Ozone National Ambient Air Quality Standard Health Exceedances on July 28, 2023

Exceedance Locations and Levels

On Friday, July 28, 2023, there were no 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 7/28/2023

STATION	Daily Maximum 8-Hr Average (ppb)
Ancora State Hospital	60
Bayonne	56
Brigantine	51
Camden Spruce St	60
Chester	55
Clarksboro	67
Colliers Mills	68
Columbia	38
Flemington	57
Leonia	52
Millville	59
Monmouth University	64
Ramapo	42
Rider University	59
Rutgers University	57
Washington Crossing*	53
TOTAL EXCEEDANCES	0

*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 six (6) 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 7/28/2023

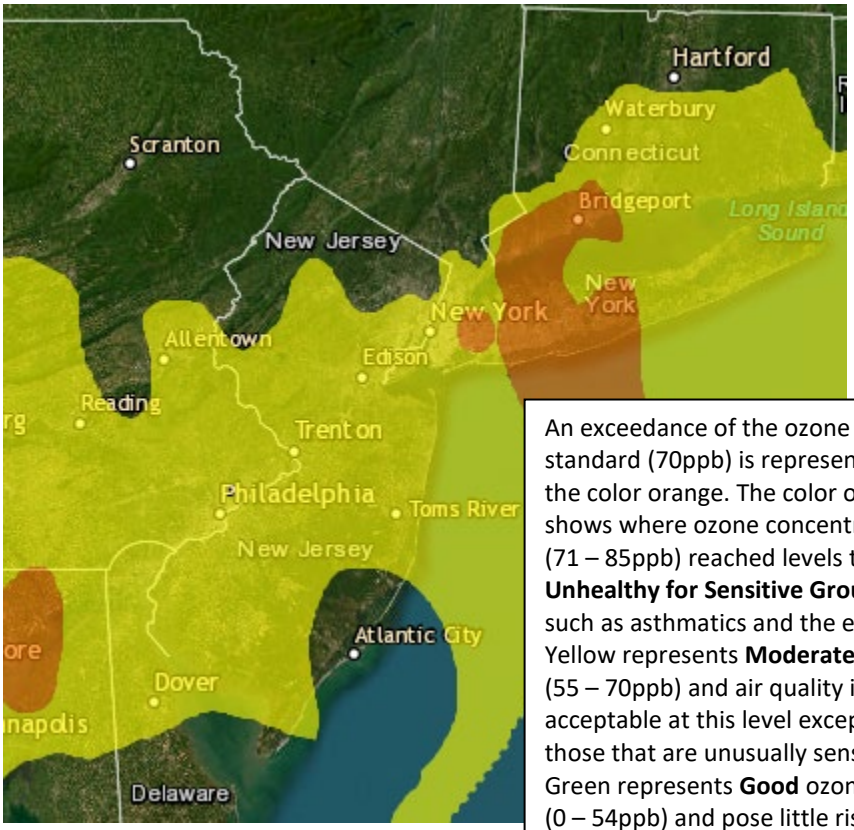
STATE	STATION	Daily Maximum 8-Hr Average (ppb)
CT	Danbury	50
CT	Greenwich	75
CT	Madison-Beach Road	64
CT	Middletown-CVH-Shed	62
CT	New Haven	64
CT	Stratford	72
CT	Westport	74
DE	BCSP (New Castle Co.)	55
DE	BELLFNT2 (New Castle Co.)	63
DE	KILLENS (Kent Co.)	47
DE	LEWES (Sussex Co.)	51
DE	LUMS 2 (New Castle Co.)	63
DE	MLK (New Castle Co.)	62
DE	SEAFORD (Sussex Co.)	50
MD	Fair Hill	64
NY	Babylon	75
NY	Bronx - IS52	62
NY	CCNY	58
NY	Flax Pond	66
NY	Fresh Kills	55
NY	Holtsville	74
NY	Pfizer Lab	60
NY	Queens	72
NY	Riverhead	67
NY	Rockland Cty	44
NY	White Plains	50
PA	BRIS (Bucks Co.)	66
PA	CHES (Delaware Co.)	66
PA	NEWG (Chester Co.)	55
PA	NORR (Montgomery Co.)	62
PA	LAB (Philadelphia Co.)	52
PA	NEA (Philadelphia Co.)	65
PA	NEW (Philadelphia Co.)	62
	TOTAL EXCEEDANCES	6

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 28, 2023 NAAQS = 70 ppb
Connecticut	16
Delaware	4
Maryland	3
New Jersey	14
New York	14
Pennsylvania	10

Figure 1. Ozone Air Quality Index for July 28, 2023



An exceedance of the ozone standard (70ppb) is represented by the color orange. 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

High pressure remained anchored offshore while associated ridging continued to impact the Mid-Atlantic region on Friday July 28th. This high pressure system allowed for another hot and humid summer day across the nonattainment area. Abundant sunshine was observed with fair weather clouds developing throughout the course of the day. Winds were light, trending westerly in southern locations and more southwesterly to the north. Overall, these favorable weather conditions allowed for ozone levels to rise throughout much of the nonattainment area. It is likely that the development of an afternoon seabreeze over coastal Connecticut and Long Island further enhanced ozone levels in this location, leading to multiple exceedances on this day.

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	75
CT	Westport	74
CT	Stratford	72
NY	Babylon	75
NY	Holtsville	74
NY	Queens	72

Figure 2. 48-hour Back Trajectories for July 28, 2023 at 10 meters

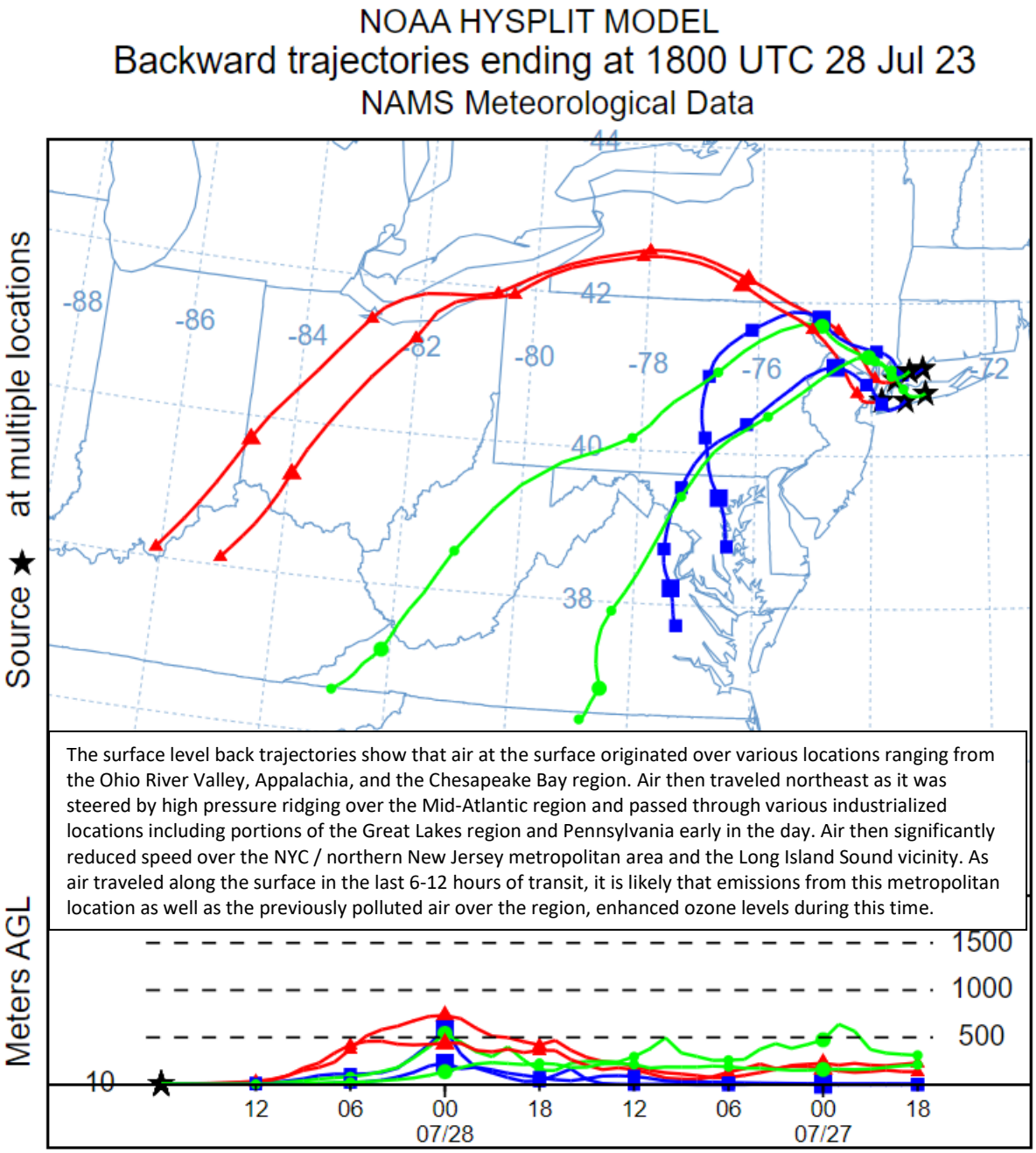


Figure 3. 48-hour Back Trajectories for July 28, 2023 at 500 meters

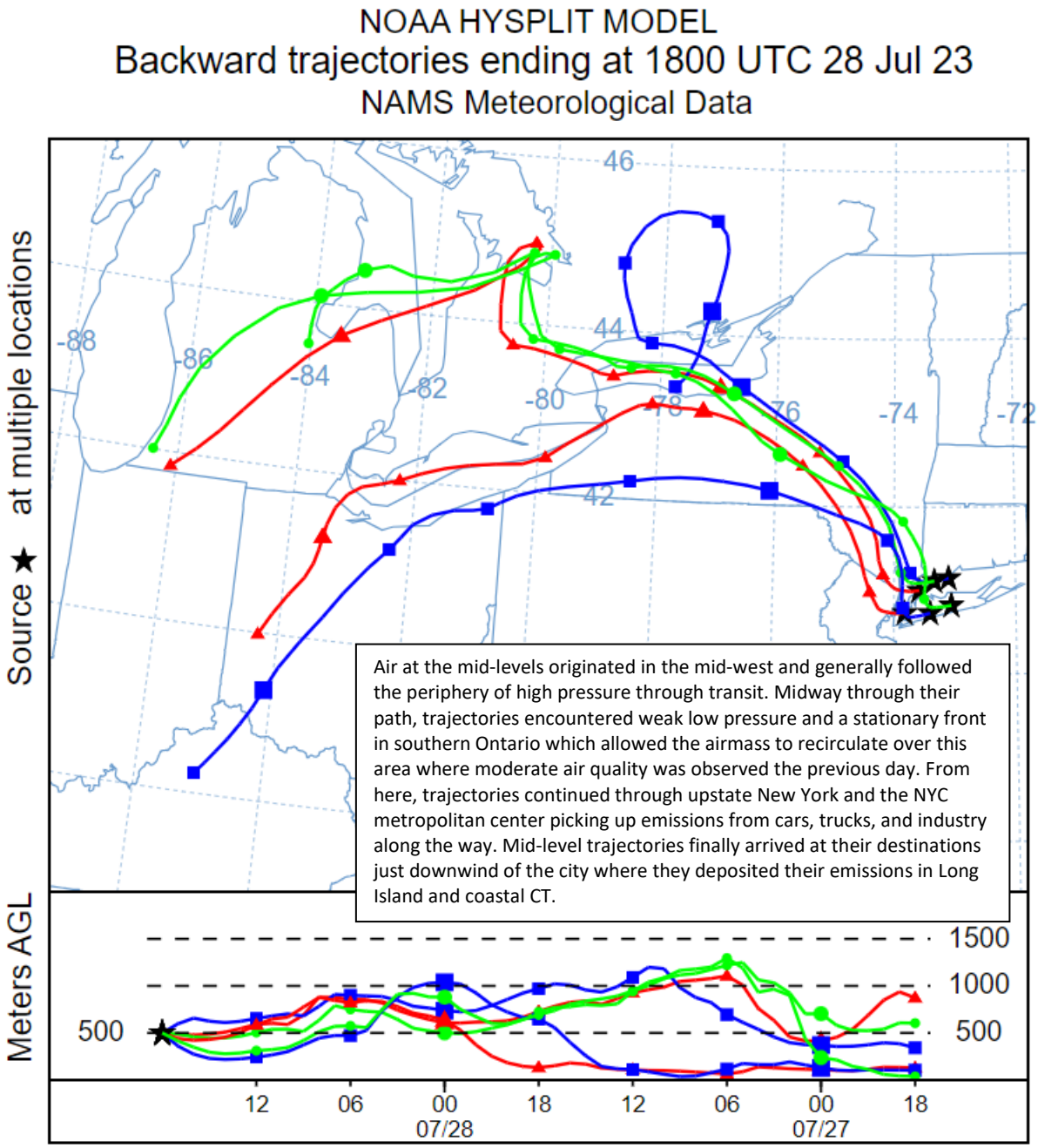
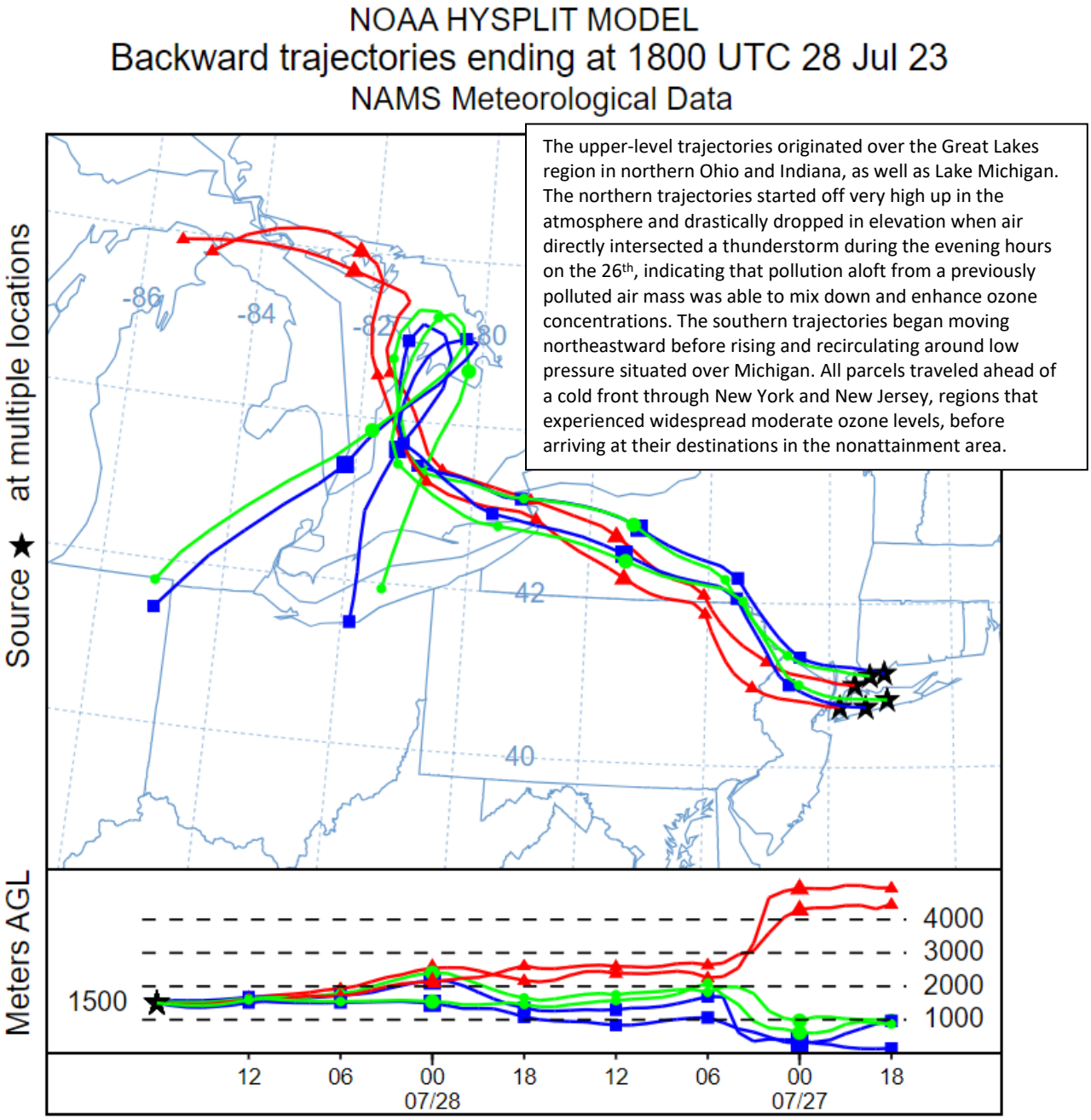
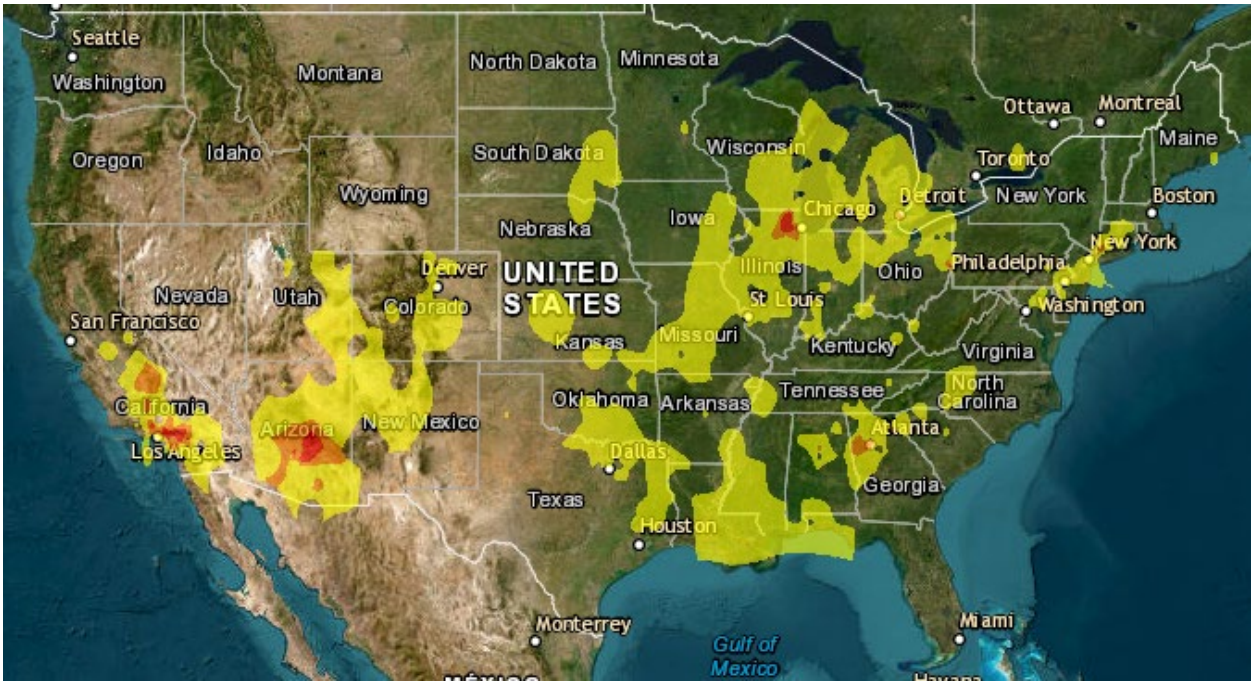


Figure 4. 48-hour Back Trajectories for July 28, 2023 at 1500 meters



The upper-level trajectories originated over the Great Lakes region in northern Ohio and Indiana, as well as Lake Michigan. The northern trajectories started off very high up in the atmosphere and drastically dropped in elevation when air directly intersected a thunderstorm during the evening hours on the 26th, indicating that pollution aloft from a previously polluted air mass was able to mix down and enhance ozone concentrations. The southern trajectories began moving northeastward before rising and recirculating around low pressure situated over Michigan. All parcels traveled ahead of a cold front through New York and New Jersey, regions that experienced widespread moderate ozone levels, before arriving at their destinations in the nonattainment area.

Figure 5. Air Quality Index for the United States on July 27, 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 .