



Ozone Season Summary

2015

Sunil Kumar

MWAQC-TAC Meeting

September 8, 2015



Ozone Season Summary

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 54
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 48	19 62
20 68	21 54	22 56	23 67	24 68	25 63	26 62
27 58	28 70	29 49	30 51	31 67		

AUGUST 2015						
MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY	SUNDAY
					1 67	2 54
3 62	4 64	5 73	6 55	7 53	8 55	9 55
10 37	11 52	12 48	13 55	14 75	15 75	16 67
17 68	18 59	19 44	20 39	21 63	22 60	23 69
24 62	25 64	26 57	27 53	28 62	29 62	30 61
31 62						

SEPTEMBER 2015						
MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY	SUNDAY
	1 72	2 77	3 68	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30				

* Since April 1, 2015, there have been 2 Code Orange Days, 60 Code Yellow Days, and 94 Code Green Days

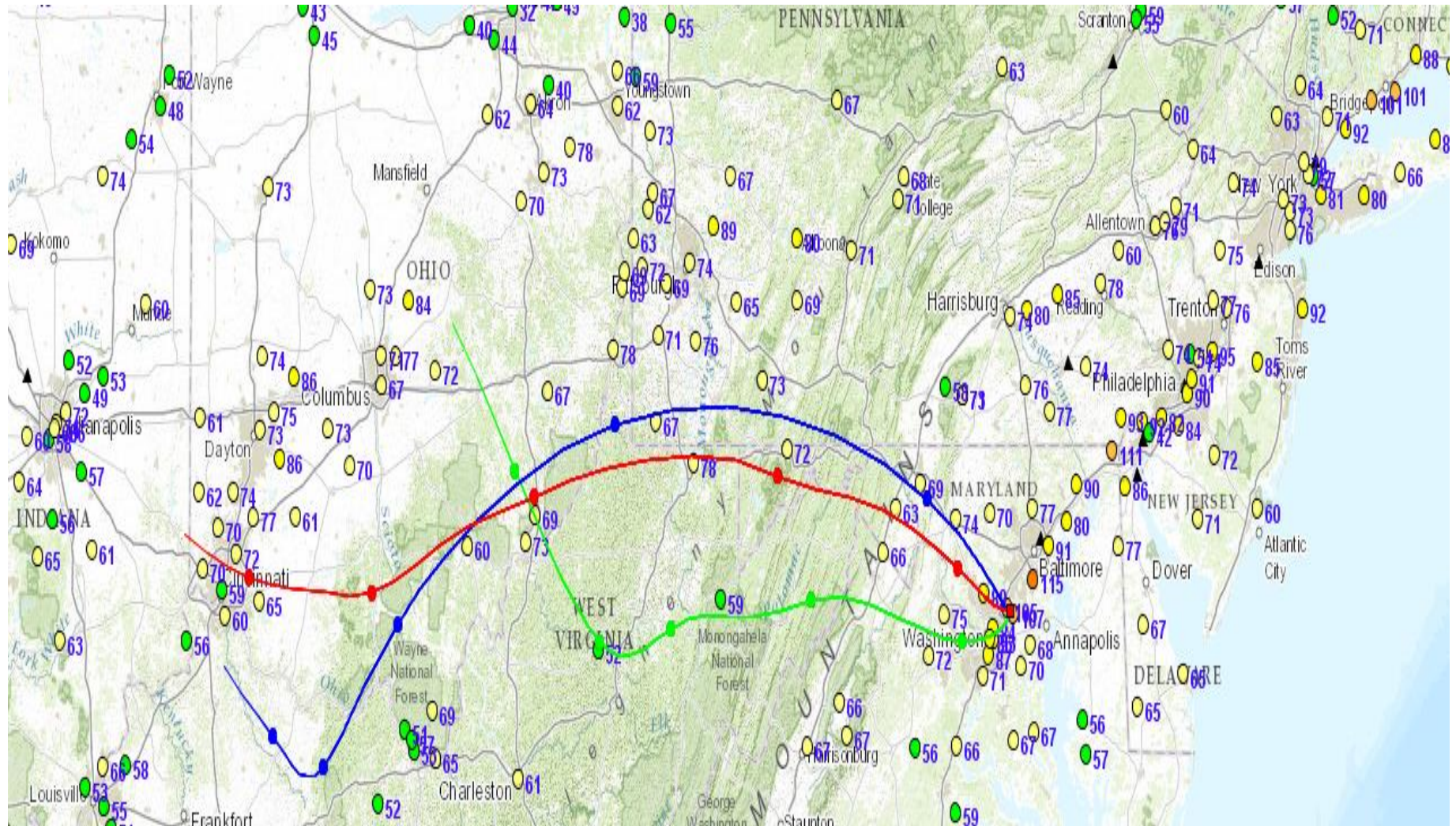


Meteorology Factors on Exceedance Days

- June 11 & September 2
 - High Temperatures: 92°F/93°F
 - Light winds
 - Westerly winds brought ozone from Ohio River Valley
 - Similar conditions during the previous day caused ozone to build up
 - Clear skies
 - Recirculation (September 2)
 - Canadian wildfire smoke (June 11 only)

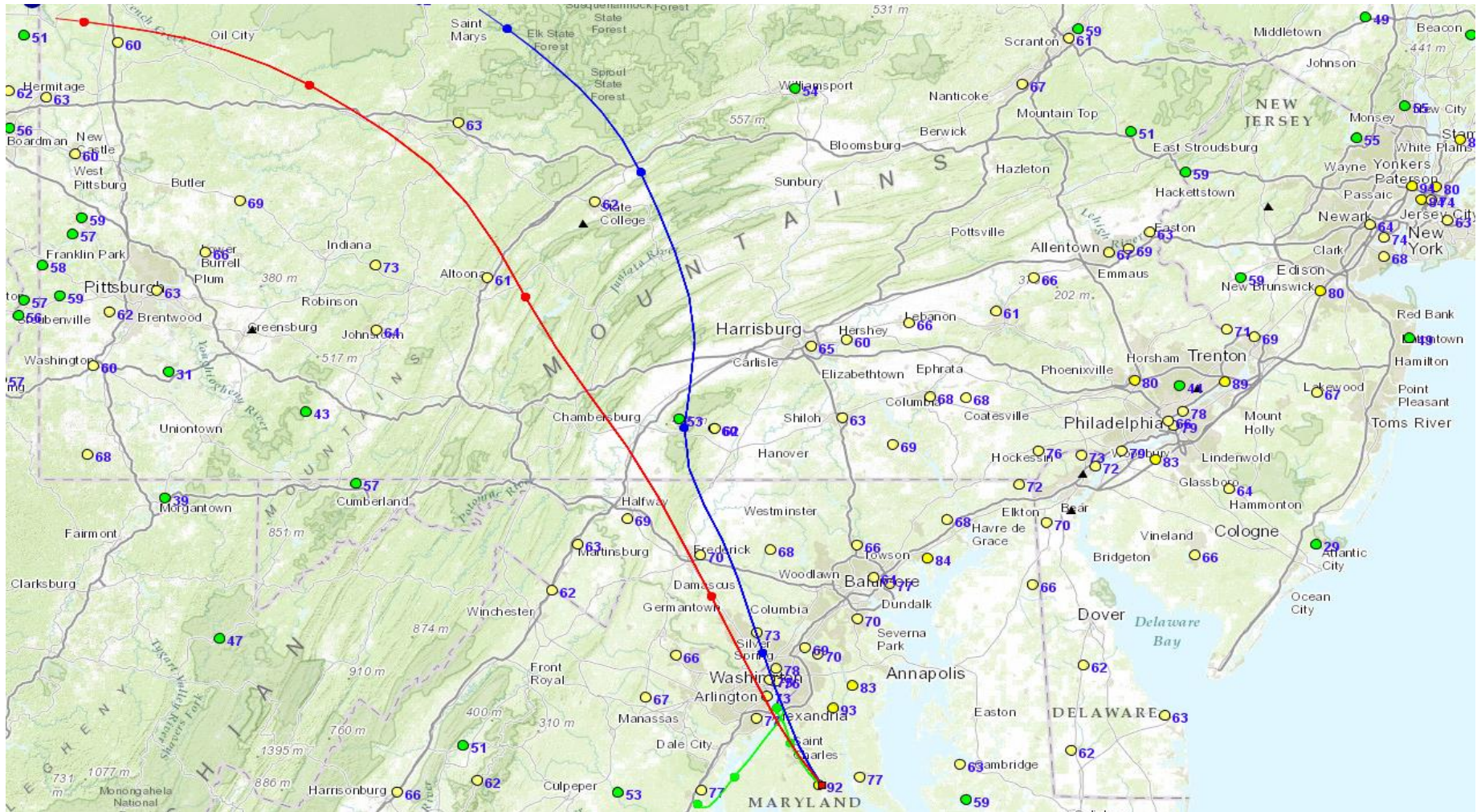


Wind Trajectories (June 11)





Wind Trajectories (September 2)





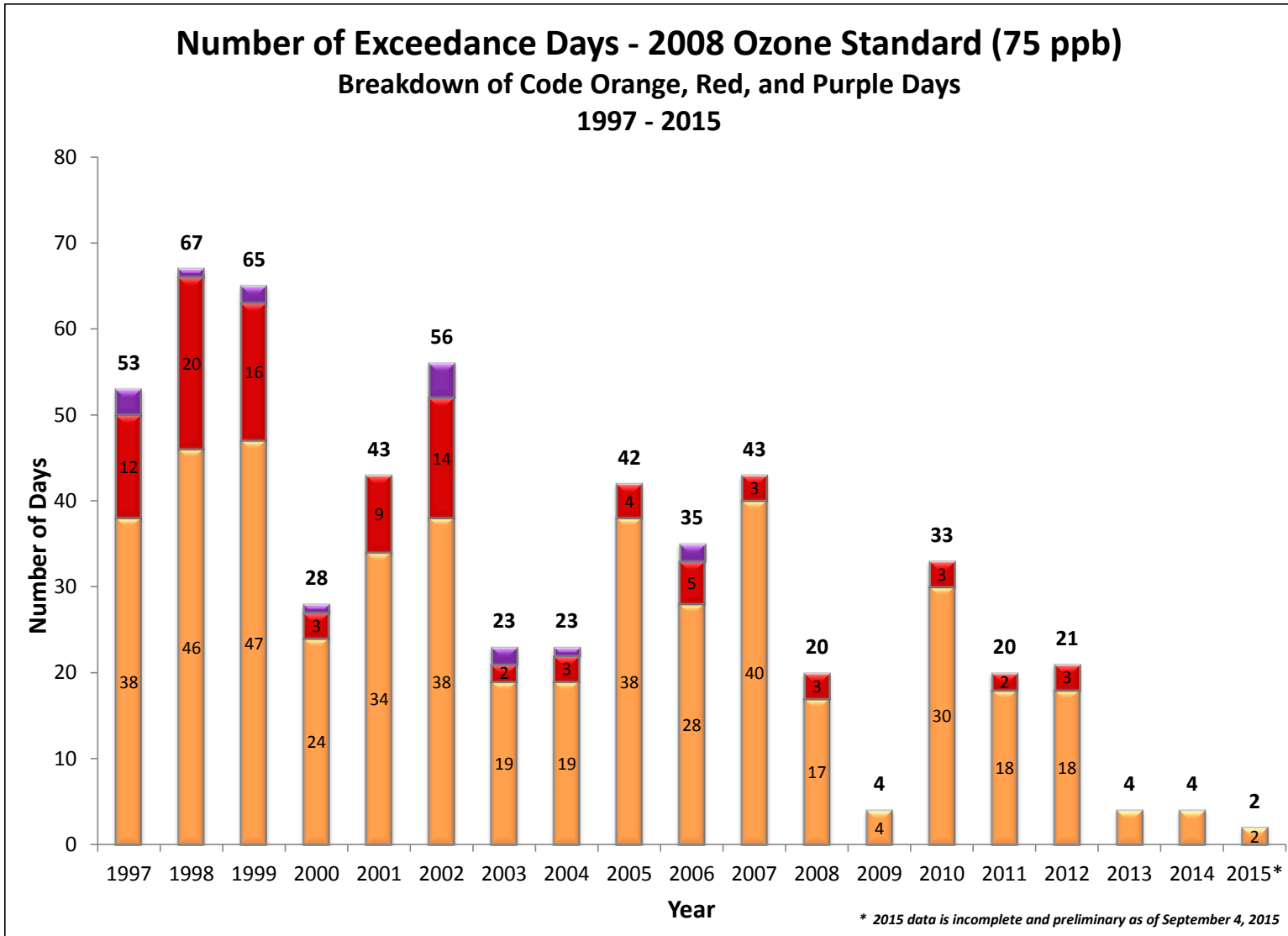
2014 Ozone Exceedances

Date	Monitors Exceeding	Highest Monitor	8-Hr Max (ppb)
6/11/15	6	HU-Beltsville	88
9/2/2015	1	Southern Maryland	77

*Analysis is based on draft data as of September 4, 2015. Data is subject to change.

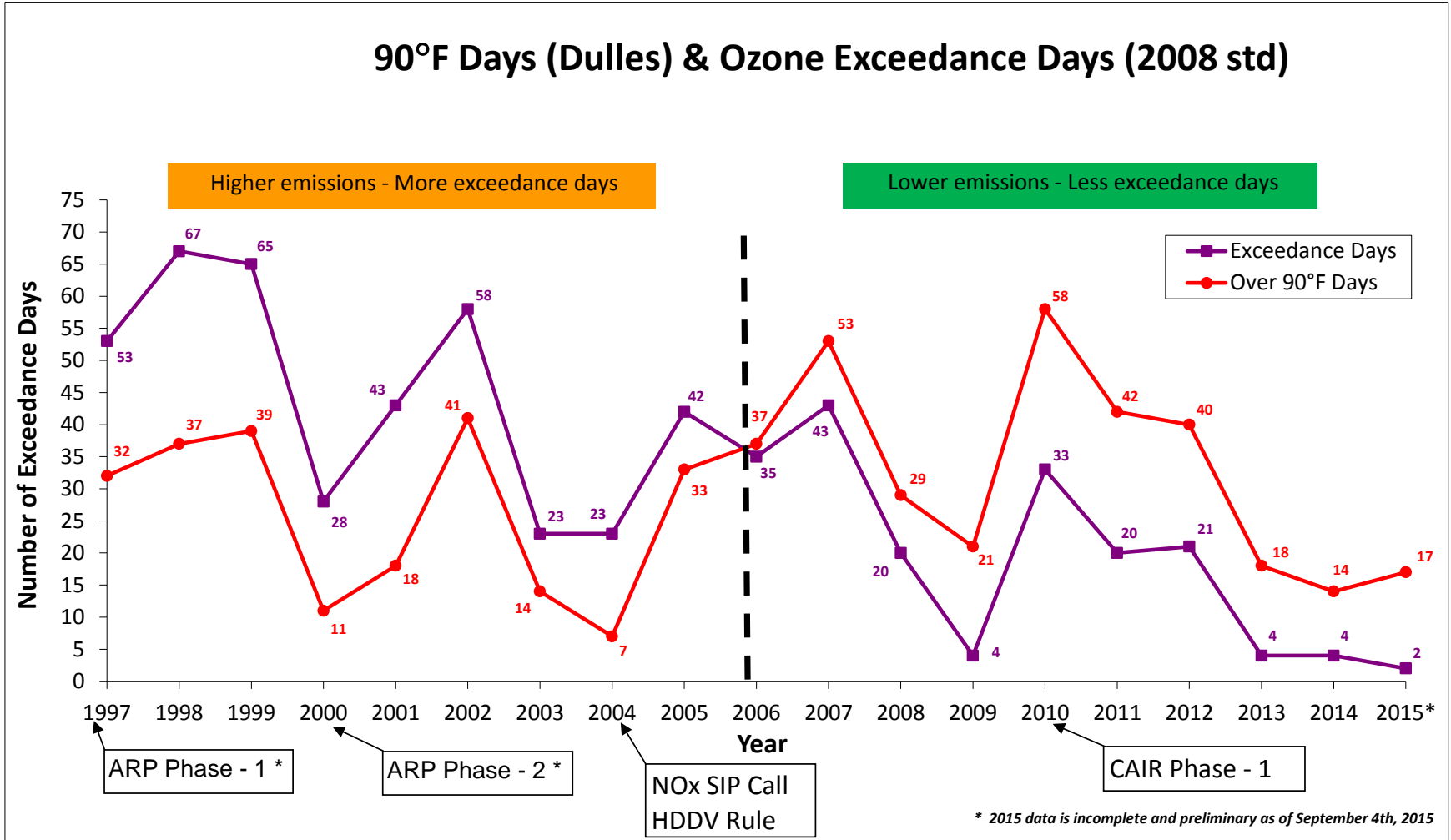


Ozone Exceedance Trend





Trends of 90°F Days and Exceedance Days





Why Fewer Exceedance Days Now ?

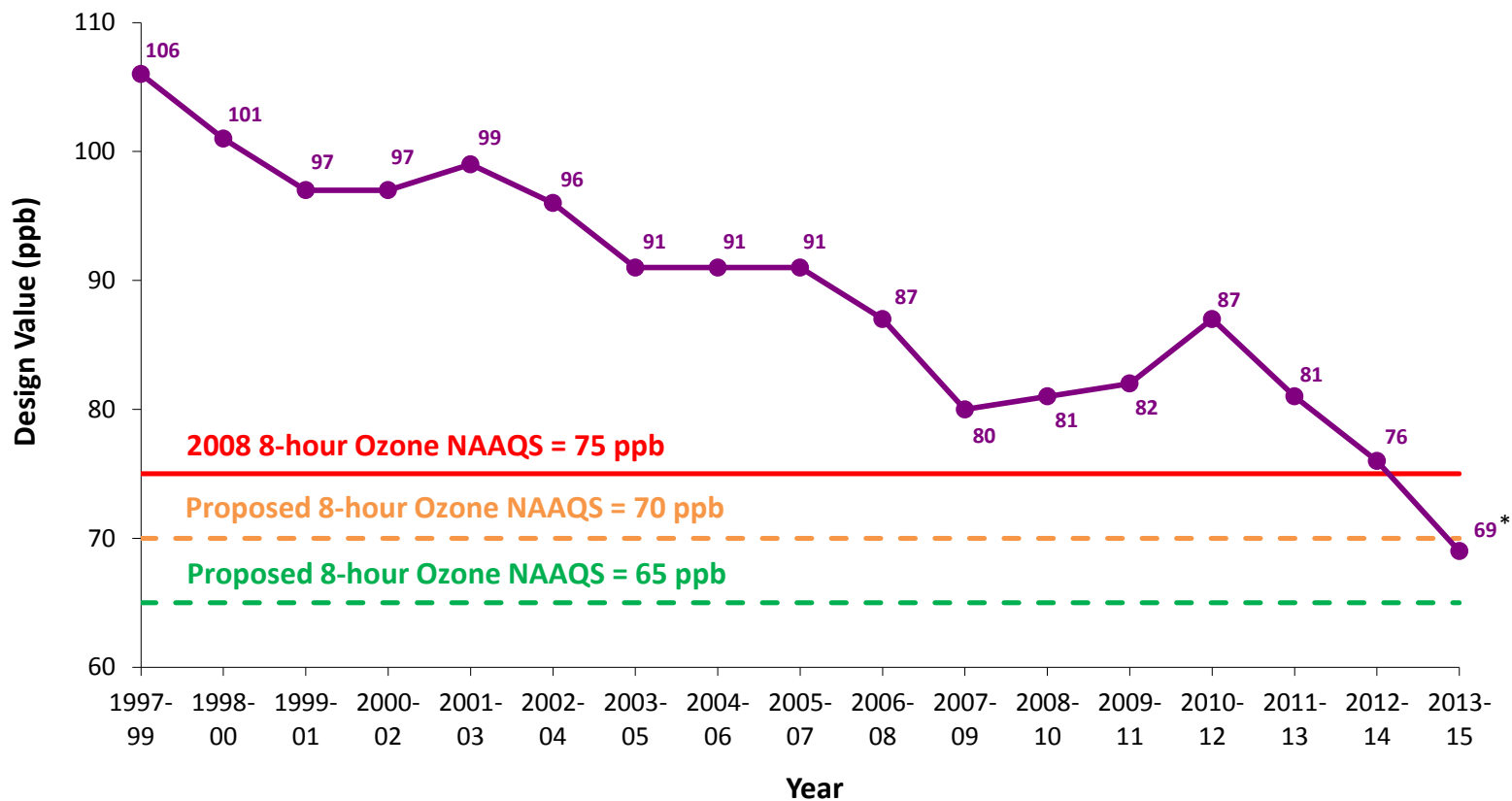
Emission Control Programs

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 Washington, DC-MD-VA Ozone Nonattainment Area (1999-2015)



* Design value = 3-year average of 4th highest daily maximum 8-hour average ozone concentrations.

* 2015 design value is preliminary and based on incomplete data as of September 4, 2015.



Fine Particle Summary

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

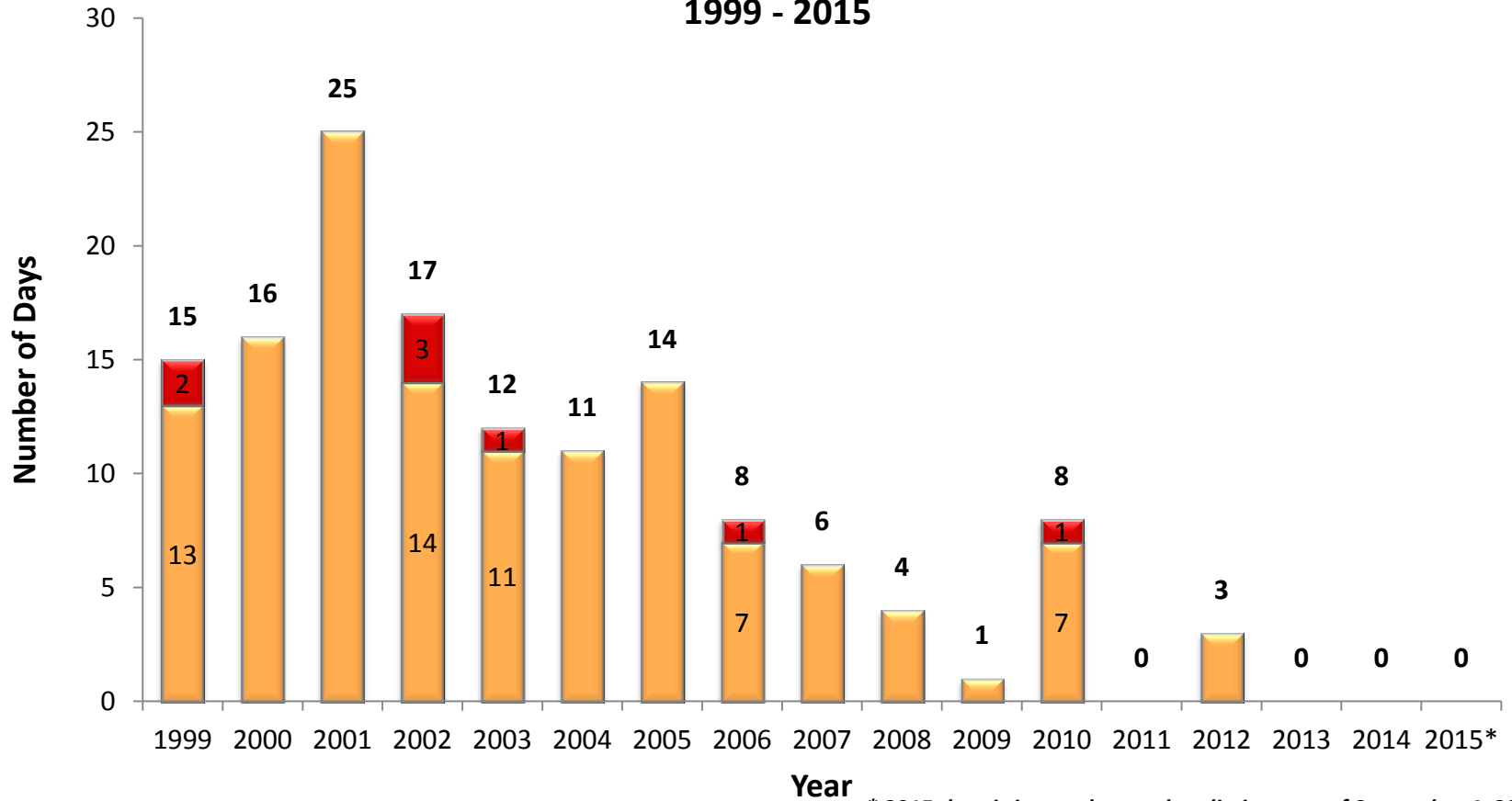
APRIL 2015							MAY 2015							JUNE 2015						
MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY	SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY	SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY	SUNDAY
		1 10.5	2 11.4	3 16.6	4 7.5	5 6.8					1 13.1	2 14.3	3 19.2	1 9.7	2 4.7	3 6.8	4 7.7	5 6.5	6 9.9	7 9.6
6 10.1	7 16.7	8 8.8	9 12.1	10 12.7	11 8.2	12 9.1	4 21.2	5 24.4	6 21.5	7 16.7	8 18.7	9 12.7	10 17.4	8 10.0	9 11.5	10 24.6	11 32.5	12 17.2	13 14.2	14 13.9
13 11.6	14 13.4	15 8.9	16 10.0	17 13.5	18 17.2	19 13.9	11 20.5	12 16.1	13 6.5	14 5.6	15 9.3	16 15.8	17 11.0	15 10.5	16 8.8	17 10.5	18 9.1	19 14.0	20 11.7	21 8.1
20 12.7	21 11.3	22 12.5	23 9.0	24 7.6	25 11.0	26 10.9	18 12.7	19 10.6	20 8.4	21 8.5	22 8.4	23 6.0	24 11.5	22 10.3	23 15.0	24 6.0	25 11.2	26 12.6	27 5.7	28 5.1
27 10.9	28 11.0	29 13.2	30 16.3				25 14.1	26 13.5	27 11.2	28 12.7	29 14.2	30 8.7	31 12.2	29 8.2	30 10.9					
JULY 2015							AUGUST 2015							SEPTEMBER 2015						
MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY	SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY	SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY	SUNDAY
		1 20.5	2 22.1	3 21.9	4 29.2	5 20.1						1 11.4	2 12.4		1 18.1	2 26.7	3 21.7	4	5	6
6 12.4	7 20.2	8 17.8	9 10.9	10 12.1	11 15.5	12 17.2	3 10.7	4 11.3	5 10.9	6 10.7	7 10.8	8 9.0	9 10.2	7	8	9	10	11	12	13
13 16.5	14 10.1	15 6.1	16 6.7	17 11.6	18 10.1	19 14.2	10 9.3	11 10.9	12 6.8	13 5.9	14 9.3	15 12.5	16 15.8	14	15	16	17	18	19	20
20 11.5	21 13.0	22 9.1	23 9.6	24 9.7	25 13.9	26 13.7	17 14.1	18 17.1	19 12.4	20 9.2	21 7.4	22 8.7	23 8.7	21	22	23	24	25	26	27
27 14.2	28 17.2	29 10.6	30 12.9	31 10.4			24 12.7	25 9.7	26 10.0	27 8.8	28 11.4	29 12.6	30 15.7	28	29	30				
							31 17.2													

* Since April 1, 2015, there have been 72 Code Yellow Days and 84 Code Green Days



PM_{2.5} Exceedance Trend

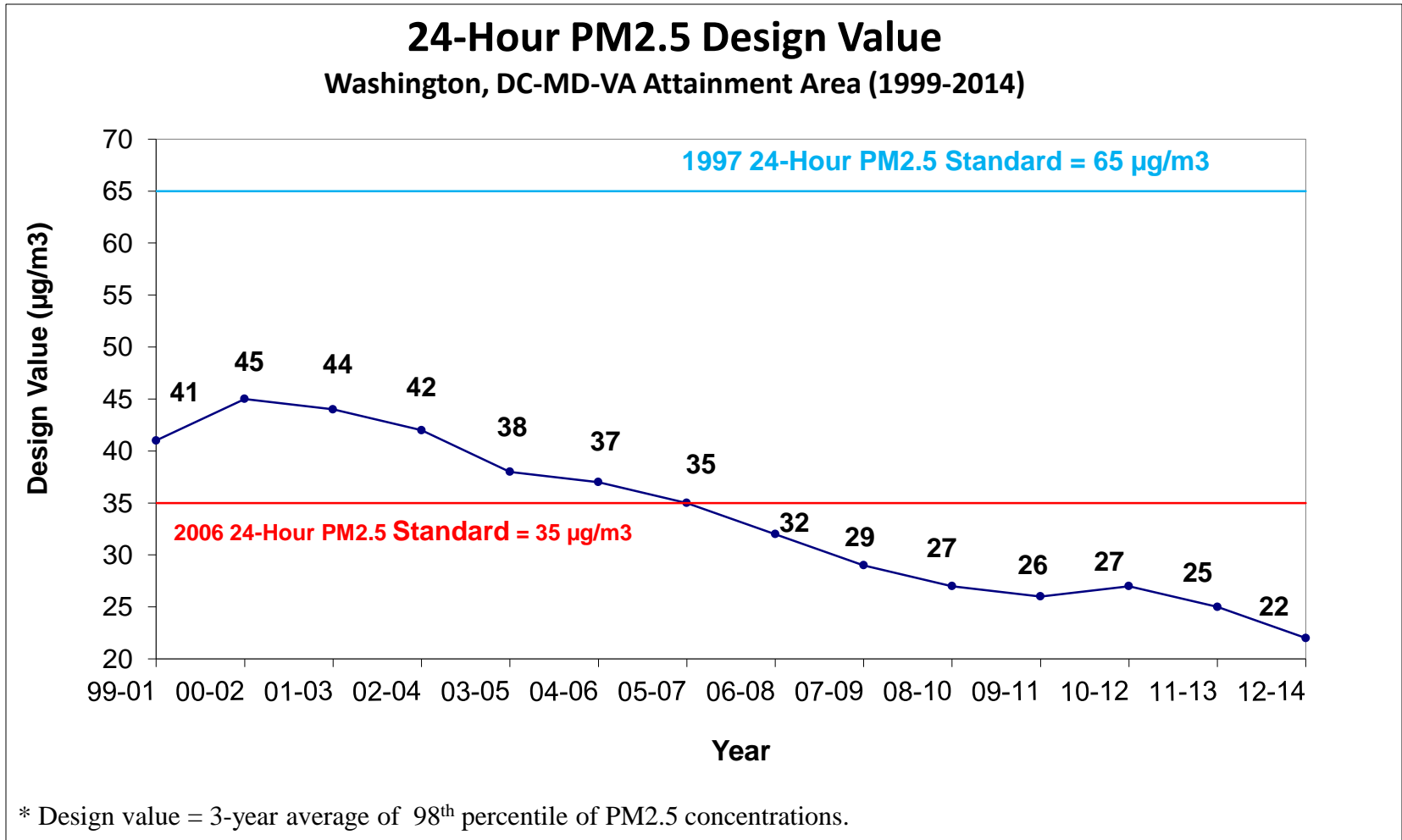
Number of Exceedance Days - 2006 24-Hour PM_{2.5} Standard (35 µg/m³)
Breakdown of Code Orange, Red, and Purple Days
1999 - 2015



* 2015 data is incomplete and preliminary as of September 4, 2015



24-Hour PM_{2.5} Design Value Trend





Annual PM_{2.5} Design Value Trend

