Ozone National Ambient Air Quality Standard Health Exceedances on June 30, 2022

Exceedance Locations and Levels

On Thursday, June 30, 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 6/30/2022

STATION	Daily Maximum 8-Hr Average (ppb)
Ancora State Hospital	73
Bayonne	62
Brigantine	60
Camden Spruce St	67
Chester	65
Clarksboro	78
Colliers Mills	72
Columbia	60
Flemington	68
Leonia	59
Millville	65
Monmouth University	69
Newark Firehouse	63
Ramapo	59
Rider University	68
Rutgers University	66
Washington Crossing*	65
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 seven (7) 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 6/30/2022

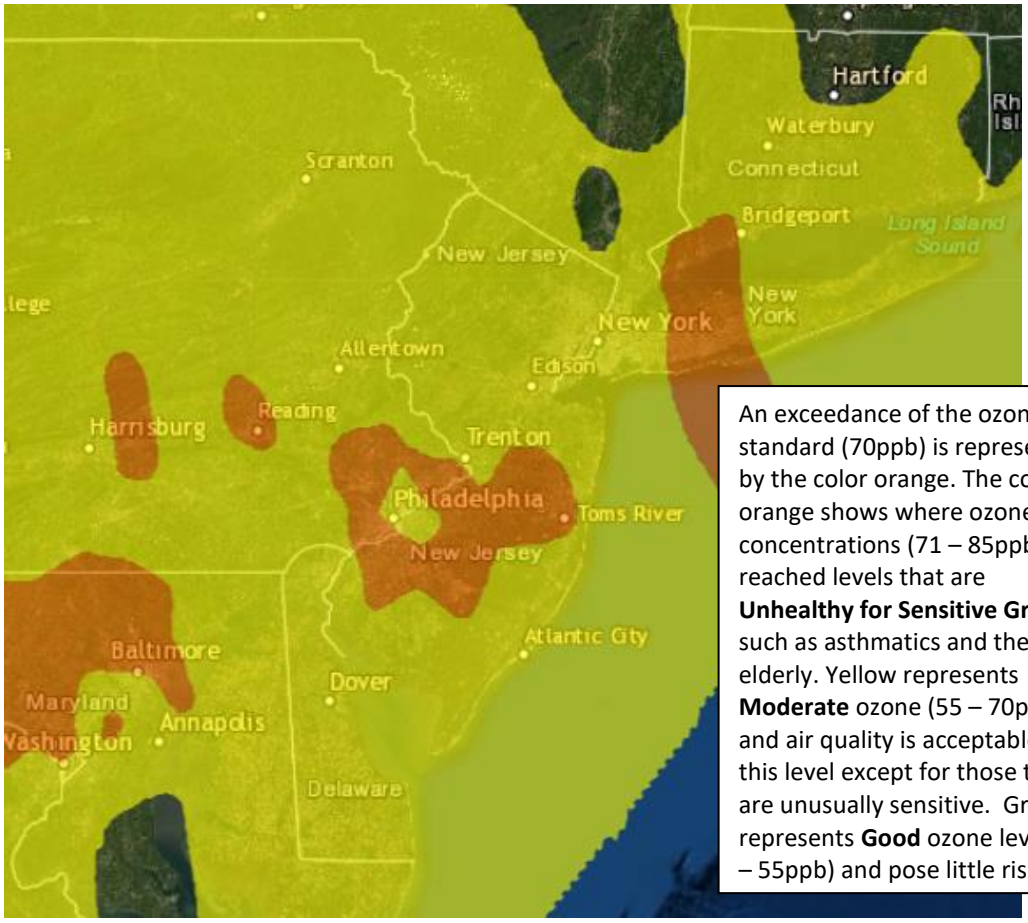
STATE	STATION	Daily Maximum 8-Hr Average (ppb)
CT	Danbury	61
CT	Greenwich	73
CT	Madison-Beach Road	63
CT	Middletown-CVH-Shed	60
CT	New Haven	58
CT	Stratford	68
CT	Westport	71
DE	BCSP (New Castle Co.)	67
DE	BELLFNT2 (New Castle Co.)	67
DE	KILLENS (Kent Co.)	65
DE	LEWES (Sussex Co.)	60
DE	LUMS 2 (New Castle Co.)	65
DE	MLK (New Castle Co.)	67
DE	SEAFORD (Sussex Co.)	58
MD	Fair Hill	67
NY	Babylon	77
NY	Bronx - IS52	61
NY	CCNY	60
NY	Flax Pond	70
NY	Fresh Kills	60
NY	Holtsville	69
NY	Pfizer Lab	60
NY	Queens	70
NY	Riverhead	62
NY	Rockland Cty	53
NY	White Plains	60
PA	BRIS (Bucks Co.)	71
PA	CHES (Delaware Co.)	71
PA	NEWG (Chester Co.)	58
PA	NORR (Montgomery Co.)	73
PA	LAB (Philadelphia Co.)	67
PA	NEA (Philadelphia Co.)	72
PA	NEW (Philadelphia Co.)	69
	TOTAL EXCEEDANCES	7

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 – June 30, 2022 NAAQS = 70 ppb
Connecticut	4
Delaware	0
Maryland	1
New Jersey	2
New York	2
Pennsylvania	1

Figure 1. Ozone Air Quality Index for June 30, 2022



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 centered off the Mid-Atlantic coast remained in control in the early morning hours of Thursday, June 30th. Calm winds turned northwesterly and westerly as a weak cold front progressed southward, before dissipating over central New Jersey by the afternoon. This front was able to transport previously polluted air to southern portions of the non-attainment area and allow for mixing down to the surface. As the day progressed, warm air and abundant sunshine, conditions conducive for ozone formation, raised temperatures to the mid-80s to the low-90s, with cooler temperatures observed along the coast. Meanwhile, a sea breeze developed during the afternoon. This kept ozone levels at the Jersey Shore a little cleaner, as pollution was pushed inland in between the cold front and sea breeze. In Connecticut and Long Island however, the sea breeze pushed pollution back onshore, allowing for these areas to see a rise in ozone levels. All of these conditions, along with a previously polluted airmass and transport from upwind locations, allowed for exceedances to occur in New Jersey, eastern Pennsylvania, and parts of Long Island and the Connecticut coastline.

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	73
CT	Westport	71
NY	Babylon	77
NJ	Clarksboro	78
NJ	Colliers Mills	72
PA	Bristol	71
PA	Chester	71
PA	NEA	72

Figure 2. 48-hour Back Trajectories for June 30, 2022 at 10 meters

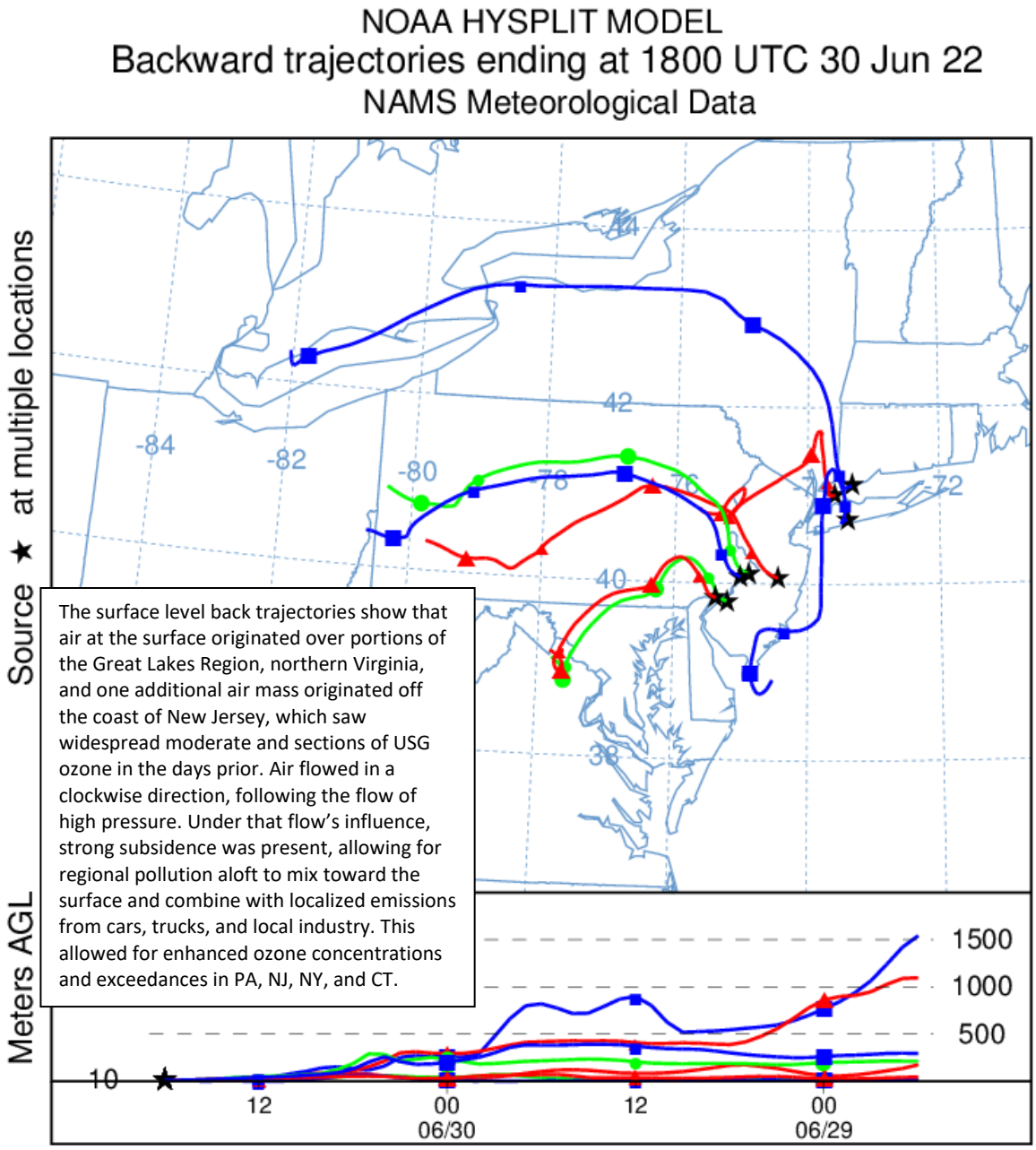


Figure 3. 48-hour Back Trajectories for June 30, 2022 at 500 meters

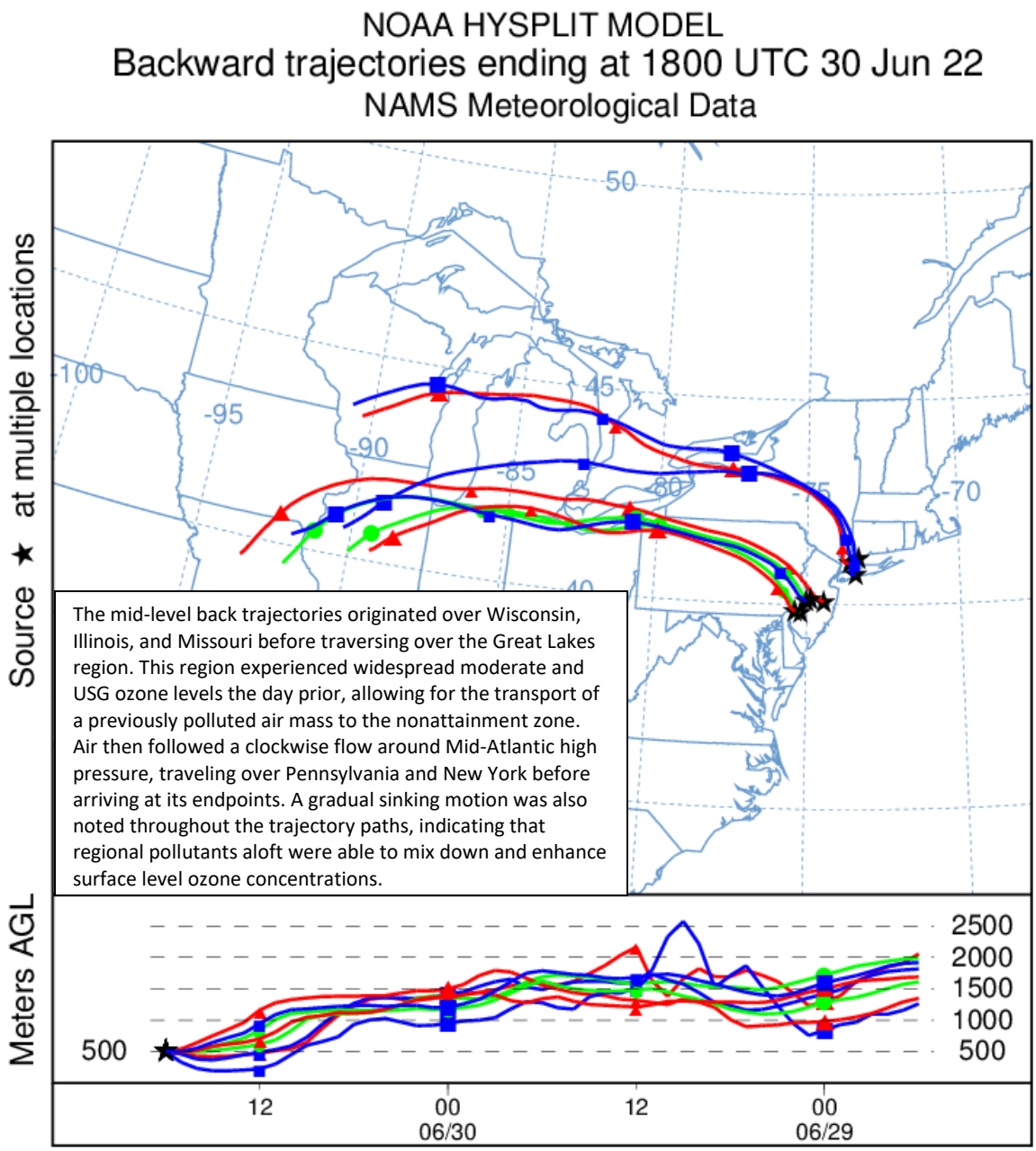
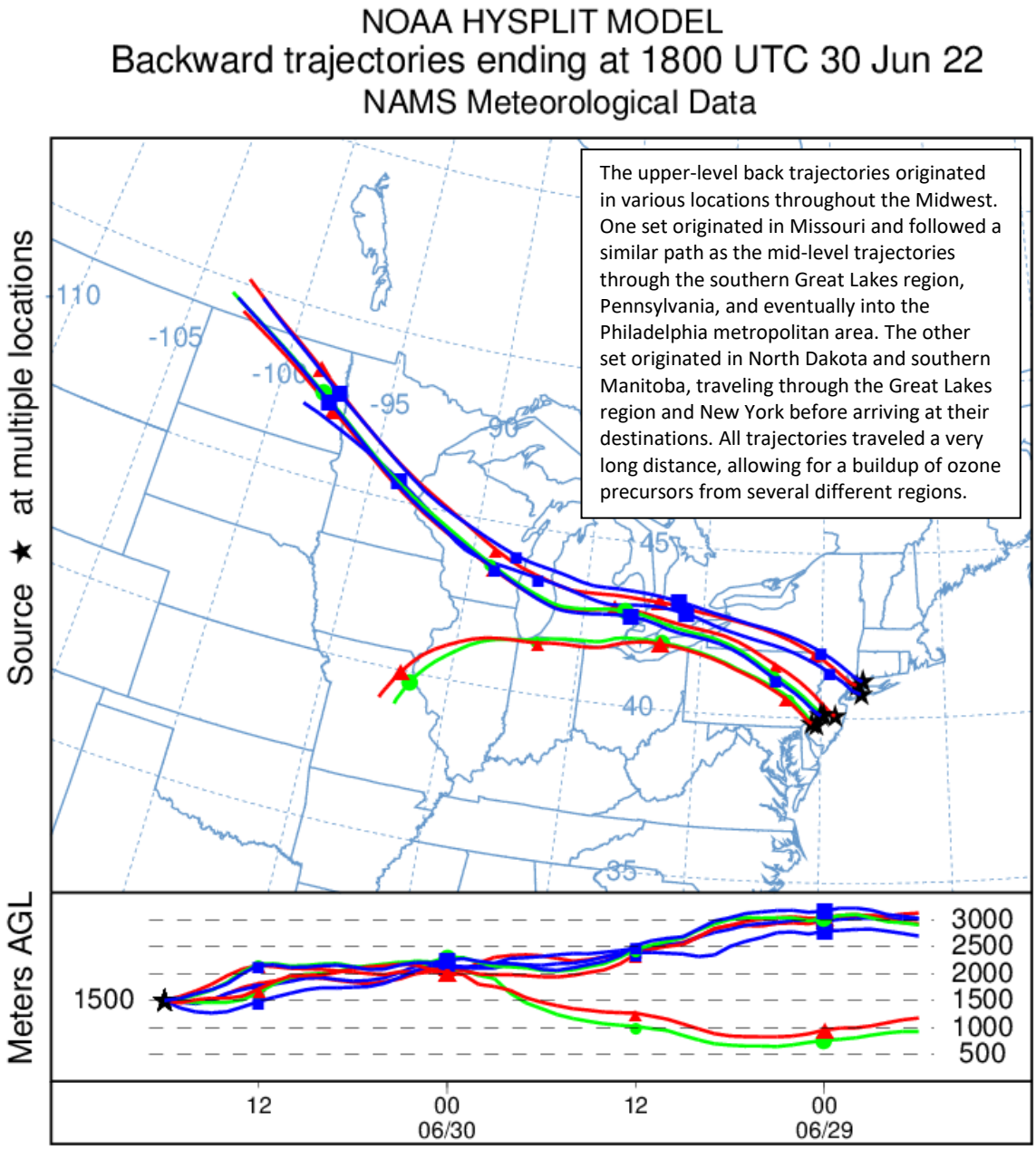
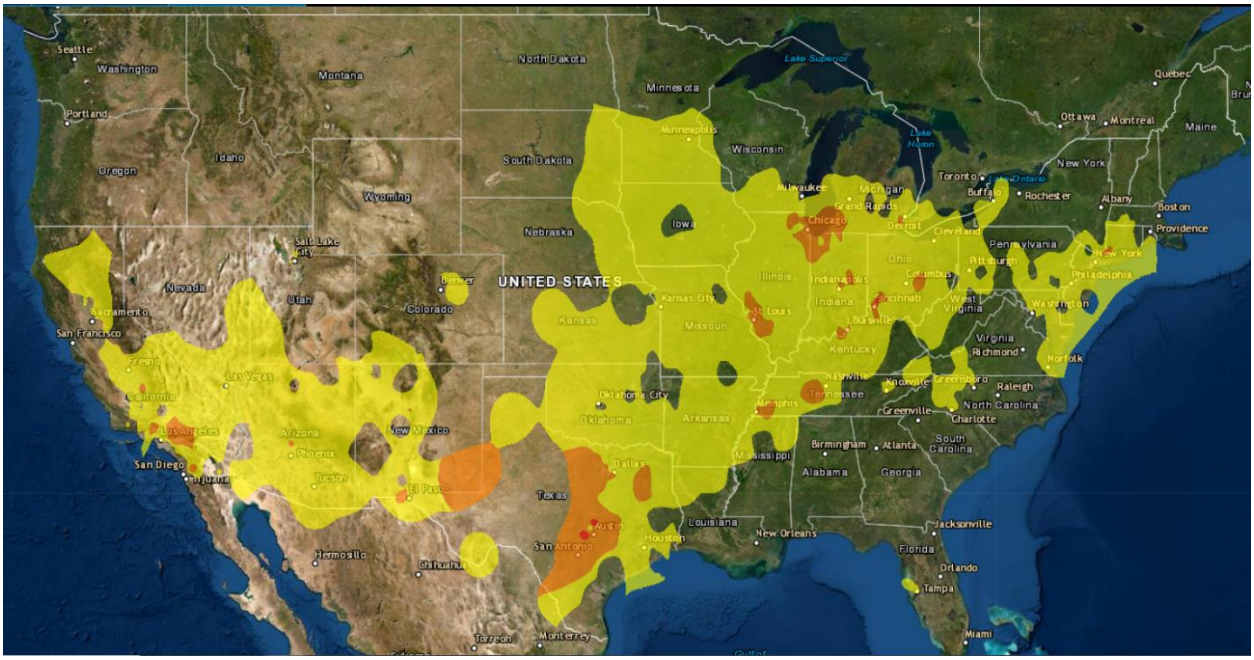


Figure 4. 48-hour Back Trajectories for June 30, 2022 at 1500 meters



The upper-level back trajectories originated in various locations throughout the Midwest. One set originated in Missouri and followed a similar path as the mid-level trajectories through the southern Great Lakes region, Pennsylvania, and eventually into the Philadelphia metropolitan area. The other set originated in North Dakota and southern Manitoba, traveling through the Great Lakes region and New York before arriving at their destinations. All trajectories traveled a very long distance, allowing for a buildup of ozone precursors from several different regions.

Figure 5. Air Quality Index for the United States on June 29, 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 .