

OZONE SEASON SUMMARY 2016

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Metropolitan Washington Air Quality Committee
September 28, 2016

Agenda Item 4



Peak 8-Hour Average Ozone Levels (ppb)

APRIL 2016							MAY 2016							JUNE 2016						
MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY	SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY	SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY	SUNDAY
				48	46	45							37			77	44	46	44	37
51	45	52	42	46	41	47	38	40	29	27	34	39	48	55	68	47	59	63	66	63
55	49	48	57	57	65	64	39	43	29	40	52	48	48	53	66	64	66	55	58	62
73	75	55	61	51	46	54	50	43	47	56	60	48	45	79	52	59	49	60	66	63
59	62	35	38	36	36	46	62	76	75	69	65	56	56	58	57	59				
							49	68												

JULY 2016							AUGUST 2016							SEPTEMBER 2016								
MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY	SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY	SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY	SUNDAY		
				57	48	41	59	63	52	52	36	52	50						53	37	42	46
34	47	69	68	62	58	45	49	41	37	42	49	47	40	49	65	66	64	60	55	46		
63	56	49	51	60	63	60	62	56	51	55	65	67	36	55	55	68	38	48	45	37		
57	62	68	79	76	64	61	45	55	54	59	63	61	59	25	42	56	72	80				
70	74	80	62	67	54	53	79	68	65													

13 Code Orange Days, 77 Code Yellow Days, 86 Code Green Days

Analysis is based on draft data as of September 23, 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	6	Beltsville	76
5/26	6	Calvert	75
6/1	3	Frederick Airport	77
6/20	1	PG Equestrian	79
7/21	8	McMillan	79
7/22	1	PG Equestrian	76
7/26	2	Southern Maryland	74
7/27	6	Southern Maryland	80
8/29	1	Franconia	79
9/22	1	Prince William	72
9/23	7	Arlington	80

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Meteorology on Exceedance Days

Two distinct meteorological conditions during ozone exceedances

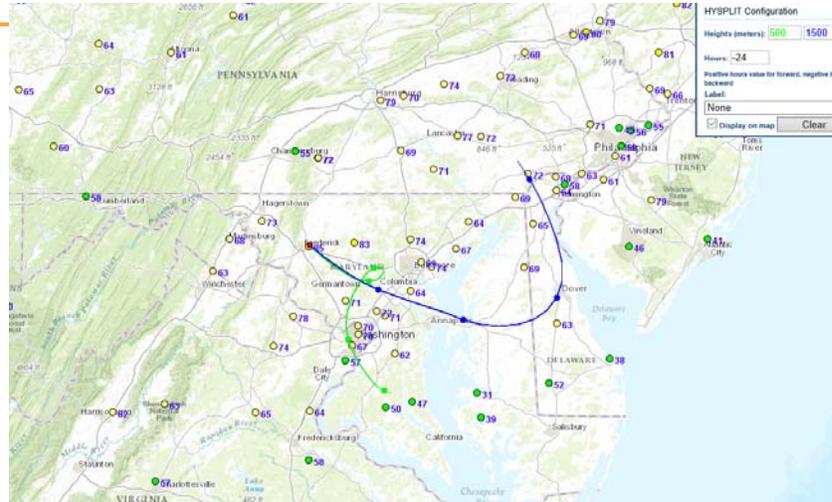
1. **Combination of Local & Transported Emissions** (April 18/19 & May 25/26, July 26/27, August 29, September 23)
 1. High Temperatures: 82-95 °F, Clear skies
 2. Light westerly winds brought additional ozone from Ohio River Valley into the region
 3. Ozone build up on previous days

2. **Mostly Local Emissions & Recirculation** (June 1/20 & July 21/22, September 23)
 1. High Temperature: 87-95 °F, Clear skies
 2. Light winds recirculating local emissions, keeping ozone within the region
 3. Ozone build up on previous days

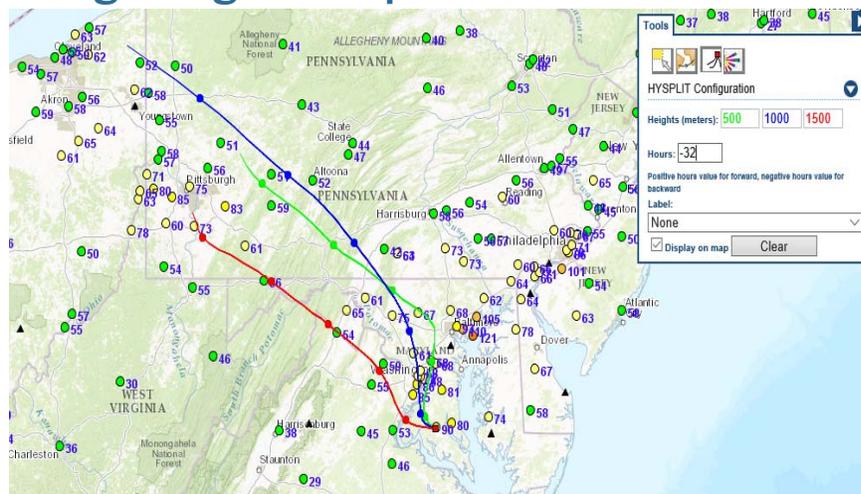


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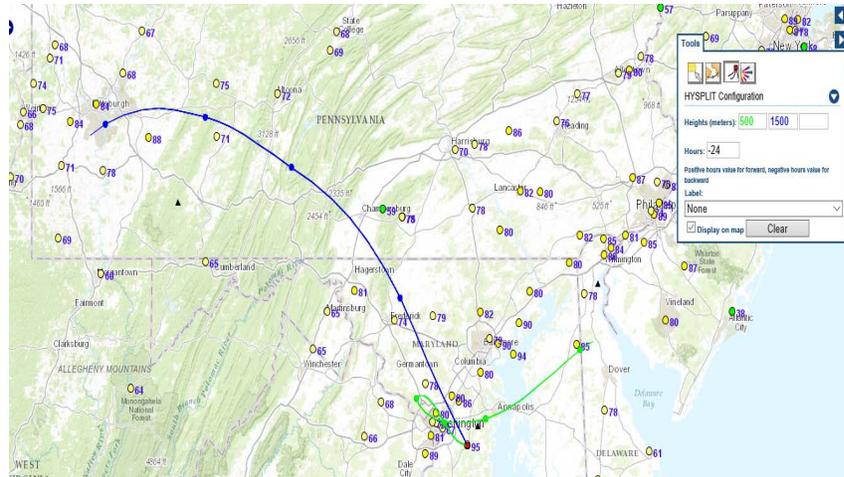
Wind Trajectories (June 1) – Local Emissions & Recirculation



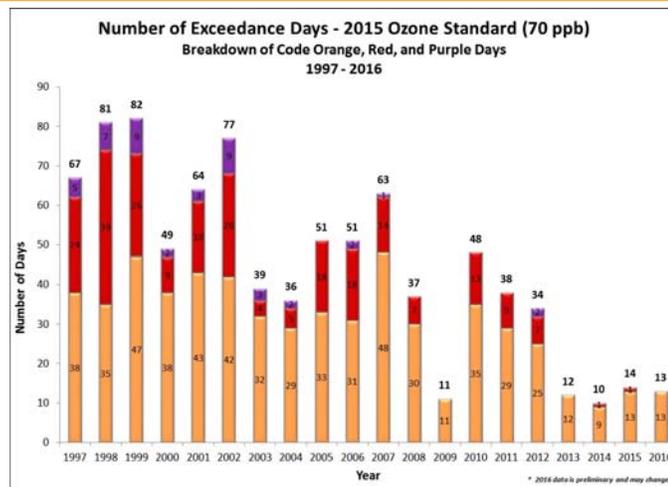
Wind Trajectories (July 27) – Long Range Transport



Wind Trajectories (September 23) – Recirculation & Long Range Transport

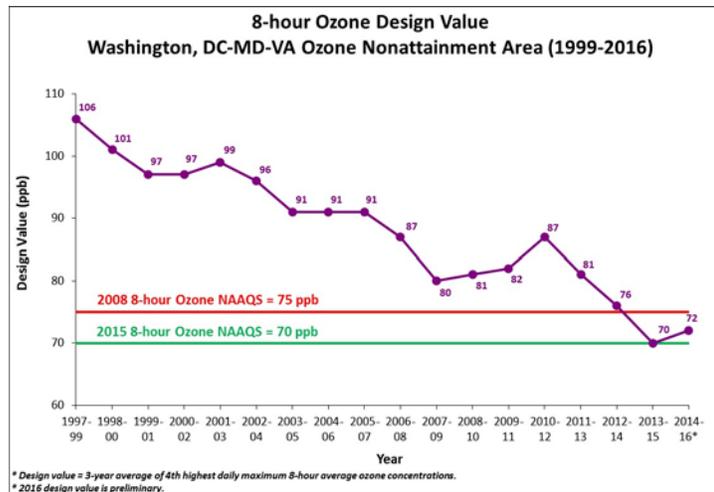


Ozone Exceedance Trend



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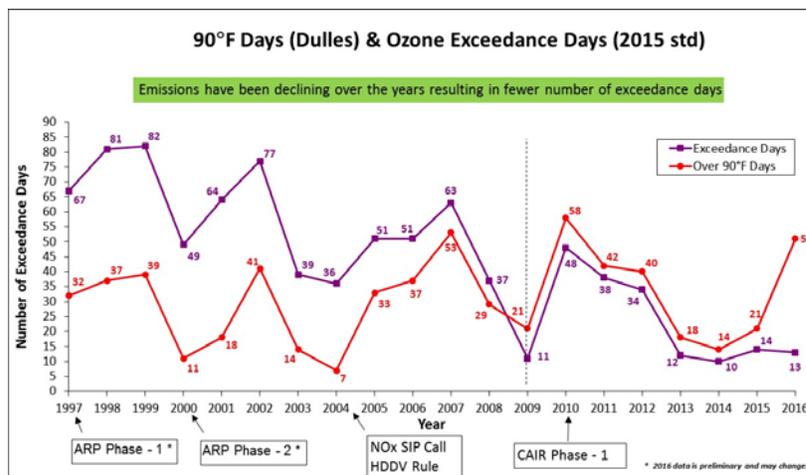
Ozone Design Value Trend



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

Timeline – 2015 Ozone Standard (70 ppb)

Milestone	Dates
Final Rule Announced	October 1, 2015
State Designation Recommendations to EPA	October 1, 2016
EPA Response to State Designation Recommendations	June 1, 2017
Final Designations	October 1, 2017 (Likely based on 2014-16 data)
Attainment Demonstration SIPs Due	2020/2021 (for Moderate and above)
Attainment Dates	2020-2037 (depends on level of nonattainment designation) Marginal = October 1, 2020

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

APRIL 2016							MAY 2016							JUNE 2016						
MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY	SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY	SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY	SUNDAY
				7.9	7.0	4.7						5.1			13.5	6.9	8.0	9.7	7.5	
5.9	7.7	10.6	6.9	4.7	6.0	7.1	6.8	12.8	10.7	7.9	3.9	5.3	5.5	7.4	10.5	8.5	5.7	7.7	11.5	7.6
7.6	9.3	8.0	13.7	9.1	13.6	9.7	9.6	11.6	13.6	14.6	14.4	9.0	5.2	5.5	6.3	10.5	12.9	6.0	6.4	6.9
10.1	11.4	5.4	12.5	13.0	9.0	4.3	5.6	8.1	12.5	13.0	11.6	7.1	6.5	8.2	8.3	8.4	6.6	9.8	9.7	8.4
10.3	10.2	12.7	13.6	11.2	13.3		16.1	11.3						11.3	12.3	8.3	9.9			

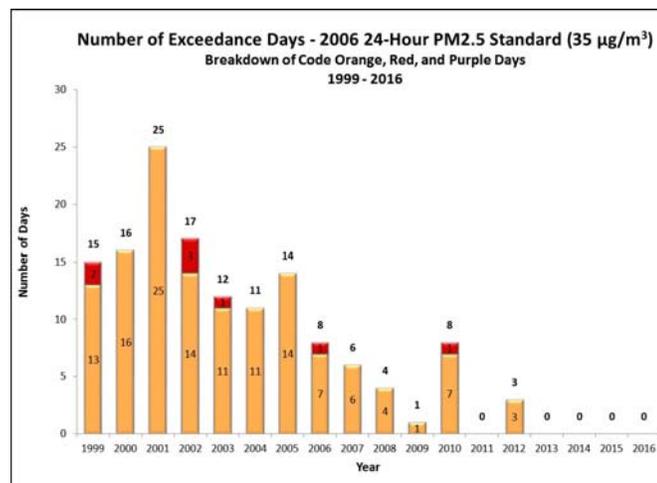
JULY 2016							AUGUST 2016							SEPTEMBER 2016						
MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY	SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY	SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY	SUNDAY
				10.7	6.0	7.5	8.8	10.8	7.7	8.0	8.7	12.0	6.9				16.8	8.0	6.2	7.9
12.8	6.4	9.1	10.9	10.3	8.5	6.7	10.8	9.9	8.3	12.6	11.9	11.0	10.0	7.6	10.4	9.0	11.9	12.1	13.9	7.9
7.5	10.8	11.0	11.3	8.0	7.2	7.2	6.2	8.1	6.5	12.2	15.4	17.0	16.0	5.1	6.5	8.5	6.5	5.1	6.1	5.7
9.0	8.1	12.5	15.8	17.7	15.5	12.0	12.4	13.5	12.0	12.6	11.7	12.5	12.1	4.4	9.2	11.9	12.1	12.6		
16.0	13.5	17.4	13.8	9.4	12.1	6.6	13.2	14.4	18.1											

49 Code Yellow Days, 127 Code Green Days

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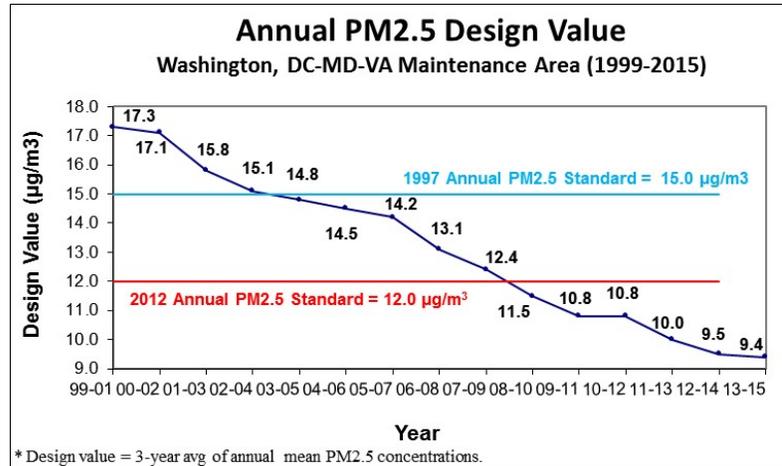
PM2.5 Exceedance Trend



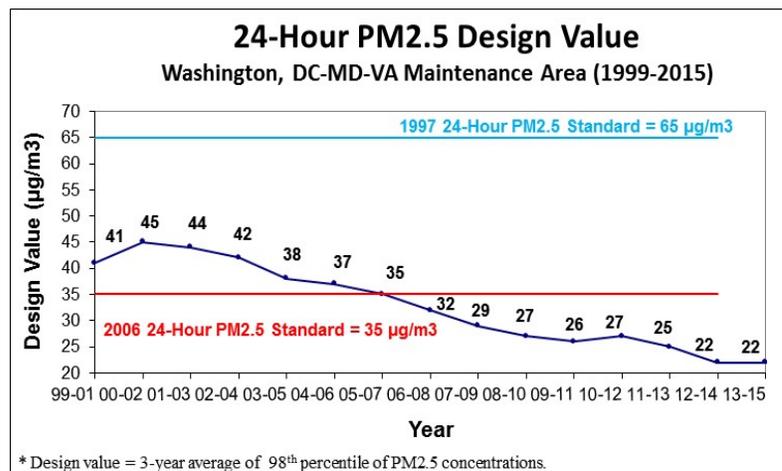
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Annual PM2.5 Design Value Trend



24-Hour PM2.5 Design Value Trend



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