



# Ozone Season Summary & Air Quality Trends

MWAQC TAC  
September 16, 2005



# I-Hour Ozone Summary

Daily Peak One-Hour Ozone Concentration (ppb)  
Washington Area-2005

## MAY

Sun	Mon	Tues	Wed	Thurs	Fri	Sat
1	2	3	4	5	6	7
58	55	44	58	61	54	75
8	9	10	11	12	13	14
68	66	76	79	58	50	70
15	16	17	18	19	20	21
56	47	53	68	61	59	55
22	23	24	25	26	27	28
56	48	37	46	57	71	63
29	30	31				
56	67	67				

## JUNE

Sun	Mon	Tues	Wed	Thurs	Fri	Sat
			1	2	3	4
			87	57	36	59
5	6	7	8	9	10	11
87	98	98	96	70	49	62
12	13	14	15	16	17	18
45	49	80	70	69	56	75
19	20	21	22	23	24	25
61	60	84	86	89	92	100
26	27	28	29	30		
96	54	84	61	104		

## JULY

Draft

Sun	Mon	Tues	Wed	Thurs	Fri	Sat
					1	2
					104	75
3	4	5	6	7	8	9
82	80	89	81	66	53	88
10	11	12	13	14	15	16
86	90	115	66	106	67	68
17	18	19	20	21	22	23
76	78	67	97	112	115	74
24	25	26	27	28	29	30
81	107	111	86	78	72	83
31						
66						

Draft

## AUGUST

Sun	Mon	Tues	Wed	Thurs	Fri	Sat
	1	2	3	4	5	6
	100	104	116	111	116	103
7	8	9	10	11	12	13
84	60	30	77	119	102	111
14	15	16	17	18	19	20
96	80	62	94	83	67	79
21	22	23	24	25	26	27
70	69	73	65	86	68	43
28	29	30	31			
72	69	37	48			

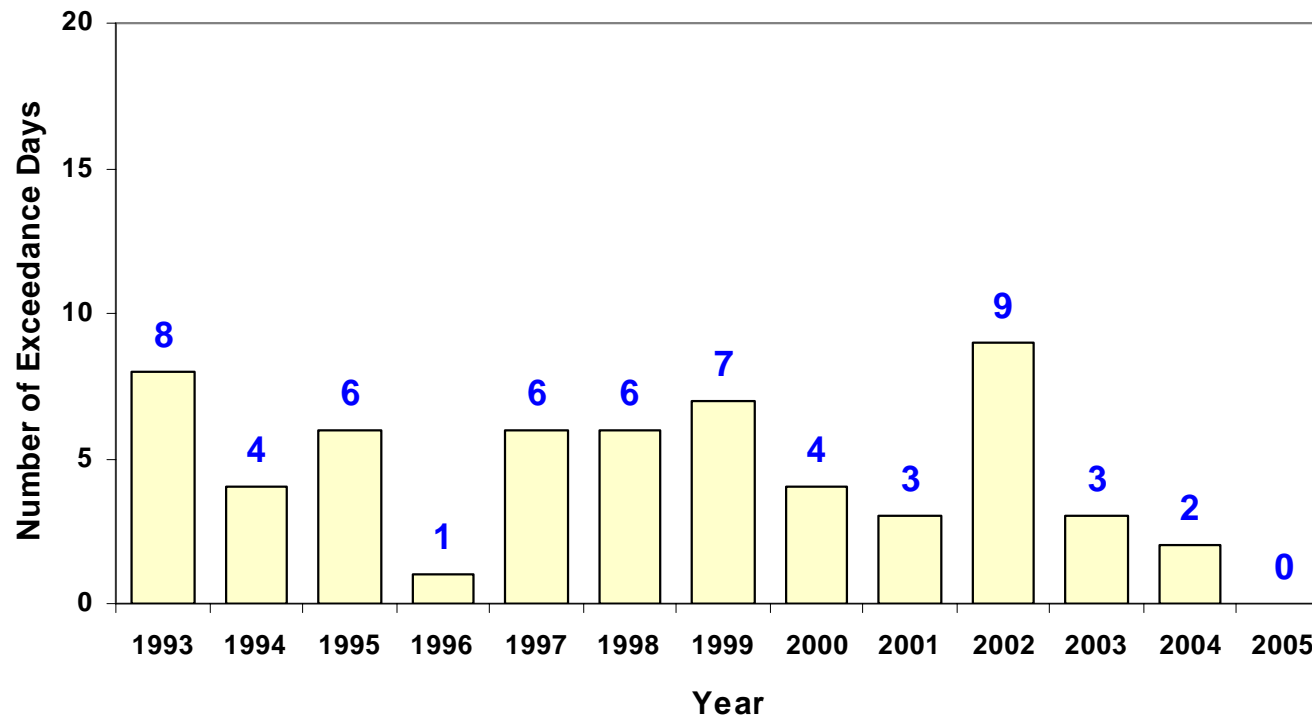
## SEPTEMBER

Sun	Mon	Tues	Wed	Thurs	Fri	Sat
				1	2	3
				61	83	61
4	5	6	7	8	9	10
57	62	70	71	97	98	89
11	12	13	14	15	16	17
94						
18	19	20	21	22	23	24
25	26	27	28	29	30	



# I-hr Ozone Exceedance Days

Exceedances of 1-hour Ozone Standard  
Washington, D.C. Region, 1993-2005

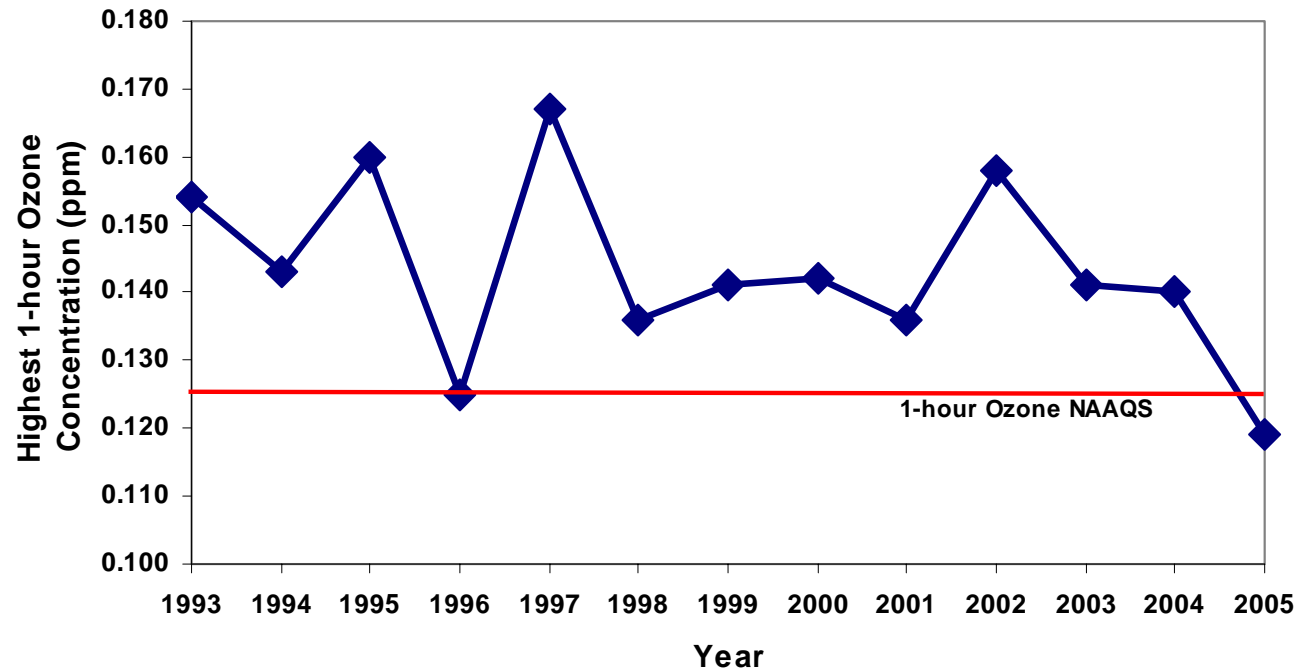


\*2005 data is preliminary and subject to change



# Peak 1-hr Ozone Concentrations

Peak 1-hour Ozone Concentrations  
Washington, D.C. Region, 1993-2005



\*2005 data is preliminary and subject to change



# 8-Hour Ozone Summary

Daily Peak 8-Hour Ozone Concentration (ppb)  
Washington Area-2005

## MAY

Sun	Mon	Tues	Wed	Thurs	Fri	Sat
1	2	3	4	5	6	7
55	51	40	53	58	51	69
8	9	10	11	12	13	14
64	60	67	67	47	46	59
15	16	17	18	19	20	21
50	44	47	62	58	54	49
22	23	24	25	26	27	28
52	41	29	37	53	65	53
29	30	31				
53	58	63				

## JUNE

Sun	Mon	Tues	Wed	Thurs	Fri	Sat
			1	2	3	4
			78	45	32	49
5	6	7	8	9	10	11
81	75	80	83	63	41	52
12	13	14	15	16	17	18
48	41	75	66	60	53	69
19	20	21	22	23	24	25
49	48	78	73	70	81	87
26	27	28	29	30		
96	43	67	52	91		

## JULY

Sun	Mon	Tues	Wed	Thurs	Fri	Sat
					1	2
					86	69
3	4	5	6	7	8	9
78	68	66	70	48	47	75
10	11	12	13	14	15	16
75	81	100	52	81	50	58
17	18	19	20	21	22	23
58	69	54	88	93	94	64
24	25	26	27	28	29	30
64	80	97	78	66	55	70
31						
59						

Draft

Draft

## AUGUST

Sun	Mon	Tues	Wed	Thurs	Fri	Sat
	1	2	3	4	5	6
	82	89	97	97	94	88
7	8	9	10	11	12	13
69	52	28	60	94	88	88
14	15	16	17	18	19	20
80	73	46	71	73	46	69
21	22	23	24	25	26	27
63	62	62	58	68	56	35
28	29	30	31			
58	55	29	43			

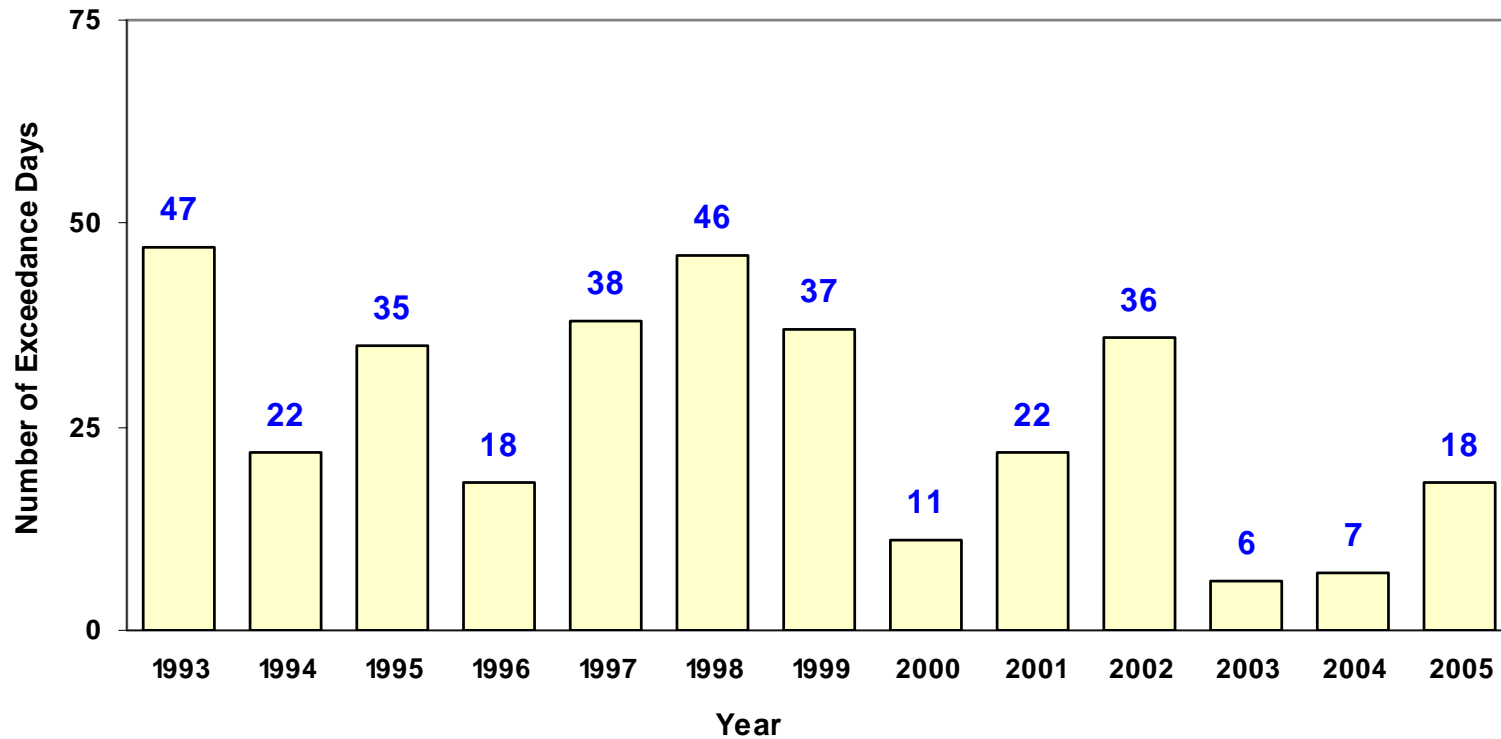
## SEPTEMBER

Sun	Mon	Tues	Wed	Thurs	Fri	Sat
				1	2	3
				54	72	54
4	5	6	7	8	9	10
50	55	60	67	83	88	80
11	12	13	14	15	16	17
77						
18	19	20	21	22	23	24
25	26	27	28	29	30	



# 8-hr Ozone Exceedance Days

Exceedances of 8-hour Ozone Standard  
Washington, D.C. Region, 1993-2005

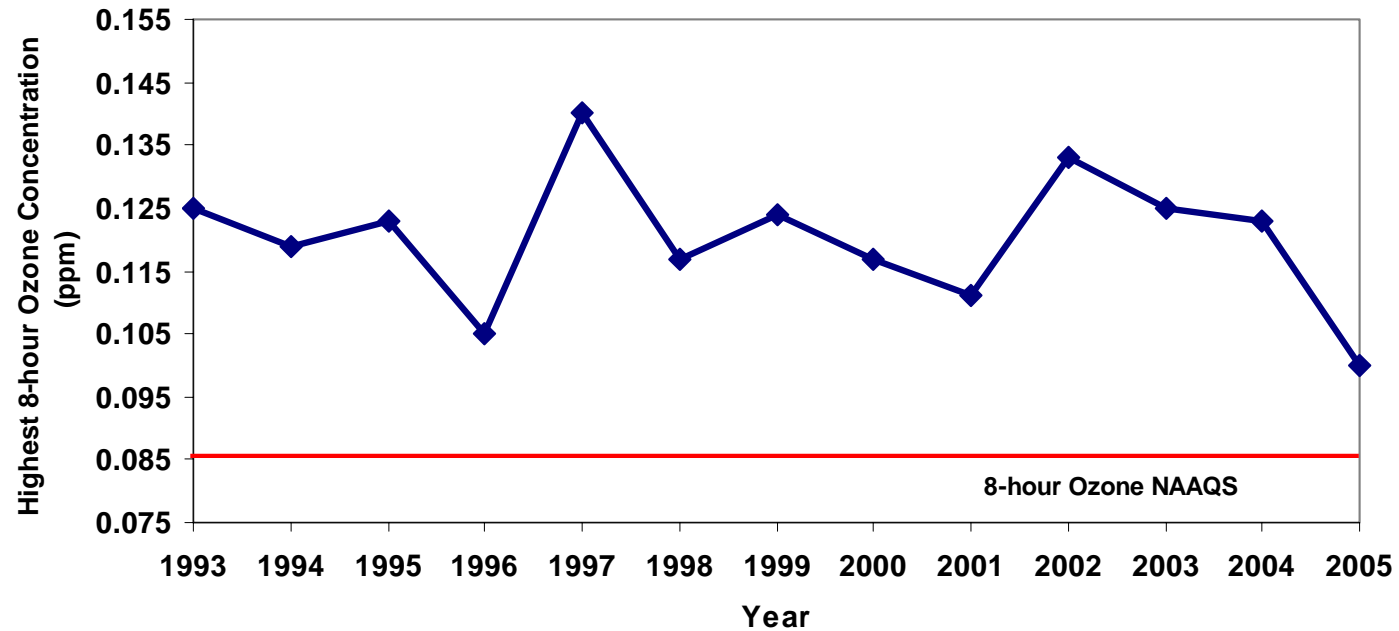


\*2005 data is preliminary and subject to change



# Peak 8-hr Ozone Concentrations

Peak 8-hour Ozone Concentrations  
Washington, D.C. Region, 1993-2005



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# Code Red Forecast – August 13<sup>th</sup>

## FORECAST OZONE CODE

Baltimore: Red  
Washington, DC: Red

### Meteorology:

- Hot summer day with the western fringe of Bermuda High dominating the weather pattern.
- Highest temperatures : 2 - 5 PM.
- Limited vertical mixing.
- Wind pattern little unusual as winds were calm until 2 PM when they started increasing rapidly.
- Scattered clouds observed beginning 2 PM.
- Upper level winds (500 & 1000 m) at 3 PM arriving from Southern Ohio region.

### Ozone:

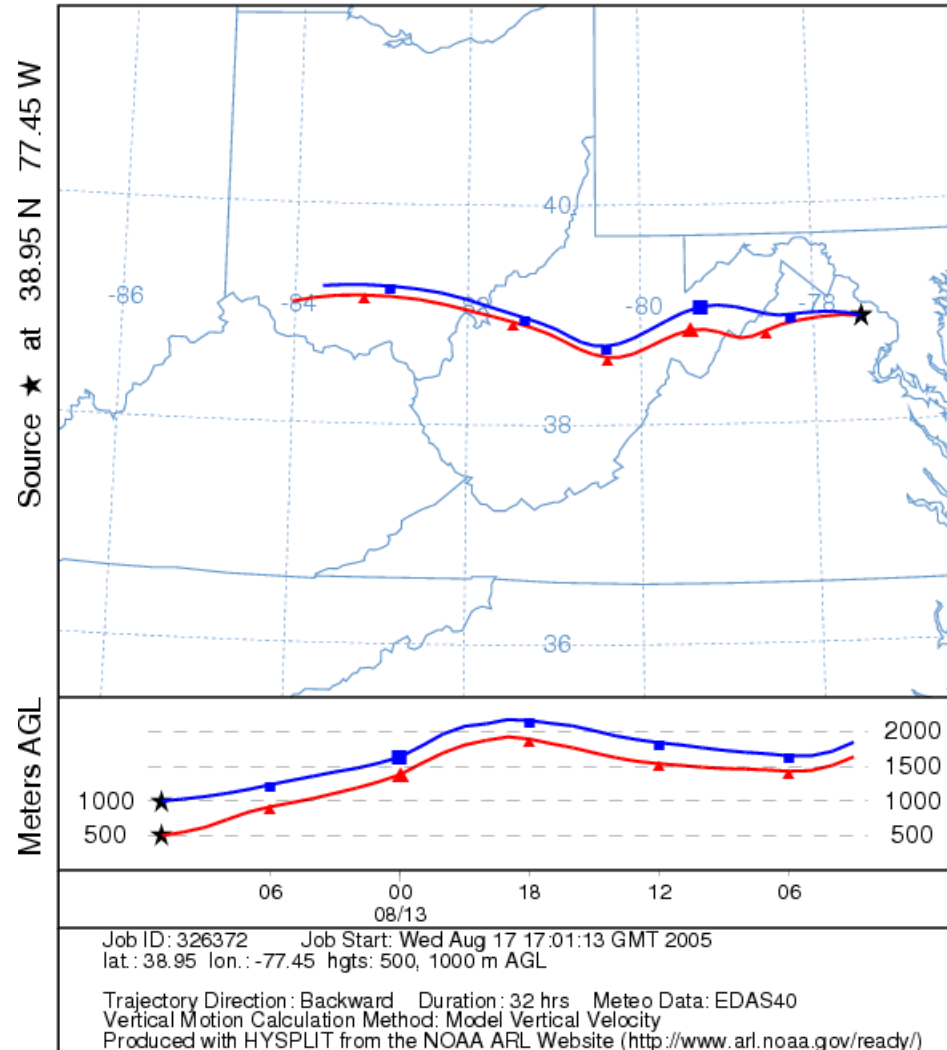
- Ozone levels increased due to increasing temperature and virtually no winds until 3 PM.
- Limited vertical mixing didn't allow the ozone levels to get diluted until this time.
- Beginning 2 PM scattered clouds observed and winds 9 mph.
- Winds mostly from SSW direction and so not much transported ozone or precursors.
- Upper level winds from Southern Ohio region, but didn't have chance to mix very well with ground level ozone due to limited vertical mixing.
- Therefore, increased wind speed and clouds after 3 PM coupled with lack of transported ozone on August 13, 2005 most probably caused ozone levels to go down after 3 PM and didn't allow the levels to reach upto code Red (expected) in the region.
- Reduced emissions on this day (Saturday) might also be one of the factors.





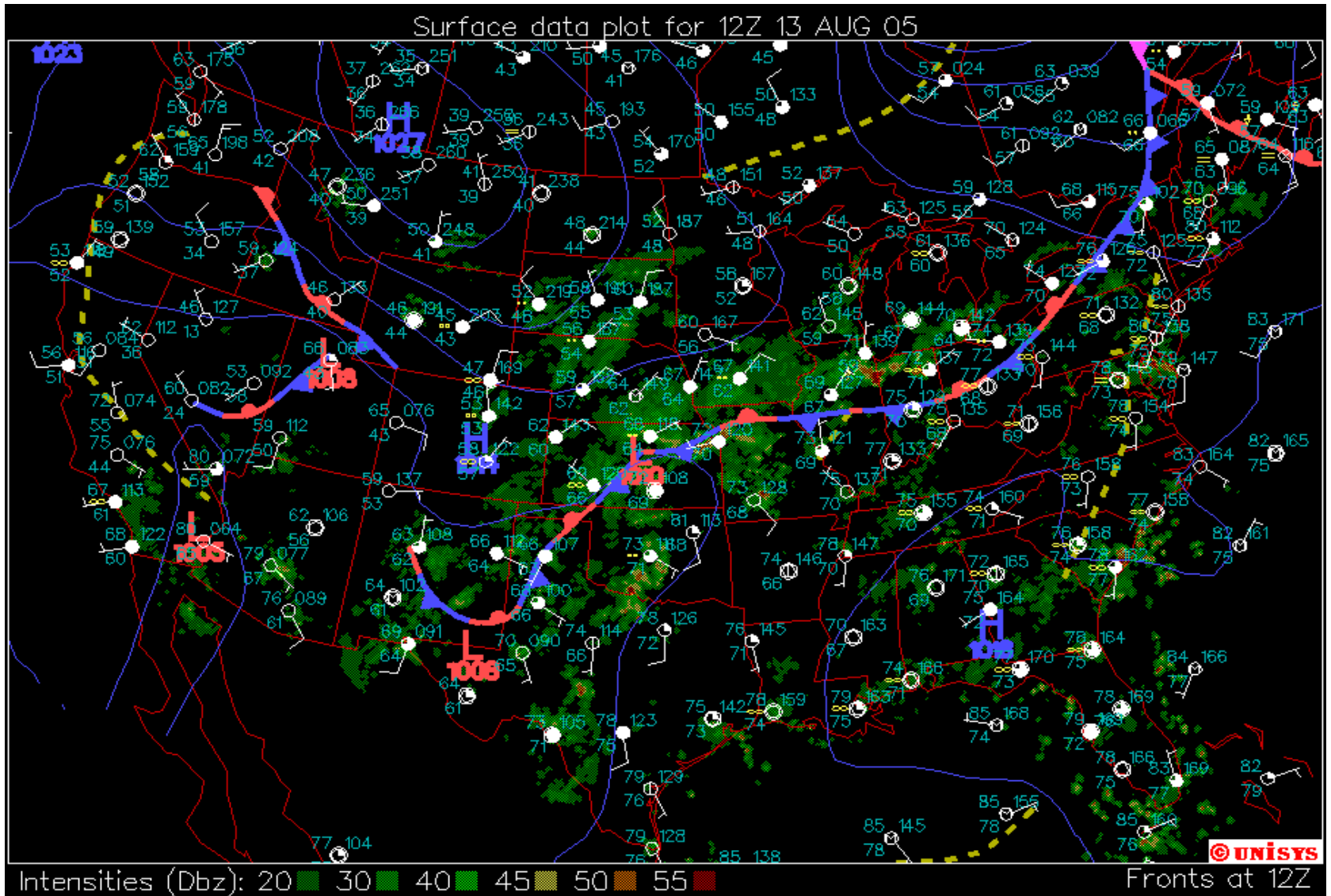
# What Happened - Trajectories

NOAA HYSPLIT MODEL  
Backward trajectories ending at 11 UTC 13 Aug 05  
EDAS Meteorological Data



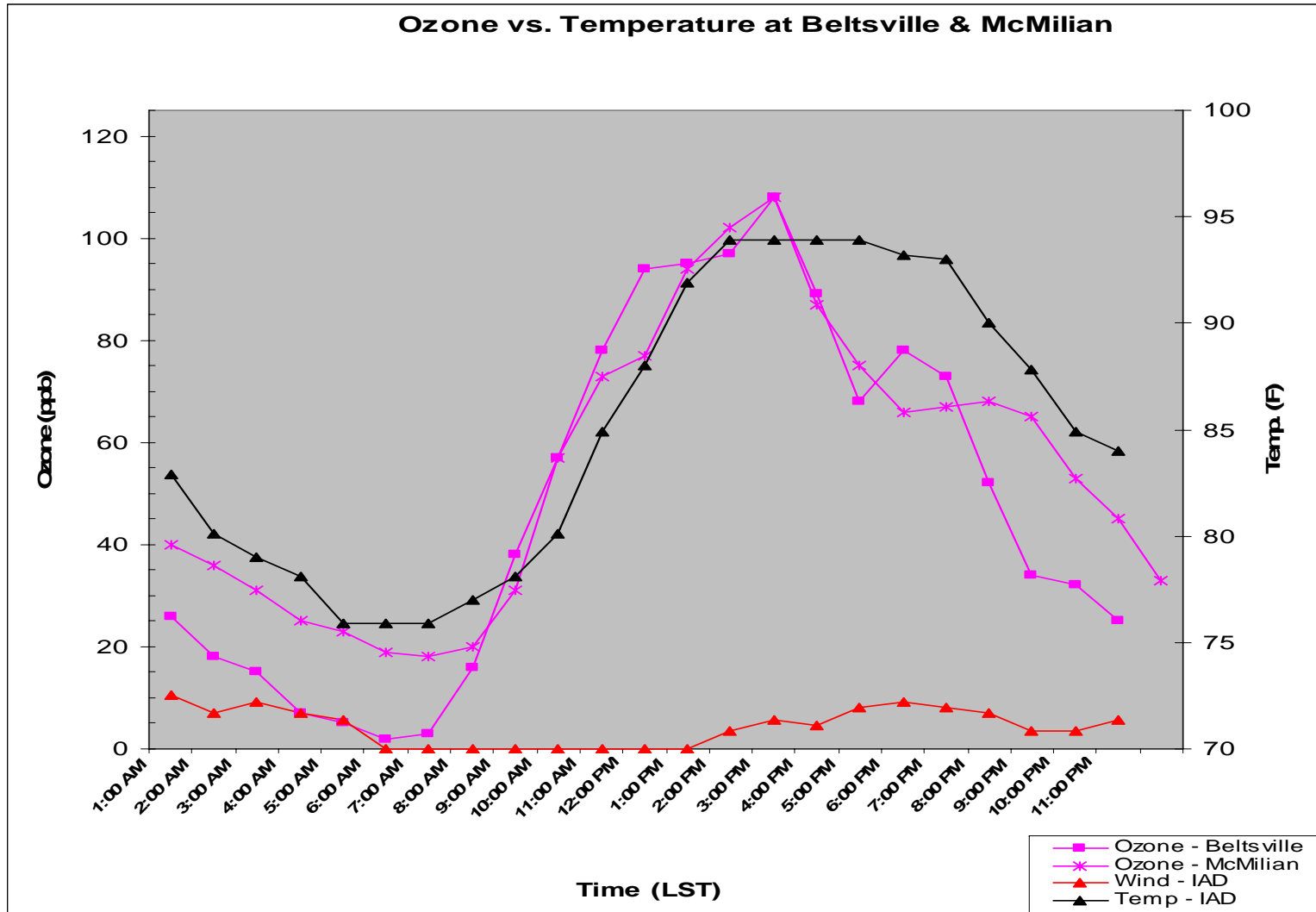


# What Happened – Surface Data





# What Happened - Ozone vs. Temperature





# 24-Hour Fine Particle Summary

Daily Peak 24-Hour Particle Concentration (ug/m3)  
Washington Area-2005

## MAY

Sun	Mon	Tues	Wed	Thurs	Fri	Sat
1	2	3	4	5	6	7
11	8	8	13	16	12	13
8	9	10	11	12	13	14
8	5	8	14	7	4	12
15	16	17	18	19	20	21
10	9	12	20	22	4	6
22	23	24	25	26	27	28
10	12	8	3	5	13	14
29	30	31				
7	13	12				

## JUNE

Sun	Mon	Tues	Wed	Thurs	Fri	Sat
			1	2	3	4
			18	10	2	11
5	6	7	8	9	10	11
24	24	12	21	19	13	15
12	13	14	15	16	17	18
9	8	23	13	8.3	9	14
19	20	21	22	23	24	25
5	9	16	22	8	15	21
26	27	28	29	30		
19	5	14	9	26		

## JULY

Draft

Sun	Mon	Tues	Wed	Thurs	Fri	Sat
					1	2
					21	17
3	4	5	6	7	8	9
12	21	20	23	24	3	15
10	11	12	13	14	15	16
15	34	33	24	18	24	23
17	18	19	20	21	22	23
17	23	21	27	30	34	12
24	25	26	27	28	29	30
9	31	23	26	10	18	16
31						
11						

Draft

## AUGUST

Sun	Mon	Tues	Wed	Thurs	Fri	Sat
	1	2	3	4	5	6
	18	29	25	34	35	24
7	8	9	10	11	12	13
24	15	6	10	31	43	44
14	15	16	17	18	19	20
39	16	14	12	24	12	24
21	22	23	24	25	26	27
19	13	14	13	12	10	5
28	29	30	31			
16	8	6	7			

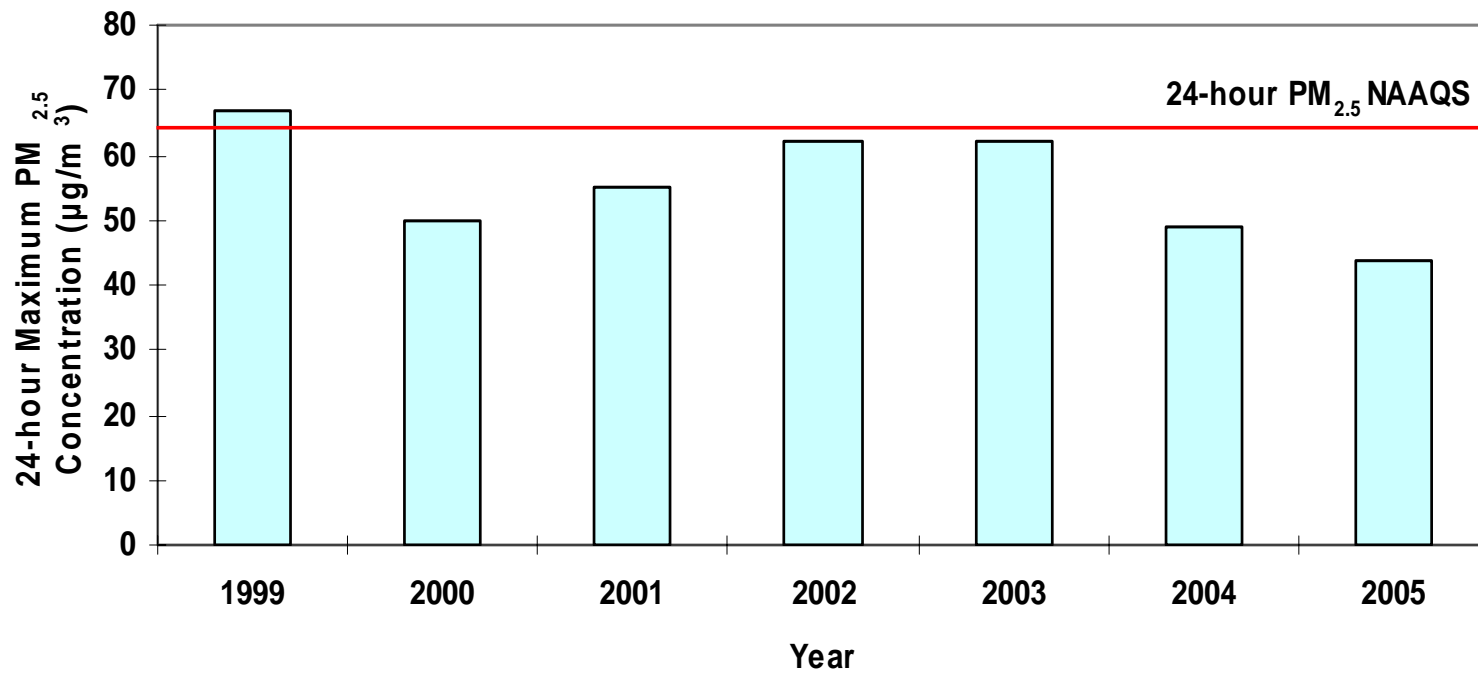
## SEPTEMBER

Sun	Mon	Tues	Wed	Thurs	Fri	Sat
				1	2	3
				16	19	7
4	5	6	7	8	9	10
5	7	7	6	12	34	34
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	



# 24-Hr Fine Particle Concentrations

PM<sub>2.5</sub> 24-hour Maximum Concentrations  
Washington, D.C. Region, 1999-2005



\*2005 data is preliminary and subject to change



# Annual Fine Particle Concentrations

PM<sub>2.5</sub> Highest Annual Average Concentrations  
Washington, D.C. Region, 1999-2004

