

OZONE SEASON SUMMARY 2016

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MWAQC-Technical Advisory Committee
July 27, 2016

Peak 8-Hour Average Ozone Levels (ppb)

APRIL 2016						
MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY	SUNDAY
				1	2	3
				48	46	45
4	5	6	7	8	9	10
51	45	52	42	46	41	47
11	12	13	14	15	16	17
55	49	48	57	57	65	64
18	19	20	21	22	23	24
73	75	55	61	51	46	54
25	26	27	28	29	30	
59	62	35	38	36	36	

MAY 2016						
MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY	SUNDAY
						1
						37
2	3	4	5	6	7	8
38	40	29	27	34	39	48
9	10	11	12	13	14	15
39	43	29	40	52	48	48
16	17	18	19	20	21	22
50	43	47	56	60	48	45
23	24	25	26	27	28	29
46	62	76	75	69	65	56
30	31					
49	68					

JUNE 2016						
MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY	SUNDAY
		1	2	3	4	5
		77	44	46	44	37
6	7	8	9	10	11	12
55	68	47	59	63	66	63
13	14	15	16	17	18	19
53	66	64	66	55	58	62
20	21	22	23	24	25	26
79	52	59	49	60	66	63
27	28	29	30			
56	58	57	59			

JULY 2016						
MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY	SUNDAY
				1	2	3
				57	48	41
4	5	6	7	8	9	10
34	47	69	68	62	58	45
11	12	13	14	15	16	17
63	56	49	51	60	63	60
18	19	20	21	22	23	24
57	62	68	79	76	64	61
25	26	27	28	29	30	31
70						

8 Code Orange Days, 52 Code Yellow Days, 56 Code Green Days

Analysis is based on draft data as of July 25, 2016. Data is subject to change

2016 Ozone Exceedances

Date	Monitors Exceeding	Highest Monitor	8-Hr Max (ppb)
4/18	1	Southern Maryland	73
4/19	6	Southern Maryland	75
5/25	2	McMillan/ Takoma	72
5/26	6	Calvert	75
6/1	3	Frederick Airport	77
6/20	1	PG Equestrian	79
7/21	7	McMillan	79
7/22	1	PG Equestrian	76



Meteorology on Exceedance Days

Two distinct meteorological conditions during ozone exceedances

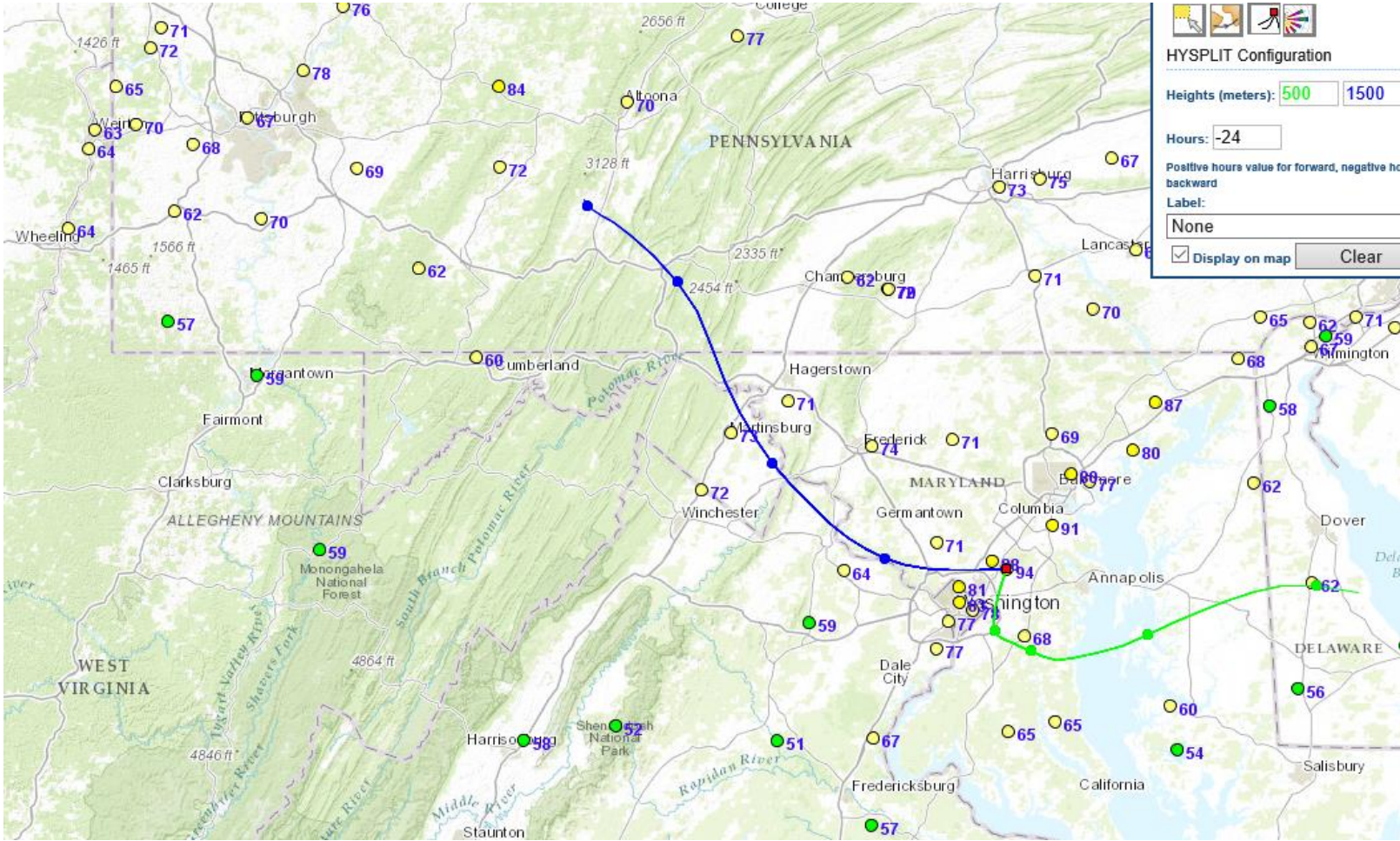
1. Combination of Local & Transported Emissions (April 18/19 & May 25/26)

1. High Temperatures: 82-89 °F, Clear skies
2. Light westerly winds brought additional ozone from Ohio River Valley into the region
3. Ozone build up on previous days

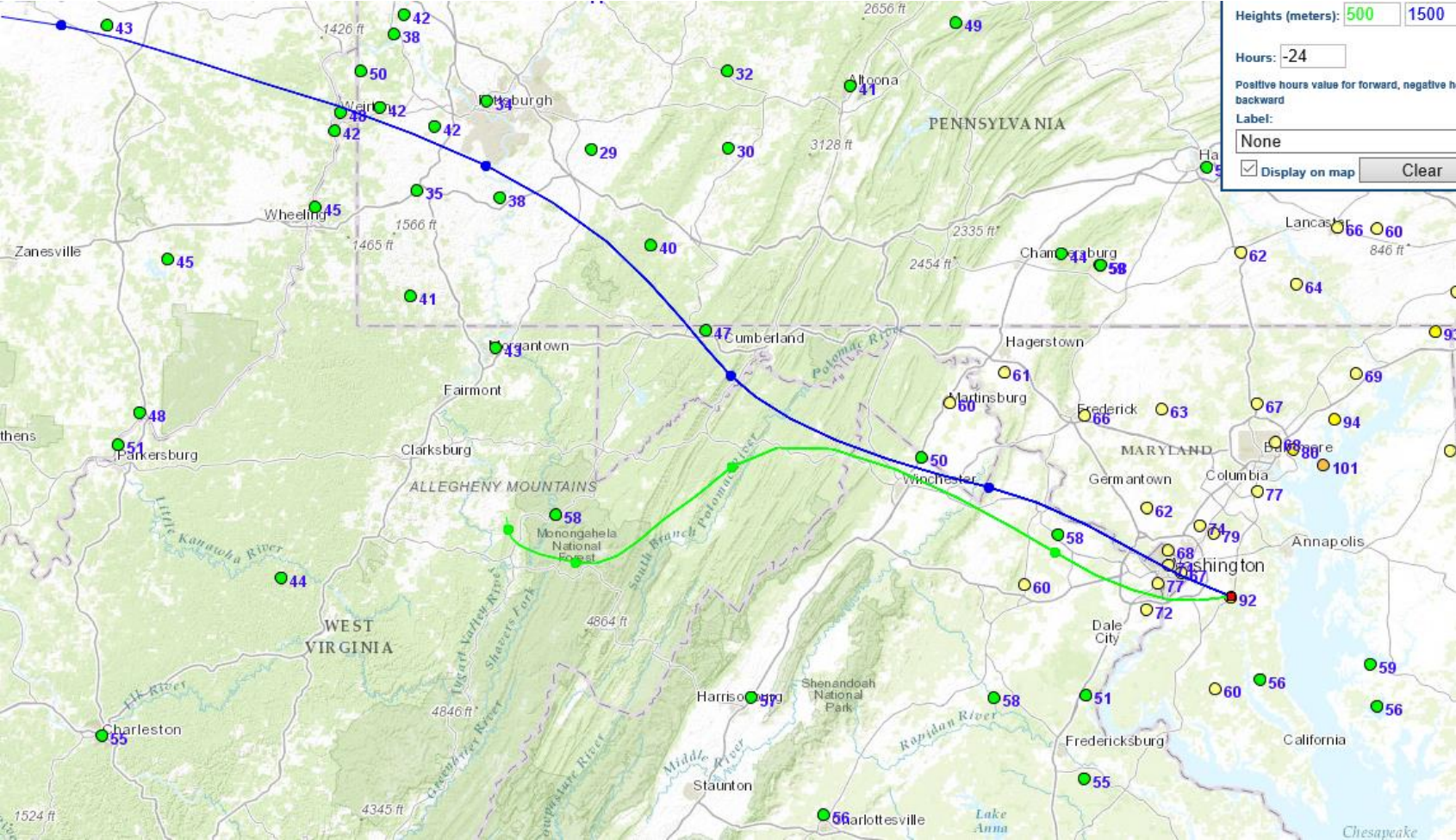
2. Mostly Local Emissions & Recirculation (June 1/20 & July 21/22)

1. High Temperature: 87-94 °F, Clear skies
2. Light winds recirculating local emissions, keeping ozone within the region
3. Ozone build up on previous days

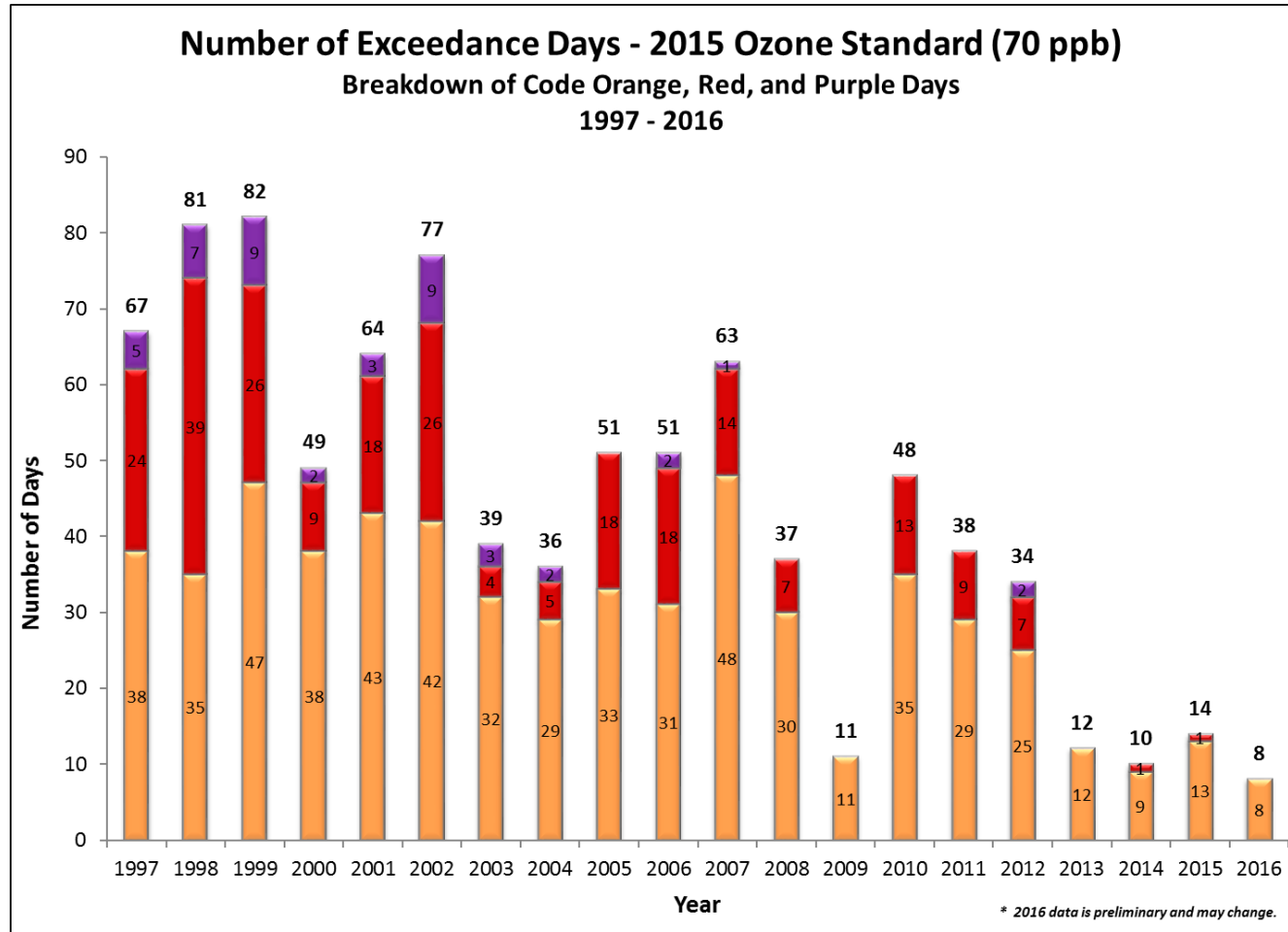
Wind Trajectories (July 21)



Wind Trajectories (July 22)

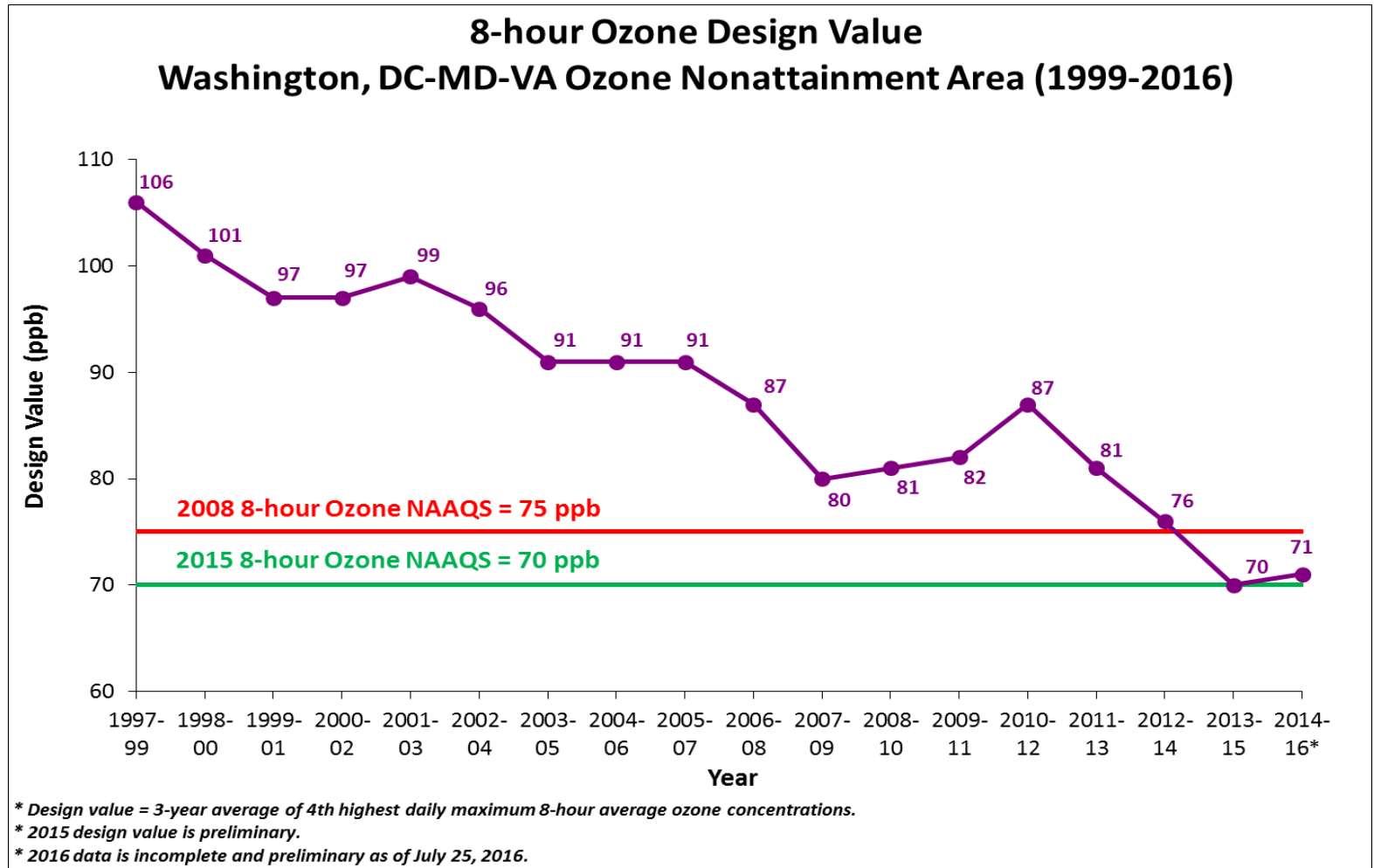


Ozone Exceedance Trend

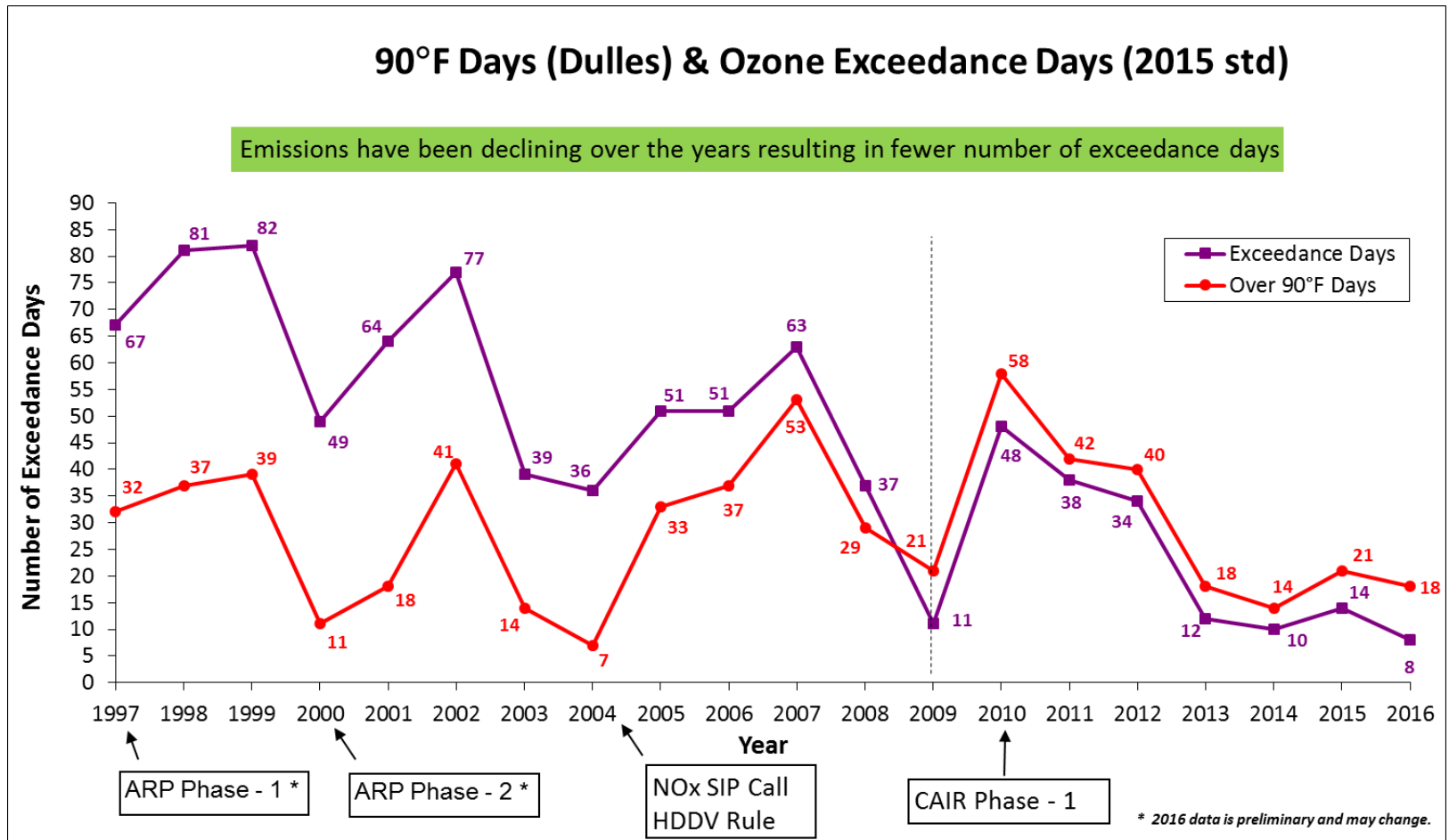


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Ozone Design Value Trend



Ozone & Temperature Trend



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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)		Low VOC Paint
Clean Air Interstate Rule/CSAPR (2009/2015)	Ozone Transport Commission Rules	Gas Can Replacement

24-Hour Average PM2.5 Levels ($\mu\text{g}/\text{m}^3$)

APRIL 2016						
MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY	SUNDAY
				1	2	3
				7.9	7.0	4.7
4	5	6	7	8	9	10
5.9	7.7	10.6	6.9	4.7	6.0	7.1
11	12	13	14	15	16	17
7.6	9.3	8.0	13.7	9.1	13.6	9.7
18	19	20	21	22	23	24
10.1	11.4	5.4	12.5	13.0	9.0	4.3
25	26	27	28	29	30	
10.3	10.2	12.7	13.6	11.2	13.3	

MAY 2016						
MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY	SUNDAY
						1
						5.1
2	3	4	5	6	7	8
6.8	12.8	10.7	7.9	3.9	5.3	5.5
9	10	11	12	13	14	15
9.6	11.6	13.6	14.6	14.4	9.0	5.2
16	17	18	19	20	21	22
5.6	8.1	12.5	13.0	11.6	7.1	6.5
23	24	25	26	27	28	29
10.9	10.4	15.7	19.1	20.0	15.7	9.8
30	31					
16.1	11.3					

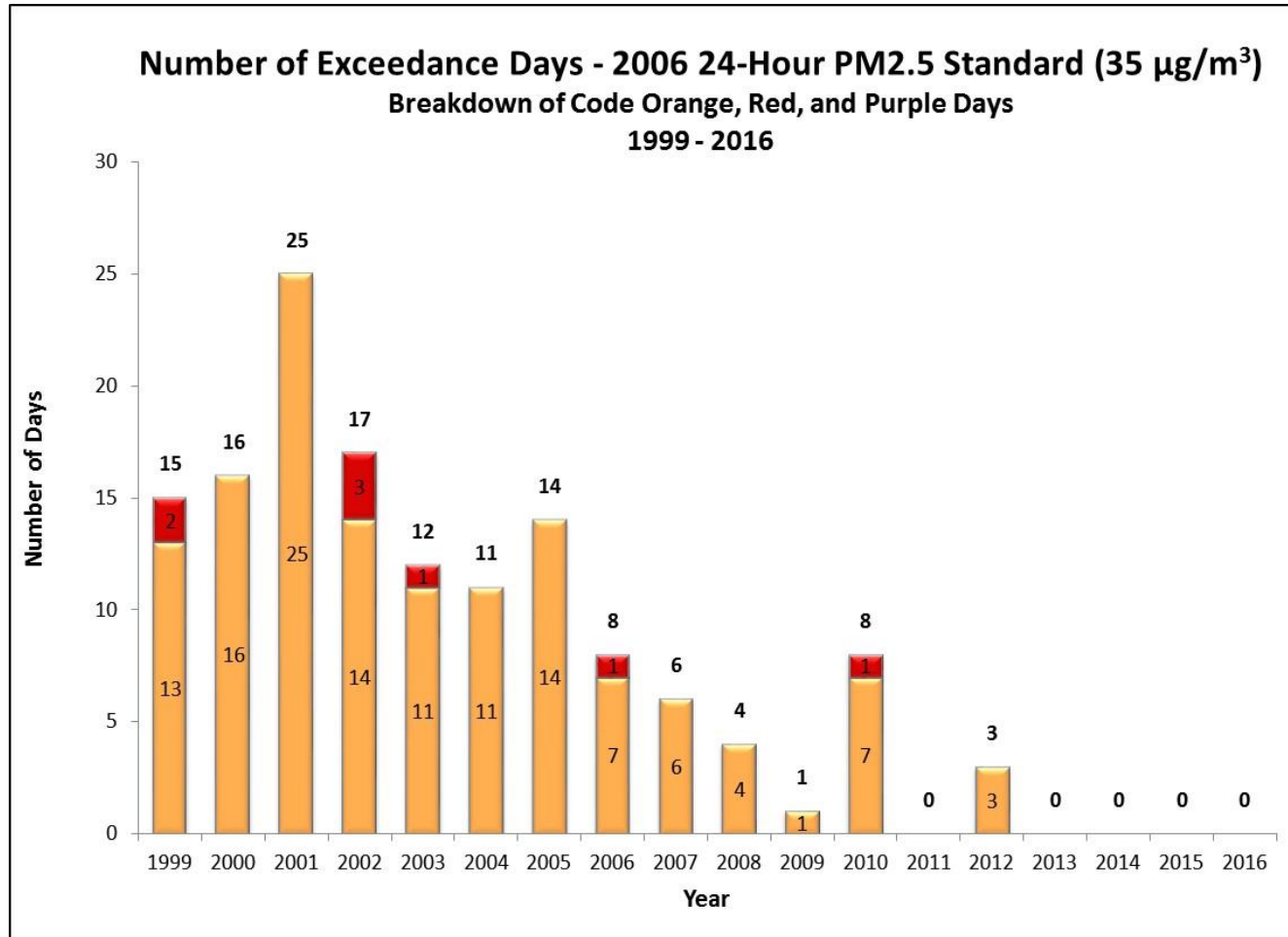
JUNE 2016						
MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY	SUNDAY
		1	2	3	4	5
		13.5	6.9	8.0	9.7	7.5
6	7	8	9	10	11	12
7.4	10.5	8.5	5.7	7.7	11.5	7.6
13	14	15	16	17	18	19
5.5	6.3	10.5	12.9	6.0	6.4	6.9
20	21	22	23	24	25	26
8.2	8.3	8.4	6.6	9.8	9.7	8.4
27	28	29	30			
11.3	12.3	8.3	9.9			

JULY 2016						
MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY	SUNDAY
				1	2	3
				10.7	6.0	7.5
4	5	6	7	8	9	10
12.8	6.4	9.1	10.9	10.3	8.5	6.7
11	12	13	14	15	16	17
7.5	10.8	11.0	11.3	8.0	7.2	7.2
18	19	20	21	22	23	24
9.0	8.1	12.5	15.8	17.7	15.5	12.0
25	26	27	28	29	30	31
16.0						

27 Code Yellow Days, 89 Code Green Days

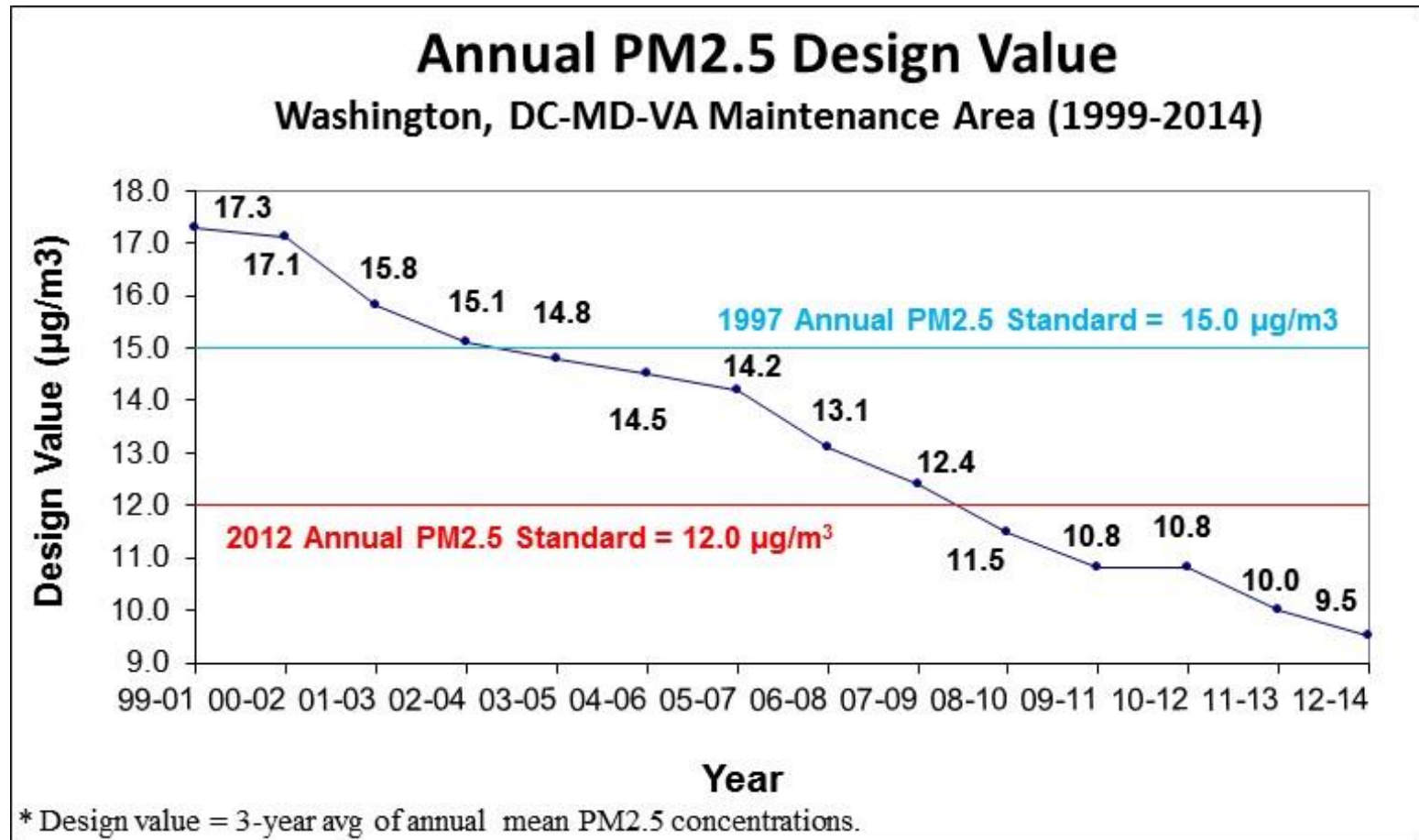
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PM2.5 Exceedance Trend

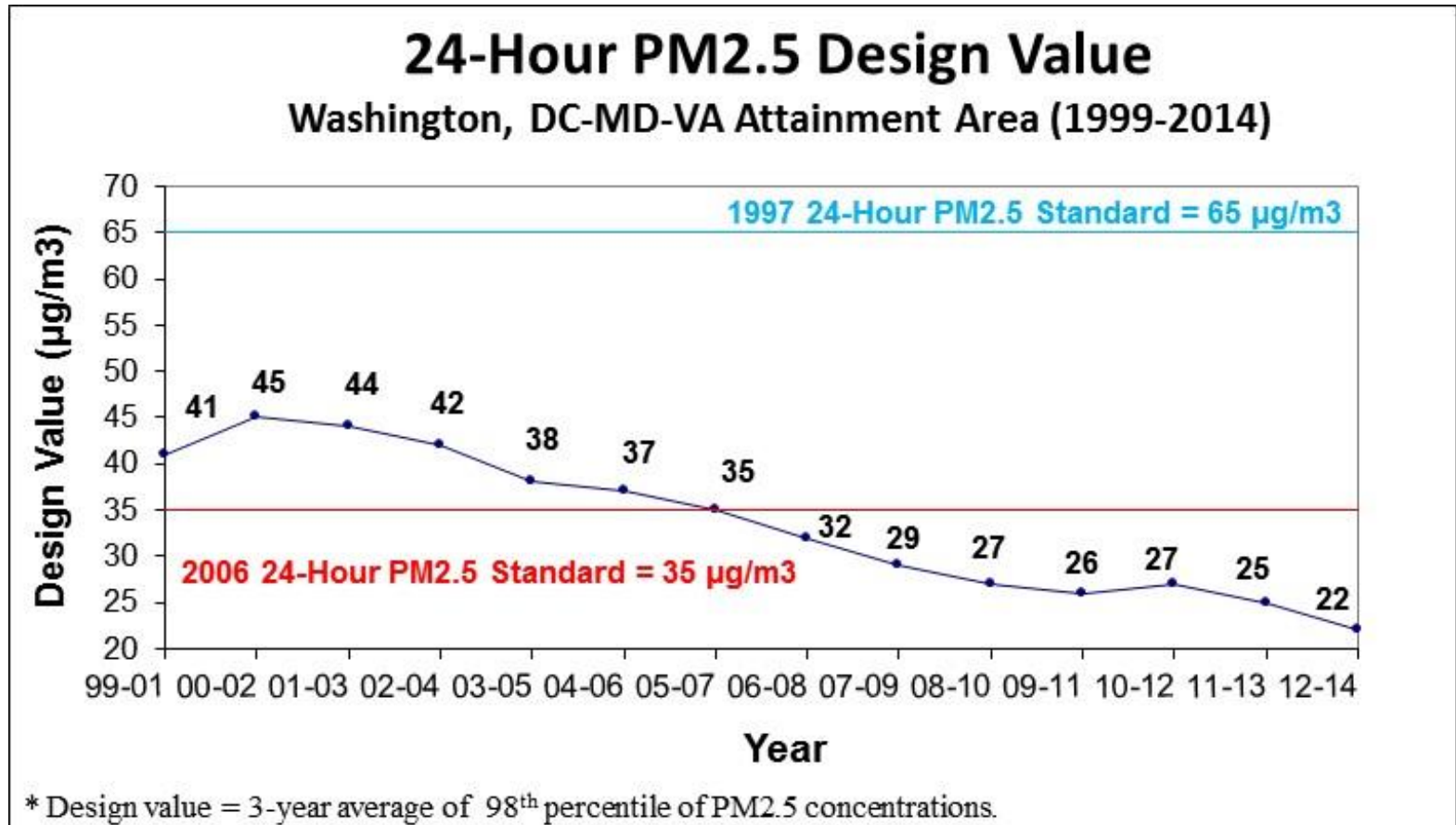


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Annual PM2.5 Design Value Trend



24-Hour PM2.5 Design Value Trend



What Would It Take to Be Designated as Nonattainment for 2015 Ozone NAAQS

Monitor	4 th Highest 8-hour Max Ozone Concentration Needed for Nonattainment in 2016 (ppm)	Current 4 th Highest 8-hour Max Ozone Concentration in 2016 (ppm)	Current 2014-2016 Design Value (ppm)
Arlington	0.069	0.071	0.071
Takoma	0.072	0.069	0.070
PG Equestrian	0.075	0.073	0.070
McMillan NCORE	0.073	0.069	0.069
Calvert	0.076	0.069	0.068
HU- Beltsville	0.076	0.069	0.068
Franconia	0.076	0.067	0.068
Rockville	0.077	0.068	0.068
Beltsville	0.077	0.070	0.068
S. Maryland	0.078	0.069	0.068
Ashburn	0.079	0.064	0.066
Frederick	0.080	0.067	0.066
Long Park	0.084	0.066	0.065

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