

Extreme Heat & Air Quality Preparedness and Response Plan for Waterbury

Overview for Community Stakeholders



Agenda



Review of extreme heat and air quality data



Overview of the Template for Municipal Extreme Heat and Air Quality Response Plan

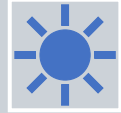


Plan for afternoon session

Climate Change Impacts Heat and Air Quality



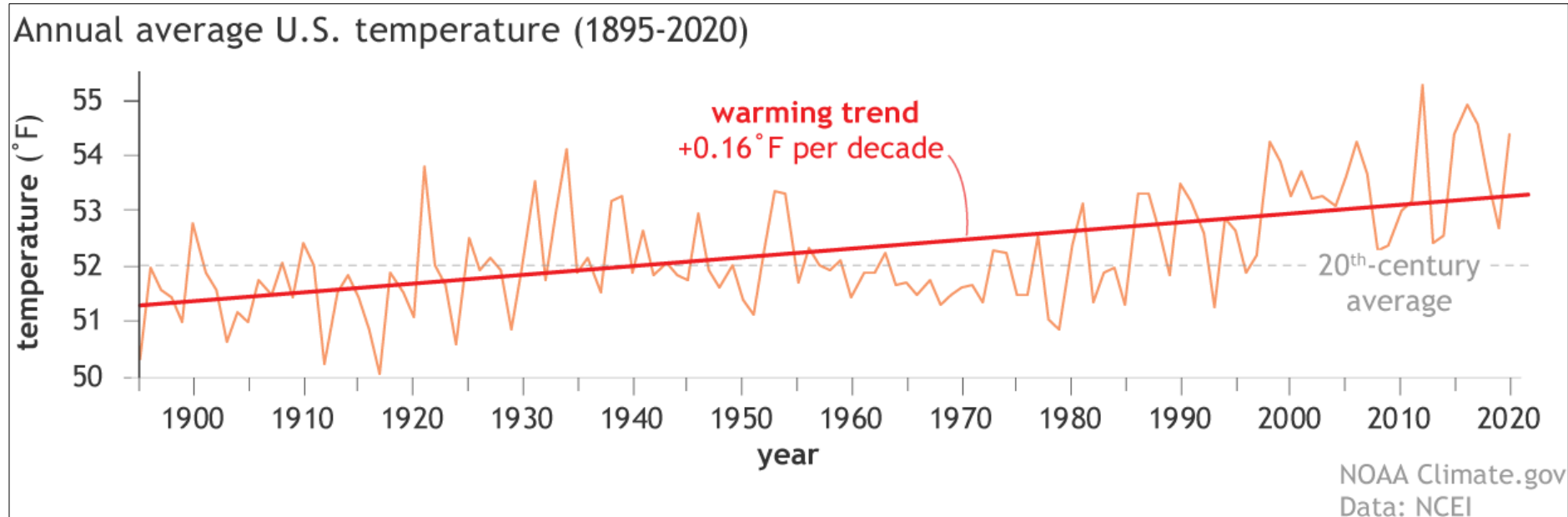
Climate changes increases intensity and frequency of extreme heat events & poor air quality days



Average temperatures continue to rise because of greenhouse gases



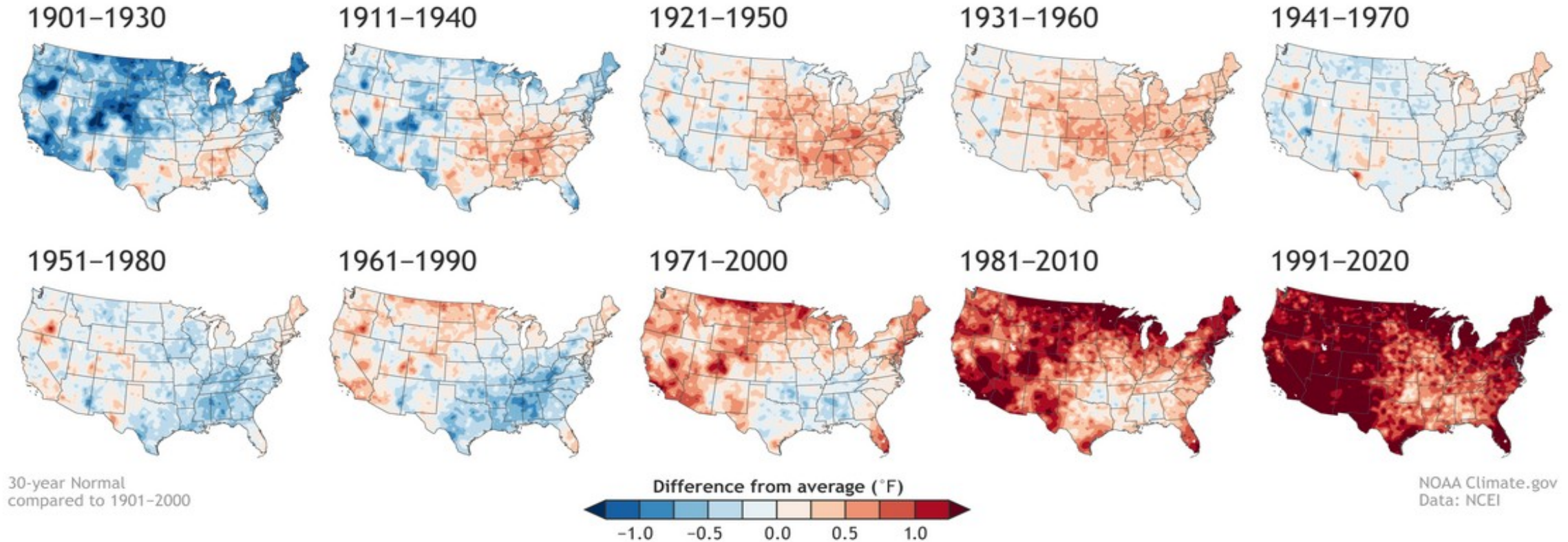
As temperatures increase, communities will experience more severe weather events



Source: NOAA National Centers for Environmental information, Climate at a Glance: <https://www.ncei.noaa.gov/access/monitoring/climate-at-a-glance/>

How U.S. Temperatures Have Increased Over Time

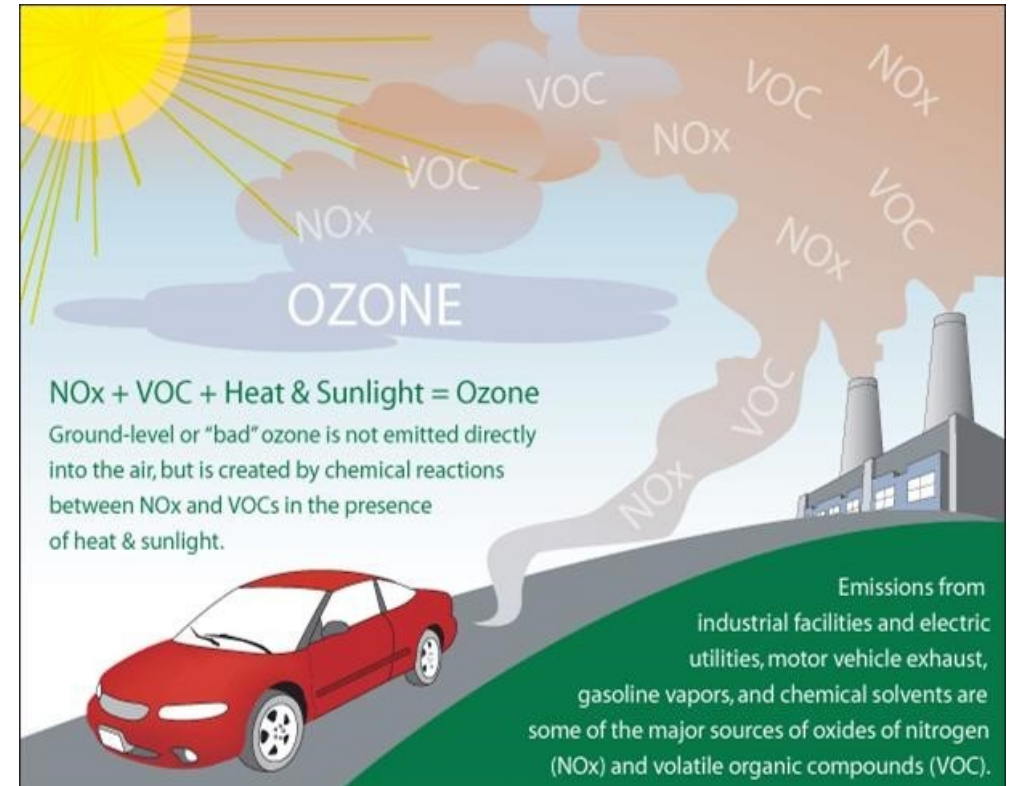
U.S. ANNUAL TEMPERATURE COMPARED TO 20th-CENTURY AVERAGE



Source: NOAA Climate.gov, based on analysis by Jared Rennie, North Carolina Institute for Climate Studies/NCEI. <https://www.climate.gov/news-features/understanding-climate/climate-change-and-1991-2020-us-climate-normals>

Air Pollutant of Concern: Ground-Level Ozone (O₃)

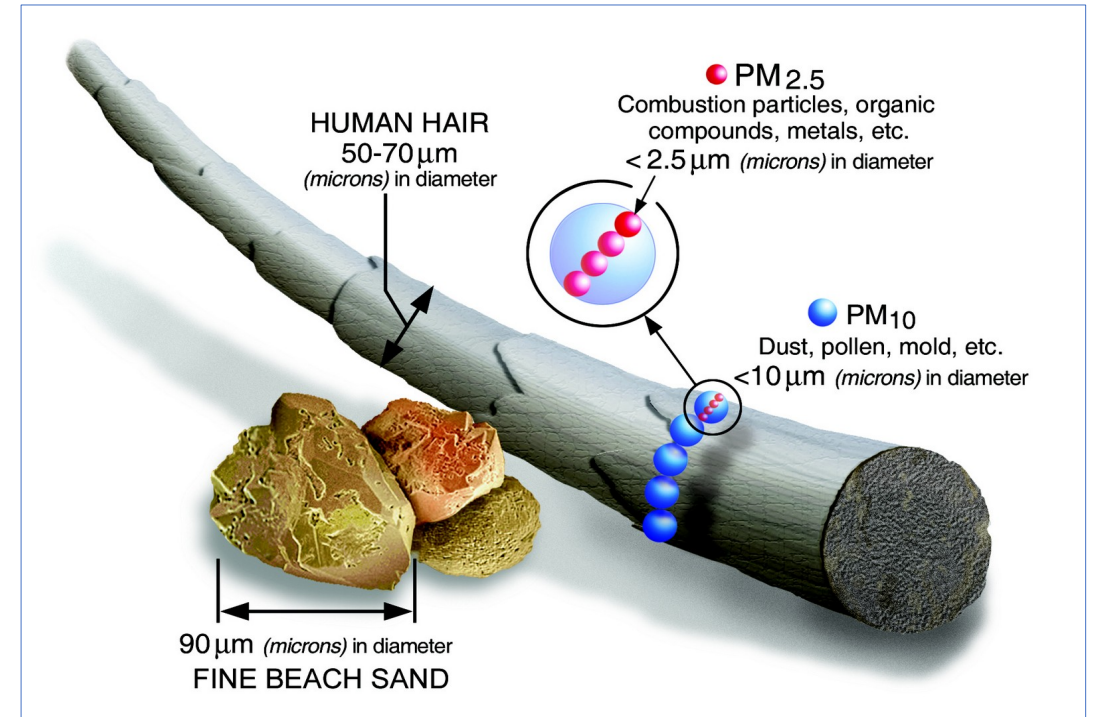
- Forms in lower atmosphere when nitrogen oxides and volatile organic compounds react with heat and sunlight
- Sources: gasoline and diesel-powered cars, power plants, industrial factories
- Health impacts: irritates lungs and breathing passages, causes coughing and pain in chest and throat, increases susceptibility to respiratory infections.
- Children, older adults, and people with asthma and other respiratory illness are most at risk.
- Extreme heat events accelerate ozone production^{1,2}



Source: EPA Ground-level Ozone Basics. https://19january2021snapshot.epa.gov/ground-level-ozone-pollution/ground-level-ozone-basics_.html

Air Pollutant of Concern: Particulate Matter (PM) 2.5

- Tiny particles suspended in the air
- PM 2.5 = particles with diameters of 2.5 micrometers or smaller
- Sources: fossil fuel combustion, heavy industry activities, wildfire smoke
- Health impacts: Aggravates existing heart and lung diseases, changes body's defenses against inhaled materials, damages lung tissue
- People with respiratory or heart disease, older adults, and children are most at risk
- Positively associated with higher temperatures³



Source: EPA Particulate Matter (PM) Basics. <https://www.epa.gov/pm-pollution/particulate-matter-pm-basics#PM>

Air Quality Index

Daily AQI Color	Levels of Concern	Values of Index	Description of Air Quality
Green	Good	0 to 50	Air quality is satisfactory, and air pollution poses little or no risk.
Yellow	Moderate	51 to 100	Air quality is acceptable. However, there may be a risk for some people, particularly those who are unusually sensitive to air pollution.
Orange	Unhealthy for Sensitive Groups	101 to 150	Members of sensitive groups may experience health effects. The general public is less likely to be affected.
Red	Unhealthy	151 to 200	Some members of the general public may experience health effects; members of sensitive groups may experience more serious health effects.
Purple	Very Unhealthy	201 to 300	Health alert: The risk of health effects is increased for everyone.
Maroon	Hazardous	301 and higher	Health warning of emergency conditions: everyone is more likely to be affected.

High Ozone Days by County

Air quality index and color coding for days based on 8-hour ozone concentration

2025 report (included years 2021-2023)

0 – 54 ppb	Good (Green)*
55 – 70 ppb	Moderate (Yellow)*
71 – 85 ppb	Unhealthy for Sensitive Groups (Orange)*
86 – 105 ppb	Unhealthy (Red)*
106 – 200 ppb	Very Unhealthy (Purple)*
>200 ppb	Hazardous (Maroon)*

County	Grade	*Wgt. Avg.	*Orange Days	*Red Days	*Purple Days
Fairfield	F	20.2	44	11	0
New Haven	F	9.2	26	1	0
Middlesex	F	7.2	20	1	0
New London	F	5	15	0	0
Hartford	D	3	9	0	0
Litchfield	D	2.7	8	0	0
Tolland	D	2.2	5	1	0
Windham	C	1	3	0	0

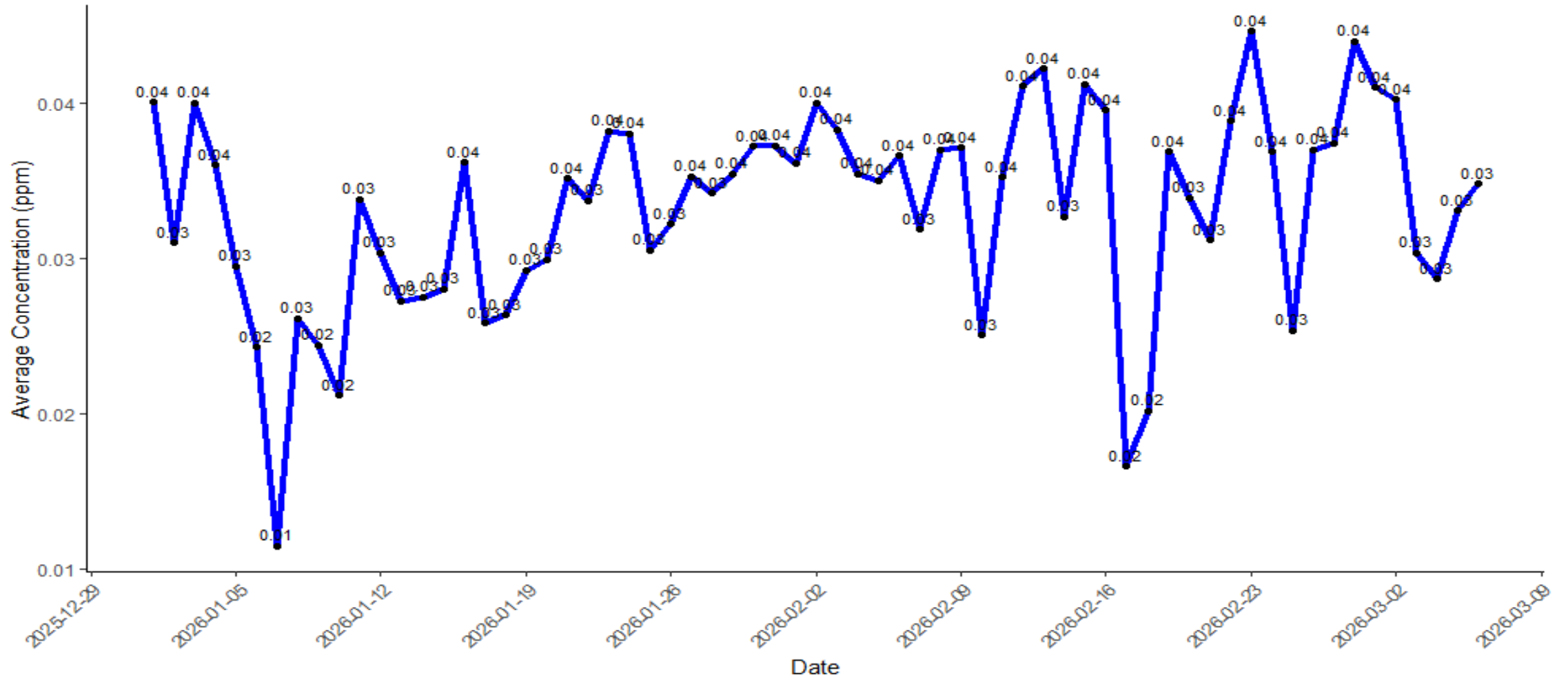
Grades are assigned based on the weighted averages as follows: A = 0.0, B = 0.3-0.9, C = 1.0-2.0, D = 2.1-3.2, F = 3.3+

2026 report (included years 2022-2024)

County	Grade	*Wgt. Avg.	*Orange Days	*Red Days	*Purple Days
Fairfield	F	21.2	50	9	0
New Haven	F	9.5	27	1	0
Middlesex	F	5.5	15	1	0
Hartford	F	5.2	14	1	0
Litchfield	F	4.7	14	0	0
New London	F	4.7	14	0	0
Tolland	F	3.7	8	2	0
Windham	C	1.3	4	0	0

Average Ozone Concentration in Waterbury

Average Daily Ozone (O₃) Concentration for Waterbury from January 2026-March 2026



High PM2.5 Days By County

Air quality index and color coding for days based on 24 hour particulate matter (PM2.5) concentration

0 – 9.0 µg/m ³	Good (Green)*
9.1 – 35.4 µg/m ³	Moderate (Yellow)*
35.5 – 55.4 µg/m ³	Unhealthy for Sensitive Groups (Orange)*
55.5 – 125.4 µg/m ³	Unhealthy (Red)*
125.5 – 225.4 µg/m ³	Very Unhealthy (Purple)*
>=225.5 µg/m ³	Hazardous (Maroon)*

2025 report (included years 2021-2023)

*County	Grade	Wgt. Avg.	Orange Days	Red Days	Purple Days	Maroon Days	Grade (Annual)
Fairfield	D	3.2	3	3	1	0	Pass
New Haven	F	3.3	5	2	1	0	Pass
Hartford	D	2.8	4	3	0	0	Pass
Litchfield	D	3	3	4	0	0	Pass
New London	D	2.5	3	3	0	0	Pass

2026 report (included years 2022-2024)

*County	Grade	Wgt. Avg.	Orange Days	Red Days	Purple Days	Maroon Days	Grade (Annual)
Fairfield	D	2.5	1	3	1	0	Pass
New Haven	D	2.3	2	2	1	0	Pass
Litchfield	D	2.3	1	4	0	0	Pass
Hartford	D	2.2	2	3	0	0	Pass
New London	D	2.2	2	3	0	0	Pass

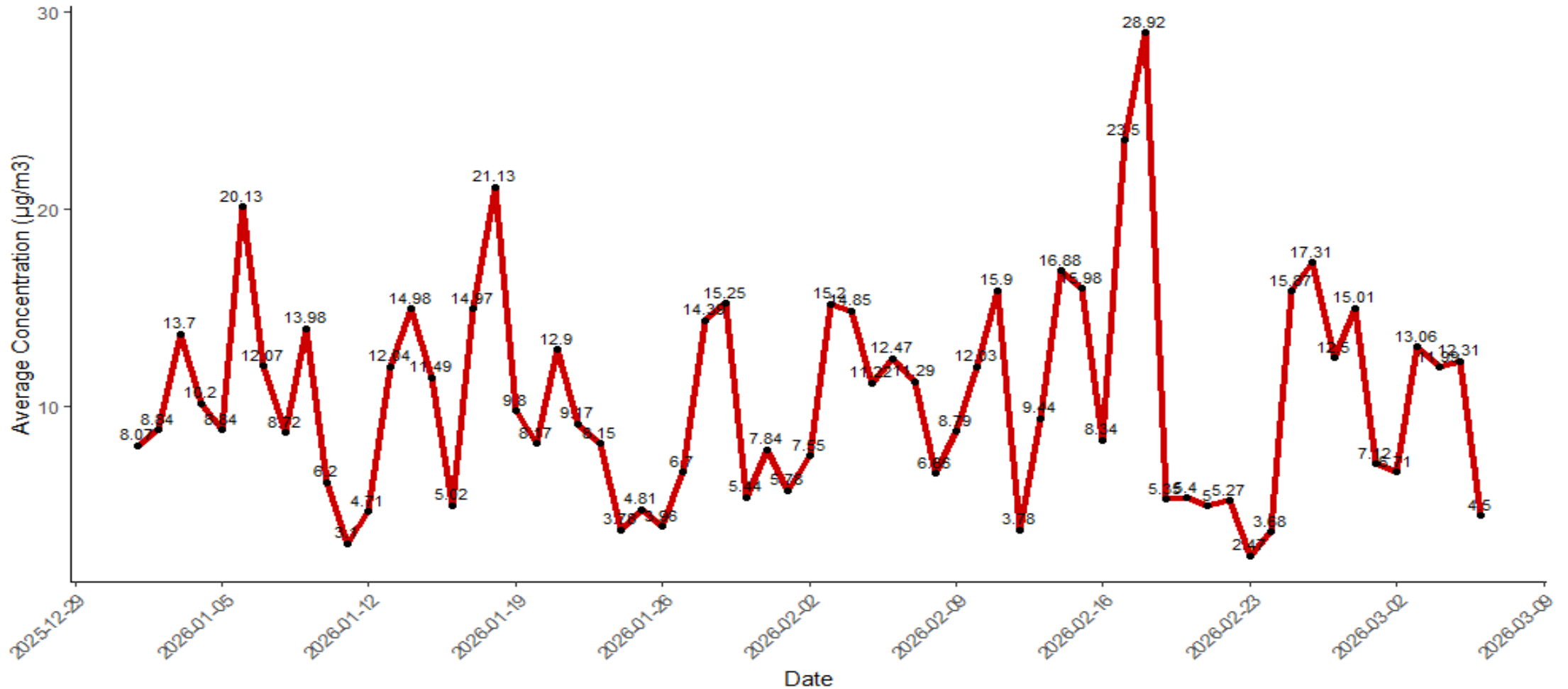
**Only 5 out of 8 CT counties reported this data*

Grades are assigned based on the weighted averages as follows: A=0.0, B=0.3-0.9, C=1.0-2.0, D=2.1-3.2, F=3.3+



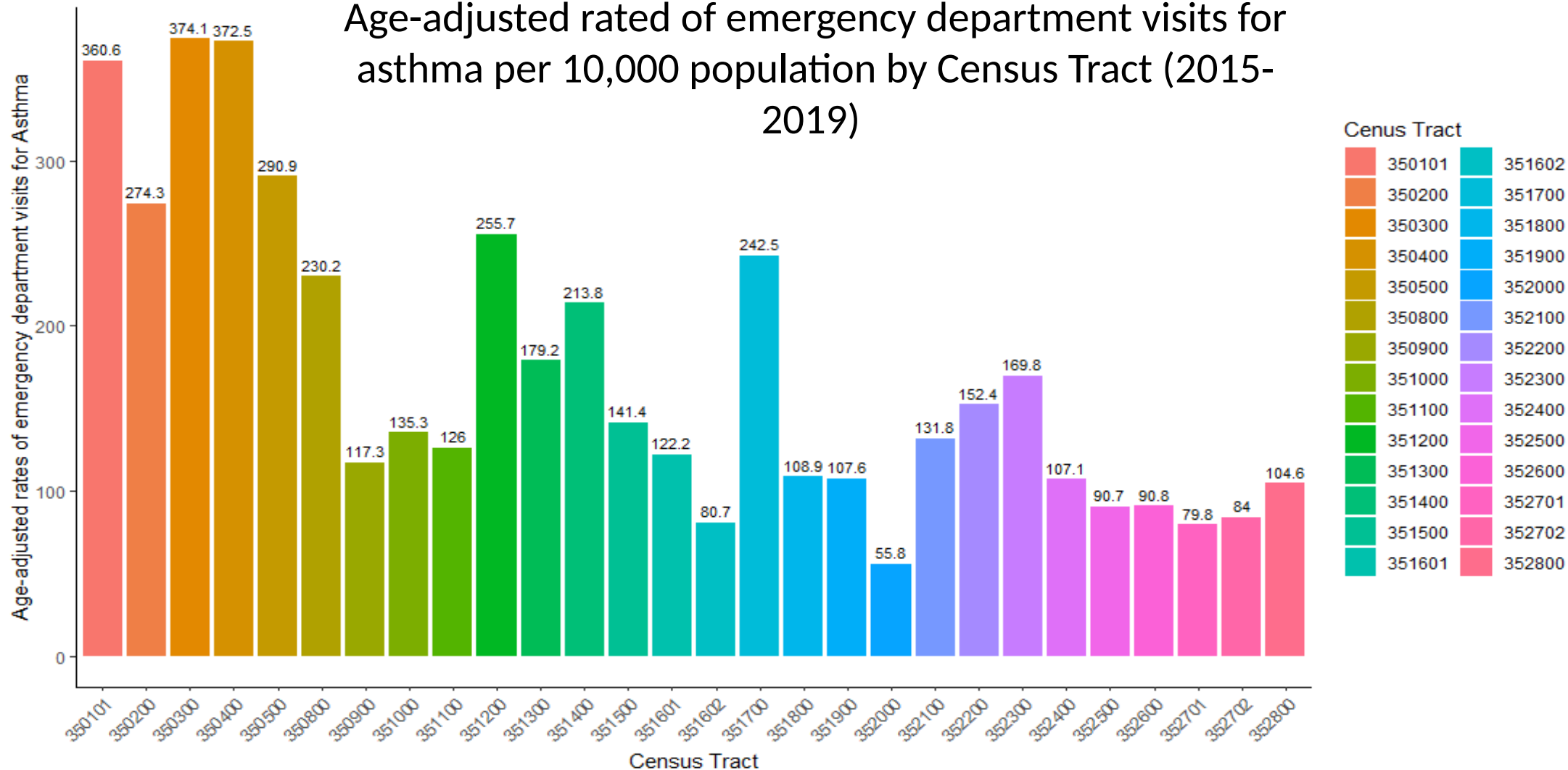
Average Daily PM2.5 Concentration

Average Daily PM2.5 Concentration for Waterbury from January 2026-March 2026



Impact of Air Quality

Age-adjusted rated of emergency department visits for asthma per 10,000 population by Census Tract (2015-2019)



Data Source: National Environmental Public Health Tracking Network [National Environmental Public Health Tracking Network Data Explorer](#)

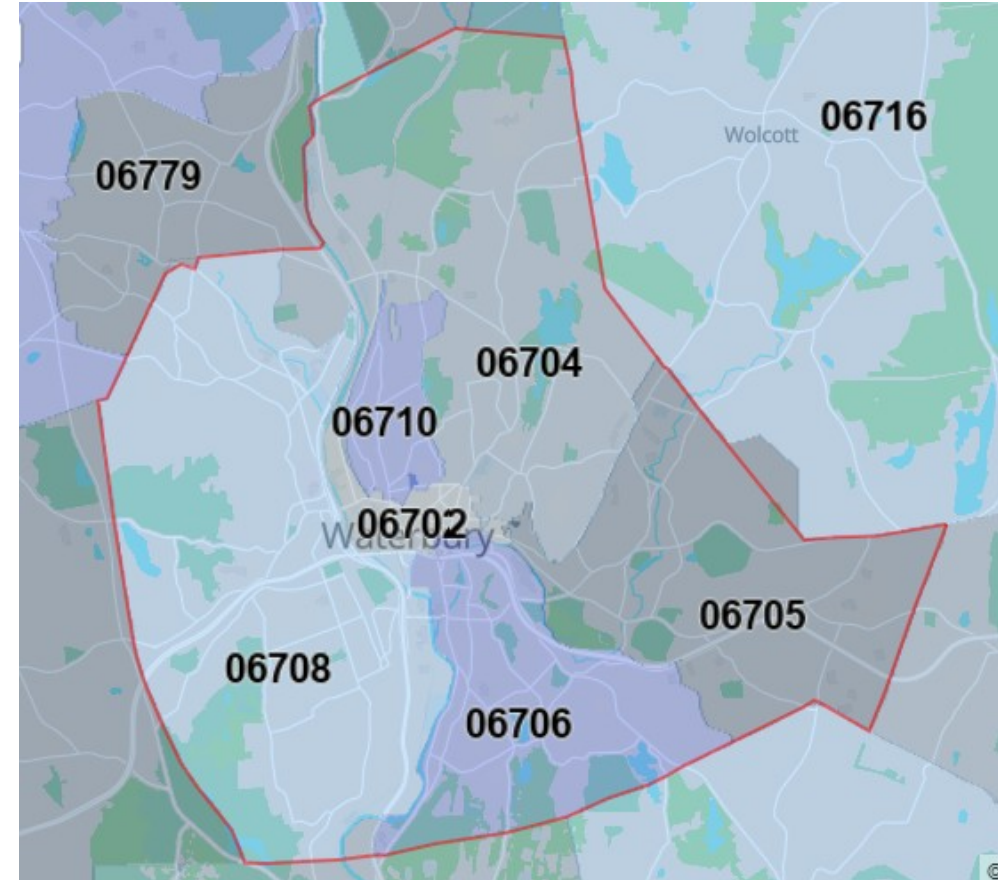
Annual Number of Emergency Department Visits for Heat Related Illness in Connecticut



Age Group	2021		2022		2023	
	Male	Female	Male	Female	Male	Female
0 to 4	3	3	7	1	4	2
5 to 14	16	11	17	21	22	7
15 to 34	94	52	75	35	42	31
35 to 64	95	60	94	45	85	38
>= 65	44	47	50	38	26	31

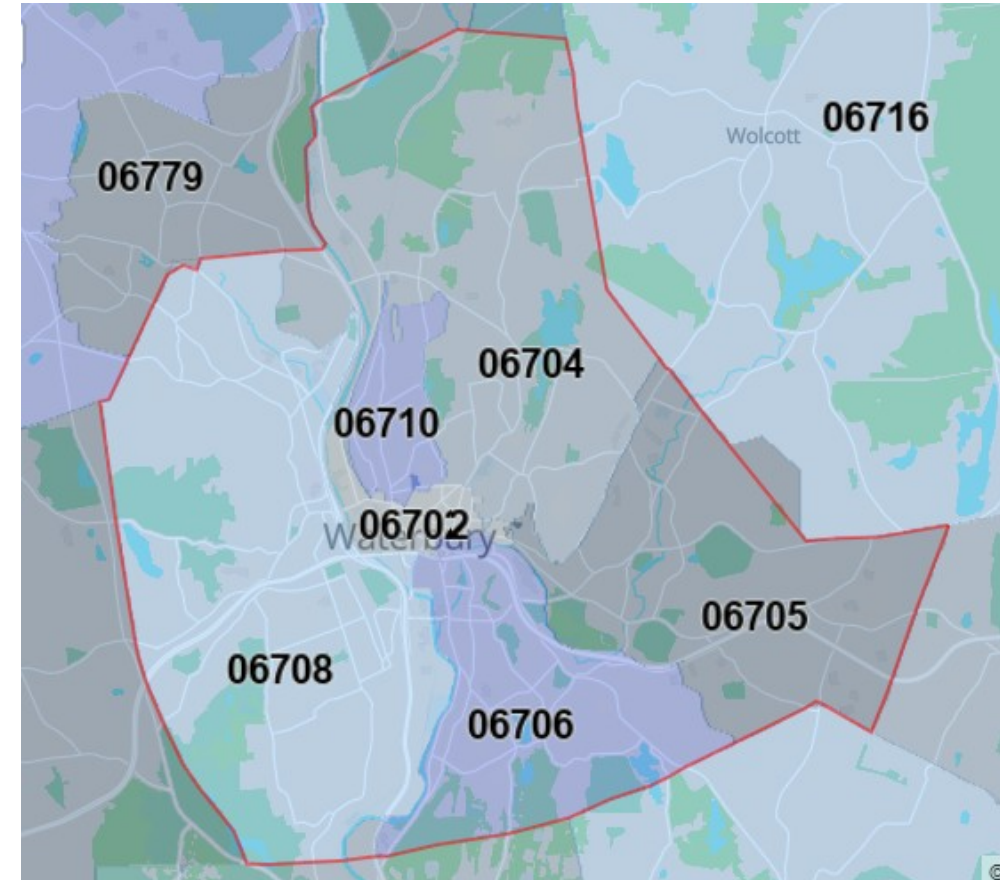
Heat and Health Index by Zip Code, 2024

Zip Code	Heat and Health Index Rank
06702	94.85
06704	86.11
06705	84.75
06706	85.46
06708	85.60
06710	94.85



Heat Burden by Zip Code, 2024

Zip Code	Heat Burden Percentile Rank
06702	94.85
06704	86.11
06705	84.75
06706	85.46
06708	85.60
06710	94.85



Populations at Risk by County

County	Total Pop	Under 18	65 & Over	Pediatric Asthma	Adult Asthma	COPD	Lung Cancer	Cardio-vascular Disease	Pregnancy	Poverty Estimate	People of Color
Fairfield	959,768	195,188	158,603	15,463	81,758	35,190	537	56,117	9,064	85,452	386,212
Hartford	896,854	71,422	158,512	5,658	77,334	33,422	502	53,235	8,649	92,542	371,285
Litchfield	185,000	28,968	42,169	2,295	16,300	8,046	104	13,154	1,494	15,713	25,753
Middlesex	164,759	91,898	35,695	7,280	14,744	6,991	92	11,344	1,462	10,537	29,067
New Haven	863,700	17,576	156,201	1,392	75,199	32,671	483	52,088	8,557	100,433	345,820
New London	268,805	20,138	51,843	1,595	23,561	10,518	150	16,857	2,420	23,102	69,656
Tolland	150,293	110,222	25,398	8,732	13,667	5,537	84	8,685	1,598	15,039	26,007
Windham	116,418	53,152	20,814	4,211	10,221	4,456	65	7,117	1,097	13,043	21,471
TOTAL:	3,605,597	588,564	649,235	46,626	312,784	136,831	2,017	218,597	34,341	355,861	1,275,271

Age of Housing Stock



Older - 1800



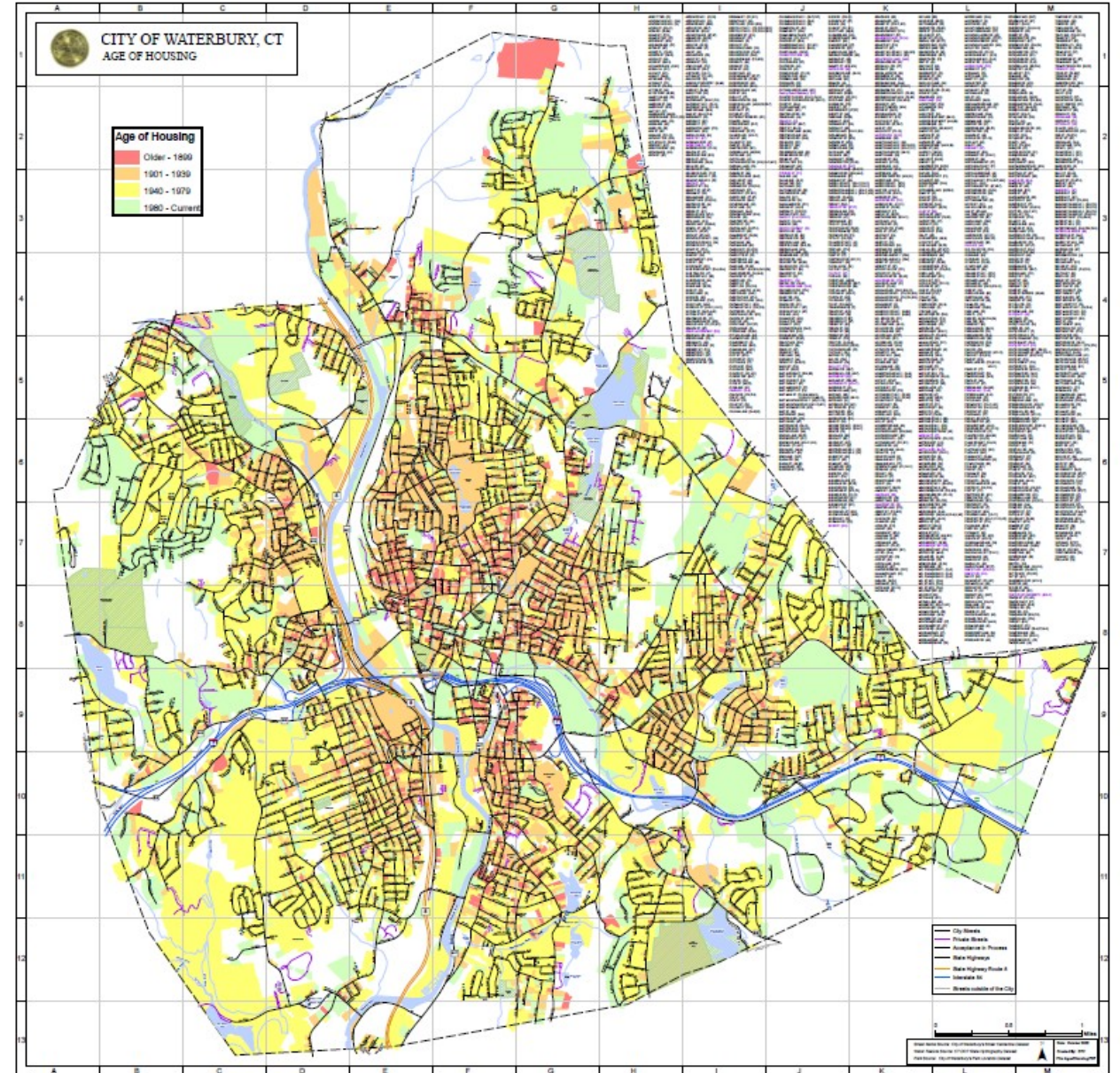
1901 - 1939



1940 - 1979



1980 - Current

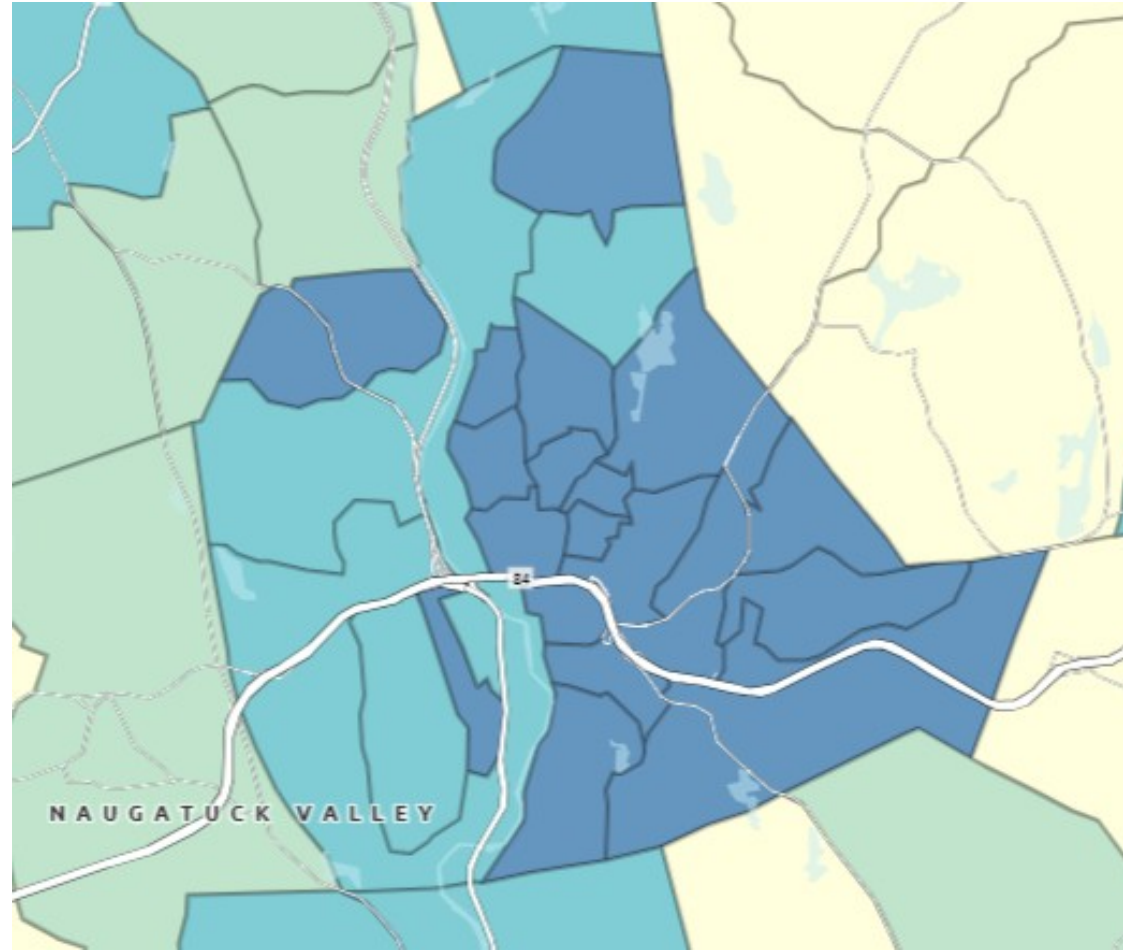
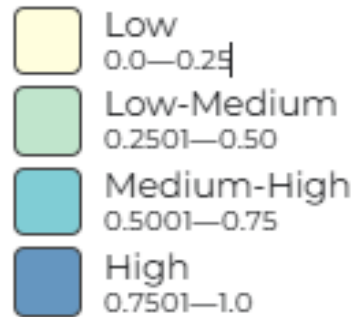


Social Vulnerability Index by Census Tract, 2022

Legend

Overall SVI

Levels of Vulnerability



Purpose of Plan



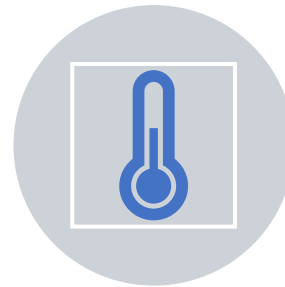
Prepare for and respond to extreme heat and poor air quality events.



Protect residents from heat-related illness and air pollution exposure.



Coordinate municipal agencies, healthcare providers, and community organizations.



Promote long-term climate resilience and equity.

What Does the Toolkit Cover?

The toolkit focuses on:

Extreme heat and heat emergency planning

Indoor and outdoor air quality concerns

Poor air quality events, especially ground-level ozone and PM2.5 (fine particle pollution)

The impacts of heat and air pollution on vulnerable populations

Seasonal preparedness activities

Emergency response actions during heat waves and air quality events

Public communication and community outreach strategies

Coordination between local government, schools, healthcare providers, and community organizations

Piece of Plan: Activation Phases

Pre-seasonal: Planning, training, outreach, preparation, and stakeholder coordination

Seasonal: Monitoring conditions and sharing public communication

Heat emergency: Cooling centers, wellness checks, transportation, hydration support

Air quality emergency: AQI alerts, PPE distribution, respiratory health messaging

Post-event: Evaluation, follow-up, and plan improvement

Piece of Plan: Communication Strategies

Multilingual public messaging and alerts

Use of social media, press releases, websites, and flyers

Coordination with trusted community organizations

Consistent updates during emergencies

Clear messaging on protective actions residents can take

Afternoon Session

Three breakout groups:

- Group A: Children/students going to and from school
- Group B: Older adults in poor quality housing
- Group C: Unhoused or homeless individuals

The discussion will focus on:

- Challenges families and communities face during extreme heat or poor air quality events
- Communication strategies and barriers
- Community resources and support needs
- Ideas for preparedness and response efforts



References

1. Burrows, L. (2016). The complex relationship between heat and ozone. The Harvard Gazette. <http://news.harvard.edu/gazette/story/2016/04/the-complex-relationship-between-heat-and-ozone/>, accessed December 4, 2024
2. Environmental Protection Agency (2024). Trends in ozone adjusted for weather conditions. <https://www.epa.gov/air-trends/trends-ozone-adjusted-weather-conditions>, accessed December 4, 2024
3. Pascal, M., Wagner, V., Alari, A., Corso, M. & Le Tertre, A. (2021). Extreme heat and acute air pollution episodes: A need for joint public health warnings?. Atmospheric Environment, 249 (15), 118249. <https://doi.org/10.1016/j.atmosenv.2021.118249>