Ozone National Ambient Air Quality Standard Health Exceedances on July 12, 2023

Exceedance Locations and Levels

On Wednesday, July 12, 2023, there were two (2) 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 7/12/2023

STATION	Daily Maximum 8-Hr Average (ppb)
Ancora State Hospital	61
Bayonne	62
Brigantine	54
Camden Spruce St	70
Chester	64
Clarksboro	74
Colliers Mills	75
Columbia	48
Flemington	62
Leonia	No Data
Millville	63
Monmouth University	68
Ramapo	50
Rider University	64
Rutgers University	63
Washington Crossing*	63
TOTAL EXCEEDANCES	2

*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 eleven (11) 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 7/12/2023

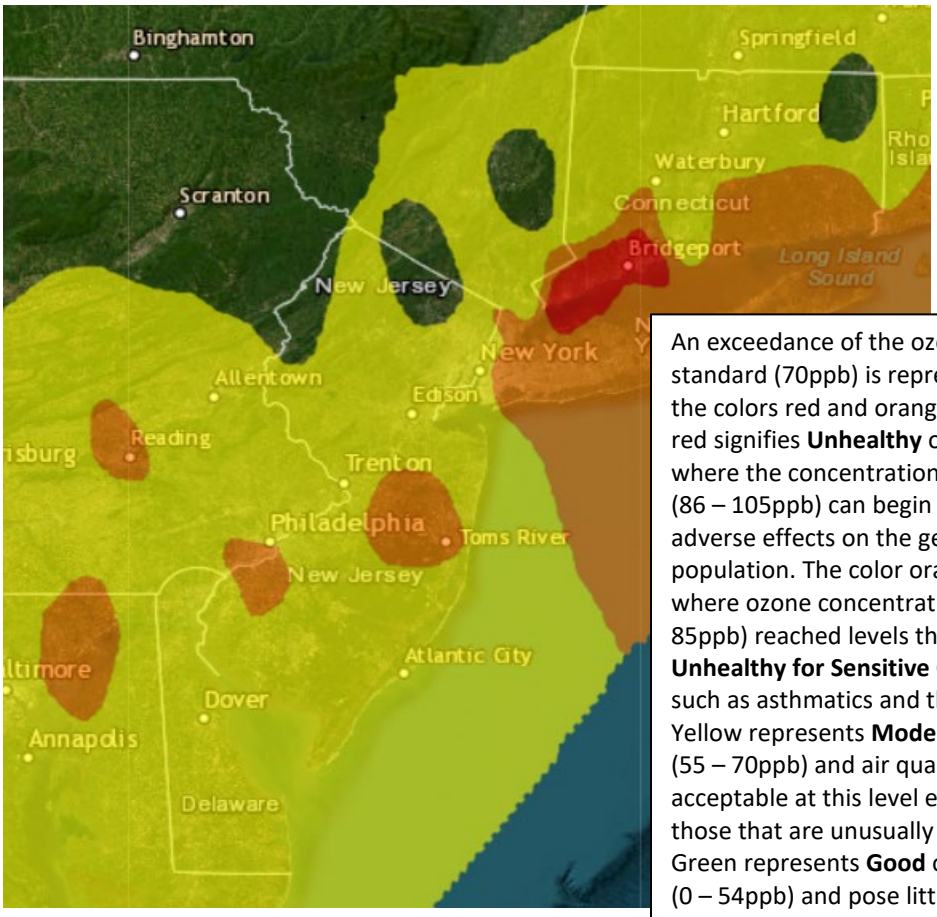
STATE	STATION	Daily Maximum 8-Hr Average (ppb)
CT	Danbury	64
CT	Greenwich	89
CT	Madison-Beach Road	81
CT	Middletown-CVH-Shed	70
CT	New Haven	66
CT	Stratford	89
CT	Westport	89
DE	BCSP (New Castle Co.)	64
DE	BELLFNT2 (New Castle Co.)	64
DE	KILLENS (Kent Co.)	58
DE	LEWES (Sussex Co.)	62
DE	LUMS 2 (New Castle Co.)	68
DE	MLK (New Castle Co.)	66
DE	SEAFORD (Sussex Co.)	59
MD	Fair Hill	67
NY	Babylon	82
NY	Bronx - IS52	70
NY	CCNY	67
NY	Flax Pond	80
NY	Fresh Kills	64
NY	Holtsville	84
NY	Pfizer Lab	72
NY	Queens	79
NY	Riverhead	76
NY	Rockland Cty	56
NY	White Plains	62
PA	BRIS (Bucks Co.)	68
PA	CHES (Delaware Co.)	71
PA	NEWG (Chester Co.)	64
PA	NORR (Montgomery Co.)	66
PA	LAB (Philadelphia Co.)	58
PA	NEA (Philadelphia Co.)	60
PA	NEW (Philadelphia Co.)	66
	TOTAL EXCEEDANCES	11

The number of days in 2023 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 2023

STATE	# of Days NAAQS was Exceeded January 1 – July 12, 2023 NAAQS = 70 ppb
Connecticut	12
Delaware	4
Maryland	3
New Jersey	12
New York	11
Pennsylvania	7

Figure 1. Ozone Air Quality Index for July 12, 2023



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: https://www.nj.gov/dep/airmon/glossary.html

Weather

On Wednesday, July 12th, numerous ozone exceedances were observed across the nonattainment area, marking the second day of a multi-day exceedance event. High pressure over the southeastern U.S. began advancing northward on the 11th, anchoring itself over the Mid-Atlantic region leading into July 12th. This atmospheric setup continued to provide the region with hot temperatures, mostly sunny skies, and light west-southwest winds. With a deteriorated air mass from the day prior and favorable meteorological conditions in place, ozone concentrations were able to rapidly spike into the Unhealthy for Sensitive Groups (USG) territory by mid-morning. Additionally, a surface trough positioned itself along the I-95 corridor throughout the afternoon into the early evening, allowing residual ozone and precursors aloft to mix down and enhance surface-level concentrations. As a result, ozone levels were able to reach the USG and Unhealthy categories along the entire southern New England coastline, in central and southern portions of New Jersey, and in southeastern Pennsylvania.

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	89
CT	Stratford	89
CT	Westport	89
CT	Madison	81
NY	Holtsville	84
NY	Babylon	82
NY	Flax Pond	80
NJ	Colliers Mills	75
NJ	Clarksboro	74
PA	Chester	71

Figure 2. 48-hour Back Trajectories for July 12, 2023 at 10 meters

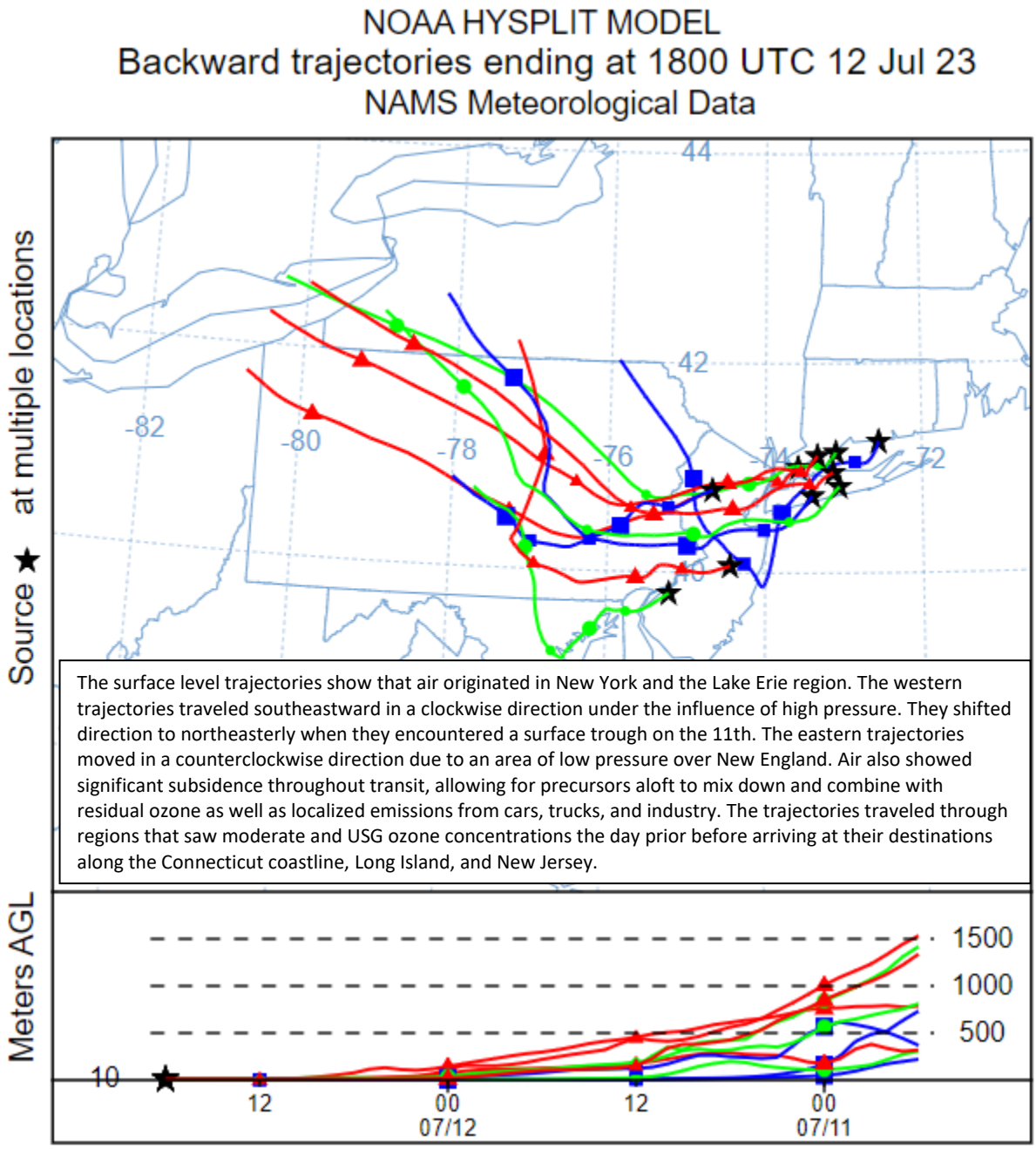


Figure 3. 48-hour Back Trajectories for July 12, 2023 at 500 meters

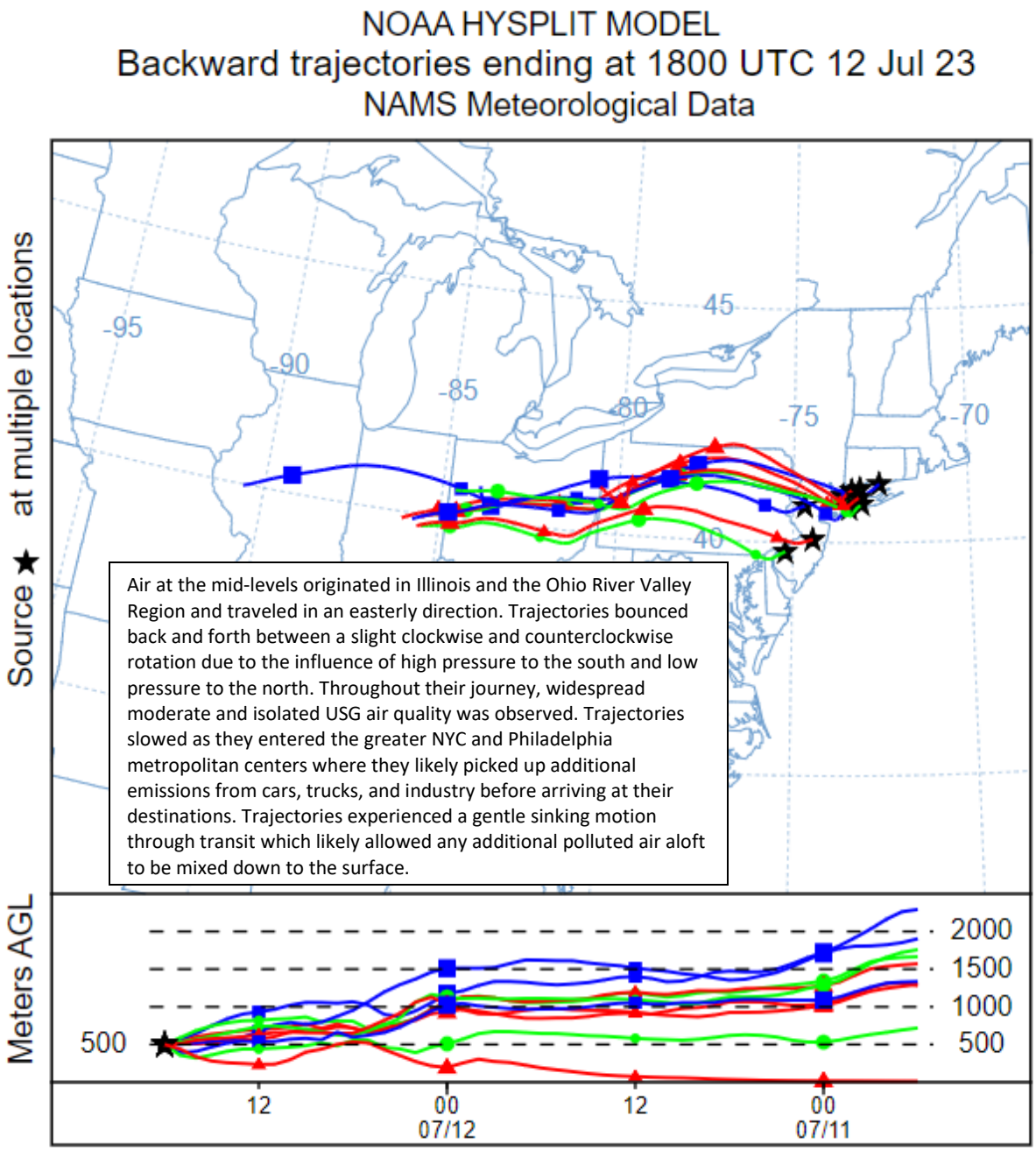


Figure 4. 48-hour Back Trajectories for July 12, 2023 at 1500 meters

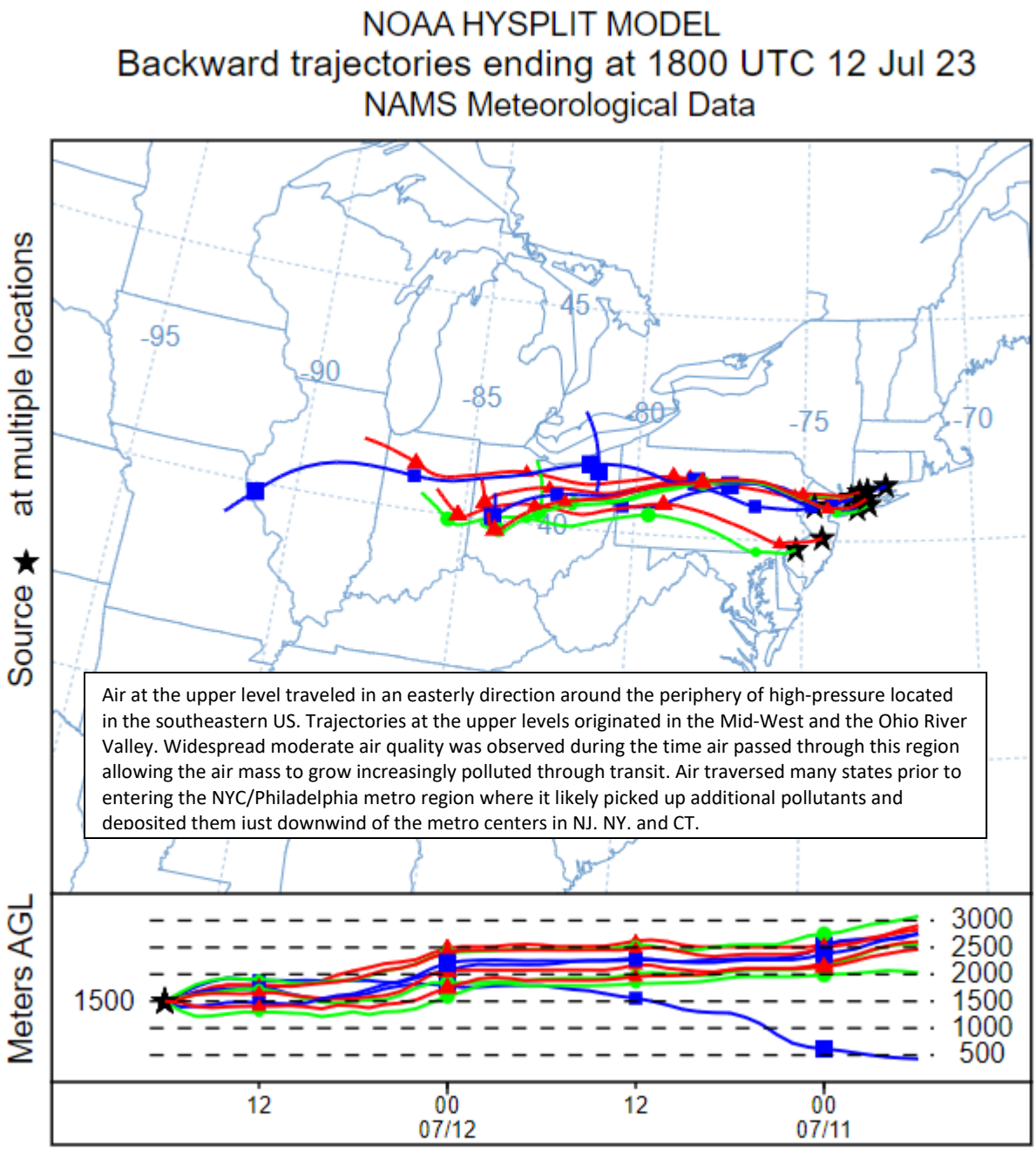
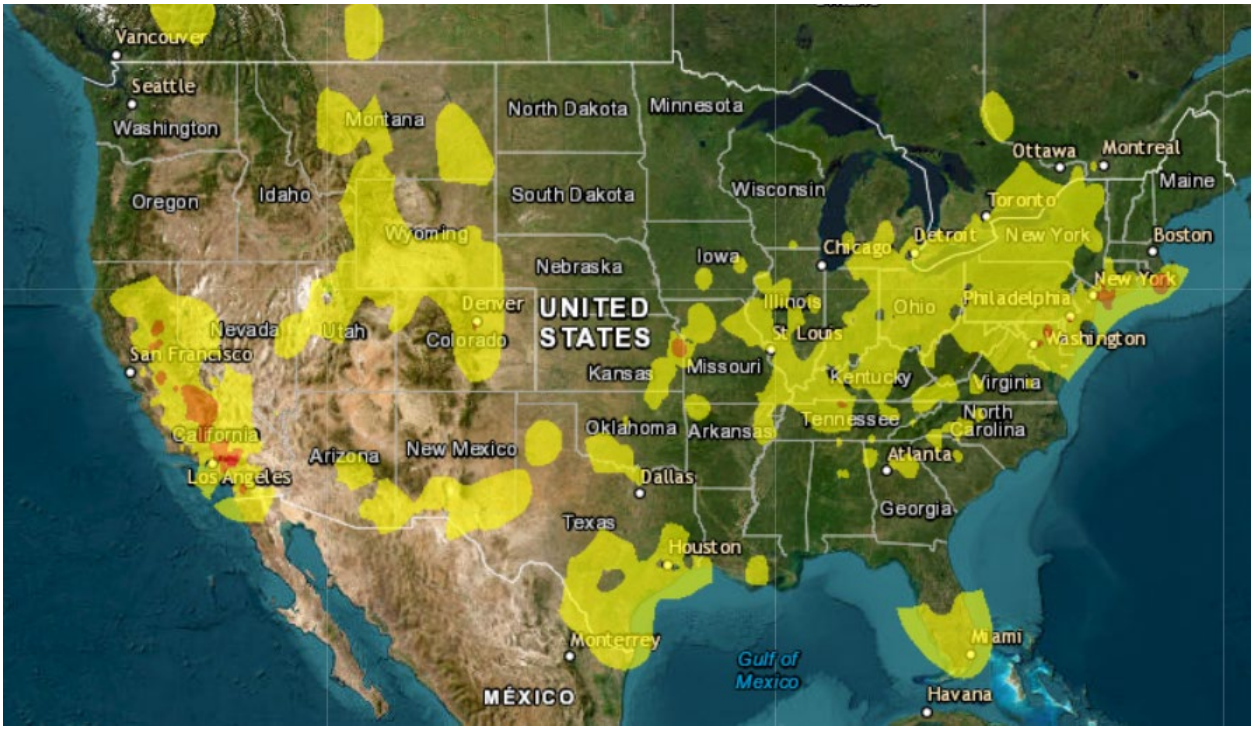


Figure 5. Air Quality Index for the United States on July 11, 2023



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 .