



2023 OZONE SEASON SUMMARY

SIPRAC

Presented by: Daniella Lopez, Planning and Standards
Bureau of Air Management

2023 OZONE FORECASTING SEASON


Ozone Forecasting Season is May 1- Sept 30.


CTDEEP forecasts are available through:

1. List-server emails
2. Phone messaging
3. [CTDEEP AQI web page](#)
4. EPA Airnow forecasts

Receive notices of Daily AQI:

- [EnviroFlash](#) - Subscribe to receive air quality information by e-mail.
- [Twitter](#) - Follow the air quality forecasts.
- Subscribe to the [DEEP Air Quality Information listserv](#) to receive a daily ozone forecast between May 1 through September 30, and a daily PM2.5 forecast year round.
- Subscribe to the [DEEP Ozone Forecast listserv](#) to receive a daily 8-hour ozone forecast that is disseminated to Connecticut’s regulated community from May 1 through September 30.





Friday, September 30, 2022

Thursday's Forecasted Air Quality	G	
Friday's Forecasted Air Quality	G	

**Predicted Daily Maximums for
Friday, September 30, 2022**

Town	8-Hour Ozone		Particulate Matter	
	AQI Value	Air Quality	AQI Value	Air Quality
Bridgeport	38	G	38	G
Cornwall	27	G	21	G
Danbury	31	G	29	G
East Hartford	28	G	33	G
Greenwich	32	G		
Groton	29	G	25	G
Madison	30	G		
Middletown	28	G		
New Haven	30	G	29	G
Stafford	25	G		
Stratford	31	G		
Waterbury			38	G
Westport	32	G		

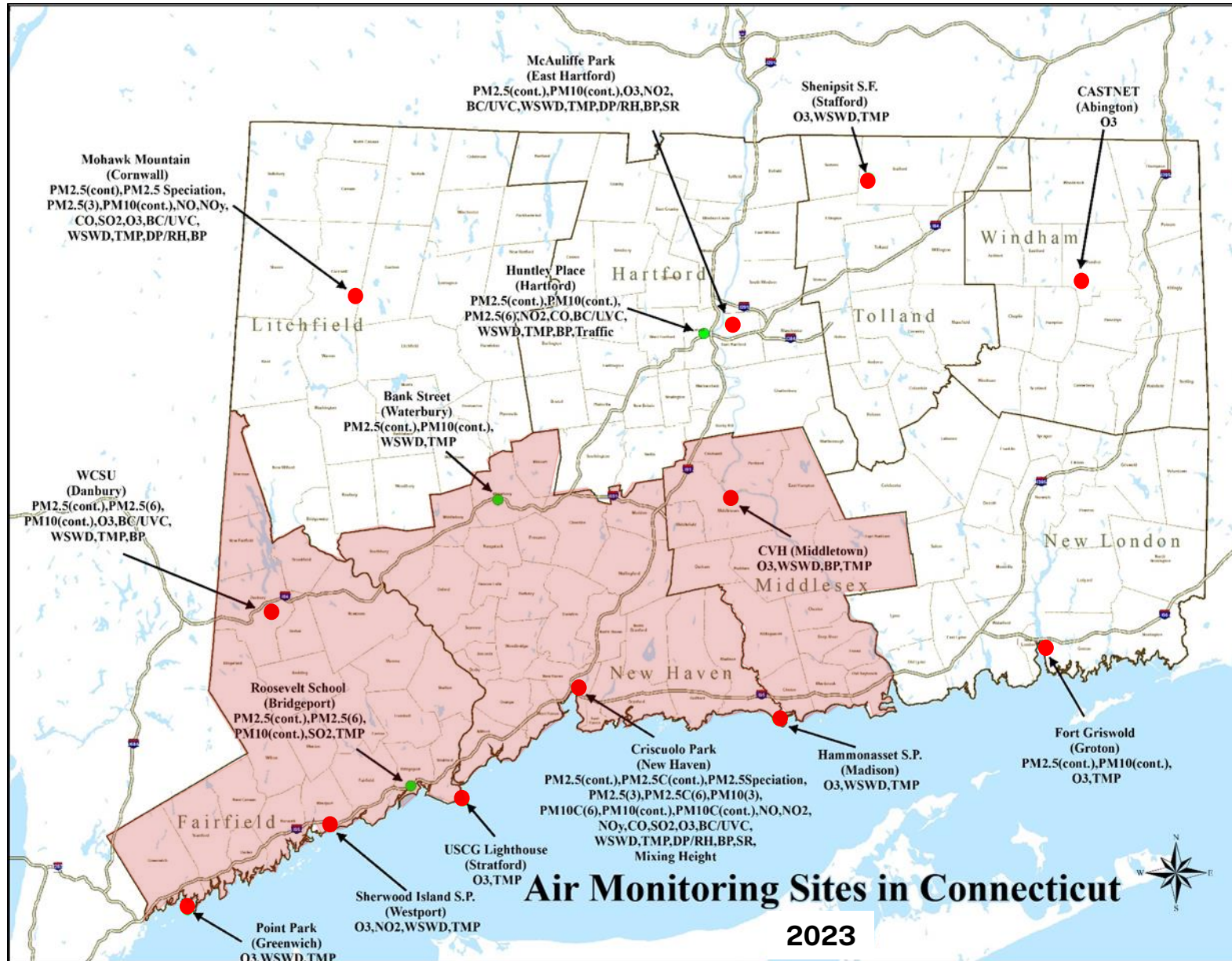
Air Quality Index (AQI) value of 100 = Federal Health Standard

Air Quality Index Value	Air Quality Descriptor
0 - 50	(G) Good
51 - 100	(M) Moderate
101 - 150	(USG) Unhealthy For Sensitive Groups
151 - 200	(U) Unhealthy
201 - 300	(VU) Very Unhealthy

DEEP's Air Quality Index: (860) 424-4167 or (800) 249-1234
State clean air programs: (800) 249-1234
Connecticut Department of Energy and Environmental Protection
79 Elm Street, Hartford, CT 06106-5127

If you have questions about the Air Quality Forecast, call (860) 424-3027

CONNECTICUT'S MONITORING SITES



2023 OZONE SEASON SUMMARY

Month	April		May	June				July							Au	Sep				
Site	13	14	12	1	2	11	30	1	6	11	12	19	26	27	28	29	21	3	7	Site Exceedances
Abington	69	74	63	61	53	56	57	71	56	45	53	49	58	55	54	52	42	48	51	2
Cornwall	67	82	65	76	58	65	78	79	59	55	57	51	67	52	47	42	41	47	58	4
Danbury	68	85	60	73	58	72	85	83	68	56	64	55	75	59	50	55	47	50	70	6
East Hartford	67	84	59	73	69	41	73	82	69	48	64	47	64	61	48	53	60	48	61	4
Greenwich	72	76	66	73	81	64	81	82	77	72	89	70	82	72	75	71	66	61	87	14
Groton	76	73	70	40	49	58	70	76	62	60	81	61	59	49	69	71	50	61	64	5
Madison	82	75	75	50	66	60	78	77	61	68	81	62	64	55	64	81	74	71	69	9
Middletown	75	82	62	68	68	63	69	80	65	52	70	60	63	59	62	80	48	55	61	4
New Haven	58	66	64	50	65	66	80	72	69	54	66	66	61	52	64	82	49	60	54	3
Stafford	71	88	64	65	51	58	68	76	60	45	61	48	61	56	49	50	47	47	59	3
Stratford	77	72	69	57	75	63	81	86	76	70	89	73	70	62	72	86	74	66	77	12
Westport	79	78	70	72	80	63	79	82	71	68	89	74	75	74	74	79	69	60	76	14
Site Exceedances	7	11	1	5	3	1	8	12	3	1	5	2	3	2	3	7	2	1	3	80
# days > Federal Standard	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	

Good (0-54 ppb)
Moderate (55-70 ppb)
Unhealthy for Sensitive Groups (71-85 ppb)
Unhealthy (86-105 ppb)
Very Unhealthy (>106 ppb)

There were five ozone exceedance days reaching 'unhealthy' spread throughout April to September.

FORECASTED EXCEEDANCE DAYS

Actual Exceedance Days = 19 Forecast Exceedance Days = 11		
Month	Actual Dates	Forecast Dates
April	13 & 14	14
May	12	None
June	1, 2, 11, 30	1, 2
July	1, 6, 11, 12, 19, 26, 27, 28, 29	1, 5, 12, 26, 27, 28
August	21	None
September	3, 7	6, 7
Total	19	11

- Of the 19 exceedance days,
1. Forecasted USG for 9 days that exceeded the standard.
 2. Did not forecast USG for 10 days that exceeded the standard.
 3. Forecasted USG for 2 days that did not exceed the standard.

Some of the under-predicted days featured one or two sites that barely exceeded the standard. Elevated Smoke events also added to the uncertainty of an ozone exceedance for the other days

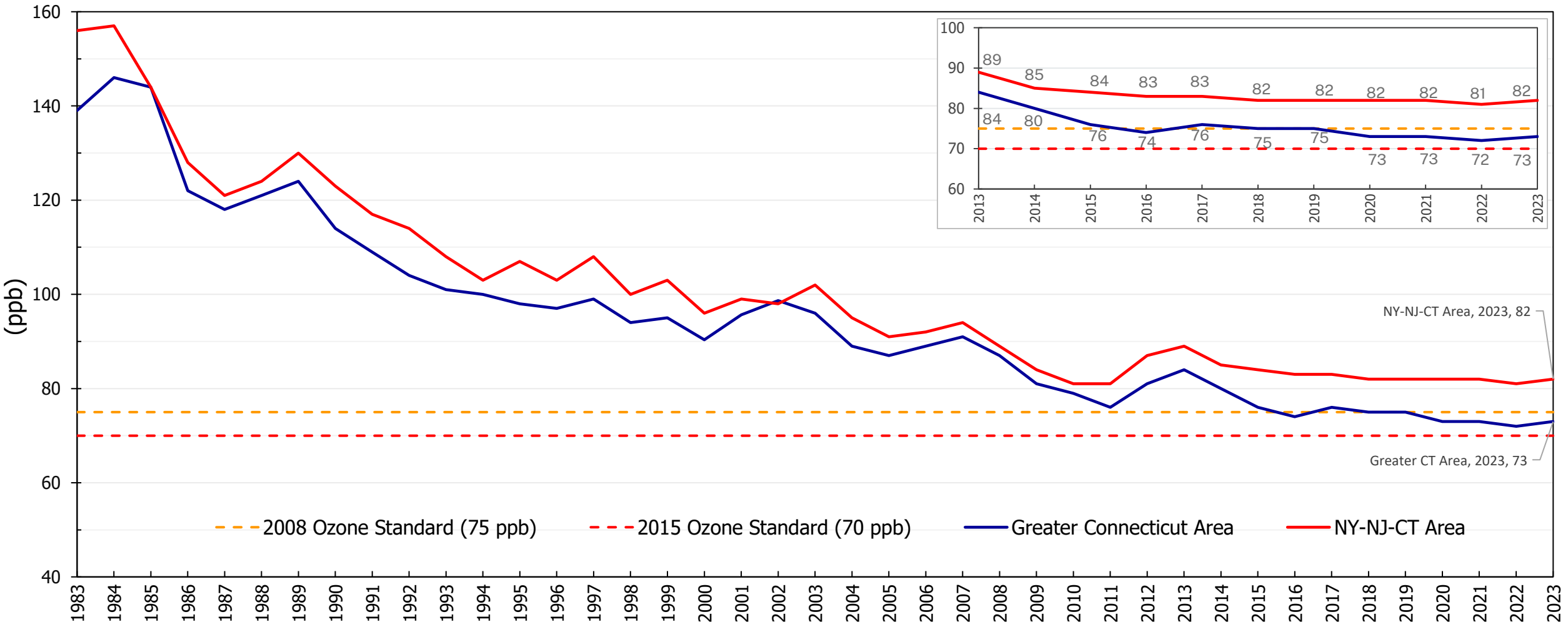
There were a lot of days with ozone values very close to the 70 ppb standard.

2023 DESIGN VALUES

		2023 Compliance Status x = Violating NAAQS							
		To Date: Prelim 2023 DV		2008 NAAQS	1997 NAAQS	# Needed to Next NAAQS in Violation (key monitors in each NA are highlighted in RED)			
Site Name									
SWCT Portion of NYC Area	Danbury	73	X			1	more days > 81	ppb day(s) violate the	2008 NAAQS
	Greenwich	78	X	X		4	more days > 100	ppb day(s) violate the	1997 NAAQS
	Madison	79	X	X		4	more days > 95	ppb day(s) violate the	1997 NAAQS
	Middletown	75	X			1	more days > 76	ppb day(s) violate the	2008 NAAQS
	New Haven	70				1	more days > 69	ppb day(s) violate the	2015 NAAQS
	Stratford	82	X	X		3	more days > 87	ppb day(s) violate the	1997 NAAQS
	Westport	82	X	X		3	more days > 87	ppb day(s) violate the	1997 NAAQS
Greater CT	Cornwall	71	X			4	more days > 89	ppb day(s) violate the	2008 NAAQS
	East Hartford	71	X			4	more days > 87	ppb day(s) violate the	2008 NAAQS
	Groton	73	X			4	more days > 81	ppb day(s) violate the	2008 NAAQS
	Stafford	68				3	more days > 77	ppb day(s) violate the	2015 NAAQS
	Abington	65				4	more days > 80	ppb day(s) violate the	2015 NAAQS
Number of Exceedance Days to Date			19			The 1997 standard was repealed with the 2008 Implementation rule. Effective April 6, 2015			

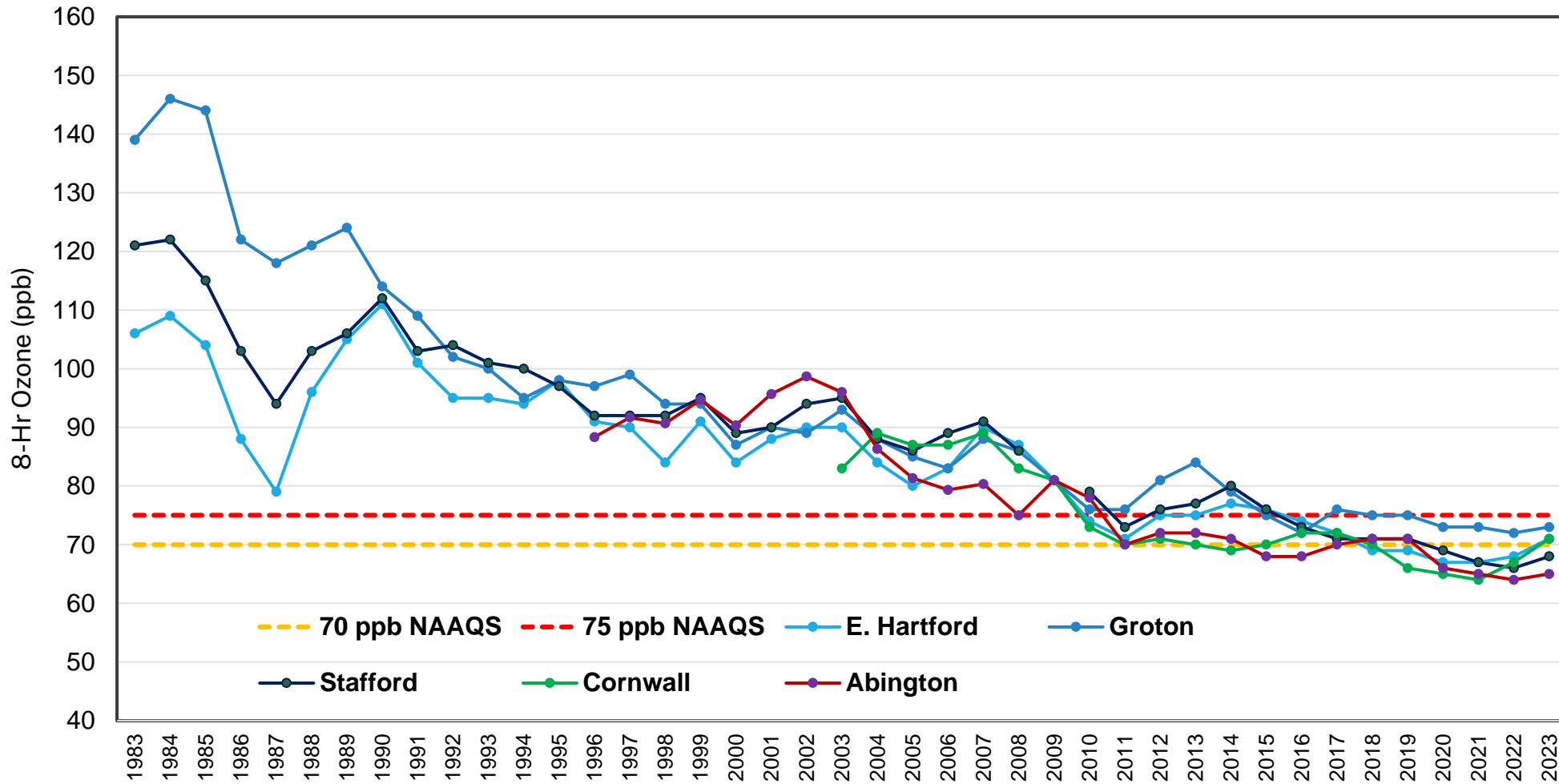
DESIGN VALUE UPDATE

Ozone Design Value Trends Connecticut's Two Nonattainment Areas



GREATER CONNECTICUT OZONE TRENDS

Greater Connecticut Ozone Non-Attainment Area 8-hr Ozone Design Value Trends

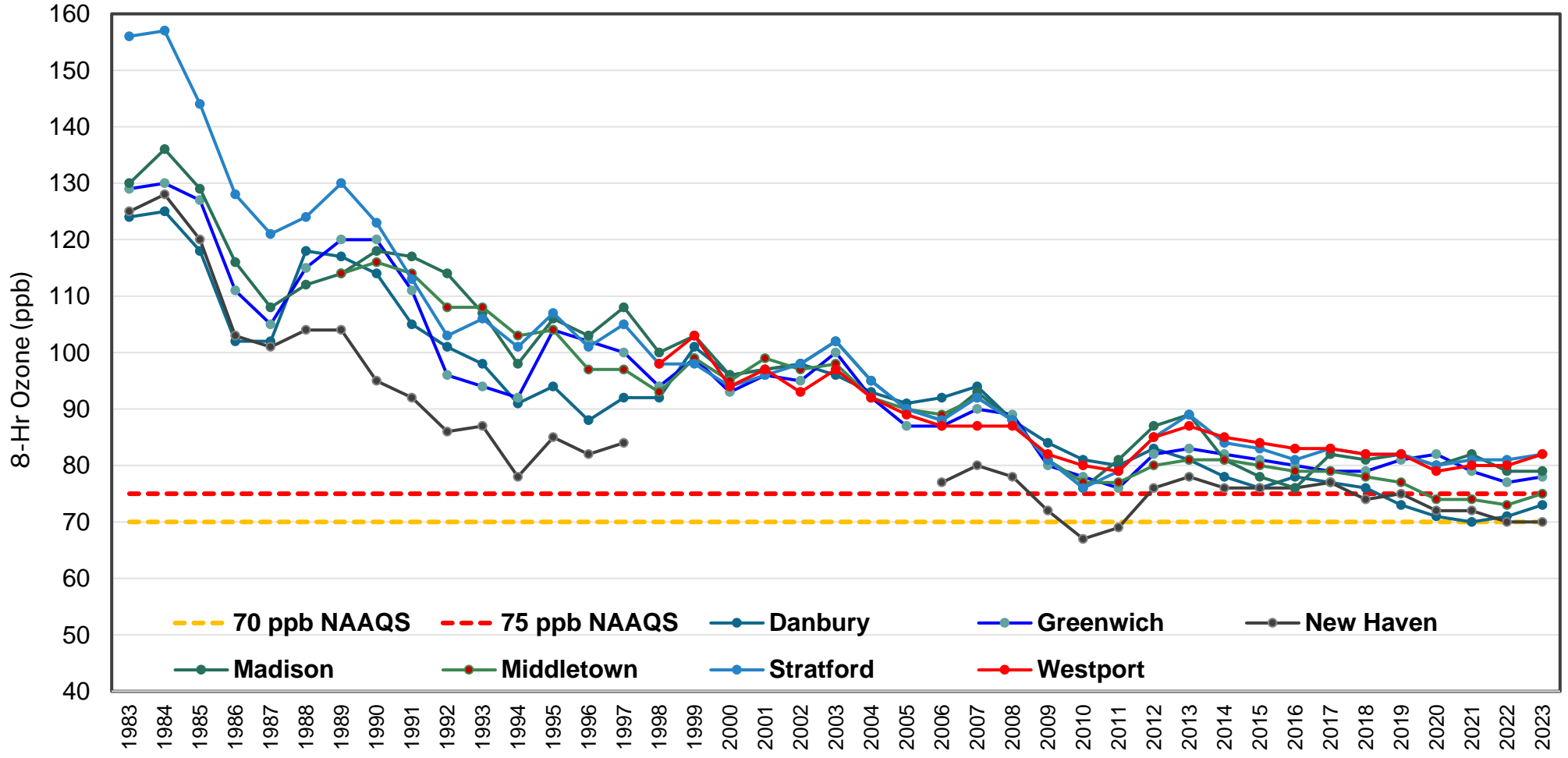


All of the Greater Connecticut sites are compliant with the 2008 NAAQS in 2023.

Groton is the continuing to be an issue for GRCT. As of 2023, Cornwall, East Hartford and Groton are noncompliant with the 2015 NAAQS.

SOUTHWEST CONNECTICUT OZONE TRENDS

Southwest Connecticut Ozone Non-Attainment Area 8-hr Ozone Design Value Trends



Danbury, Middletown, and New Haven have fallen below the 2008 NAAQS for 2023.

Stratford, Westport, Madison, and Greenwich have the highest design values across the state.

Only New Haven falls at the threshold for the 2015 NAAQS.

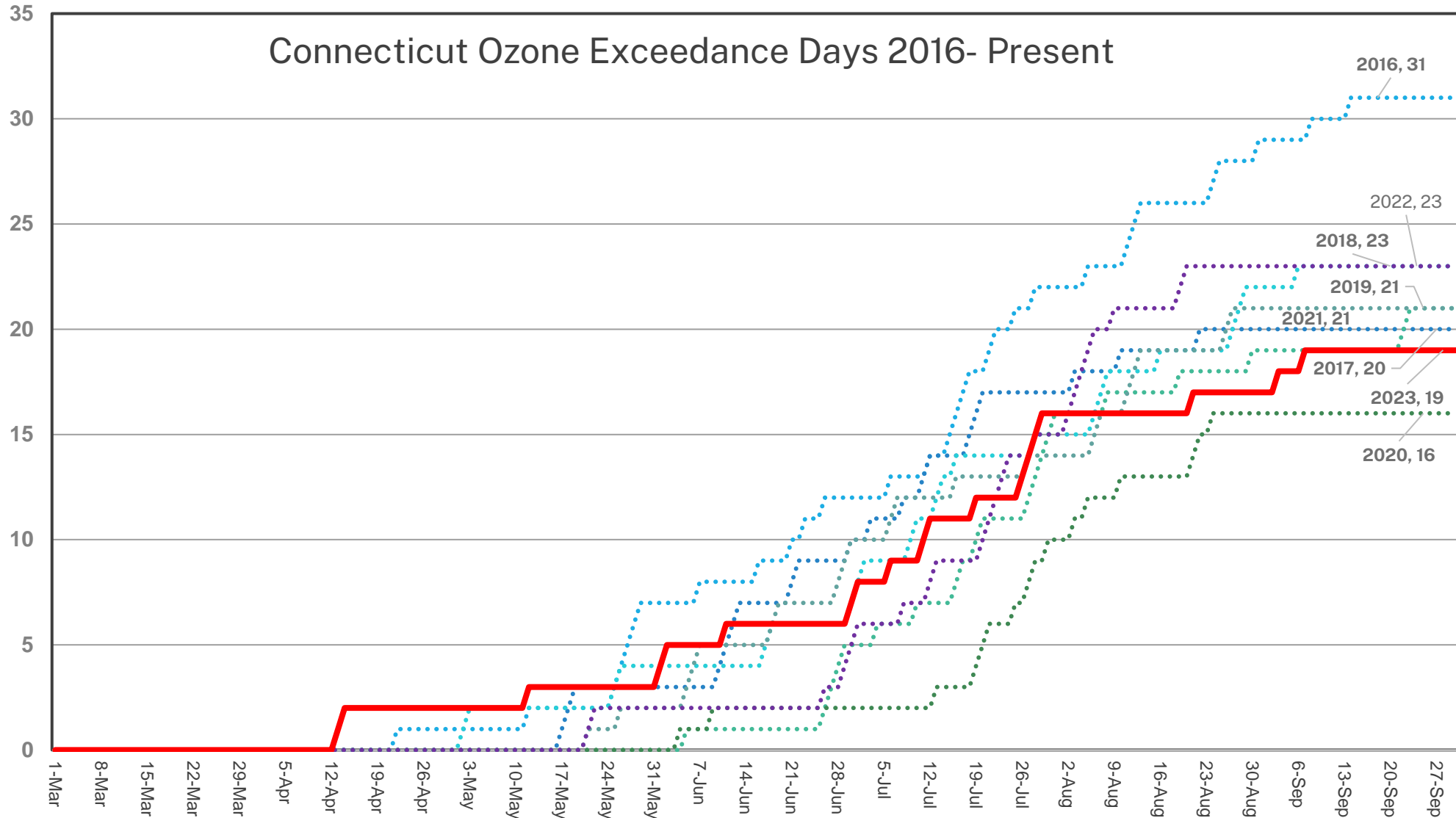
ACCUMULATED EXCEEDANCE DAYS

Exceedance days in recent years (70 ppb):

- 2016 – **31 days**
- 2017 – **20 days**
- 2018 – **23 days**
- 2019 – **21 days**
- 2020 – **17 days***
- 2021 – **21 days**
- 2022 – **23 days**
- 2023 – **19 days**

The 2023 ozone season started off unexpectedly quick with two exceedances in April.

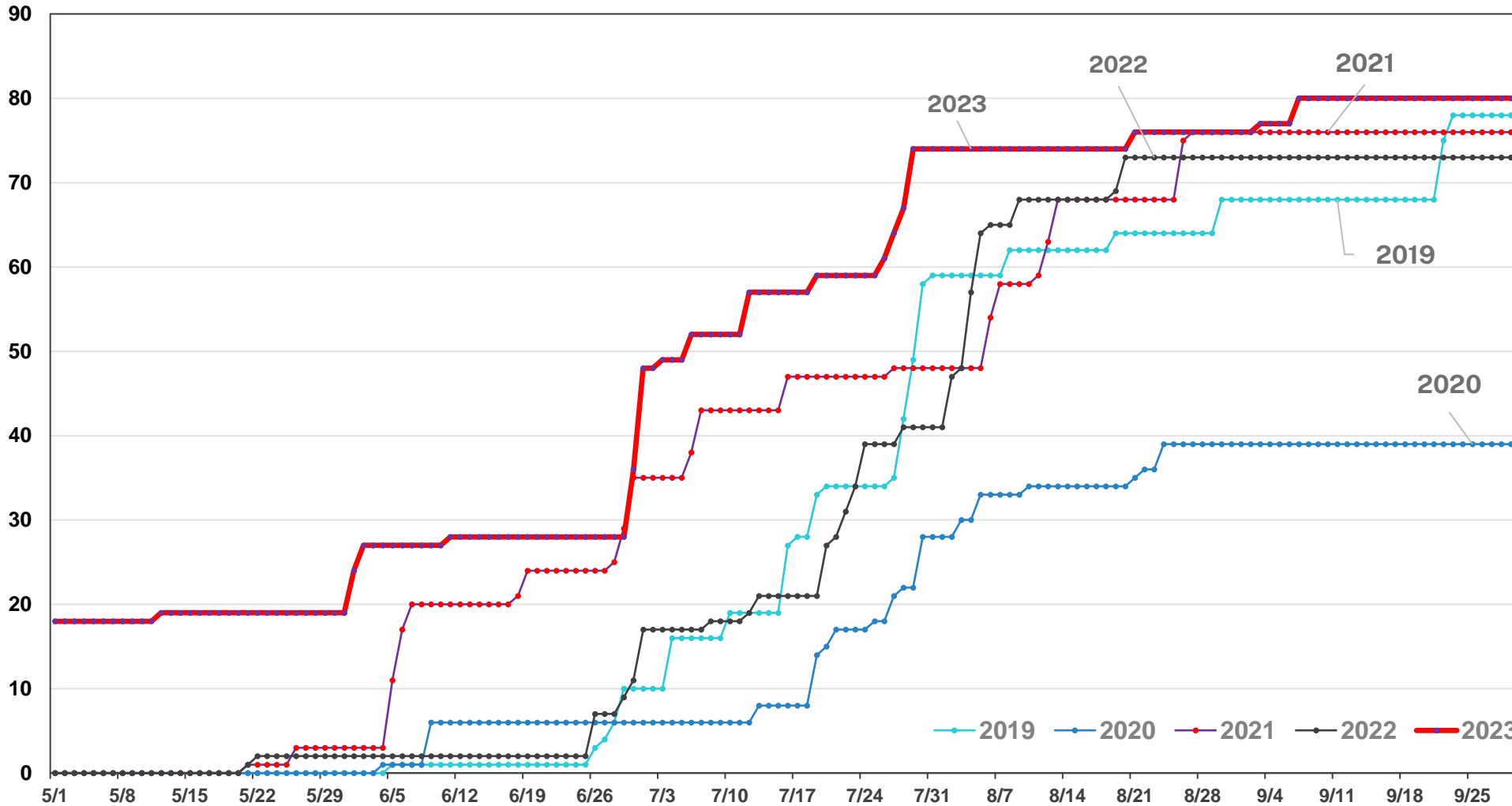
After a fairly consistent ozone season, we ended with 19 exceedance days.



* COVID-19 Shutdown

ACCUMULATED SITE EXCEEDANCES

CT Accumulated Site Exceedances 2023



Site exceedances in recent years:

- 2019 – **78 sites**
- 2020 – **39 sites***
- 2021 – **76 sites**
- 2022 – **73 sites**
- 2023 – **80 sites**

April 13 – 14, 2023 account for the 18 exceedance sites beginning the ozone season.

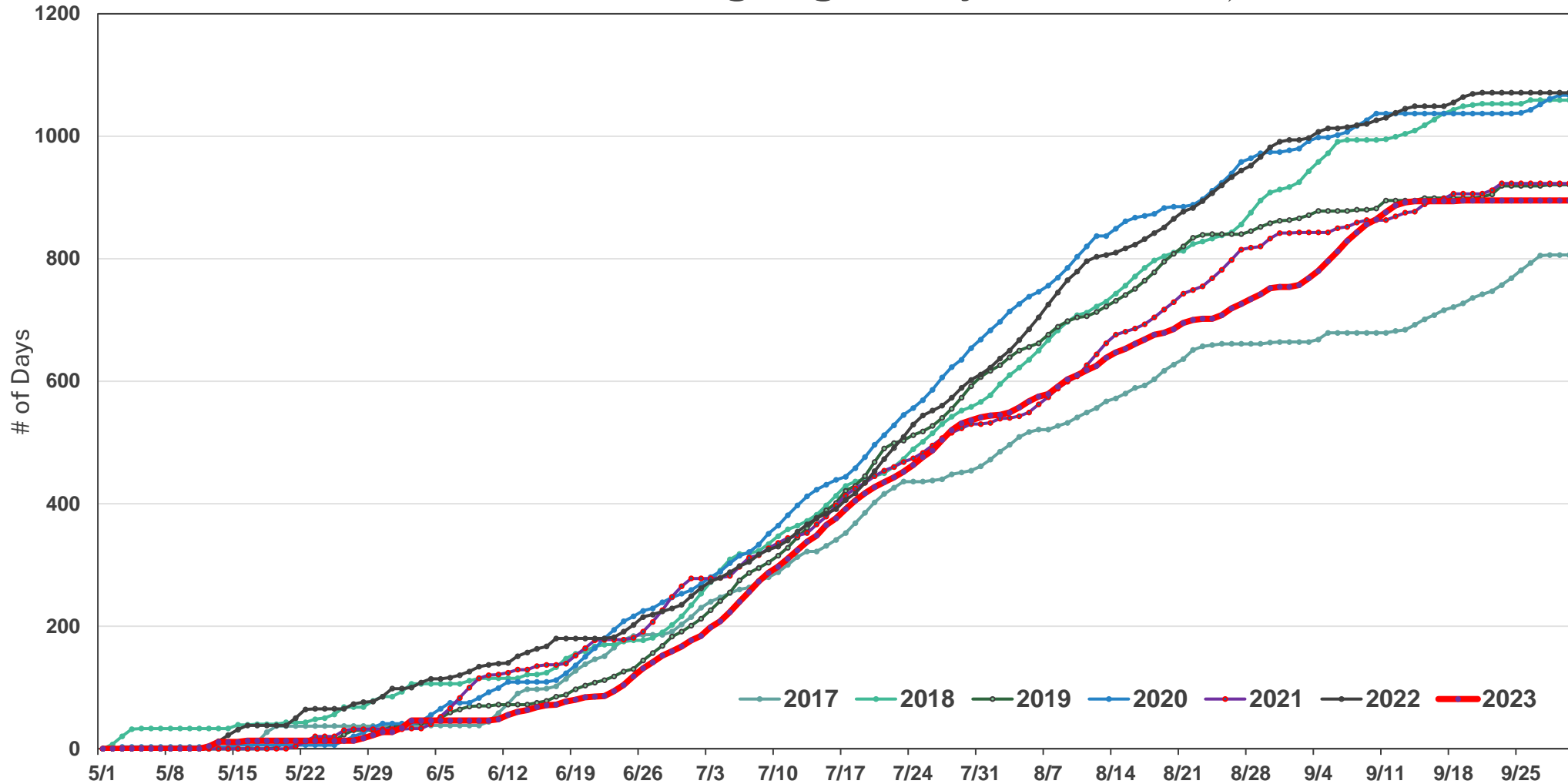
COOLING DEGREE DAYS

Accumulated Cooling Degree Days 2023 (65°F)

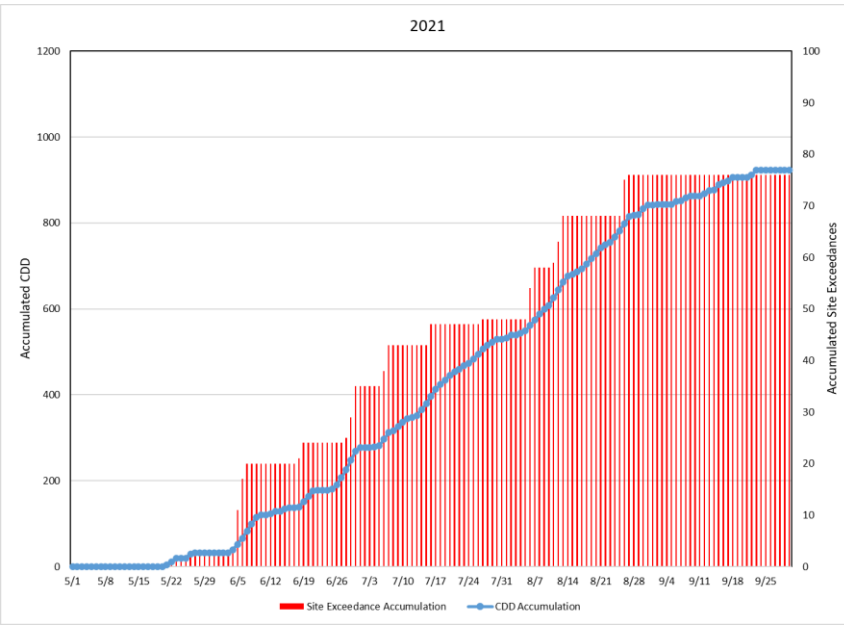
A cooling degree day (CDD) is the number of degrees a day's average temperature is above 65° F.

The first CDD for the 2023 ozone season occurred on May 12th.

Only 2017 had less CDD than 2023 in the previous six years.



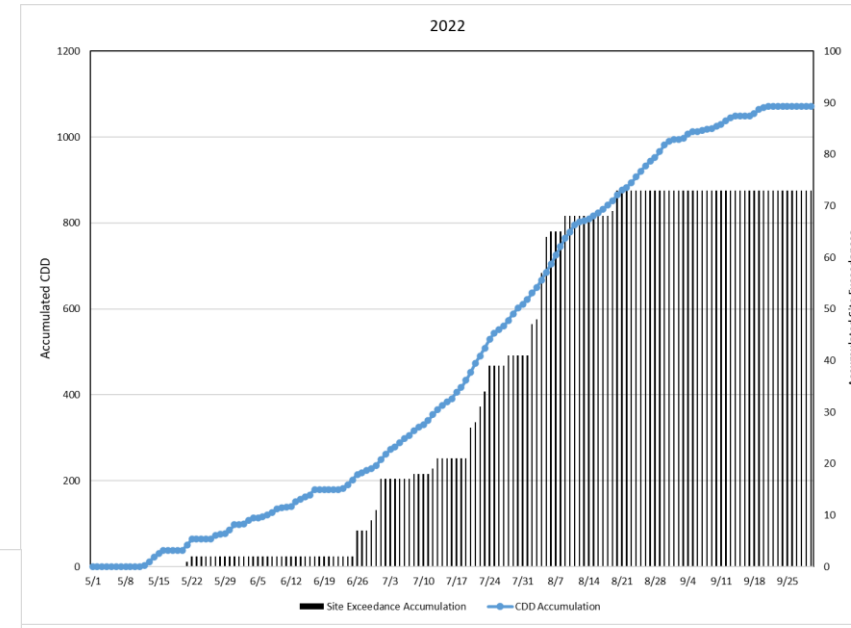
CDD UPDATE



The first exceedance in 2021 (left) was on May 21st.

The first exceedance in 2022 (right) was on May 21st.

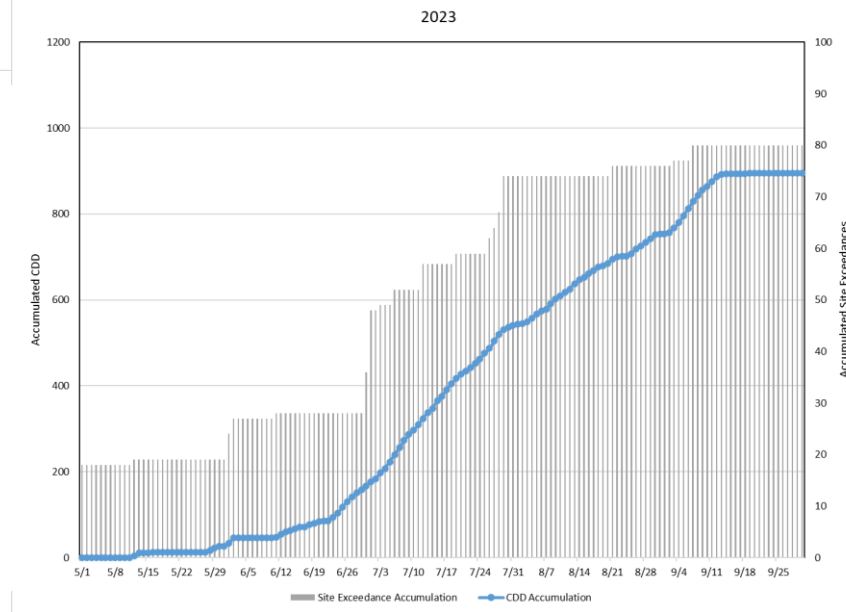
The first exceedance in 2023 (bottom) was on April 13th.



2021 had 850 CDD and 76 site exceedances.

2022 had 1015 CDD and 73 site exceedances.

2023 had 895 CDD and 80 site exceedances.



2023 had more CDD and site exceedances than 2021.

2023 had significantly less CDD than 2022, but more site exceedances.

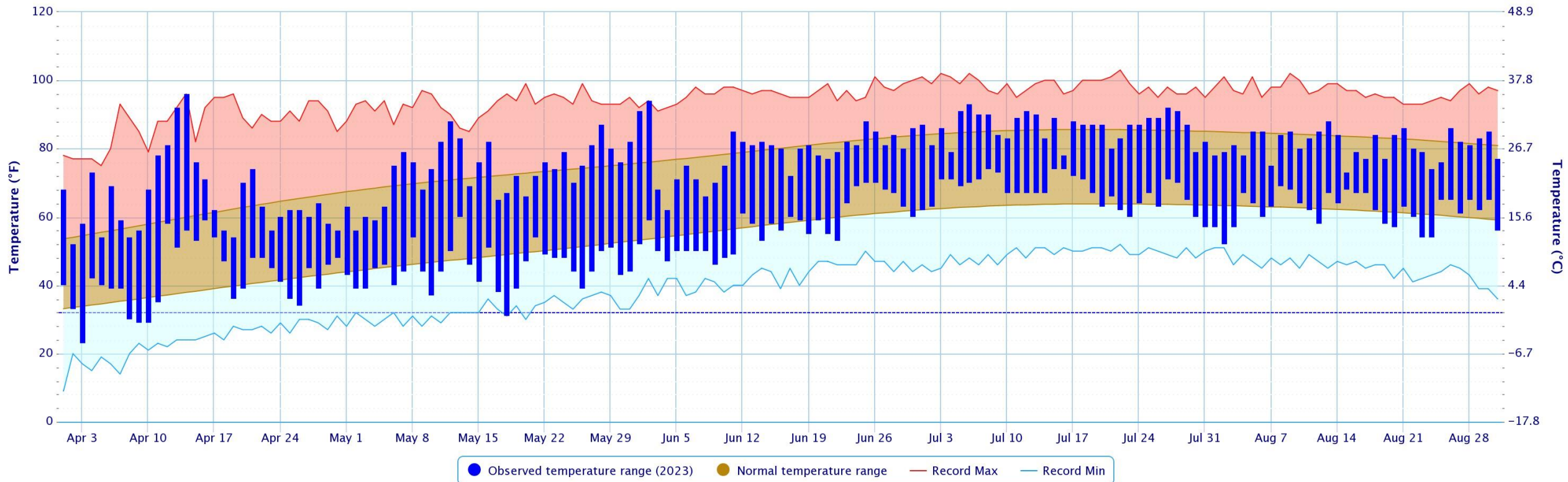
TEMPERATURES AT BDL: APRIL - AUGUST

There were 12 days during April – August at or above 90°F recorded at Bradley International Airport compared to 26 days in 2022 (June-August).

We had record breaking maximum temperatures on 3 days: April 13th (92°F), April 14th (96°F), and June 2nd (94°F).

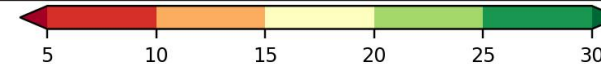
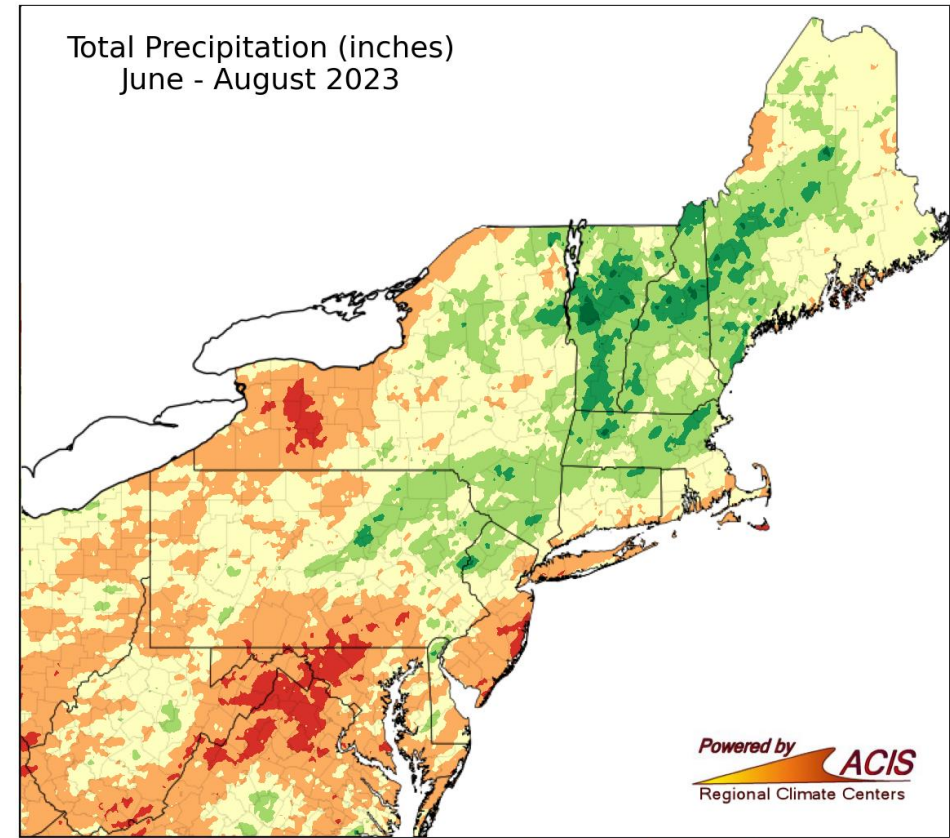
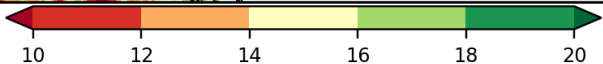
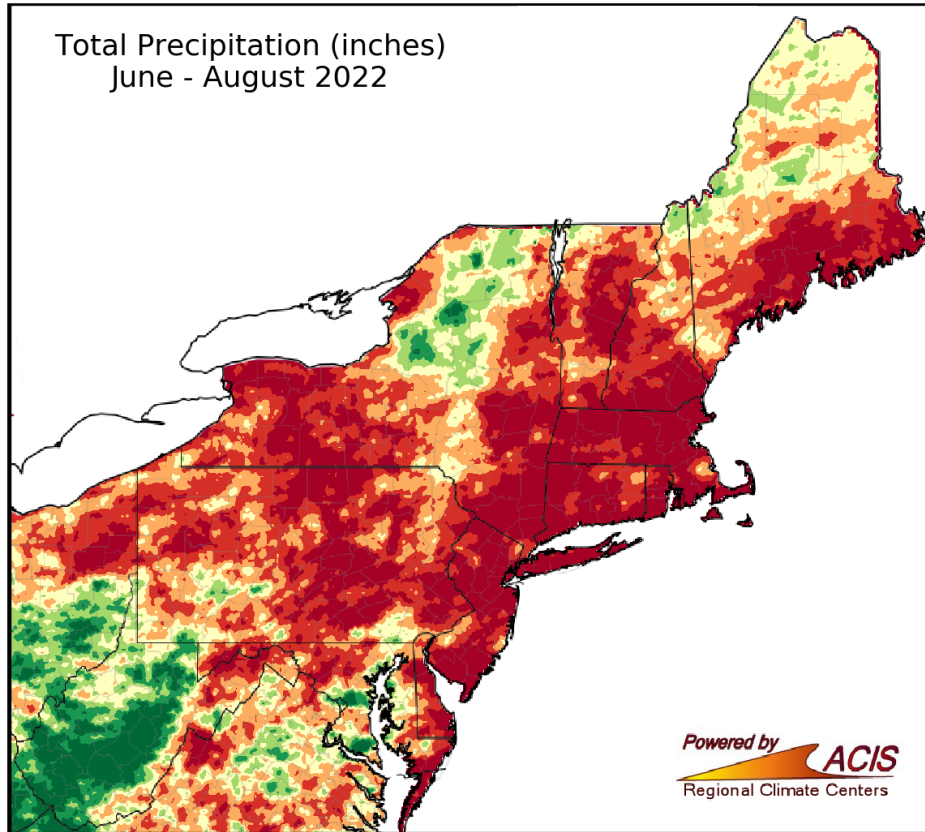
Daily Temperature Data – HARTFORD-BRADLEY INTERNATIONAL AIRPORT, CT

Period of Record – 1949-01-01 to 2023-10-10. Normals period: 1991-2020. Click and drag to zoom chart.

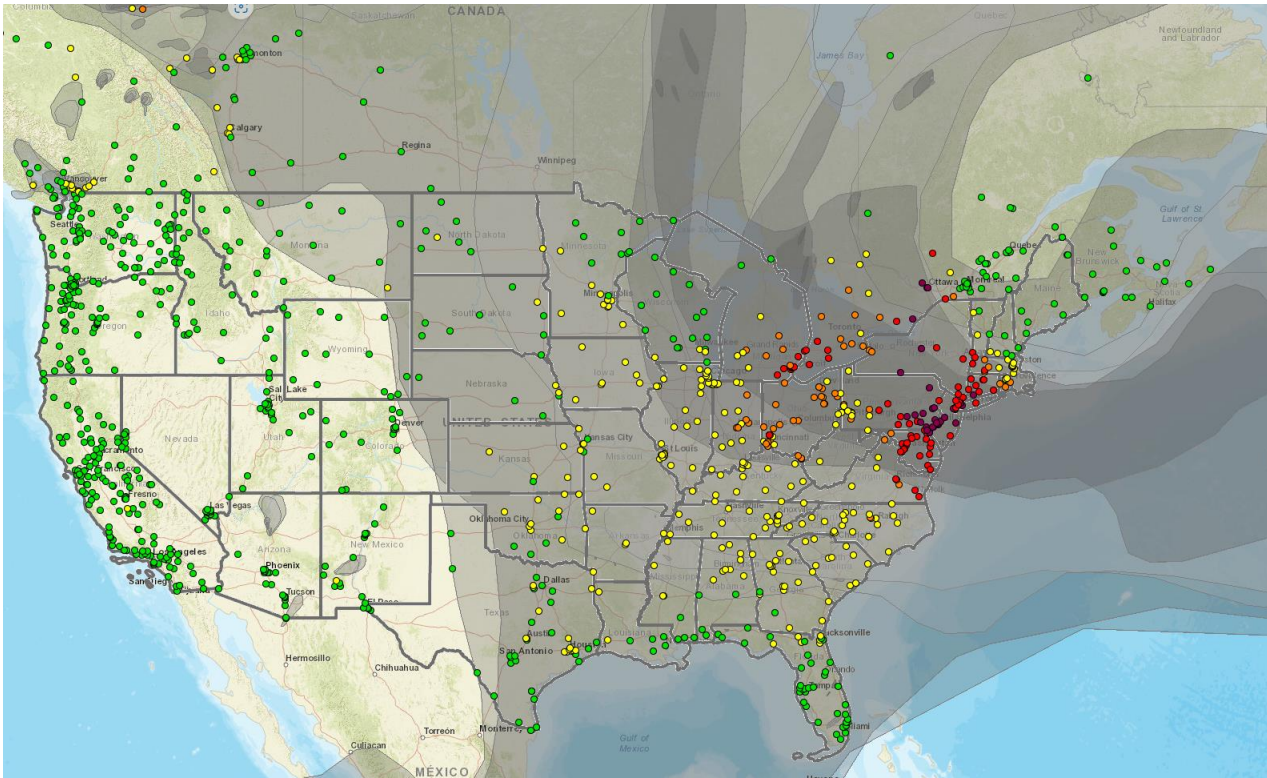


2022 VS 2023 PRECIPITATION

2022 featured a drier summer with below average precipitation departures. Meanwhile, 2023 featured a wetter summer across the state with slightly average precipitation departures.



EXCEPTIONAL EVENTS

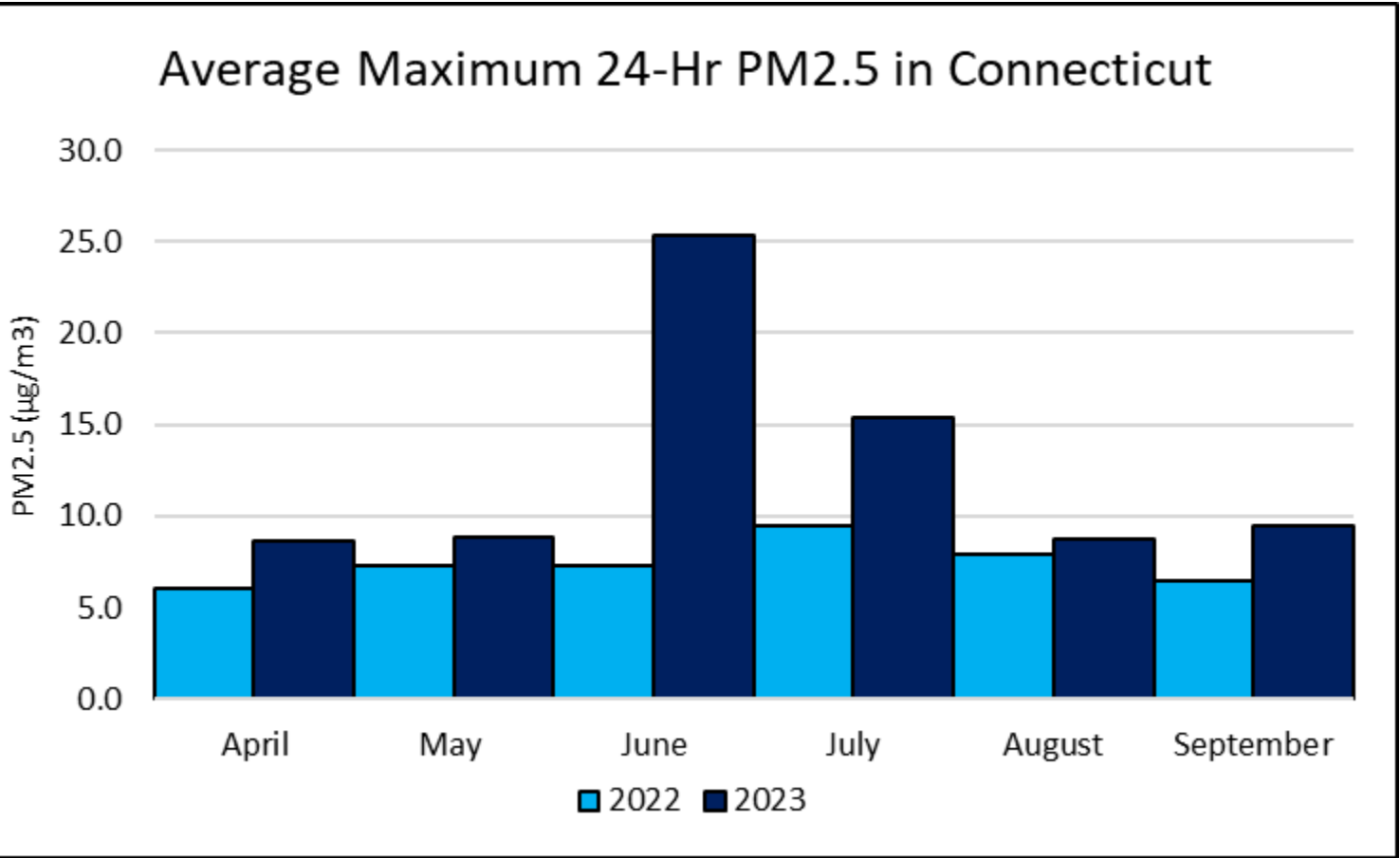


[AirNow-Tech Navigator \(airnowtech.org\)](http://airnowtech.org)



[Wildfires cause 'very unhealthy' air quality in CT \(ctinsider.com\)](http://ctinsider.com)

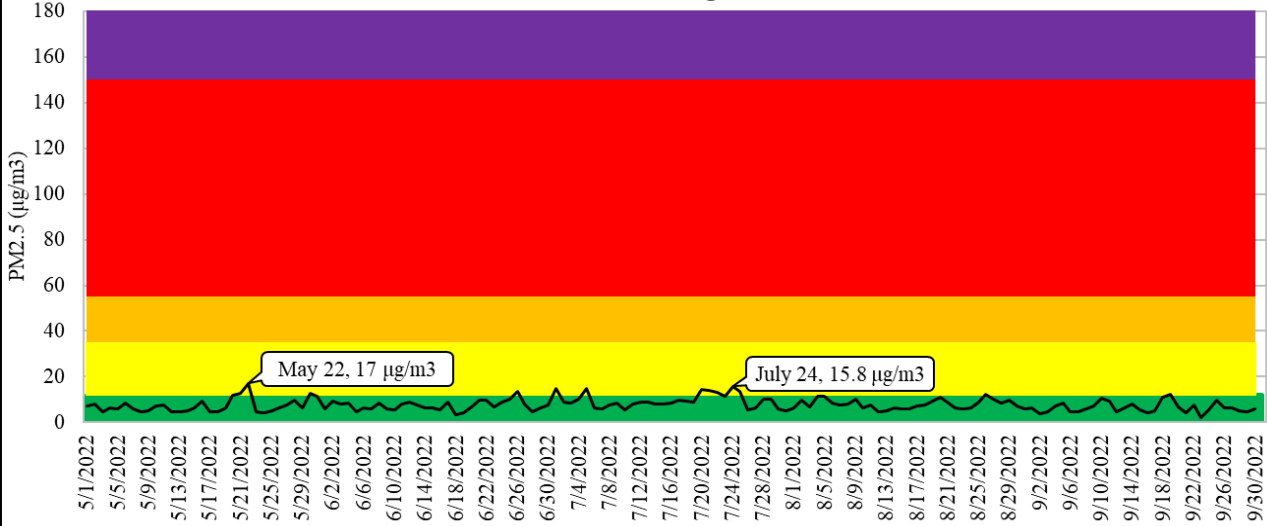
24-HR PM2.5 COMPARISON



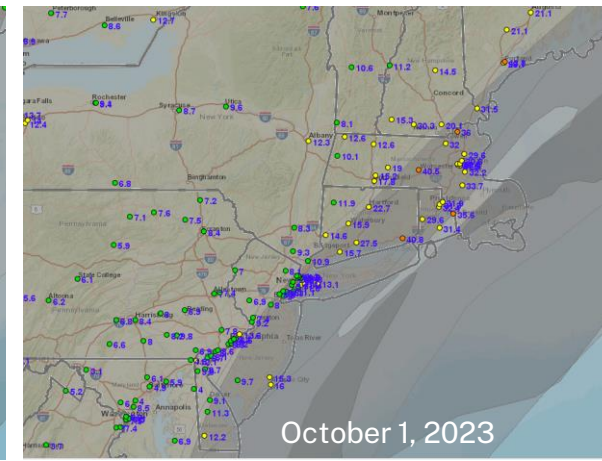
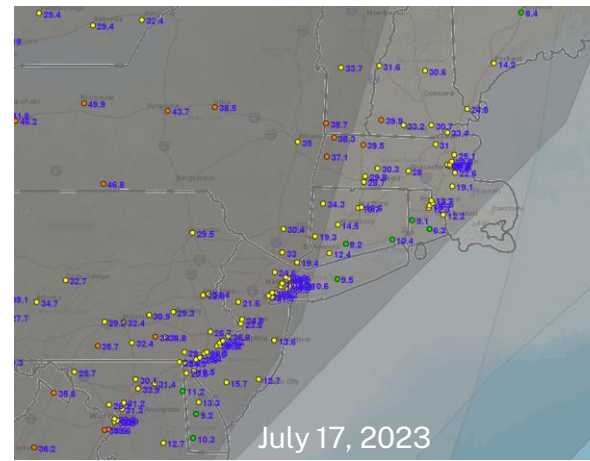
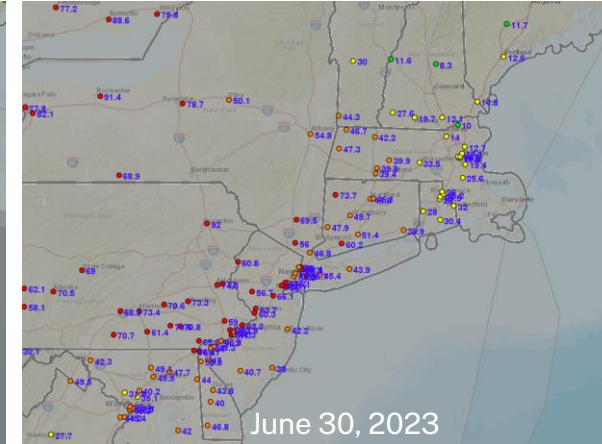
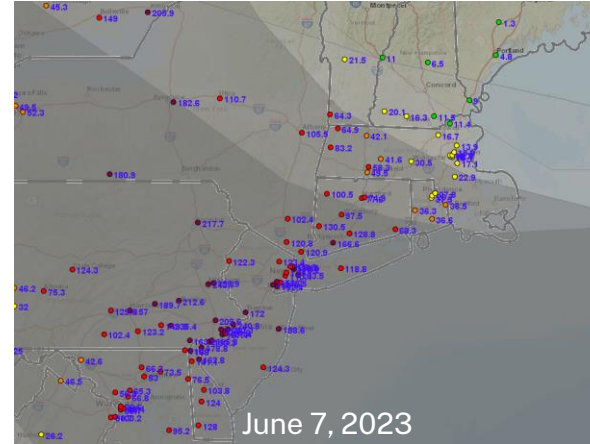
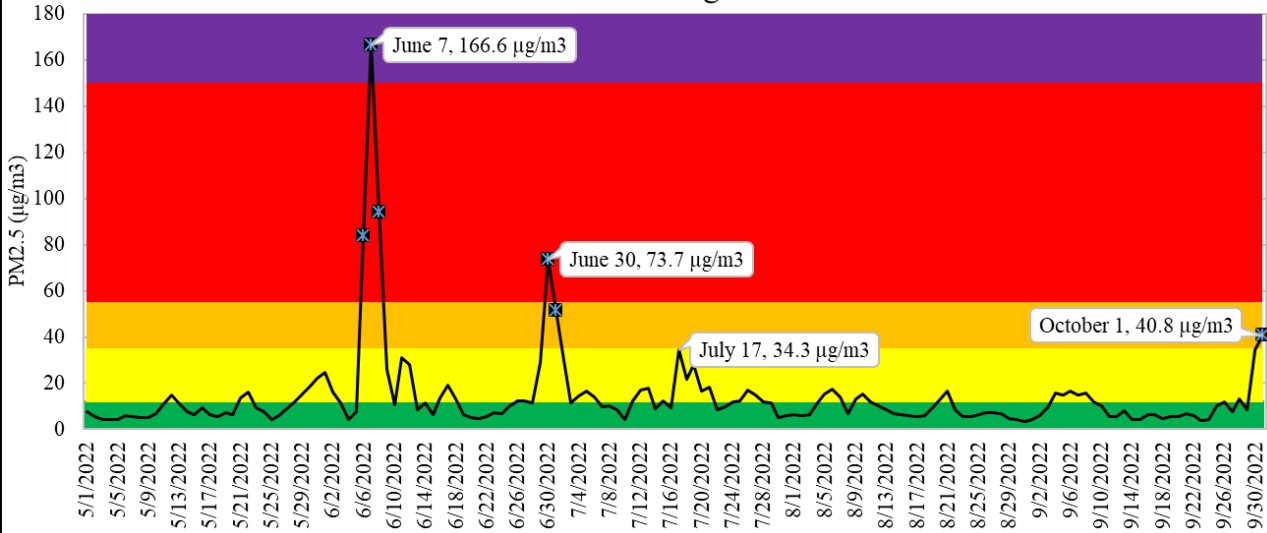
Average Maximum 24-Hr PM2.5 by Month						
	April	May	June	July	August	September
2022	6.0	7.3	7.3	9.5	7.9	6.4
2023	8.6	8.8	25.4	15.4	8.8	9.4

SMOKE INFLUENCE

2022 Maximum 24-Hr Average PM_{2.5} in Connecticut



2023 Maximum 24-Hr Average PM_{2.5} in Connecticut



REGULATORY SIGNIFICANCE

The following events are being considered for regulatory significance:

- April 13-14
- June 30-July 1
- July 12
- June 1-2

This would result in Greater CT attaining the 2015 ozone NAAQS and SW CT achieving a 4th high of 75 ppb at Greenwich.

Site	Current 4th High	Current DV	April 13	April 14	June 30	July 1	July 12	June 1	June 2	Resulting 4th High	Resulting DV
Greater CT											
Abington	63	65	69	74	57	71	53	61	53	61	64
Cornwall	76	71	67	82	78	79	57	76	58	62	66
East Hartford	73	71	67	84	73	82	64	73	69	64	68
Groton	73	73	76	73	70	76	81	40	49	64	70
Stafford	70	68	71	88	68	76	61	65	51	62	65
Southwest CT											
Danbury	75	73	68	85	85	83	64	73	58	68	71
Greenwich	82	78	72	76	81	82	89	73	81	75	76
Madison	78	79	82	75	78	77	81	50	66	71	76
Middletown	75	75	75	82	69	80	70	68	68	65	72
New Haven	69	70	58	66	80	72	66	50	65	64	69
Stratford	81	82	77	72	81	86	89	57	75	74	80
Westport	79	82	79	78	79	82	89	72	80	74	80
Site Exceedances			7	11	8	12	5	5	3		

SOUTHWEST CONNECTICUT HIGHEST OZONE 2023

Southwest CT 10 Highest Ozone Values with Accompanied PM2.5 Values per Monitor																				
Danbury	4/14/2023		6/30/2023		7/1/2023		7/26/2023		6/1/2023		6/11/2023		9/7/2023		4/13/2023		7/6/2023		7/17/2023	
	O ₃	PM2.5	O ₃	PM2.5	O ₃	PM2.5	O ₃	PM2.5	O ₃	PM2.5	O ₃	PM2.5	O ₃	PM2.5	O ₃	PM2.5	O ₃	PM2.5	O ₃	PM2.5
	85	17.5	85	47.9	83	45.1	75	13.8	73	15.8	72	24.2	70	11.9	68	12.4	68	11.7	65	19.3
Greenwich	7/12/2023		9/7/2023		7/1/2023		7/26/2023		6/30/2023		6/2/2023		7/6/2023		4/14/2023		7/28/2023		6/1/2023	
	O ₃	PM2.5	O ₃	PM2.5	O ₃	PM2.5	O ₃	PM2.5	O ₃	PM2.5	O ₃	PM2.5	O ₃	PM2.5	O ₃	PM2.5	O ₃	PM2.5	O ₃	PM2.5
	89	17.2	87	12.2	82	48.1	82	16.8	81	60.2	81	16.3	77	13.3	76	18.1	75	12.1	73	24.5
Madison	4/13/2023		7/12/2023		7/29/2023		6/30/2023		7/1/2023		4/14/2023		5/12/2023		8/21/2023		9/3/2023		9/7/2023	
	O ₃	PM2.5	O ₃	PM2.5	O ₃	PM2.5	O ₃	PM2.5	O ₃	PM2.5	O ₃	PM2.5	O ₃	PM2.5	O ₃	PM2.5	O ₃	PM2.5	O ₃	PM2.5
	82	16	81	13.4	81	9	78	51.4	77	39.8	75	18.8	75	14.6	74	15.3	71	8.4	69	13
Middletown	4/14/2023		7/29/2023		7/1/2023		4/13/2023		7/12/2023		6/30/2023		6/2/2023		6/1/2023		5/28/2023		9/2/2023	
	O ₃	PM2.5	O ₃	PM2.5	O ₃	PM2.5	O ₃	PM2.5	O ₃	PM2.5	O ₃	PM2.5	O ₃	PM2.5	O ₃	PM2.5	O ₃	PM2.5	O ₃	PM2.5
	82	16.5	80	9.2	80	51.4	75	13.7	70	14.2	69	49.7	68	13.7	68	16.8	66	7.7	66	5.6
New Haven	7/29/2023		6/30/2023		7/1/2023		7/6/2023		4/14/2023		7/12/2023		6/11/2023		6/2/2023		5/12/2023		7/4/2023	
	O ₃	PM2.5	O ₃	PM2.5	O ₃	PM2.5	O ₃	PM2.5	O ₃	PM2.5	O ₃	PM2.5	O ₃	PM2.5	O ₃	PM2.5	O ₃	PM2.5	O ₃	PM2.5
	82	9	80	51.4	72	39.8	69	10.5	66	18.8	66	13.4	66	24.2	65	11.9	64	14.6	64	14.6
Stratford	7/12/2023		7/1/2023		7/29/2023		6/30/2023		4/13/2023		9/7/2023		7/6/2023		6/2/2023		8/21/2023		7/19/2023	
	O ₃	PM2.5	O ₃	PM2.5	O ₃	PM2.5	O ₃	PM2.5	O ₃	PM2.5	O ₃	PM2.5	O ₃	PM2.5	O ₃	PM2.5	O ₃	PM2.5	O ₃	PM2.5
	89	17.2	86	48.1	86	11.6	81	60.2	77	14.9	77	12.2	76	13.3	75	16.3	74	14.4	73	28
Westport	7/12/2023		7/1/2023		6/2/2023		7/29/2023		6/30/2023		4/13/2023		4/14/2023		9/7/2023		7/26/2023		7/19/2023	
	O ₃	PM2.5	O ₃	PM2.5	O ₃	PM2.5	O ₃	PM2.5	O ₃	PM2.5	O ₃	PM2.5	O ₃	PM2.5	O ₃	PM2.5	O ₃	PM2.5	O ₃	PM2.5
	89	17.2	82	48.1	80	16.3	79	11.6	79	60.2	79	14.9	78	18.1	76	12.2	75	16.8	74	28

Collocated PM2.5 monitors were used when available, otherwise the following monitors were used:

- Bridgeport PM2.5 values were used for Greenwich, Westport, and Stratford.
- East Hartford PM2.5 values were used for Stafford and Abington.
- New Haven PM2.5 values were used for Madison.
- Waterbury PM2.5 values were used for Middletown.

	April 13 - 14, 2023 Event
	June 1-2, 2023 Event
	June 30 – July 1, 2023 Event
	July 12, 2023 Event
	Fourth High excluding Exceptional Events

*8- HR Ozone values are in parts per billion (ppb). 24-HR PM2.5 values are in micrograms per cubic meters (µg/m³)

GREATER CONNECTICUT HIGHEST OZONE 2023

Greater CT 10 Highest Ozone Values with Accompanied PM2.5 Values per Monitor																				
Cornwall	4/14/2023		7/1/2023		6/30/2023		6/1/2023		4/13/2023		7/26/2023		5/12/2023		6/11/2023		4/12/2023		7/13/2023	
	O ₃	PM2.5	O ₃	PM2.5	O ₃	PM2.5	O ₃	PM2.5	O ₃	PM2.5	O ₃	PM2.5	O ₃	PM2.5	O ₃	PM2.5	O ₃	PM2.5	O ₃	PM2.5
	82	12.5	79	50	78	73.7	76	14.6	67	9.8	67	17.2	65	6.8	65	24.5	62	7.6	62	13.7
East Hartford	4/14/2023		7/1/2023		6/30/2023		6/1/2023		5/28/2023		7/6/2023		6/2/2023		4/13/2023		7/12/2023		7/26/2023	
	O ₃	PM2.5	O ₃	PM2.5	O ₃	PM2.5	O ₃	PM2.5	O ₃	PM2.5	O ₃	PM2.5	O ₃	PM2.5	O ₃	PM2.5	O ₃	PM2.5	O ₃	PM2.5
	84	14.7	82	46.4	73	46.1	73	15.8	70	10.1	69	13.3	69	13.5	67	10.9	64	14.7	64	15.9
Groton	7/12/2023		7/1/2023		4/13/2023		4/14/2023		7/29/2023		6/30/2023		5/12/2023		7/28/2023		9/7/2023		7/6/2023	
	O ₃	PM2.5	O ₃	PM2.5	O ₃	PM2.5	O ₃	PM2.5	O ₃	PM2.5	O ₃	PM2.5	O ₃	PM2.5	O ₃	PM2.5	O ₃	PM2.5	O ₃	PM2.5
	81	15.3	76	32.7	76	13.2	73	14.8	71	11.3	70	38.9	70	12.2	69	9.5	64	15	62	10.8
Stafford	4/14/2023		7/1/2023		4/13/2023		5/28/2023		6/30/2023		6/1/2023		5/12/2023		6/12/2023		9/2/2023		4/4/2023	
	O ₃	PM2.5	O ₃	PM2.5	O ₃	PM2.5	O ₃	PM2.5	O ₃	PM2.5	O ₃	PM2.5	O ₃	PM2.5	O ₃	PM2.5	O ₃	PM2.5	O ₃	PM2.5
	88	14.7	76	46.4	71	10.9	70	10.1	68	46.1	65	15.8	64	10.2	63	24.4	62	5.3	61	8.1
Abington	4/14/2023		7/1/2023		4/13/2023		5/12/2023		5/16/2023		5/28/2023		6/1/2023		6/12/2023		7/13/2023		4/12/2023	
	O ₃	PM2.5	O ₃	PM2.5	O ₃	PM2.5	O ₃	PM2.5	O ₃	PM2.5	O ₃	PM2.5	O ₃	PM2.5	O ₃	PM2.5	O ₃	PM2.5	O ₃	PM2.5
	74	14.7	71	46.4	69	10.9	63	10.2	63	6.7	62	10.1	61	15.8	61	24.4	59	13.1	58	8

Collocated PM2.5 monitors were used when available, otherwise the following monitors were used:

- Bridgeport PM2.5 values were used for Greenwich, Westport, and Stratford.
- East Hartford PM2.5 values were used for Stafford and Abington.
- New Haven PM2.5 values were used for Madison.
- Waterbury PM2.5 values were used for Middletown.

April 13 - 14, 2023 Event

June 1-2, 2023 Event

June 30 – July 1, 2023 Event

July 12, 2023 Event

Fourth High excluding Exceptional Events

*8- HR Ozone values are in parts per billion (ppb). 24-HR PM2.5 values are in micrograms per cubic meters (µg/m³)

2023 OZONE SEASON SUMMARY

- **Connecticut had 19 ozone exceedance days in 2023, compared to 23 ozone exceedance days in 2022.**
- **Design values in Southwest Connecticut continue to exceed the 2008 and 2015 standards.**
- **Design Values in Greater CT for three sites exceed the 2015 standard.**
- **Though we had lower exceedance days this year (19), we had higher site exceedances (80).**
- **Meteorological data shows that this year should have been a rather clean season with cooler temperatures and more precipitation.**
- **PM2.5 values were significantly higher this year due to wildfire smoke events, this also influenced elevated ozone exceedances.**
- **With the approval of our exceptional Event Analysis, we expect GRCT to be within the 2015 standard and SWCT to be in attainment with the 2008 standard.**