Ozone National Ambient Air Quality Standard Health Exceedances on July 20, 2022

Exceedance Locations and Levels

On Wednesday, July 20, 2022, there were three (3) exceedances in New Jersey of the National Ambient Air Quality Standard (NAAQS) for ozone (daily maximum 8-hour average of 70 ppb). See Table 1.

Table 1. New Jersey Ozone Concentrations on 7/20/2022

STATION	Daily Maximum 8-Hr Average (ppb)
Ancora State Hospital	56
Bayonne	75
Brigantine	54
Camden Spruce St	47
Chester	65
Clarksboro	66
Colliers Mills	71
Columbia	59
Flemington	68
Leonia	66
Millville	58
Monmouth University	60
Newark Firehouse	69
Ramapo	55
Rider University	71
Rutgers University	70
Washington Crossing*	66
TOTAL EXCEEDANCES	3

*The Washington Crossing station is operated and maintained by EPA as part of the nationwide Clean Air Status and Trends Network (CASTNET).

From the out-of-state stations within New Jersey's ozone nonattainment areas, there were fifteen (15) exceedances of the ozone NAAQS. See Table 2.

Table 2. Ozone Concentrations at Out-of-State Monitoring Stations in New Jersey's Ozone Nonattainment Areas on 7/20/2022

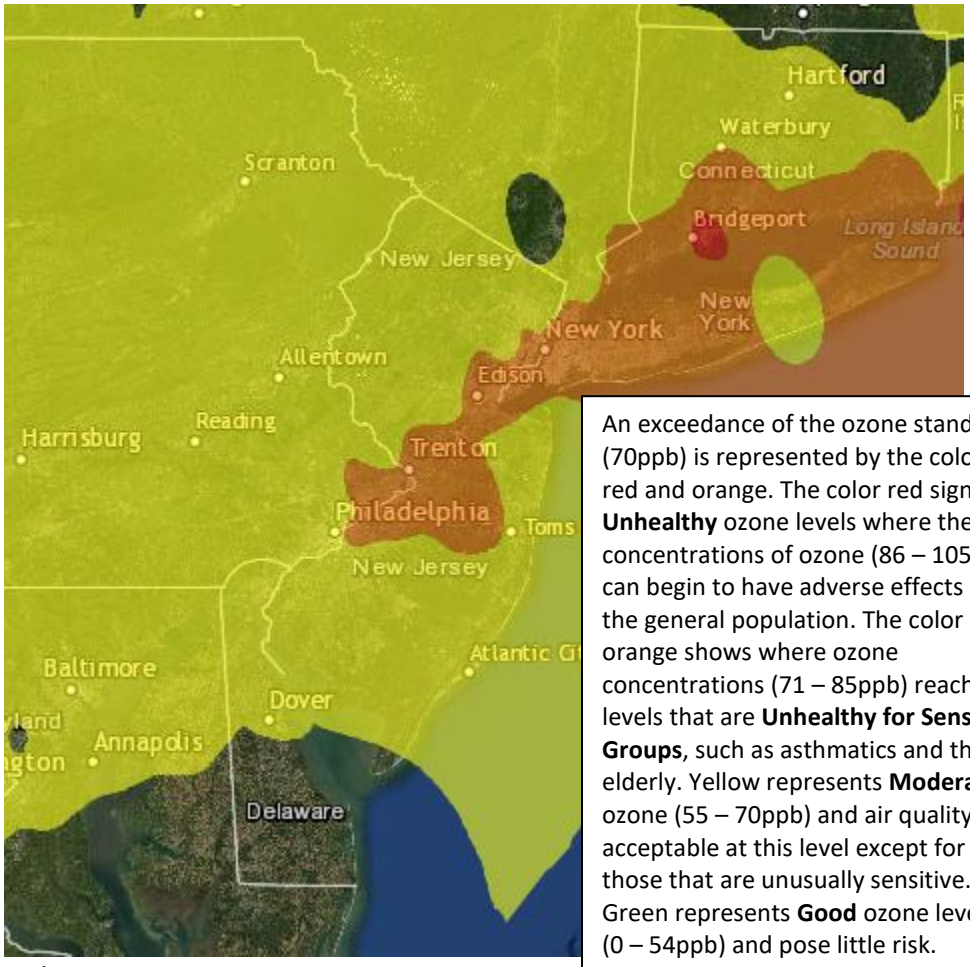
STATE	STATION	Daily Maximum 8-Hr Average (ppb)
CT	Danbury	63
CT	Greenwich	85
CT	Madison-Beach Road	78
CT	Middletown-CVH-Shed	61
CT	New Haven	72
CT	Stratford	86
CT	Westport	82
DE	BCSP (New Castle Co.)	62
DE	BELLFNT2 (New Castle Co.)	62
DE	KILLENS (Kent Co.)	52
DE	LEWES (Sussex Co.)	51
DE	LUMS 2 (New Castle Co.)	62
DE	MLK (New Castle Co.)	64
DE	SEAFORD (Sussex Co.)	51
MD	Fair Hill	62
NY	Babylon	73
NY	Bronx - IS52	71
NY	CCNY	72
NY	Flax Pond	71
NY	Fresh Kills	72
NY	Holtsville	71
NY	Pfizer Lab	70
NY	Queens	73
NY	Riverhead	69
NY	Rockland Cty	52
NY	White Plains	66
PA	BRIS (Bucks Co.)	76
PA	CHES (Delaware Co.)	66
PA	NEWG (Chester Co.)	52
PA	NORR (Montgomery Co.)	65
PA	LAB (Philadelphia Co.)	63
PA	NEA (Philadelphia Co.)	73
PA	NEW (Philadelphia Co.)	73
	TOTAL EXCEEDANCES	15

The number of days in 2022 on which exceedances of the ozone NAAQS were recorded for all the states within New Jersey's ozone nonattainment areas is summarized in Table 3.

Table 3. Number of Days Ozone NAAQS was Exceeded in NJ's Nonattainment Areas in 2022

STATE	# of Days NAAQS was Exceeded January 1 – July 20, 2022 NAAQS = 70 ppb
Connecticut	9
Delaware	0
Maryland	1
New Jersey	5
New York	4
Pennsylvania	2

Figure 1. Ozone Air Quality Index for July 20, 2022



An exceedance of the ozone standard (70ppb) is represented by the colors red and orange. The color red signifies **Unhealthy** ozone levels where the concentrations of ozone (86 – 105ppb) can begin to have adverse effects on the general population. The color orange shows where ozone concentrations (71 – 85ppb) reached levels that are **Unhealthy for Sensitive Groups**, such as asthmatics and the elderly. Yellow represents **Moderate** ozone (55 – 70ppb) and air quality is acceptable at this level except for those that are unusually sensitive. Green represents **Good** ozone levels (0 – 54ppb) and pose little risk.

Source: www.airnow.gov

For ozone terminology definitions see NJDEP Air Quality Planning's Glossary and Acronyms webpage: http://nj.gov/dep/baqp/glossary.html

Weather

High pressure was noted over much of the Eastern United States on Wednesday July 20, 2022 as a surface trough, extending from New England southwest into the Mid-Atlantic region, persisted throughout the day. This atmospheric setup allowed for mostly sunny skies and hot temperatures across the region which in turn allowed for ozone levels to rapidly rise over the nonattainment area. Winds tended light in the morning and early afternoon hours before a breezy southwesterly flow allowed for the quick transport of local/regional emissions and previously polluted air, leading to several ozone exceedances throughout the nonattainment area.

Where Did the Air Pollution that Caused Ozone Come From?

Figures 2, 3, and 4 show the back trajectories of different wind heights for the monitored exceedance(s) on this day. The figures illustrate where the air came from during the 48 hours preceding the 8-hour ozone standard exceedances. A transport analysis is provided with each figure shown below along with a map of the National Air Quality Index for the previous day (Figure 5). The monitoring station(s) that were chosen to model back trajectories are listed in Table 4.

Table 4. Monitoring Stations with an 8-hr Ozone Exceedance that were selected to Run 48-hr Back Trajectories

STATE	STATION	Daily Maximum 8-Hr Average (ppb)
CT	Greenwich	85
CT	Madison-Beach Road	78
CT	Stratford	86
NJ	Bayonne	75
NJ	Colliers Mills	71
NJ	Rider University	71
NY	Babylon	73
NY	Holtsville	71
NY	Fresh Kills	72
PA	NEW (Philadelphia Co.)	73

Figure 2. 48-hour Back Trajectories for July 20, 2022 at 10 meters

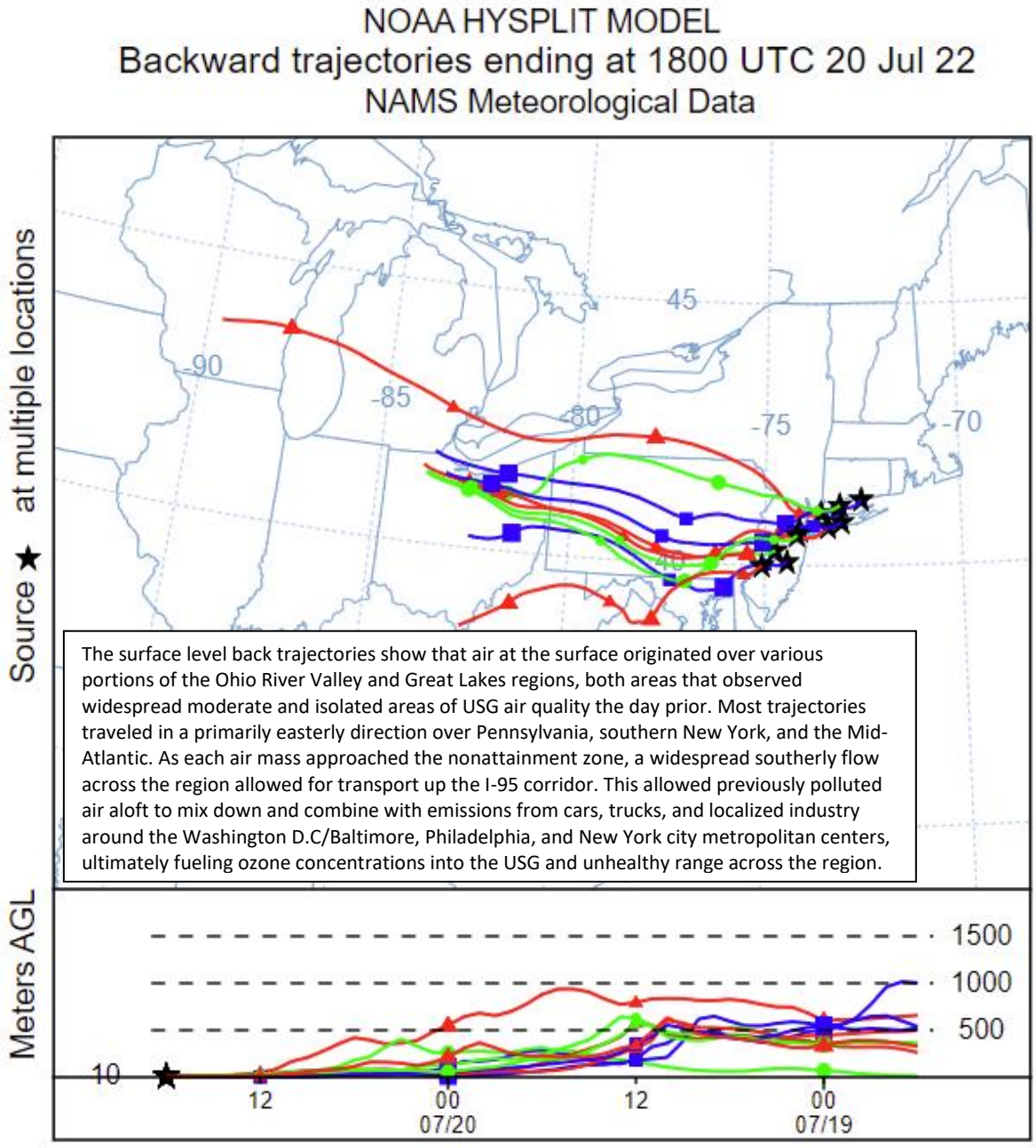


Figure 3. 48-hour Back Trajectories for July 20, 2022 at 500 meters

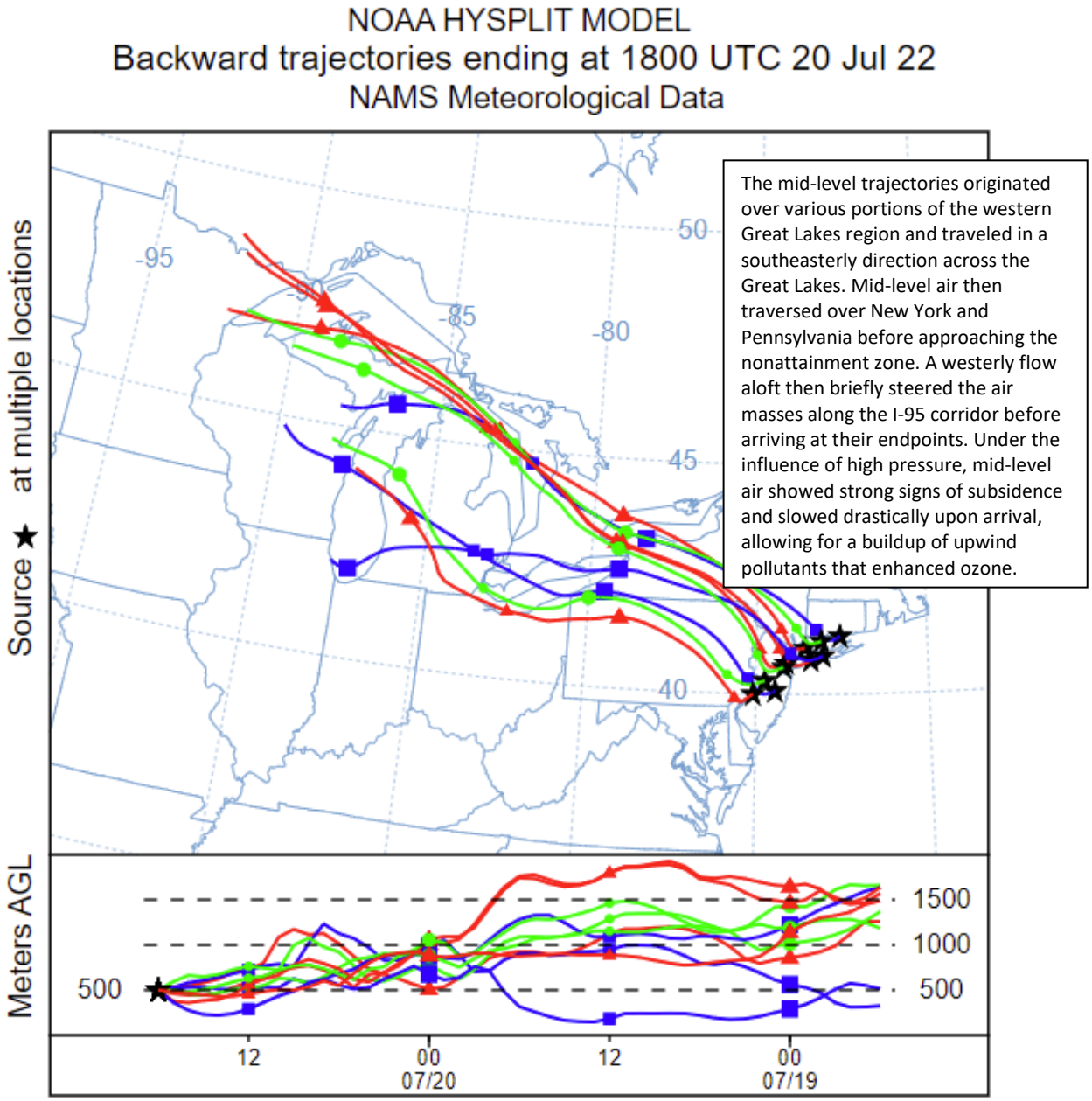


Figure 4. 48-hour Back Trajectories for July 20, 2022 at 1500 meters

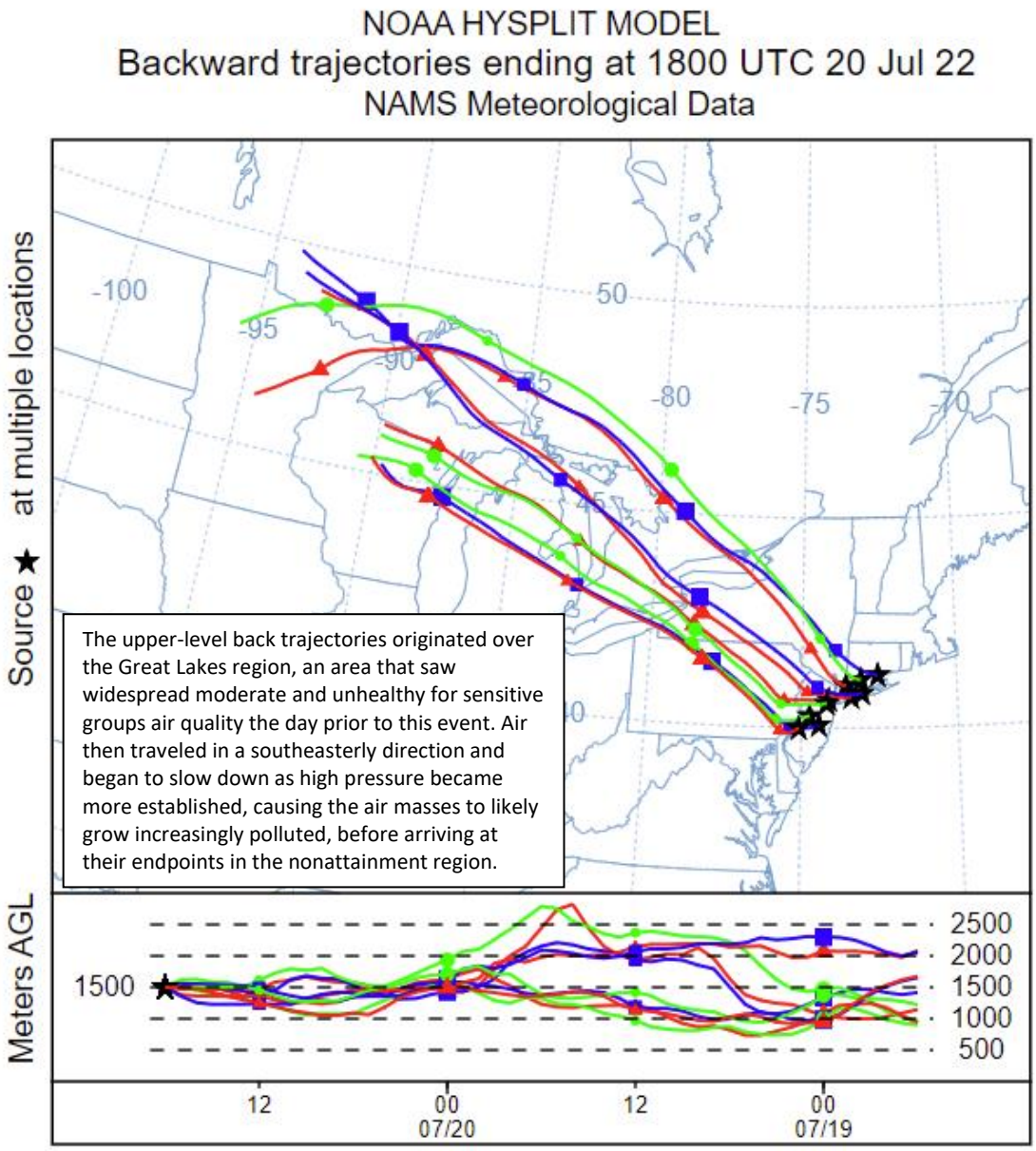
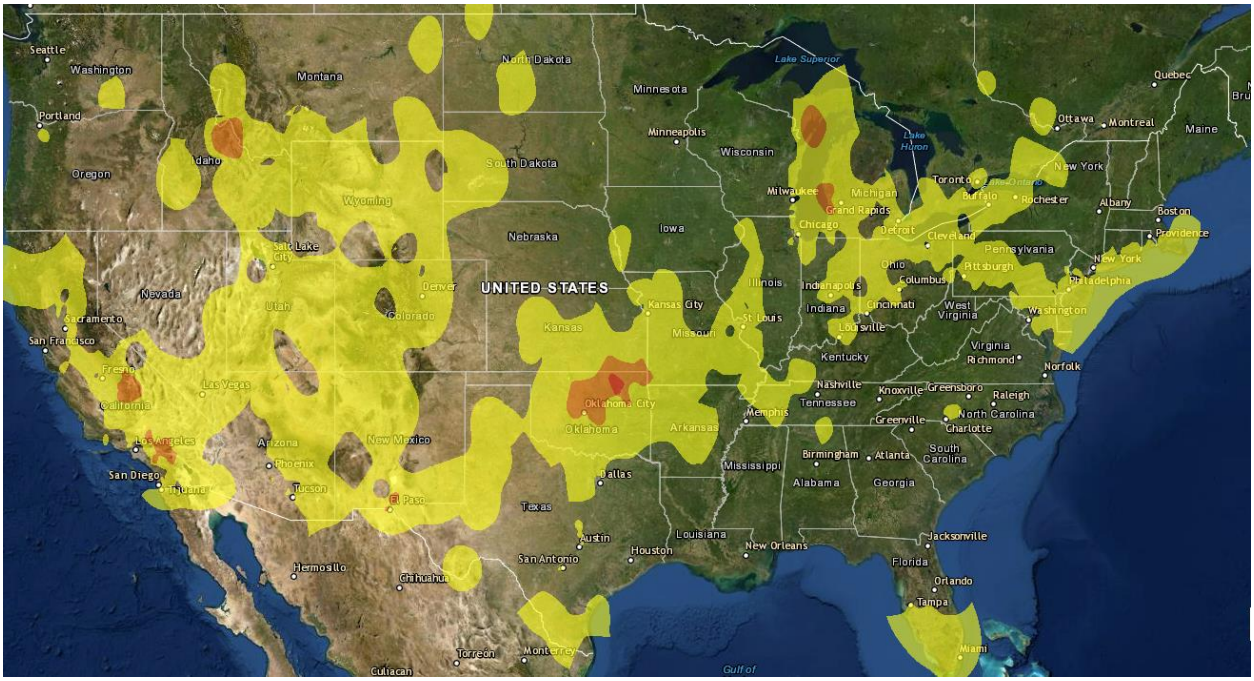


Figure 5. Air Quality Index for the United States on July 19, 2022



Source: www.airnow.gov

How is Ozone Created?

Ground-level ozone is an air pollutant known to cause several health effects and negatively impact air quality and the environment in New Jersey. Ozone is formed when oxides of nitrogen (NOx) and volatile organic compounds (VOCs) react in the presence of sunlight. Ozone can irritate any person's lungs, but the effect may be more pronounced for those with existing lung-related deficiencies, and therefore, one should take extra precautions on bad ozone days.

Find Out About Air Quality Every Day

Learn more about your local ozone air quality forecast by visiting the "What's Your Air Quality Today?" page at https://www.nj.gov/dep/baqp/aqitoday.html .