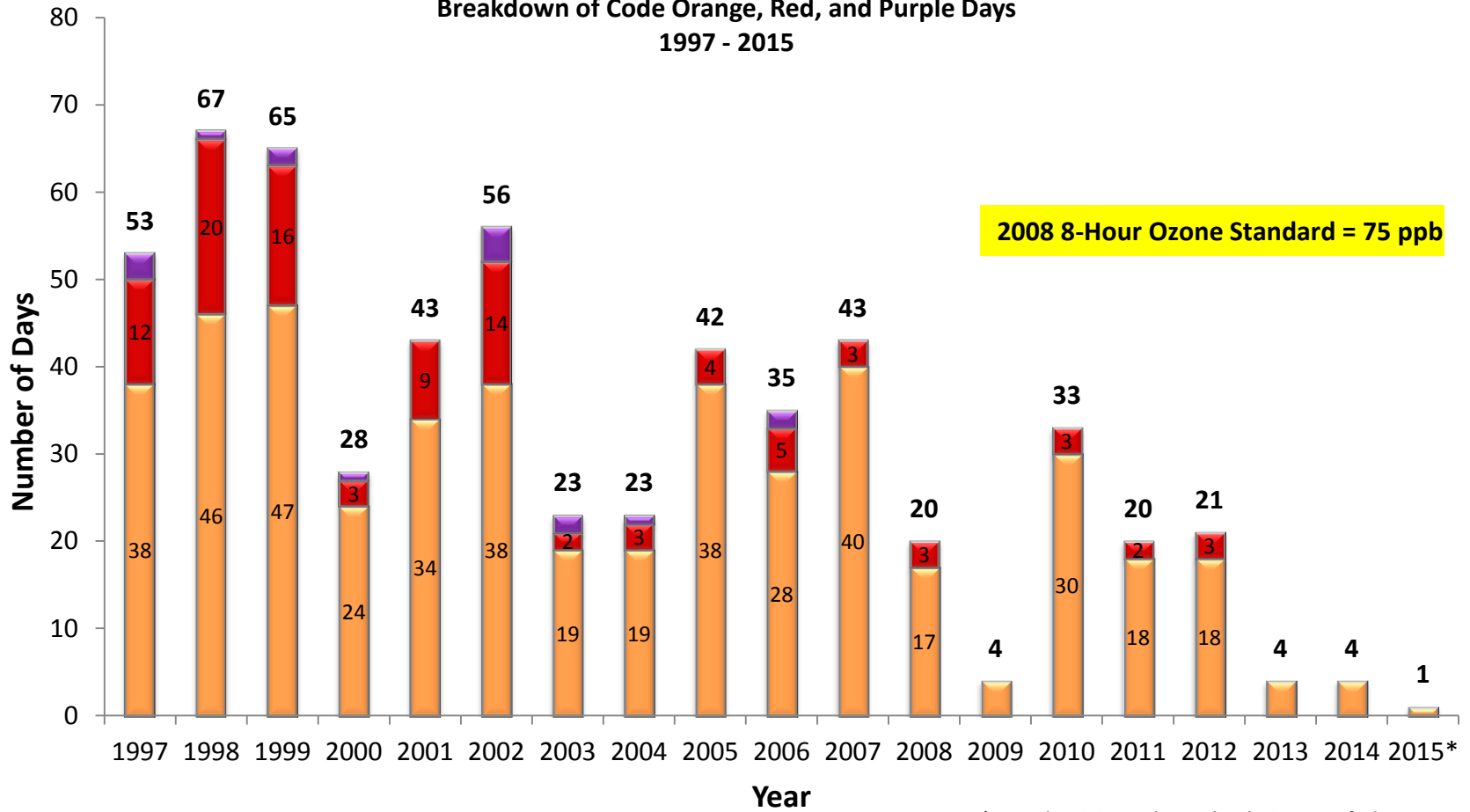


Ozone Exceedance Trend

Number of Exceedance Days for Ozone Under the 2008 8-Hour Ozone Standard

Breakdown of Code Orange, Red, and Purple Days
1997 - 2015

2008 8-Hour Ozone Standard = 75 ppb

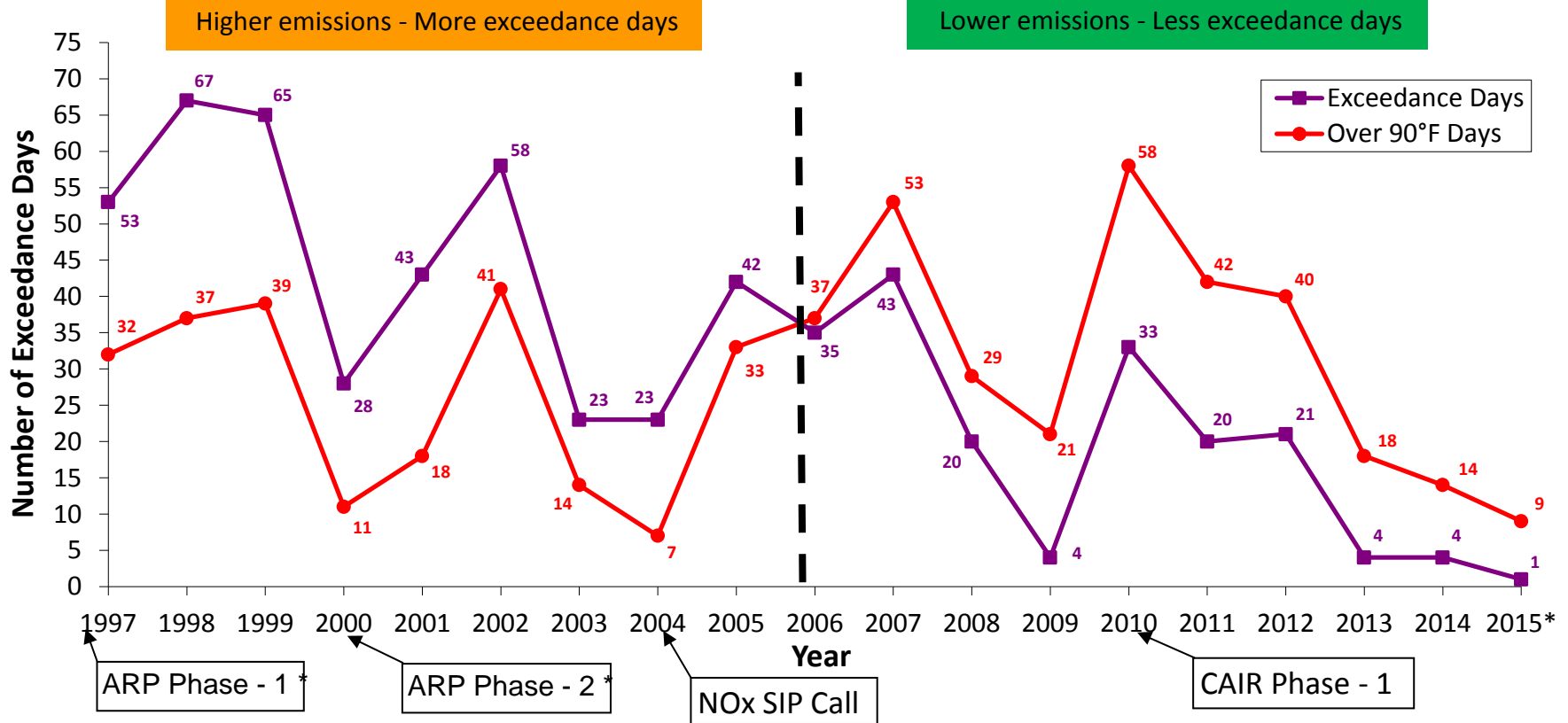


* 2015 data is incomplete and preliminary as of July 23, 2015



Trends of 90°F Days and Exceedance Days

Over 90°F Days (Dulles) and 8-hour Ozone Exceedance Days (2008 std)



* 2015 data is incomplete and preliminary as of July 23, 2015



Why Fewer Exceedance Days Now ?

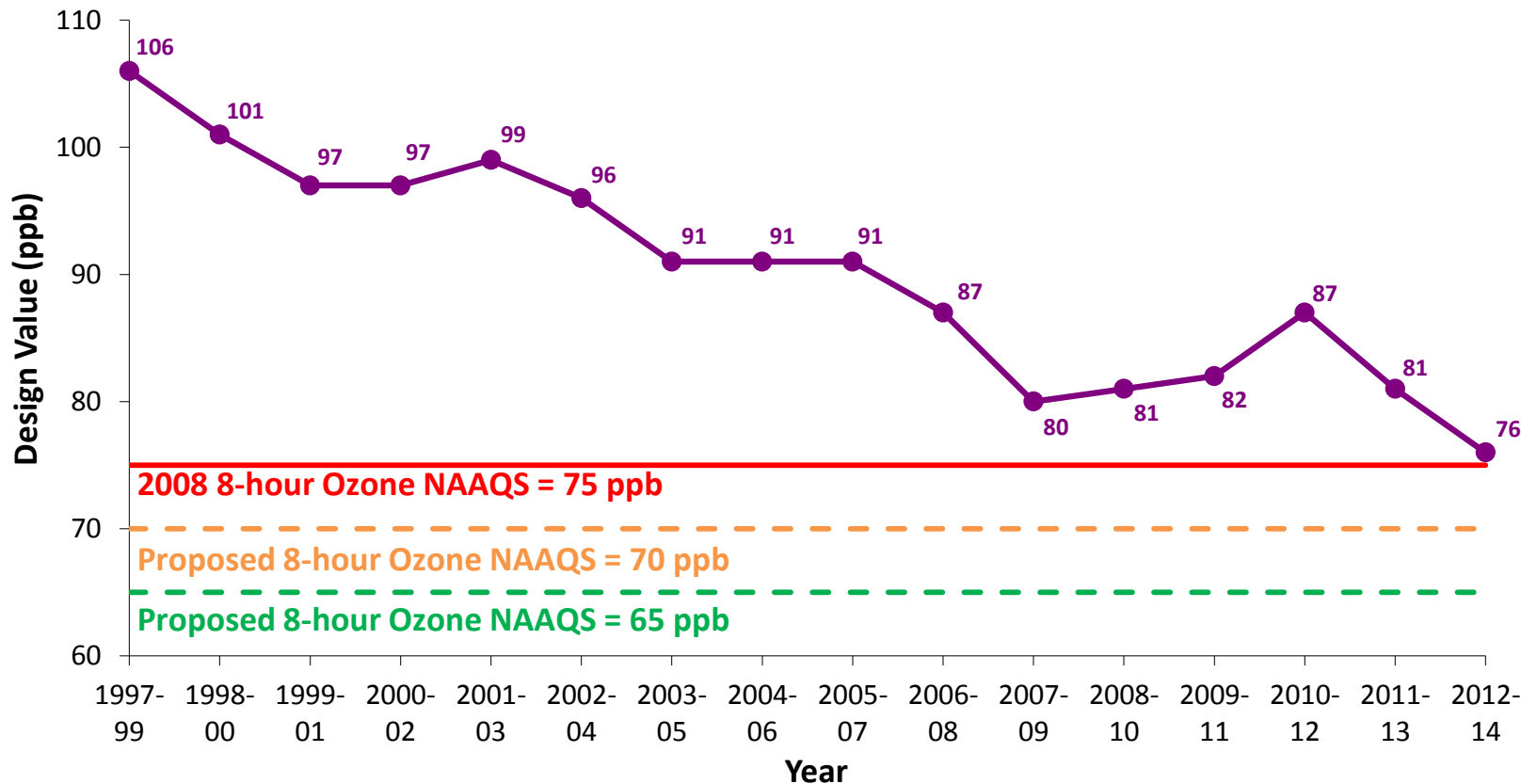
Emission Control Programs

Federal	State	Local
Acid Rain Program (1996/2000)	Vehicle Inspection and Maintenance Programs	Renewable Energy Programs Regional Wind Power Purchase Program Clean Energy Rewards Program Renewable Portfolio Standards
Tier 2 (LD Vehicle) Rule (2004)	MD Healthy Air Act (2009/2012)	Energy Efficiency Programs LED Traffic Signal Retrofit Program Building Energy Efficiency Programs
HD Diesel Vehicle Rule (2004/2007)	VA CSAPR Rule	VRE Idling Reduction
NOx SIP Call (2004)	DC CSAPR Rule	Low VOC Paint
Clean Air Interstate Rule/CSAPR (2009/2015)	Ozone Transport Commission Rules	Gas Can Replacement



Ozone Design Value Trend

8-hour Ozone Design Value for the DC-MD-VA Ozone Non-Attainment Area (1999-2014)

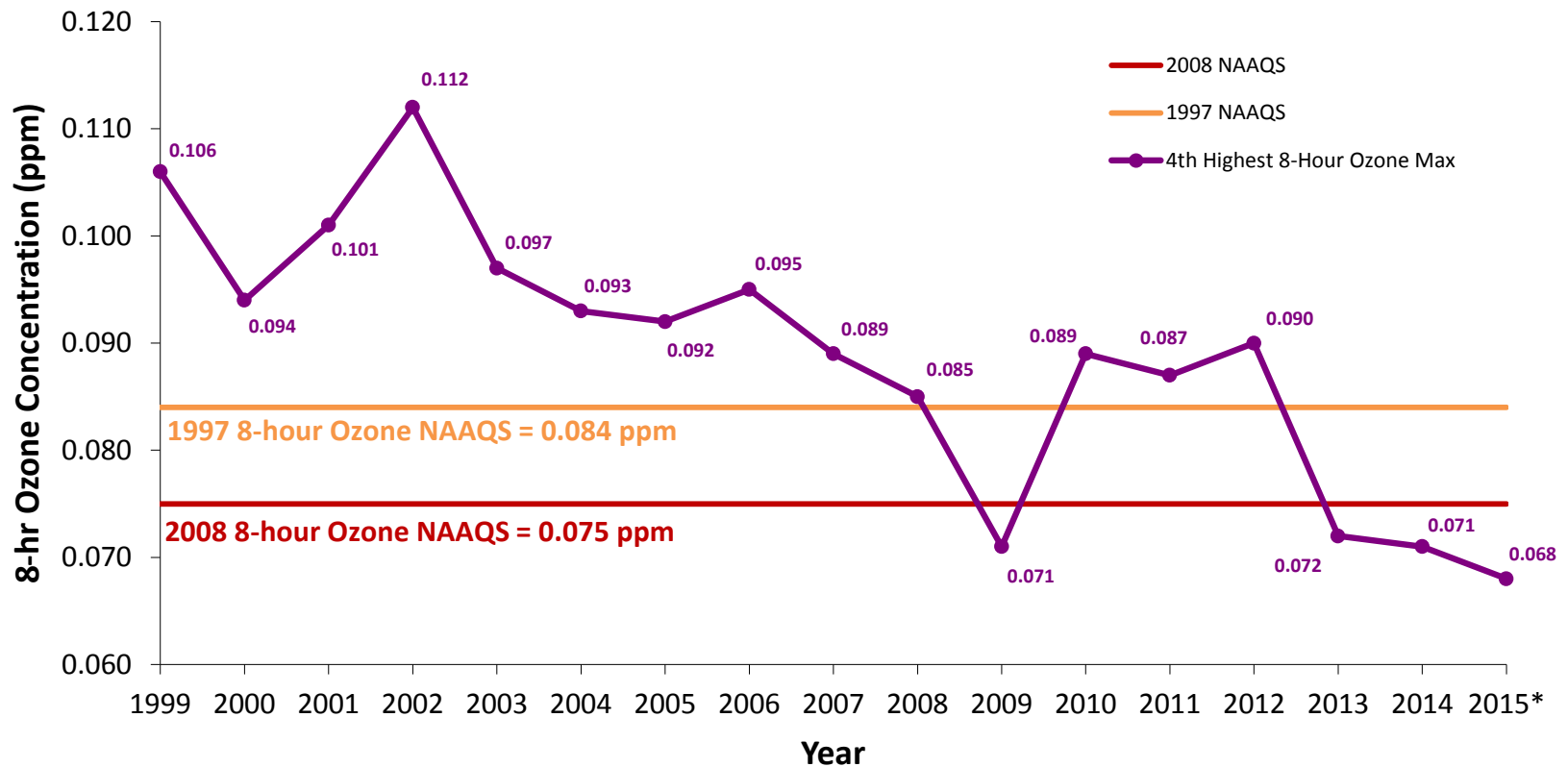


* The 8-Hour Ozone Design Value is the 3-year average of the 4th highest daily maximum 8-hour ozone concentrations



4th Highest Ozone Value Trend

4th Highest 8-hour Ozone Maximum Concentration for the DC-MD-VA Ozone Non-Attainment Area (1999-2014)



* 2015 data is incomplete and preliminary as of July 23, 2015



Fine Particle Summary

[As of July 23, 2015]

24-hour PM_{2.5} Concentrations (µg/m³)

APRIL 2015

MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY	SUNDAY
		1	2	3	4	5
		10.5	11.4	16.6	7.5	6.8
6	7	8	9	10	11	12
10.1	16.7	8.8	12.1	12.7	8.2	9.1
13	14	15	16	17	18	19
11.6	13.4	8.9	10.0	13.5	17.2	13.9
20	21	22	23	24	25	26
12.7	11.3	12.5	9.0	7.6	11.0	10.9
27	28	29	30			
10.9	11.0	13.2	16.3			

MAY 2015

MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY	SUNDAY
				1	2	3
				13.1	14.3	19.2
4	5	6	7	8	9	10
21.2	24.4	21.5	16.7	18.7	12.7	17.4
11	12	13	14	15	16	17
20.5	16.1	6.5	5.6	9.3	15.8	11.0
18	19	20	21	22	23	24
12.7	10.6	8.4	8.5	8.4	6.0	11.5
25	26	27	28	29	30	31
14.1	13.5	11.2	12.7	14.2	8.7	12.2

JUNE 2015

MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY	SUNDAY
1	2	3	4	5	6	7
9.7	4.7	6.8	7.7	6.5	9.9	9.6
8	9	10	11	12	13	14
10.0	11.5	24.6	32.5	17.2	14.2	13.9
15	16	17	18	19	20	21
10.5	8.8	10.5	9.1	14.0	11.7	8.1
22	23	24	25	26	27	28
10.3	15.0	6.0	11.2	12.6	5.7	5.1
29	30					
8.2	10.9					

JULY 2015

MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY	SUNDAY
		1	2	3	4	5
		20.5	22.1	21.9	29.2	20.1
6	7	8	9	10	11	12
12.4	20.2	17.8	10.9	12.1	15.5	17.2
13	14	15	16	17	18	19
16.5	10.1	6.1	6.7	11.6	10.1	14.2
20	21	22	23	24	25	26
11.5	13.0	9.1	9.6			
27	28	29	30	31		

* Data based on the 24-hour standard set at 35 µg/m³. Since April 1, 2015, there have been

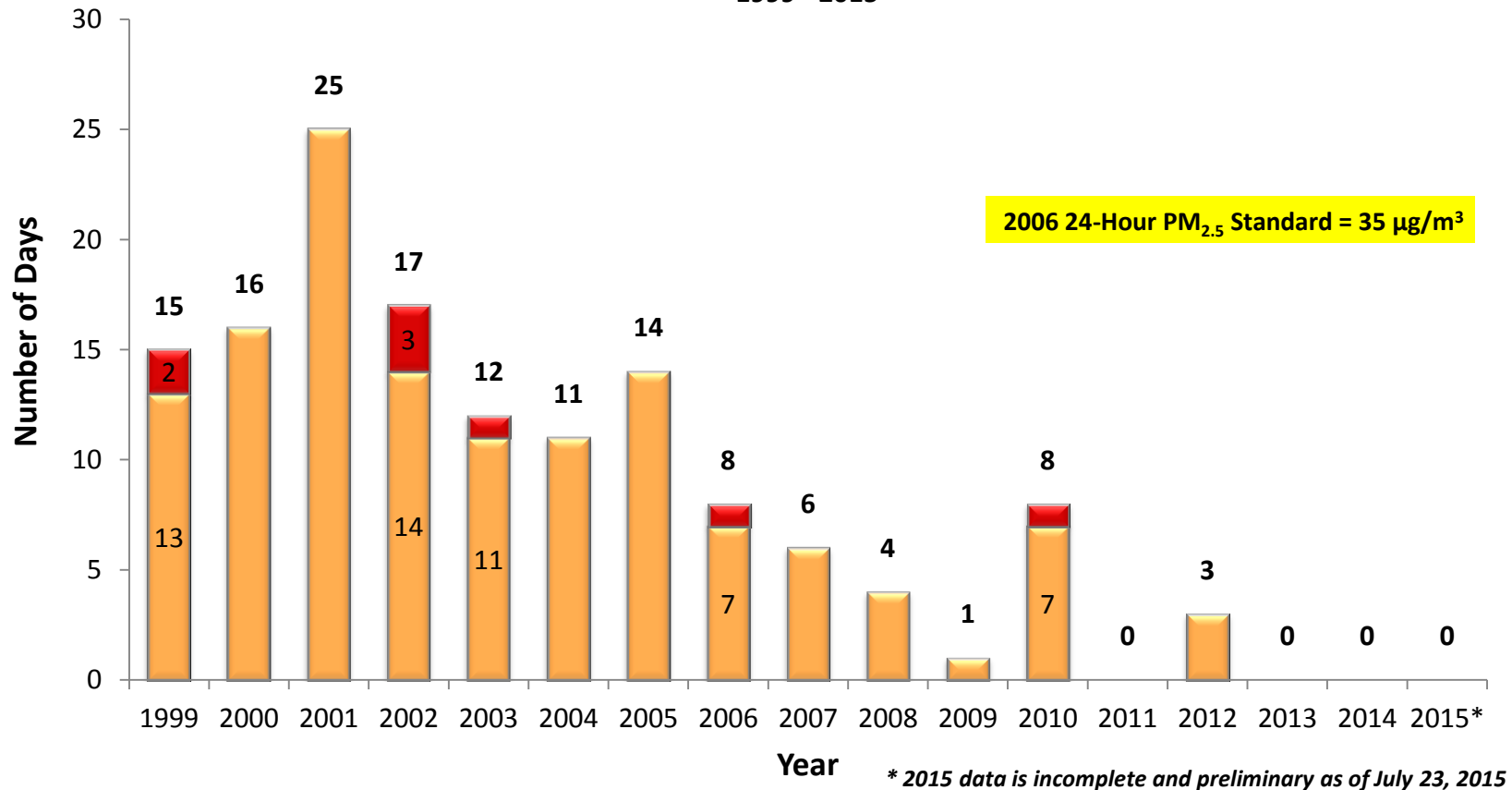
53 Code Yellow Days and 61 Code Green Days



PM_{2.5} Exceedance Trend

Number of Exceedance Days for PM_{2.5} Under the 2006 24-Hour PM_{2.5} Standard

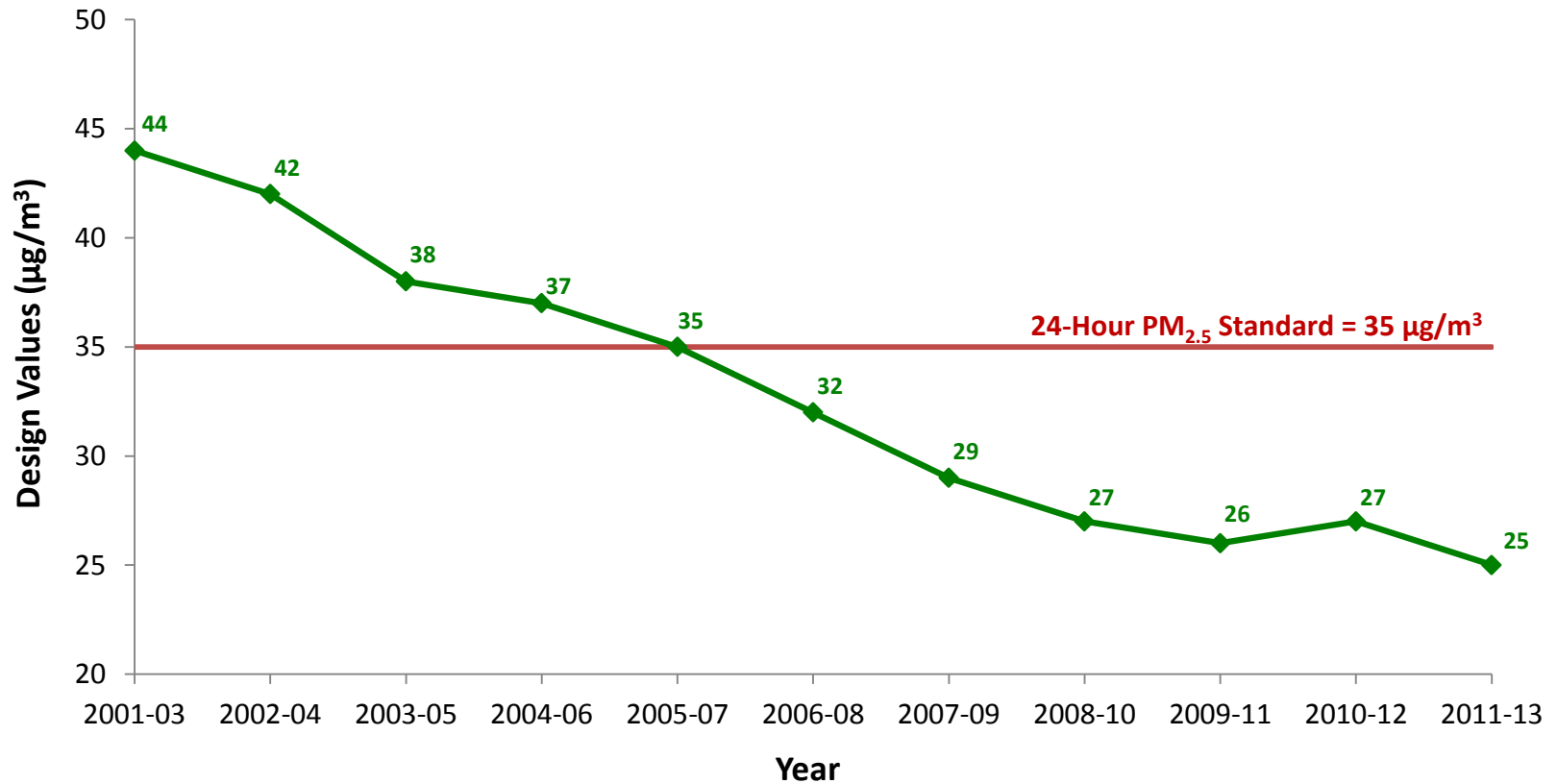
Breakdown of Code Orange and Red Days
1999 - 2015





24-Hour PM_{2.5} Design Value Trend

24-Hour PM_{2.5} Design Value
(Washington D.C. Region: 2003-2013)

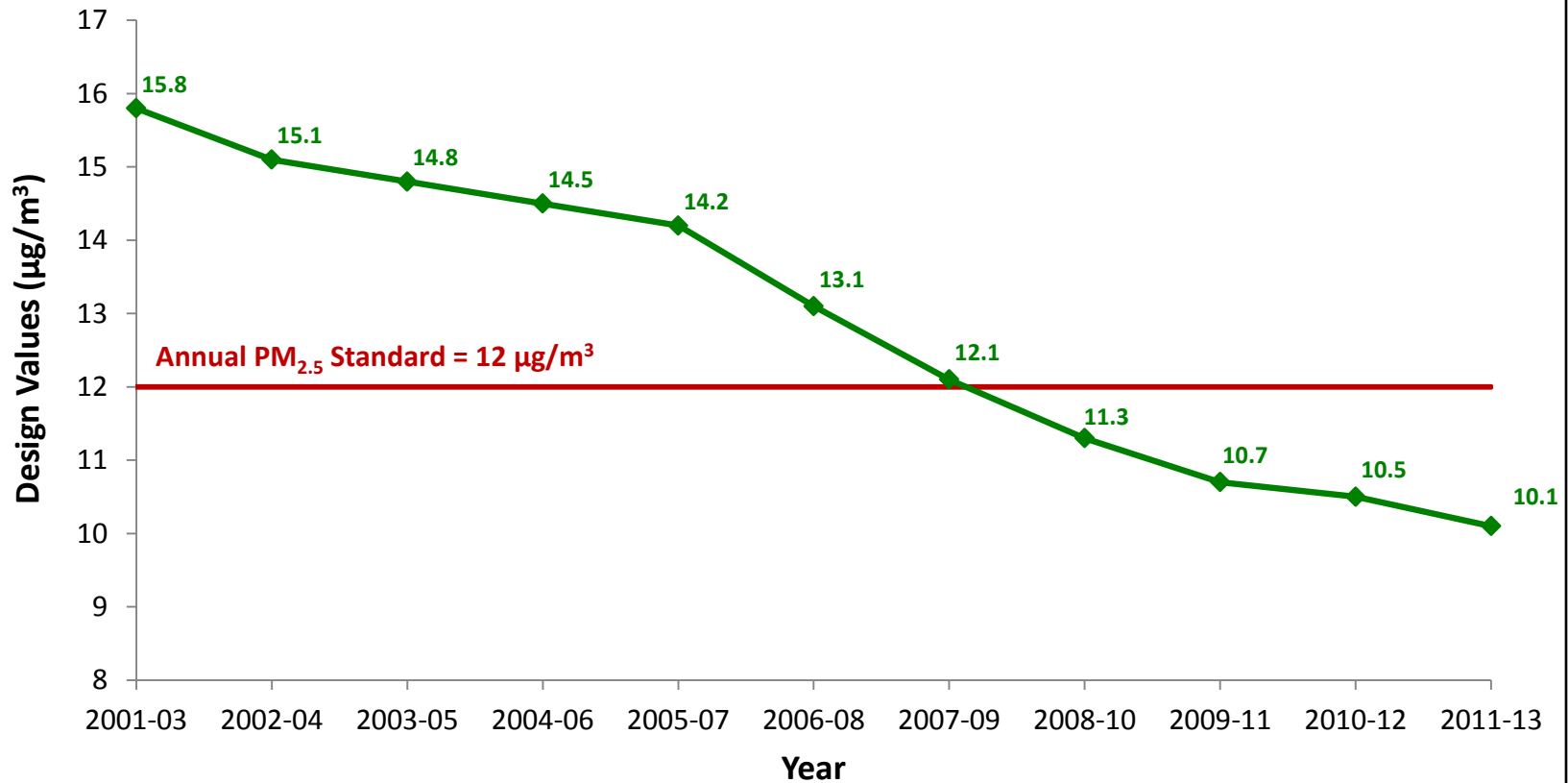


* The Annual PM_{2.5} Design Value is the 3-year average of the 98th percentile



Annual PM_{2.5} Design Value Trend

Annual PM_{2.5} Design Values
(Washington, D.C. Region: 2003-2013)



* The Annual PM_{2.5} Design Value is the 3-year average of the annual mean PM_{2.5} concentrations