OZONE SEASON SUMMARY 2023

Sunil Kumar
Principal Environmental Engineer

ACPAC
September 18, 2023

Agenda Item 3

Metropolitan Washington
Council of Governments

Peak 8-Hour Average Ozone Levels (ppb)

March 2023

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
26	27	28	01	02	03	04
			41	47	41	47
05	06	07	08	09	10	11
49	49	48	47	46	37	43
12	13	14	15	16	17	18
37	40	42	52	52	50	50
19	20	21	22	23	24	25
47	49	51	57	46	40	41
26	27	28	29	30	31	
56	44	58	55	55	56	

April 2023

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
26	27	28	29	30	31	01
						51
02	03	04	05	06	07	08
53	53	58	45	52	47	52
09	10	11	12	13	14	15
57	58	62	68	75	61	50
16	17	18	19	20	21	22
54	54	63	65	67	73	54
23	24	25	26	27	28	29
49	49	52	55	56	49	44
30						
42						

May 2023

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
30	01	02	03	04	05	06
	41	40	35	38	46	55
07	08	09	10	11	12	13
48	59	44	52	65	76	55
14	15	16	17	18	19	20
55	55	56	59	55	53	54
21	22	23	24	25	26	27
53	55	53	67	57	61	56
28	29	30	31			
54	56	56	64			

June 2023

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
28	29	30	31	01	02	03
				81	84	74
04	05	06	07	08	09	10
46	51	67	75	65	49	58
11	12	13	14	15	16	17
69	52	59	56	72	64	54
18	19	20	21	22	23	24
64	68	55	38	32	28	42
25	26	27	28	29	30	
48	58	50	55	89	58	

July 2023

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
25	26	27	28	29	30	01
						57
02	03	04	05	06	07	08
44	51	48	60	66	56	65
09	10	11	12	13	14	15
42	54	73	72	68	57	51
16	17	18	19	20	21	22
42	73	73	64	73	59	46
23	24	25	26	27	28	29
50	57	64	74	57	63	48
30	31					
42	52					

August 2023

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
30	31	01	02	03	04	05
		43	60	48	57	56
06	07	08	09	10	11	12
55	44	45	57	44	59	60
13	14	15	16	17	18	19
48	56	46	52	58	49	57
20	21	22	23	24	25	26
62	67	54	59	54	70	49
27	28	29	30	31		
52	43	39	54	46		

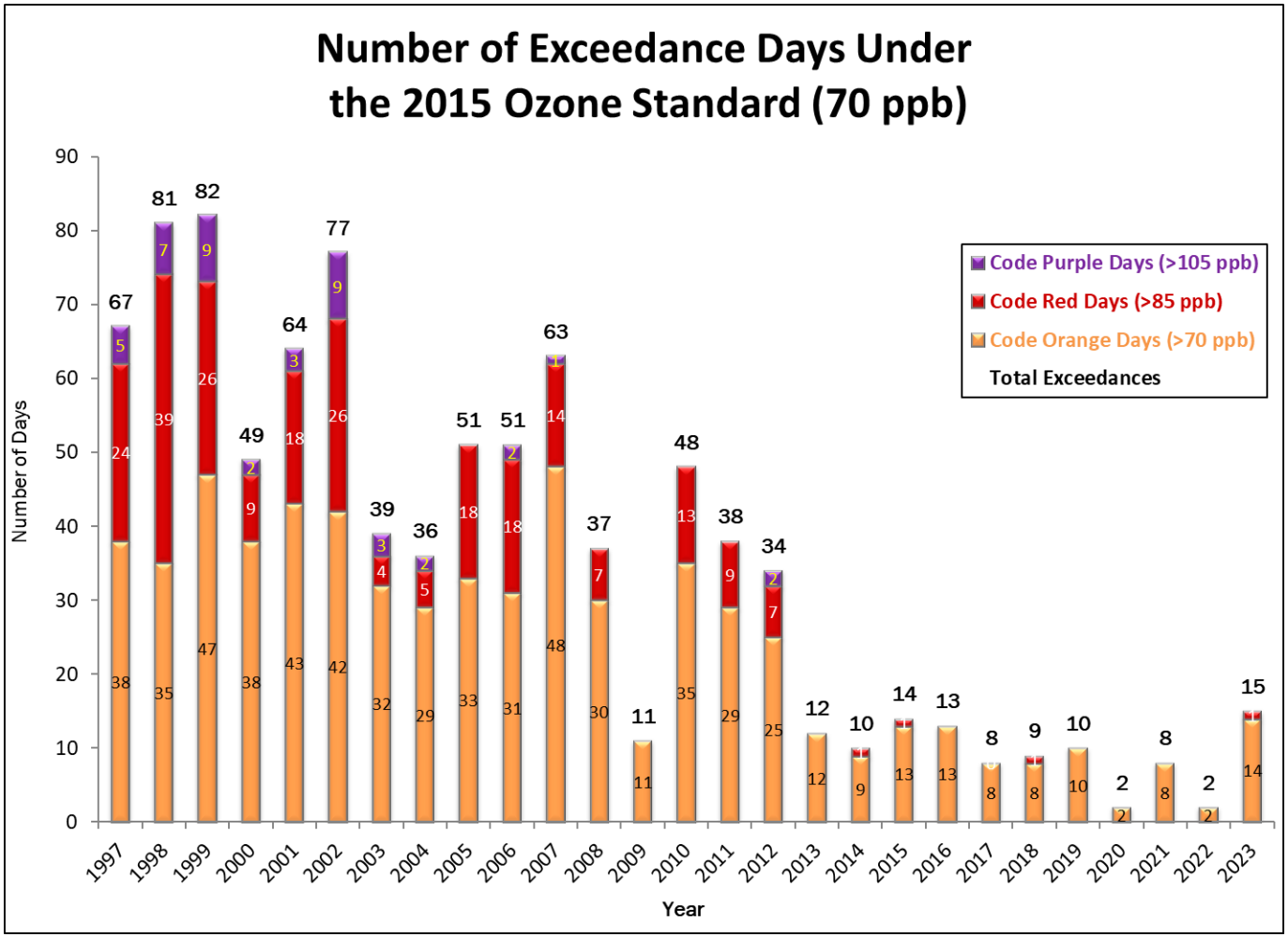
September 2023

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
27	28	29	30	31	01	02
					57	57
03	04	05	06	07	08	09
58	51	64	65	57		
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30

1 Code Red Day, 14 Code Orange Days

Analysis is based on draft data as of September 8, 2023.

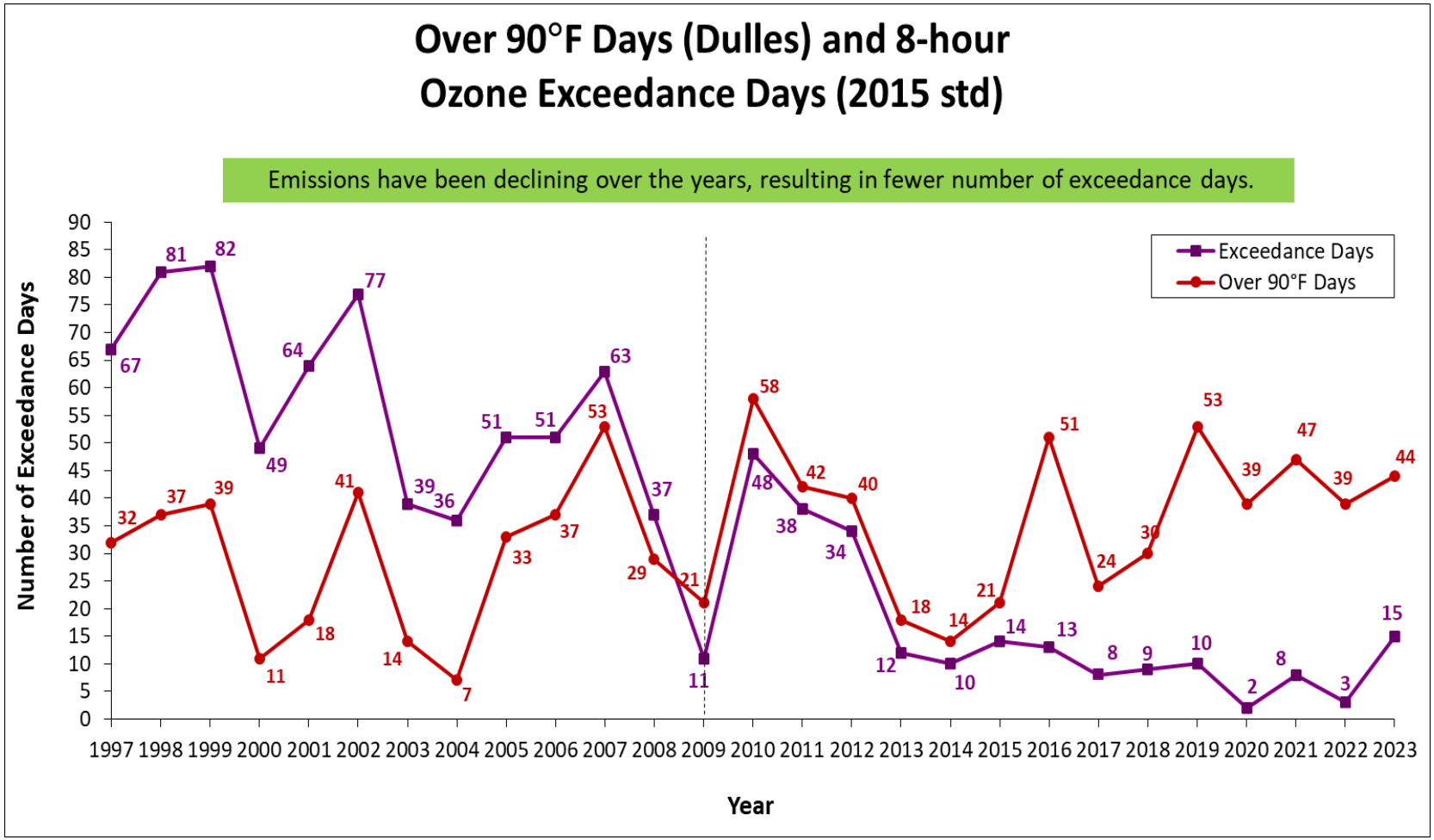
Ozone Exceedance Trend



* 2023 data is draft and incomplete as of September 8, 2023.

Metropolitan Washington
Council of Governments

Ozone & Temperature Trend



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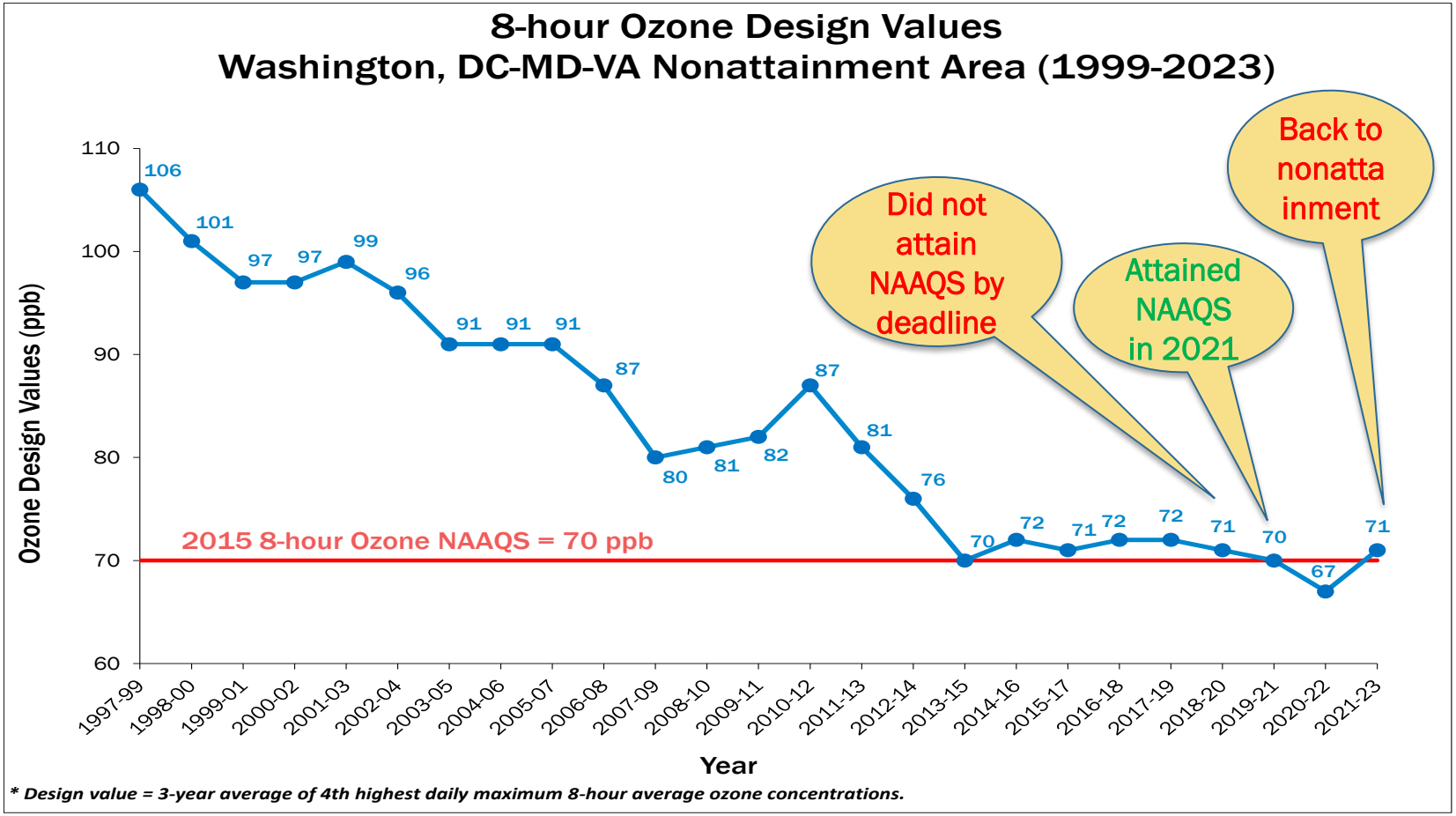
Ozone Design Value Trend



* 2023 data are draft as of September 8, 2023.

Why Fewer Exceedance Days Now ?

Emission Control Programs

Federal	State	Local
Acid Rain Program (1996/2000)	Vehicle Inspection & Maintenance Programs	Renewable Energy Programs Regional Wind Power Purchase Program Clean Energy Rewards Program Renewable Portfolio Standards
Tier 2 (LD Vehicle) Rule (2004)	Maryland Healthy Air Act (2009/2012)	Energy Efficiency Programs LED Traffic Signal Retrofit program Building Energy Efficiency Programs
HD Diesel vehicle Rule (2004/2007)	Virginia CSAPR Rule	VRE Idling Reduction
NOX SIP Call (2004)	Ozone Transport Commission Rules	LOW VOC Paint
CAIR/CSAPR/CSAPR Update/Revised CSAPR Update (2009/2015/2017/2021)		Gas Can Replacement

24-Hour Average PM2.5 Levels (µg/m³)

March 2023

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
26	27	28	01	02	03	04
			10.9	11.6	8.6	2.9
05	06	07	08	09	10	11
6.8	9.2	5.3	3.6	5.1	8.7	4.1
12	13	14	15	16	17	18
8.3	10.4	4.5	4.0	6.1	21.5	5.5
19	20	21	22	23	24	25
4.7	10.7	10.7	9.8	17.9	8.6	10.1
26	27	28	29	30	31	
6.8	15.3	6.1	6.5	7.0	8.8	

April 2023

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
26	27	28	29	30	31	01
						6.9
02	03	04	05	06	07	08
4.4	8.2	8.4	13.6	8.3	5.3	6.4
09	10	11	12	13	14	15
8.3	6.5	7.4	10.0	11.5	11.8	8.9
16	17	18	19	20	21	22
9.2	4.5	5.4	9.3	14.0	18.8	16.5
23	24	25	26	27	28	29
6.3	5.6	7.5	9.8	11.4	7.2	4.8
30						
5.0						

May 2023

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
30	01	02	03	04	05	06
5.0	5.0	3.3	2.5	2.5	5.0	8.5
07	08	09	10	11	12	13
10.0	11.3	8.2	9.0	13.0	16.2	14.6
14	15	16	17	18	19	20
10.6	6.9	10.7	9.0	5.9	7.7	7.8
21	22	23	24	25	26	27
13.9	14.6	18.1	13.7	7.0	7.3	6.6
28	29	30	31			
7.0	7.2	20.2	24.4			

June 2023

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
28	29	30	31	01	02	03
				34.4	30.8	16.5
04	05	06	07	08	09	10
9.0	8.7	36.9	103.2	146.8	23.8	21.1
11	12	13	14	15	16	17
27.5	13.1	8.8	8.2	7.7	16.1	26.8
18	19	20	21	22	23	24
22.6	24.8	19.5	7.7	4.7	6.9	6.7
25	26	27	28	29	30	
6.7	12.7	7.1	47.5	93.1	45.4	

July 2023

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
25	26	27	28	29	30	01
						31.6
02	03	04	05	06	07	08
14.5	9.6	47.7	23.4	14.4	13.0	12.6
09	10	11	12	13	14	15
8.0	7.7	10.0	13.1	13.2	5.8	10.0
16	17	18	19	20	21	22
7.2	39.6	28.7	15.7	18.3	7.6	8.5
23	24	25	26	27	28	29
9.9	8.0	10.5	13.0	16.0	14.5	9.7
30	31					
5.2	8.9					

August 2023

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
30	31	01	02	03	04	05
		9.0	11.0	12.0	12.4	12.6
06	07	08	09	10	11	12
14.4	9.3	7.9	9.4	10.6	11.9	12.3
13	14	15	16	17	18	19
8.4	9.9	9.2	6.0	32.6	16.7	14.8
20	21	22	23	24	25	26
14.0	17.4	12.7	9.8	8.7	11.7	7.8
27	28	29	30	31		
10.3	8.5	6.8	8.1	4.5		

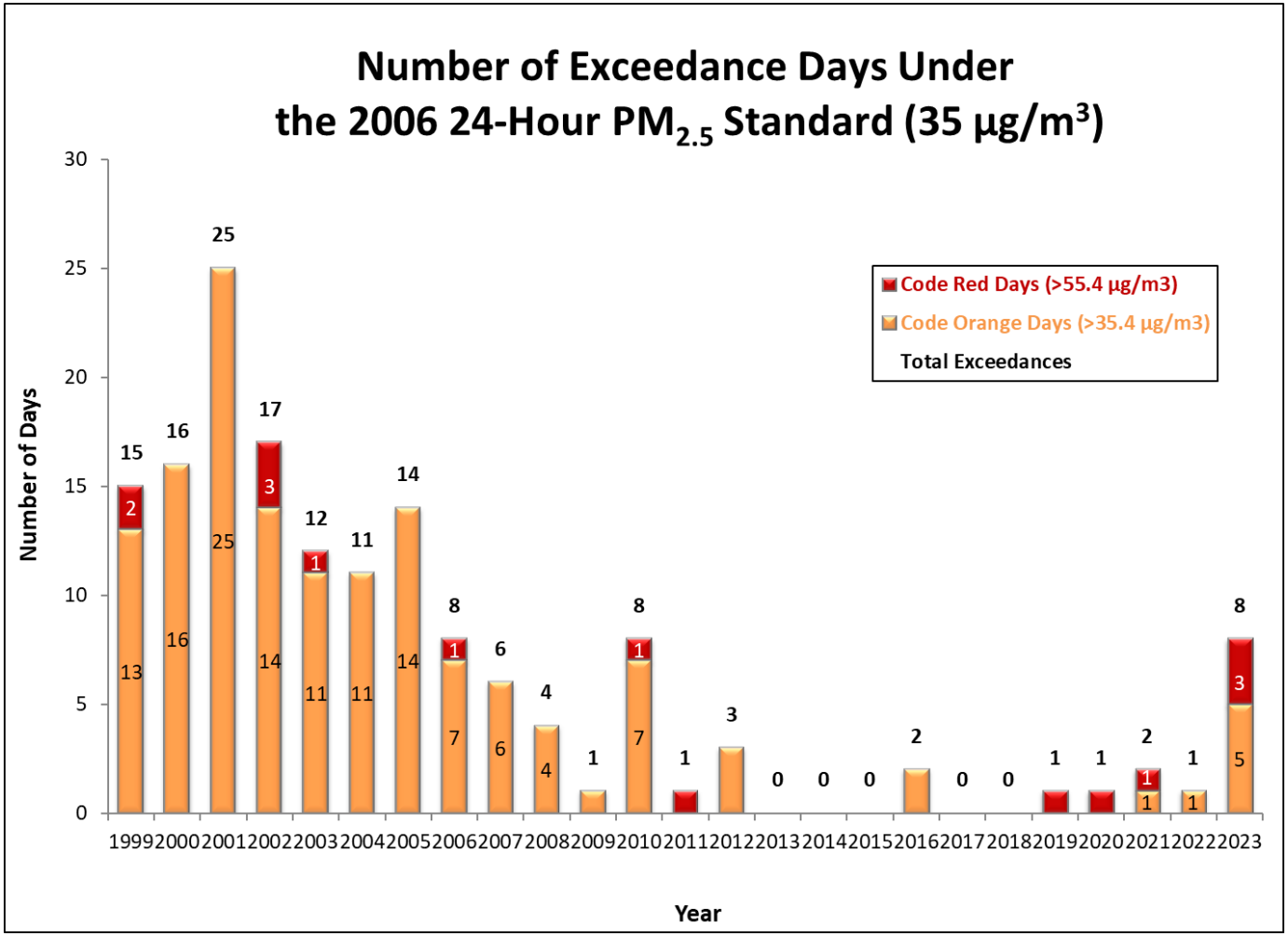
September 2023

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
27	28	29	30	31	01	02
					6.6	7.6
03	04	05	06	07	08	09
10.7	9.9	12.8	13.7	14.9		
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30

3 Code Red, 4 Code Orange Days

Analysis is based on draft data as of September 8, 2023.

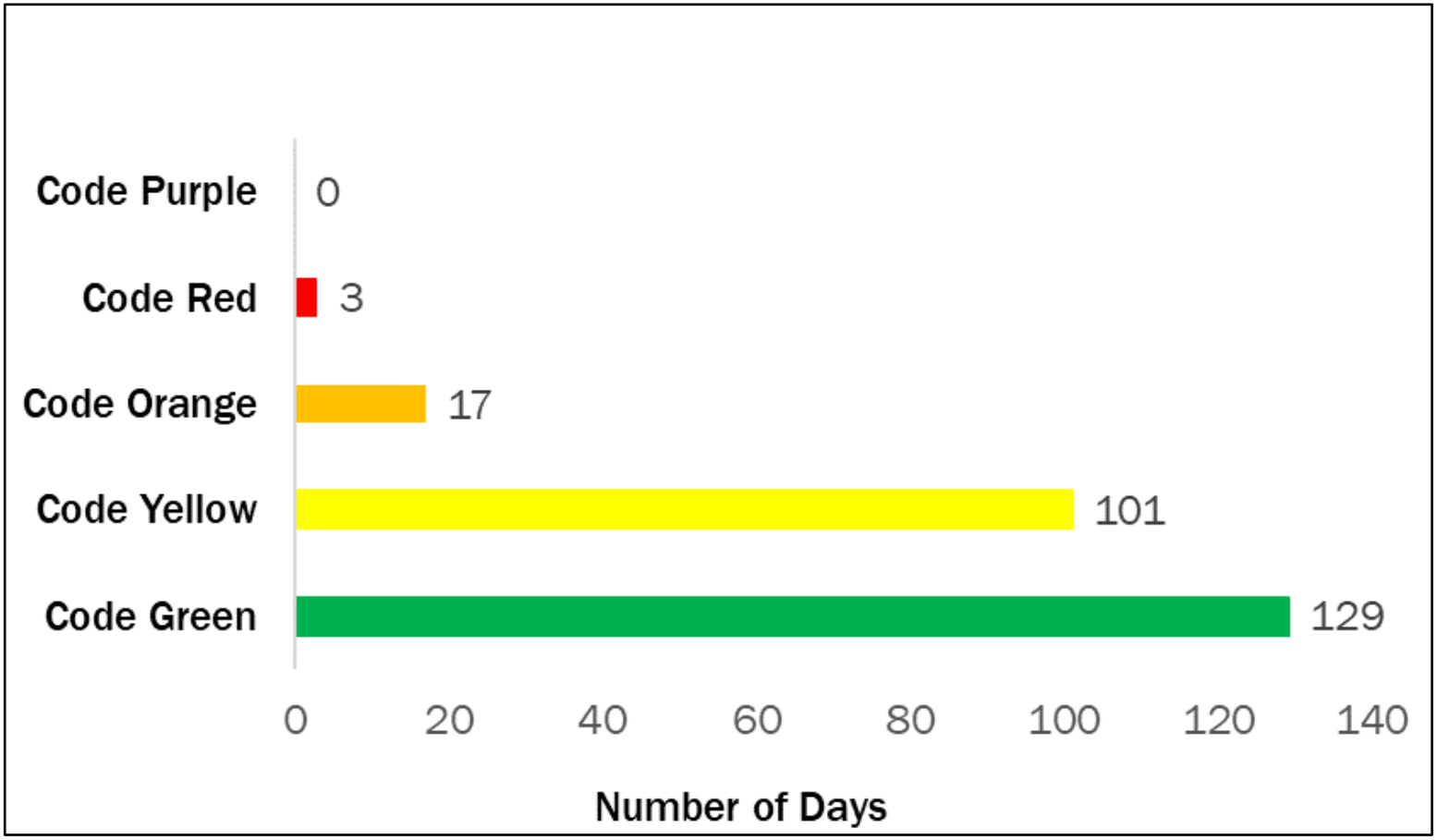
PM2.5 Exceedance Trend



* 2023 data is draft and incomplete as of September 8, 2023.

2023 - Daily Air Quality Index

(January 1-July 4, Combined Ozone & PM2.5)



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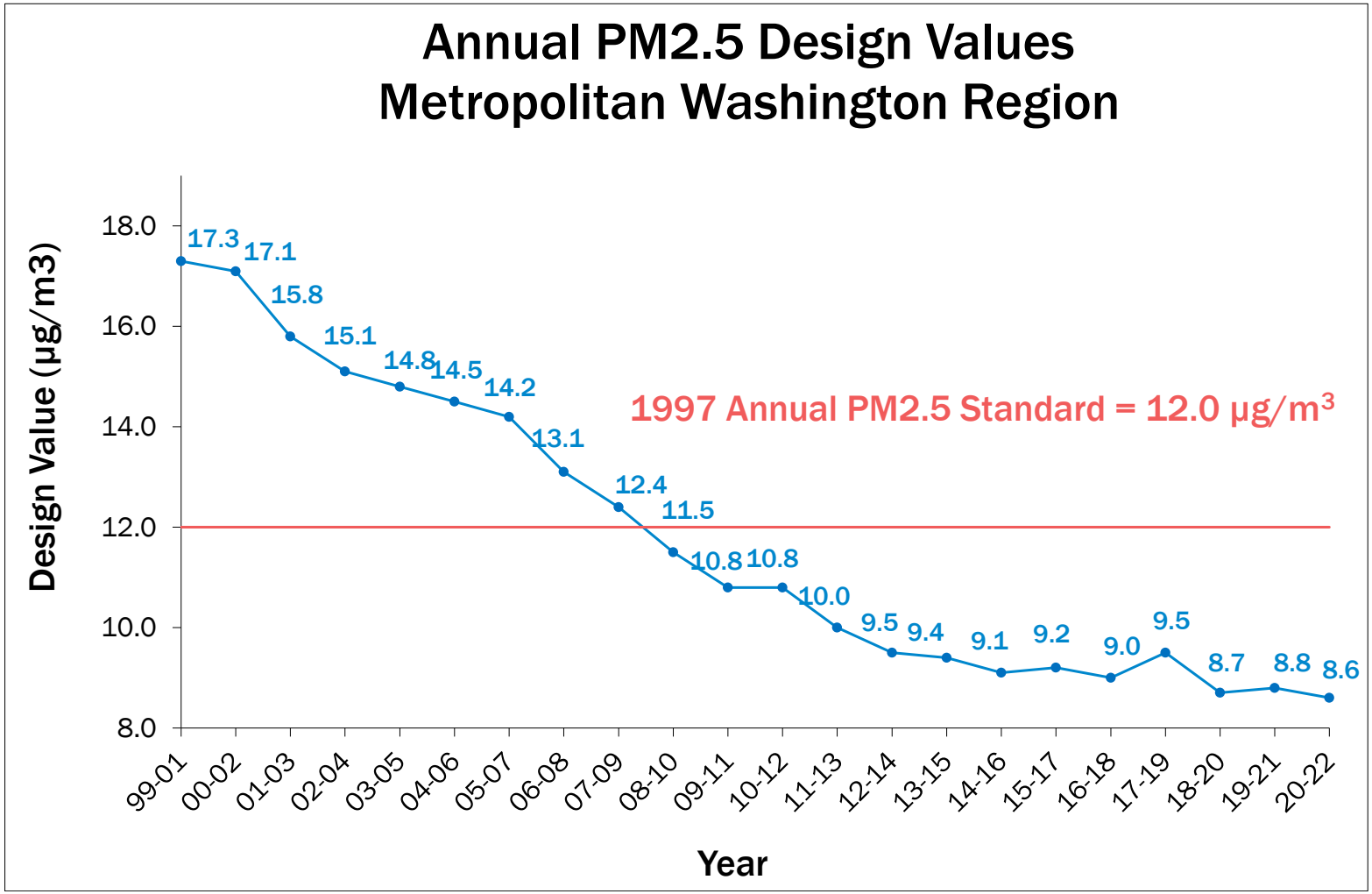
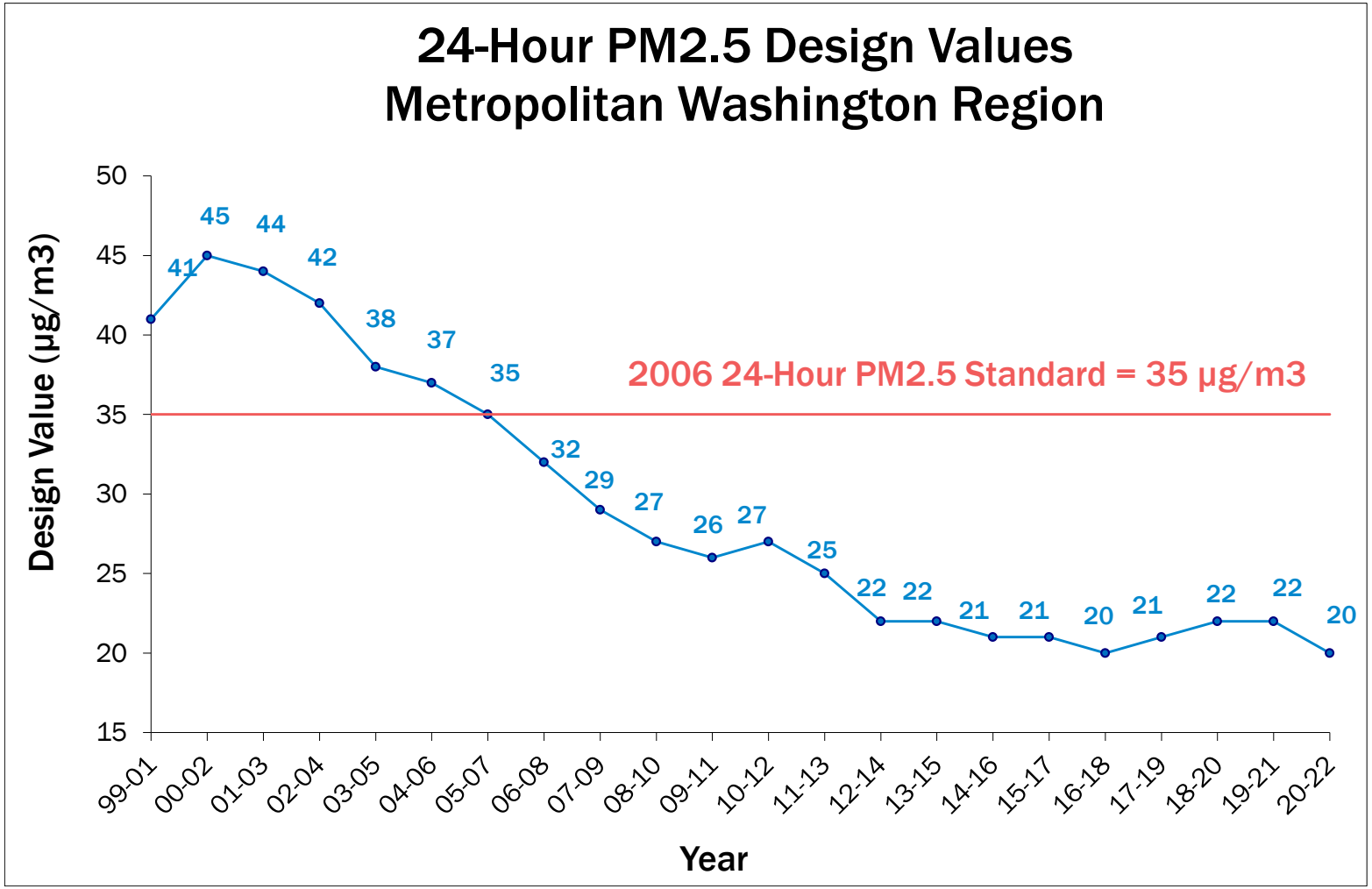
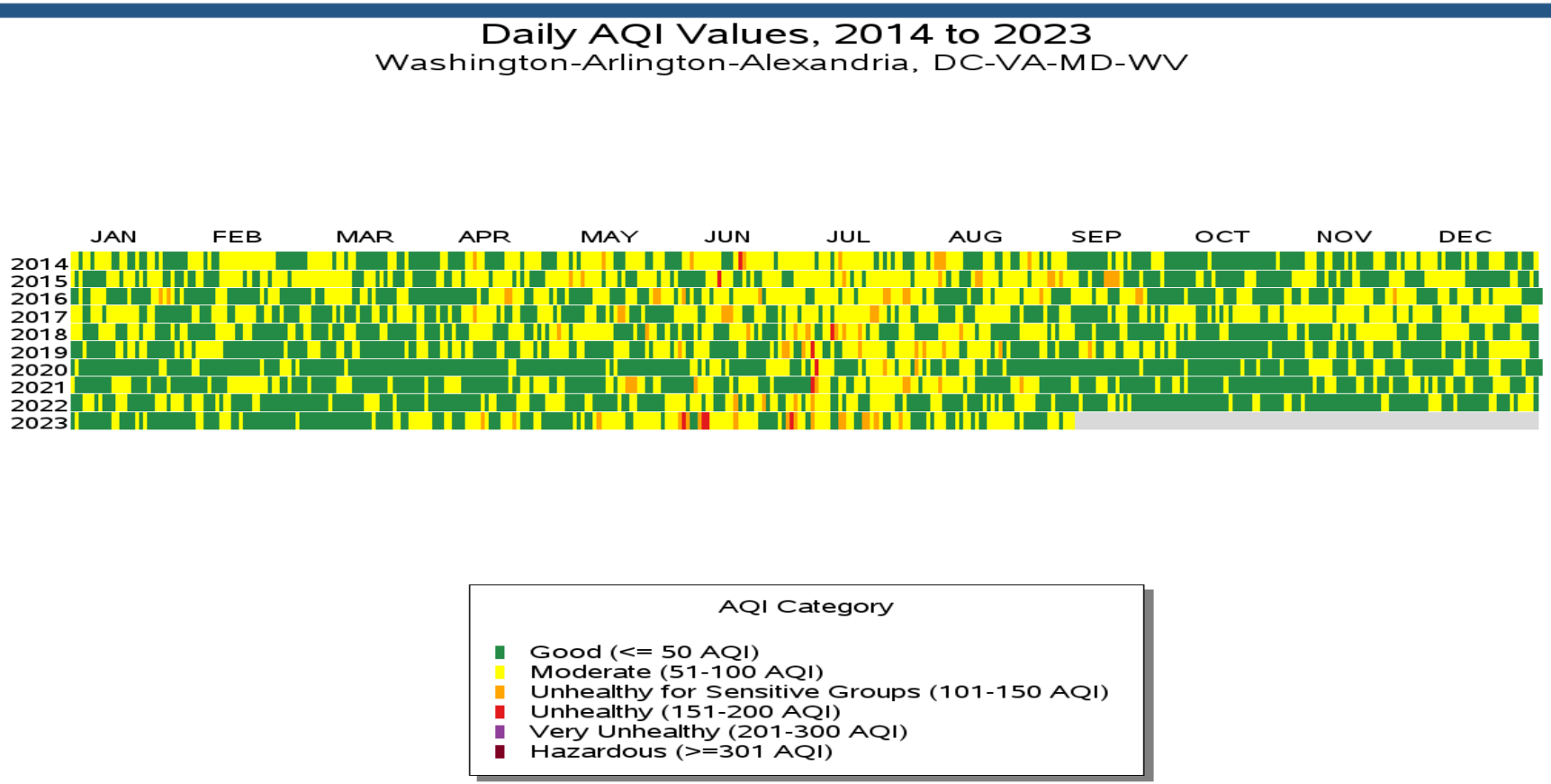
Annual PM2.5 Design Value Trend



24-Hour PM2.5 Design Value Trend



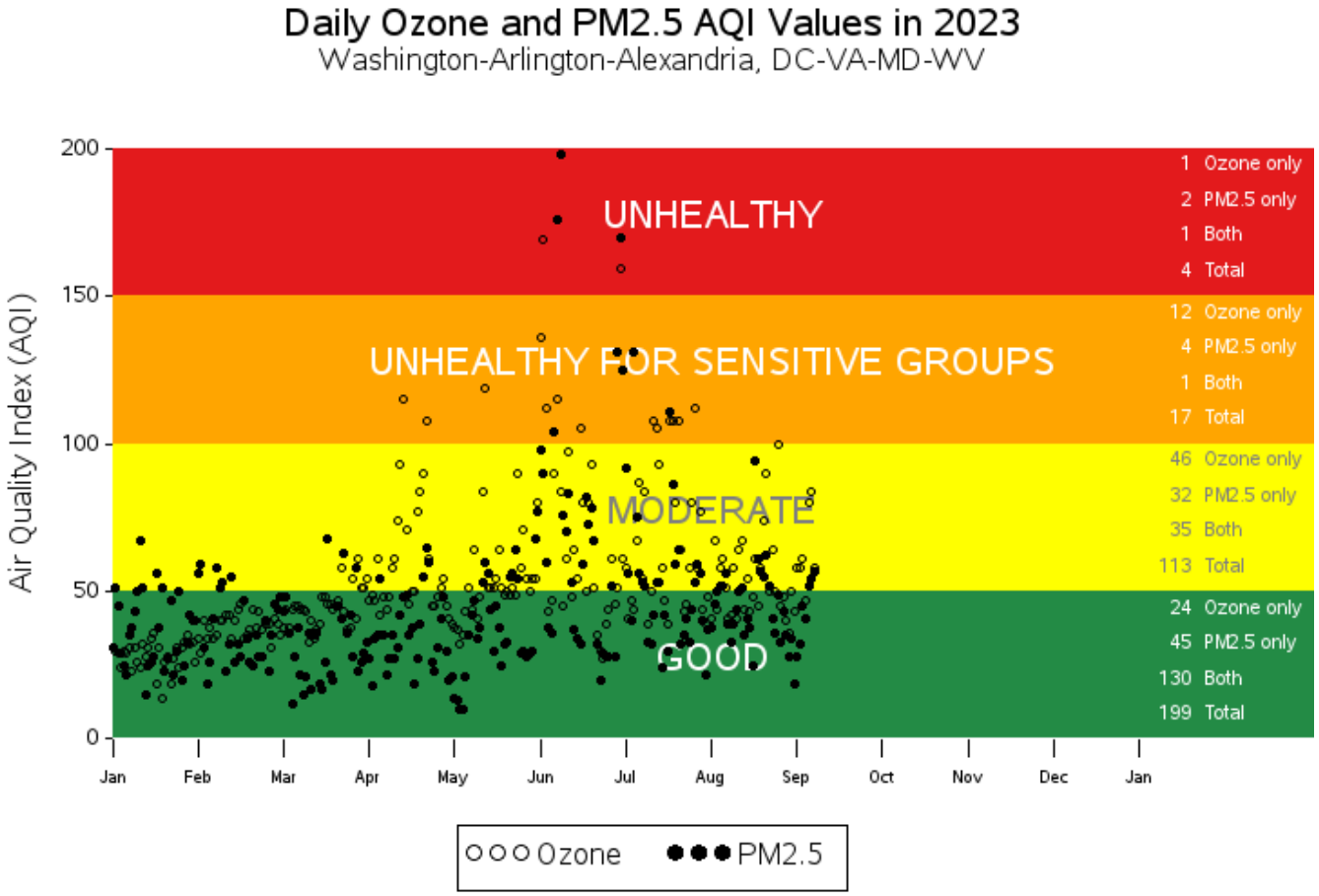
AQI Value Trends



Source: U.S. EPA AirData <https://www.epa.gov/air-data>
Generated: September 8, 2023

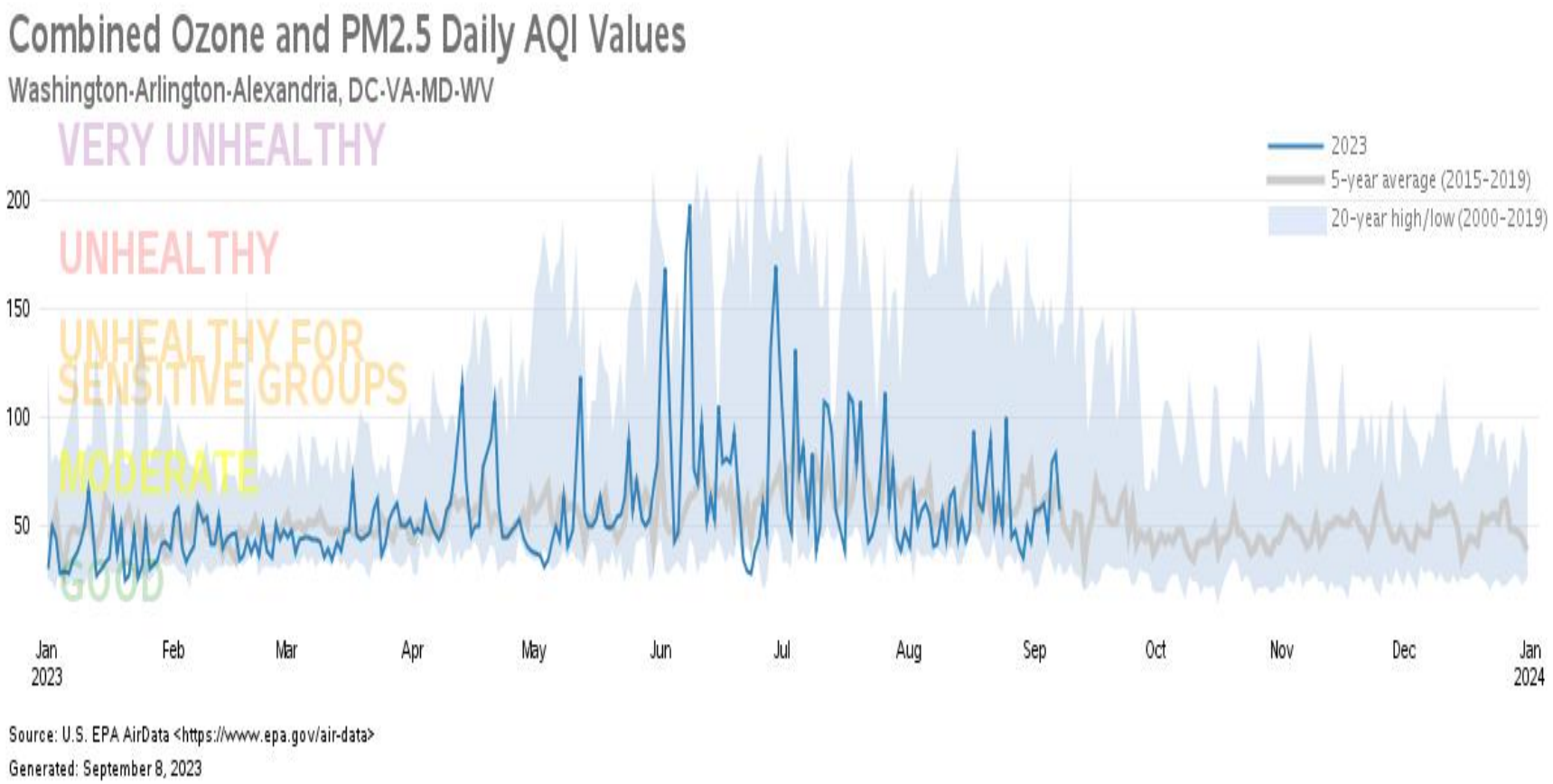
Note: Data shown above is for combined AQI values for ozone, PM2.5, PM10, CO, NO2, and SO2 for the Washington-Arlington-Alexandria CBSA.

AQI Values - 2023



Source: U.S. EPA AirData <https://www.epa.gov/air-data>
Generated: September 8, 2023

AQI Value Trends



Note: Data shown above is for the Washington-Arlington-Alexandria CBSA.

Attainment Status – 2015 Ozone NAAQS

Monitor	Draft Design Value (ppb)*	Remark
McMillan (DC)	71	NAAQS violation
Beltsville (MD)	69	Close to NAAQS violation
Prince George's Eq. Center (MD)	69	Close to NAAQS violation
Frederick (MD)	67	Can pose issue for future lower NAAQS ?
Arlington (VA)	67	Can pose issue for future lower NAAQS ?
Franconia (VA)	67	Can pose issue for future lower NAAQS ?
Rockville (MD)	66	Can pose issue for future lower NAAQS ?
HU-Beltsville (MD)	66	Can pose issue for future lower NAAQS ?
S. Maryland (MD)	65	Currently don't seem to pose issue
Ashburn (VA)	64	Currently don't seem to pose issue
Long Park (VA)	63	Currently don't seem to pose issue
Calvert (MD)	62	Currently don't seem to pose issue
River Terrace (DC)	60	Currently don't seem to pose issue
Takoma Park (DC)	55	Currently don't seem to pose issue

* Based on draft data as of September 8, 2023.

Exceptional Events Exemption Rule

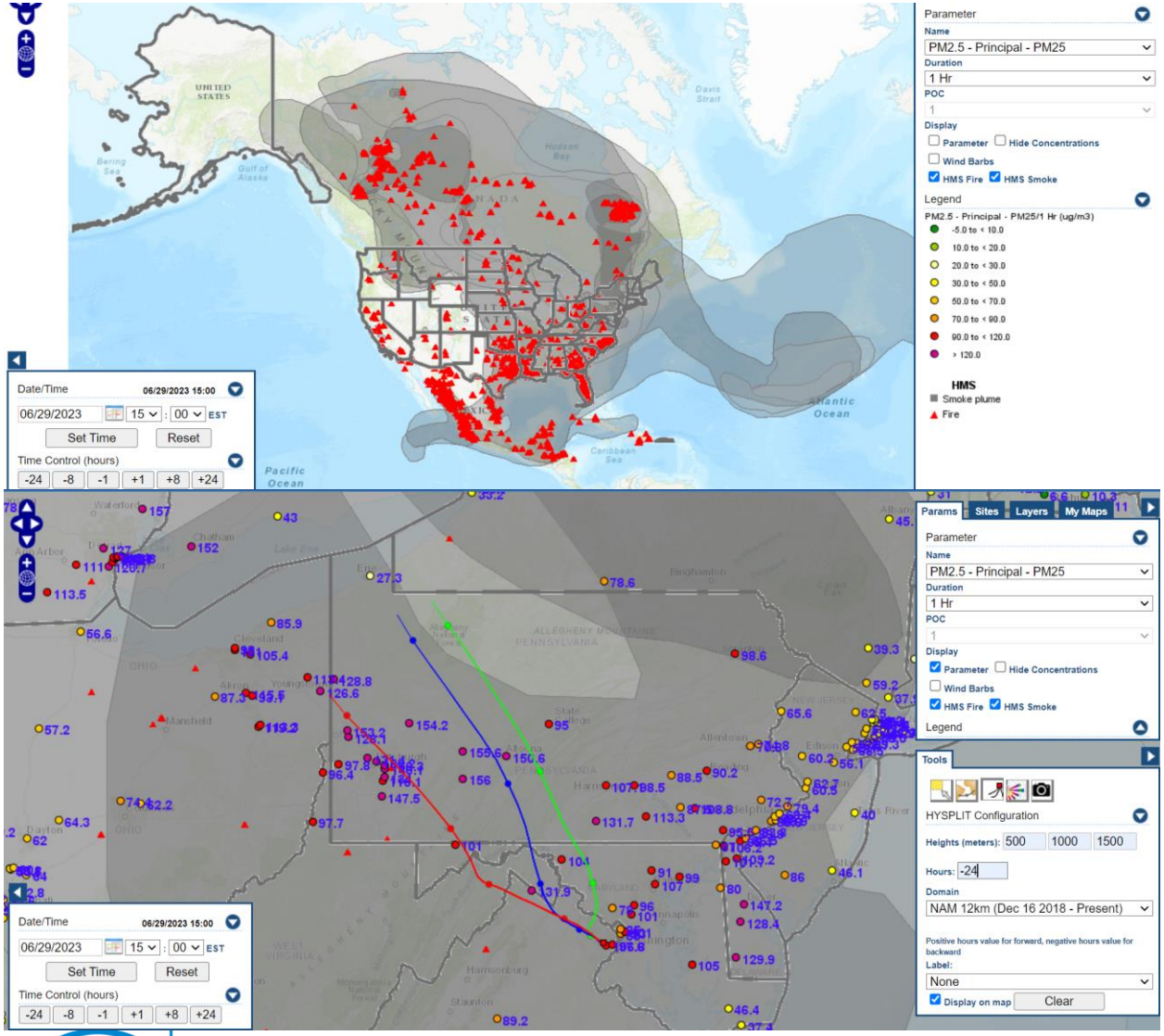
- EPA promulgated Exceptional Events (EE) rule in 2007 to address CAA section 319(b), which allows for the exclusion of air quality monitoring data influenced by exceptional events from use in determinations of exceedances or violations of the NAAQS
- EPA revised the rule in 2016 based on implementation experiences with the exceptional events data exclusion process.
- Washington region is planning to use the rule to exclude ozone data from high ozone days impacted by wildfires. This will help the region get back to attainment.

Preliminary Analysis of Candidate Dates

Date	Daily 8-Hour Max Ozone Conc (ppb)	Smoke Level	Daily Avg PM2.5 Conc (ug/m3) at Nearest Monitor	Fire Source
April 13	McMillan (71), PGEQ (72)	Slightly high	10.6, 9.4	Flint Hills, KS, Eastern CONUS Fires
May 12	McMillan (76)	Slightly high	15.3	Alberta & Saskatchewan, Canada Fires
June 1	McMillan (81)	Slightly high	32.5	Nova Scotia, Canada & New Jersey Fires
June 2	McMillan (75), PGEQ (75), Beltsville (73)	Slightly high	26.3, 21.0, 21.0	Nova Scotia, Canada & New Jersey Fires
June 15	PGEQ (72)	Normal	6.0	Aged Quebec, Canada Smoke
June 29	**McMillan (89), PGEQ (87), Beltsville (79)**	**Very high**	**80.0, 84.9, 84.9**	**Quebec, Canada Smoke**
July 11	PGEQ (73)	Normal	7.4	Alberta & Saskatchewan, Canada Fires
July 12	Beltsville (72)	Normal	9.2	Alberta & Saskatchewan, Canada Fires
July 17	McMillan (72), Beltsville (73)	High	32.9, 31.3	British Columbia & Alberta, Canada Fires
July 18	PGEQ (73)	Slightly high	23.6	British Columbia & Alberta, Canada Fires
July 20	McMillan (72)	Slightly high	16.7	None

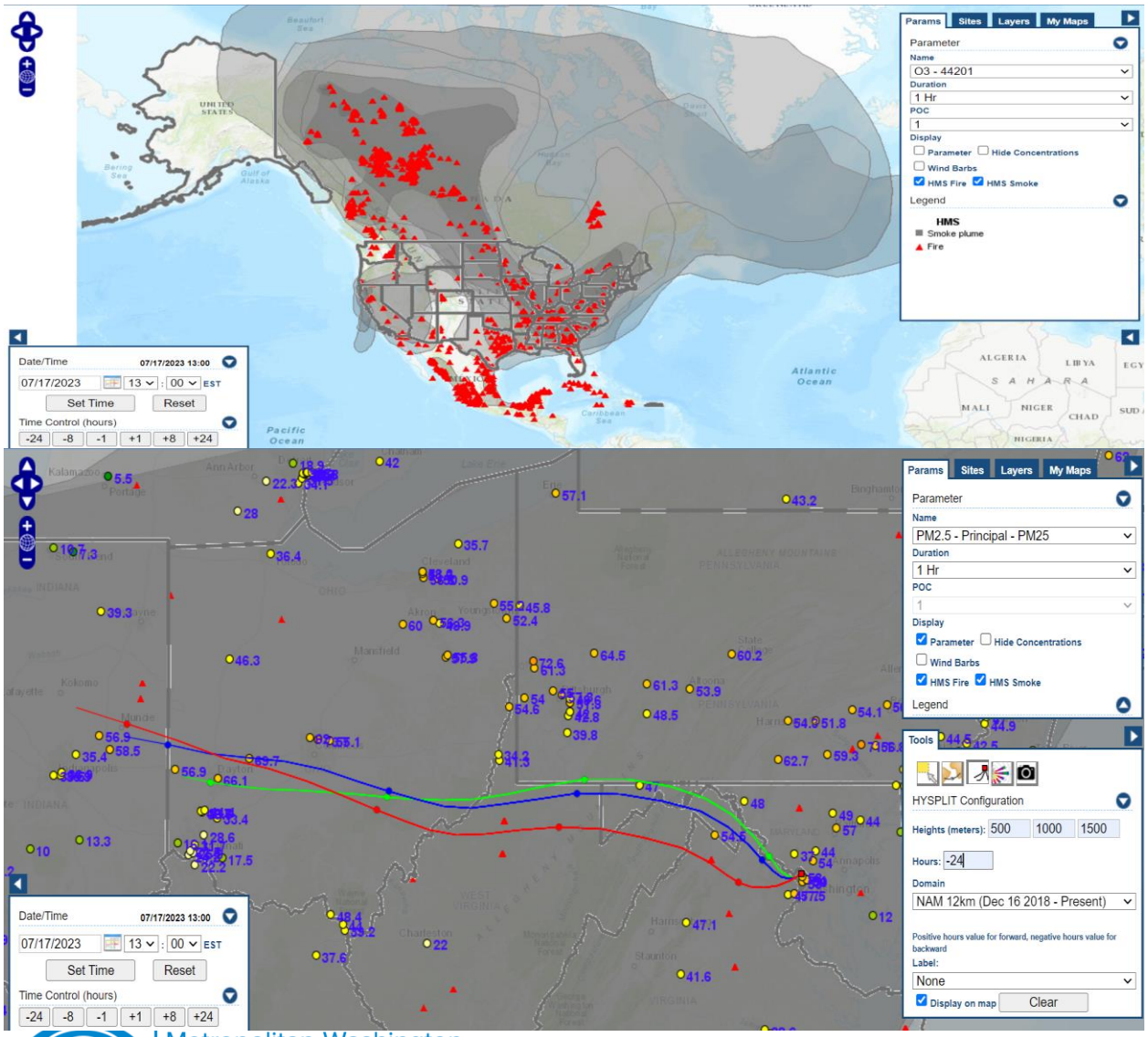
Fire Source Info-: MDE Presentation tilted “Exceptional Event Discussion” dated 8.31.2023

June 29, 2023



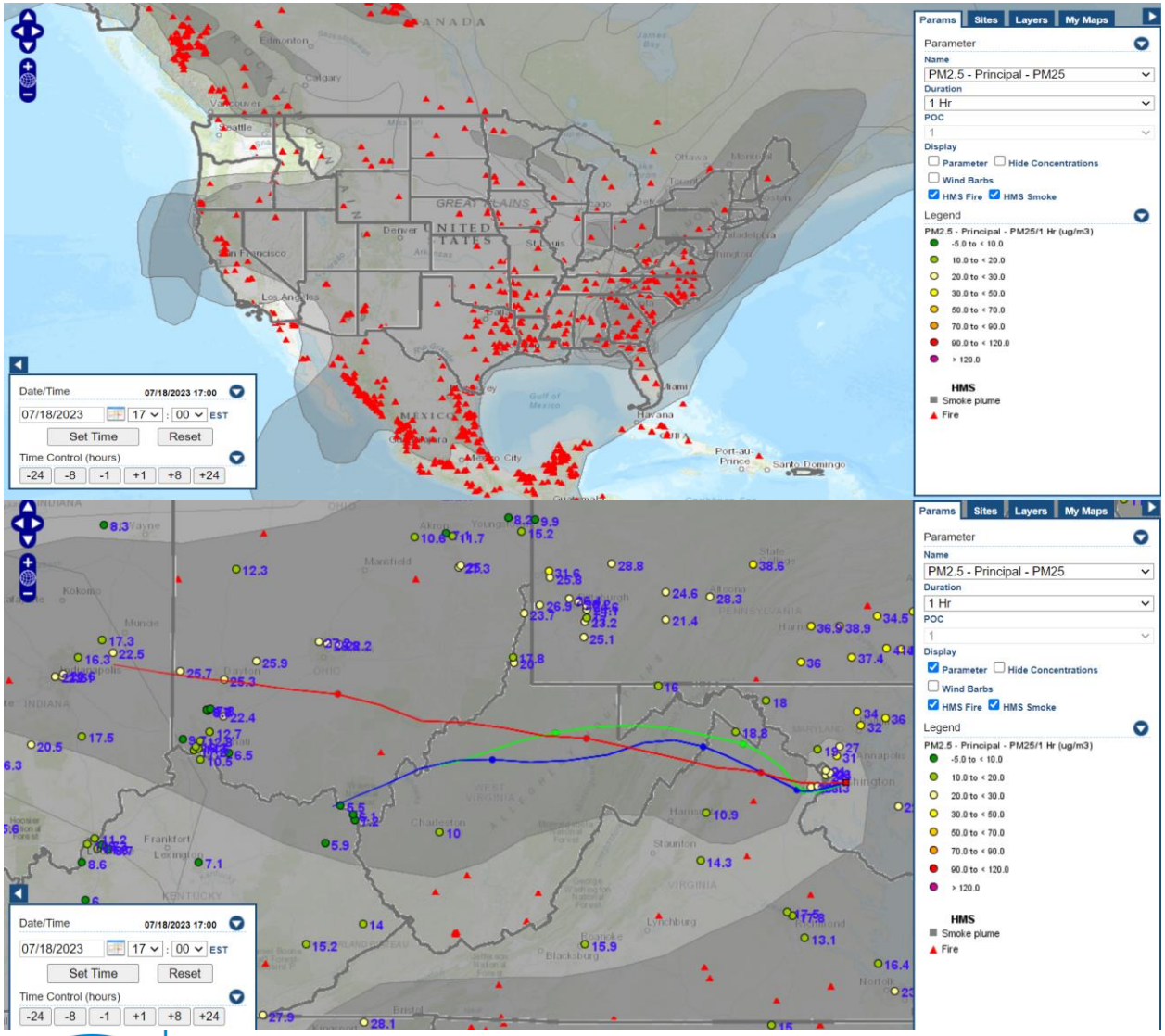
Fire Source:
Quebec, Canada

July 17, 2023



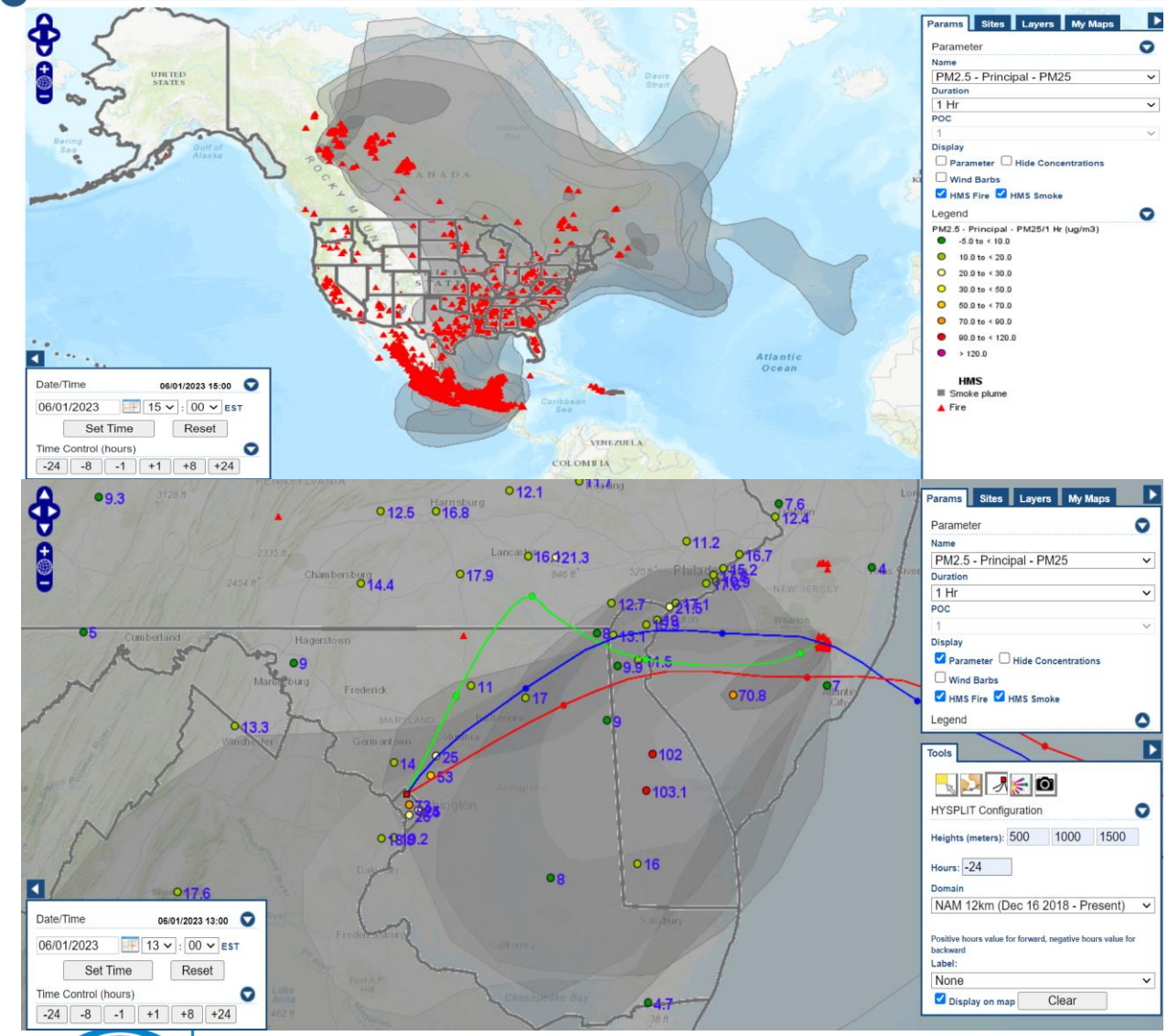
Fire Source:
British Columbia &
Alberta, Canada

July 18, 2023



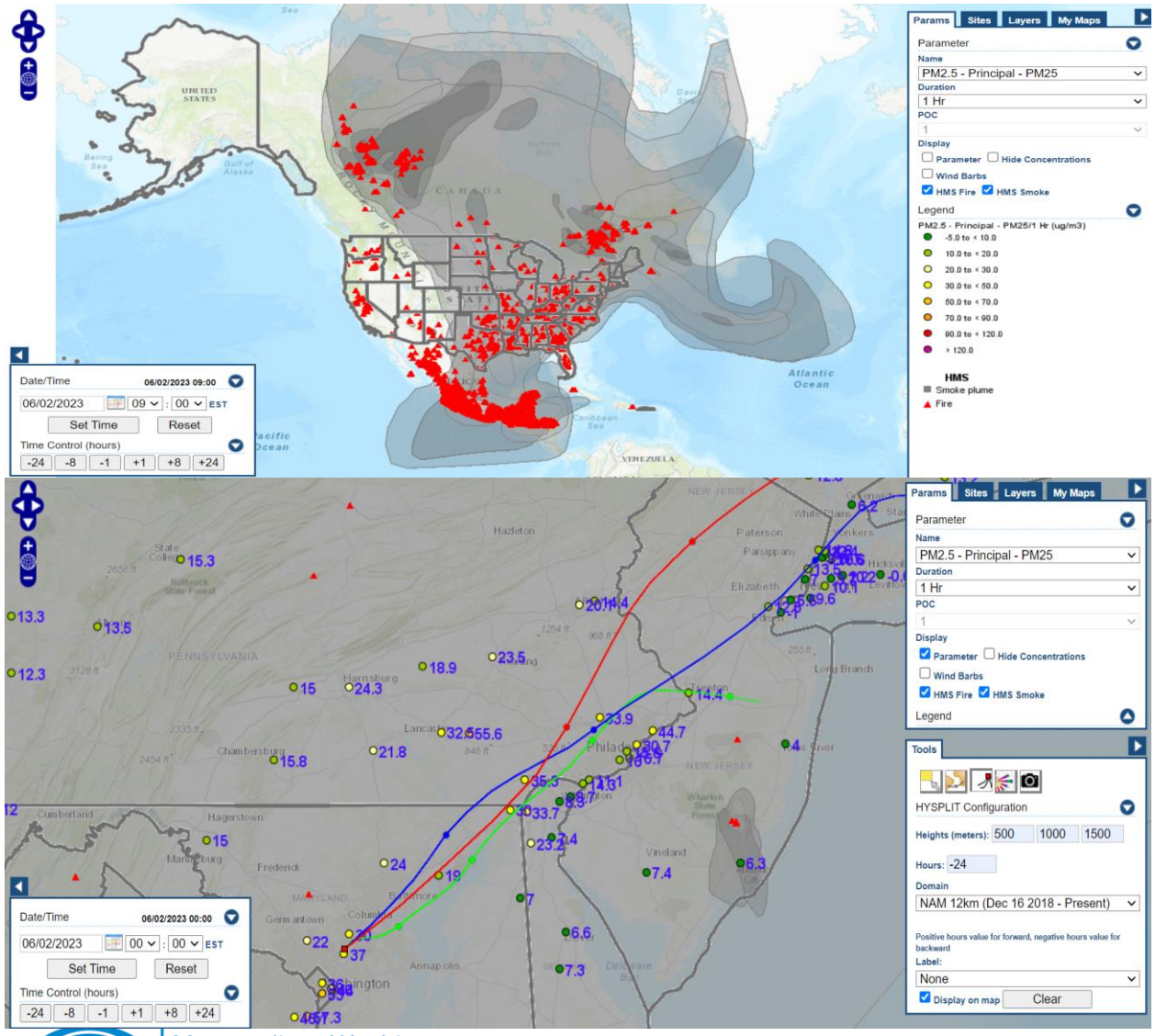
Fire Source:
British Columbia &
Alberta, Canada

June 1, 2023



Fire Source:
Nova Scotia, Canada
New Jersey

June 2, 2023



Fire Source:
Nova Scotia, Canada
New Jersey

Impact of Exemption on Design Values

Monitor Name	Current draft 2021-23 DV	DV- Data exempted (6/29)	DV- Data exempted (6/29, 7/17)	DV- Data exempted (6/29, 7/17-18)	DV- Data exempted (6/29, 7/17-18, 6/1)	DV- Data exempted (6/29, 7/17-18, 6/1-2)
McMillian	0.071	0.070	0.070	0.070	0.070	0.069
PG Equestrian Center	0.069	0.068	0.068	0.068	0.068	0.067
Beltsville	0.069	0.068	0.068	0.068	0.068	0.067

Conclusion

- Draft 2021-23 ozone design value data shows nonattainment for the 2015 ozone standard.
- There seems to be a good chance for the above five dates to be granted exceptional events exemption.
- If that happens, design values of the three monitors will come down bringing the Washington region back into attainment as well as providing some cushion for any future tougher ozone standard.

Questions?

Sunil Kumar

Principal Environmental Engineer

MWCOG

202-962-3244

skumar@mwcog.org