Ozone National Ambient Air Quality Standard Health Exceedances on July 5, 2023

Exceedance Locations and Levels

On Wednesday, July 5, 2023, 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 7/5/2023

STATION	Daily Maximum 8-Hr Average (ppb)
Ancora State Hospital	43
Bayonne	81
Brigantine	49
Camden Spruce St	57
Chester	44
Clarksboro	59
Colliers Mills	48
Columbia	27
Flemington	49
Leonia	71
Millville	46
Monmouth University	61
Ramapo	42
Rider University	48
Rutgers University	75
Washington Crossing*	46
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 three (3) 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 7/5/2023

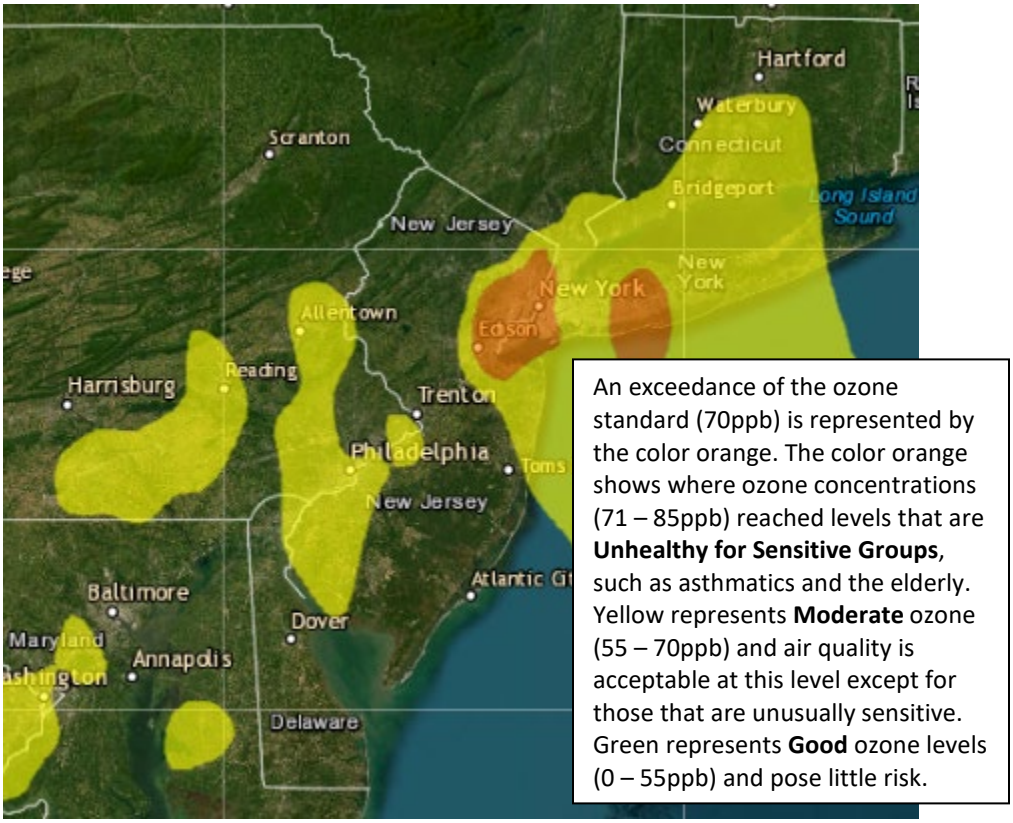
STATE	STATION	Daily Maximum 8-Hr Average (ppb)
CT	Danbury	43
CT	Greenwich	58
CT	Madison-Beach Road	58
CT	Middletown-CVH-Shed	57
CT	New Haven	56
CT	Stratford	58
CT	Westport	55
DE	BCSP (New Castle Co.)	No Data
DE	BELLFNT2 (New Castle Co.)	64
DE	KILLENS (Kent Co.)	49
DE	LEWES (Sussex Co.)	52
DE	LUMS 2 (New Castle Co.)	57
DE	MLK (New Castle Co.)	64
DE	SEAFORD (Sussex Co.)	52
MD	Fair Hill	49
NY	Babylon	73
NY	Bronx - IS52	65
NY	CCNY	76
NY	Flax Pond	55
NY	Fresh Kills	80
NY	Holtsville	68
NY	Pfizer Lab	64
NY	Queens	68
NY	Riverhead	55
NY	Rockland Cty	42
NY	White Plains	56
PA	BRIS (Bucks Co.)	56
PA	CHES (Delaware Co.)	69
PA	NEWG (Chester Co.)	50
PA	NORR (Montgomery Co.)	47
PA	LAB (Philadelphia Co.)	49
PA	NEA (Philadelphia Co.)	52
PA	NEW (Philadelphia Co.)	57
	TOTAL EXCEEDANCES	3

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 5, 2023 NAAQS = 70 ppb
Connecticut	9
Delaware	4
Maryland	3
New Jersey	10
New York	8
Pennsylvania	6

Figure 1. Ozone Air Quality Index for July 5, 2023



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 5th a weak front meandered along the New Jersey coastline before transitioning into a weak surface trough draped along the eastern United States. This meteorological set-up allowed for very little atmospheric ventilation at the surface resulting in calm/variable winds for the entire day. In the early morning hours, fog/misty conditions were exchanged for clear skies by mid-morning allowing temperatures to quickly climb into the low 90s by 2pm. Due to the light/variable winds, some locations across the state experienced winds from different directions. As a result, any ozone generated in the New York City area was likely transported westward into northern New Jersey. At this time, ozone levels in northeastern New Jersey started to rise while increasing cloud cover over southern New Jersey helped to limit ozone formation in this area. This transport in combination with favorable conditions for ozone formation likely caused ozone concentrations to reach the Unhealthy for Sensitive Groups (USG) category in northern New Jersey. As the day progressed, a strong sea breeze developed along the southern New Jersey coastline and migrated inland from southeast-to-northwest traversing the southern half of New Jersey. In addition to the increased cloud cover here, the sea breeze likely provided a clean airmass resulting in good ozone concentrations.

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)
NJ	Bayonne	81
NJ	Leonia	71
NY	Fresh Kills	80
NY	CCNY	76
NY	Babylon	73

Figure 2. 48-hour Back Trajectories for July 5, 2023 at 10 meters

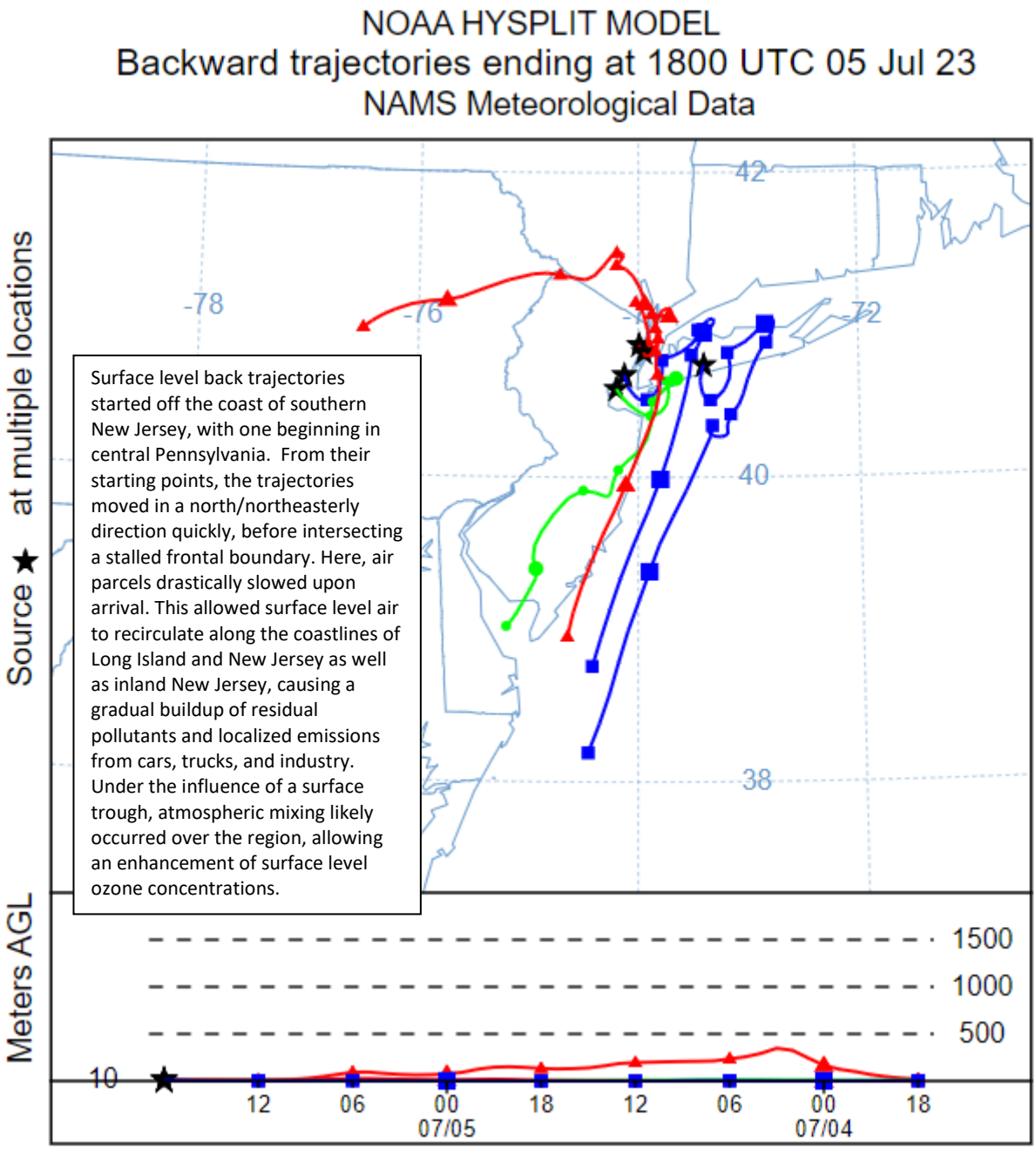


Figure 3. 48-hour Back Trajectories for July 5, 2023 at 500 meters

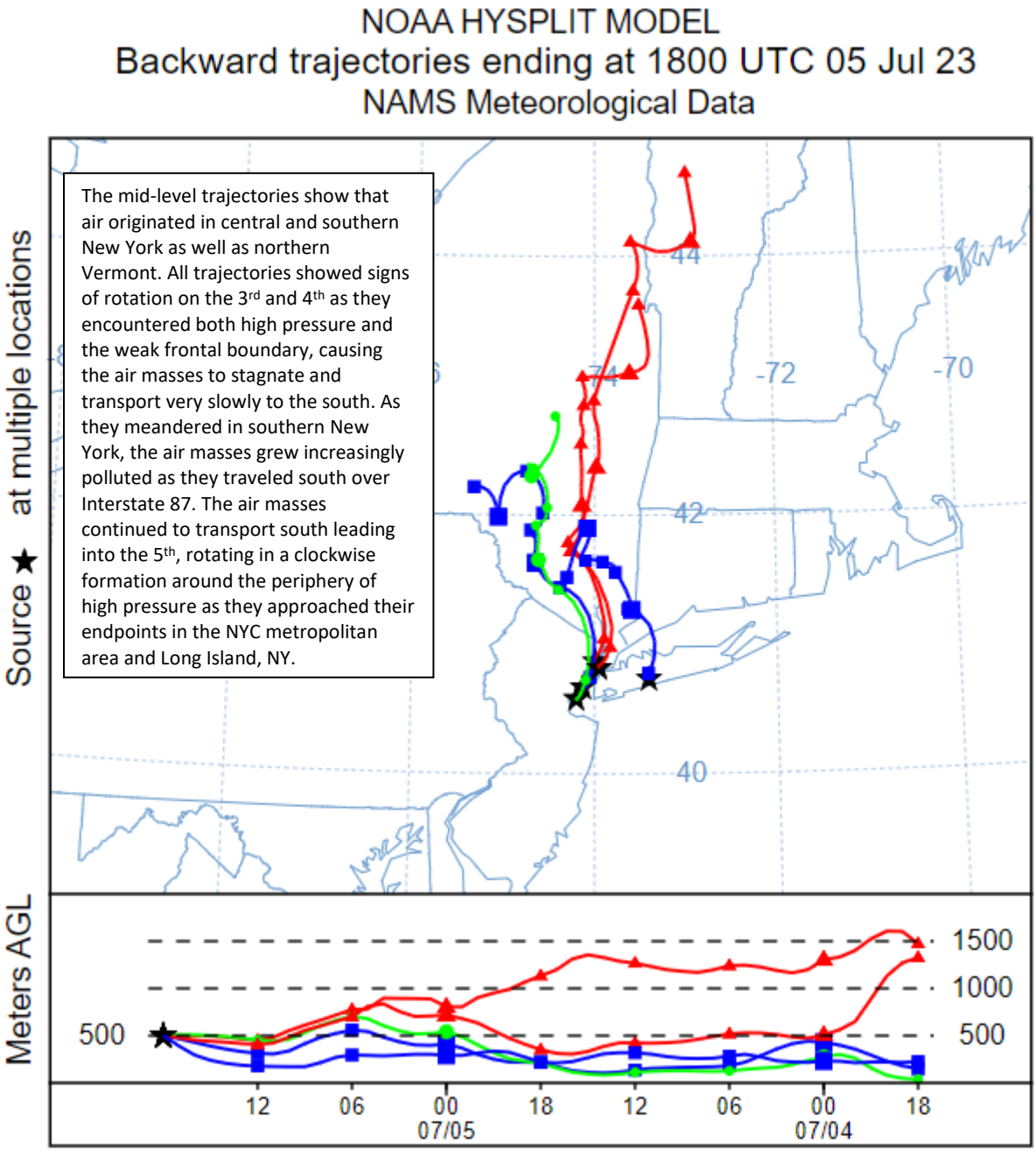


Figure 4. 48-hour Back Trajectories for July 5, 2023 at 1500 meters

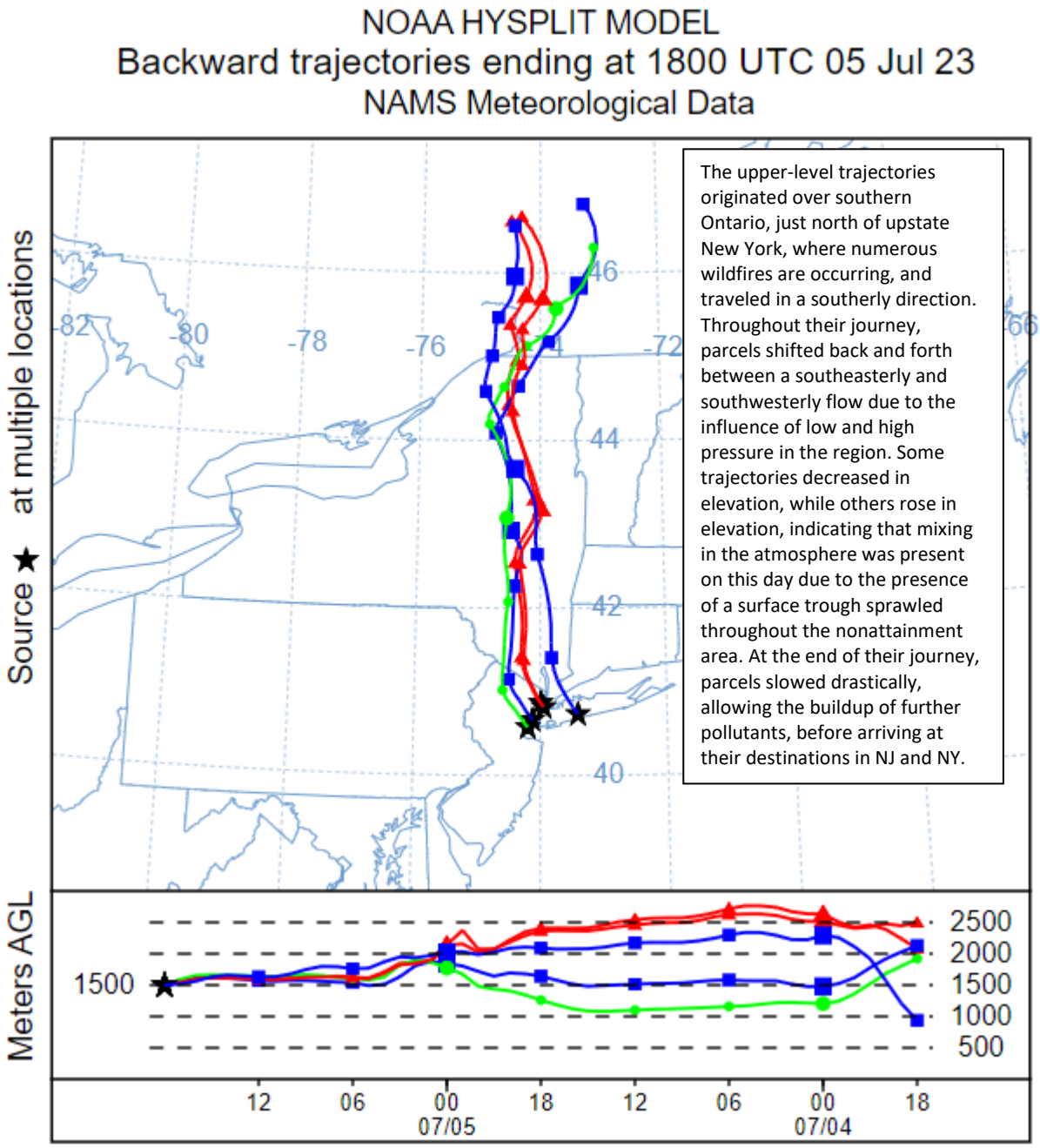
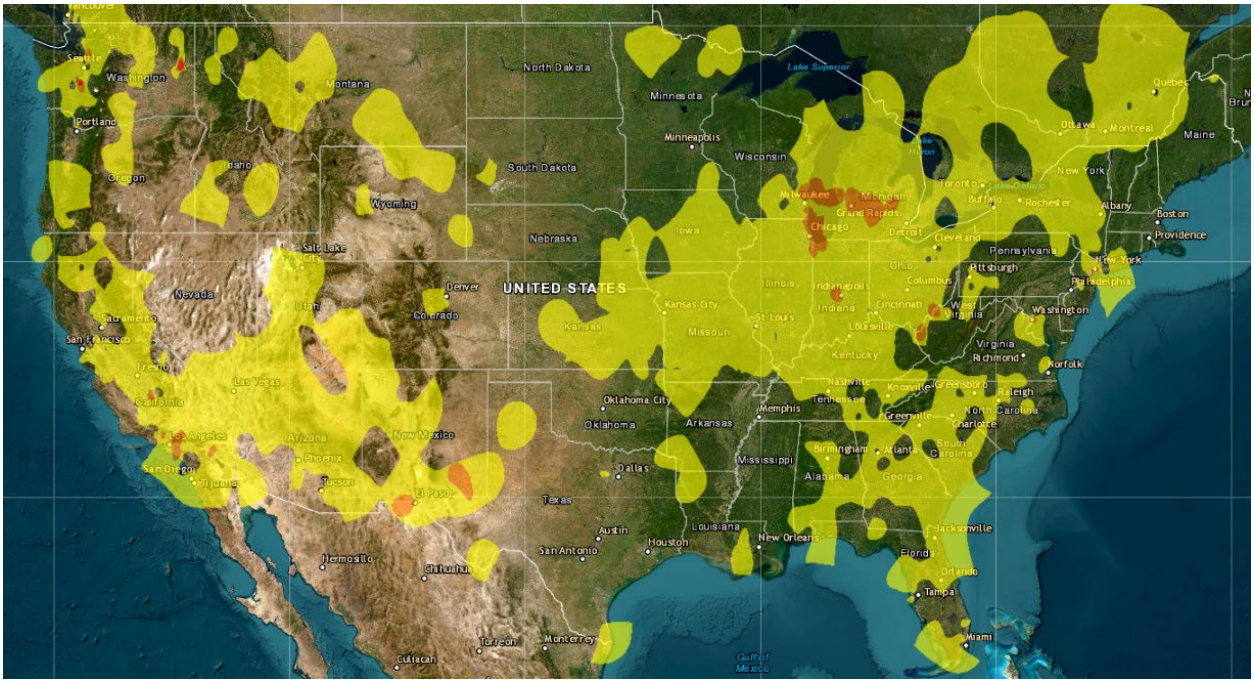


Figure 5. Air Quality Index for the United States on July 4, 2023



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 .