Ozone National Ambient Air Quality Standard Health Exceedances on July 3, 2023

Exceedance Locations and Levels

On Monday, July 3, 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 7/3/2023

STATION	Daily Maximum 8-Hr Average (ppb)
Ancora State Hospital	53
Bayonne	58
Brigantine	42
Camden Spruce St	60
Chester	48
Clarksboro	60
Colliers Mills	58
Columbia	41
Flemington	56
Leonia	60
Millville	52
Monmouth University	53
Ramapo	37
Rider University	60
Rutgers University	67
Washington Crossing*	57
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 was one (1) 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 7/3/2023

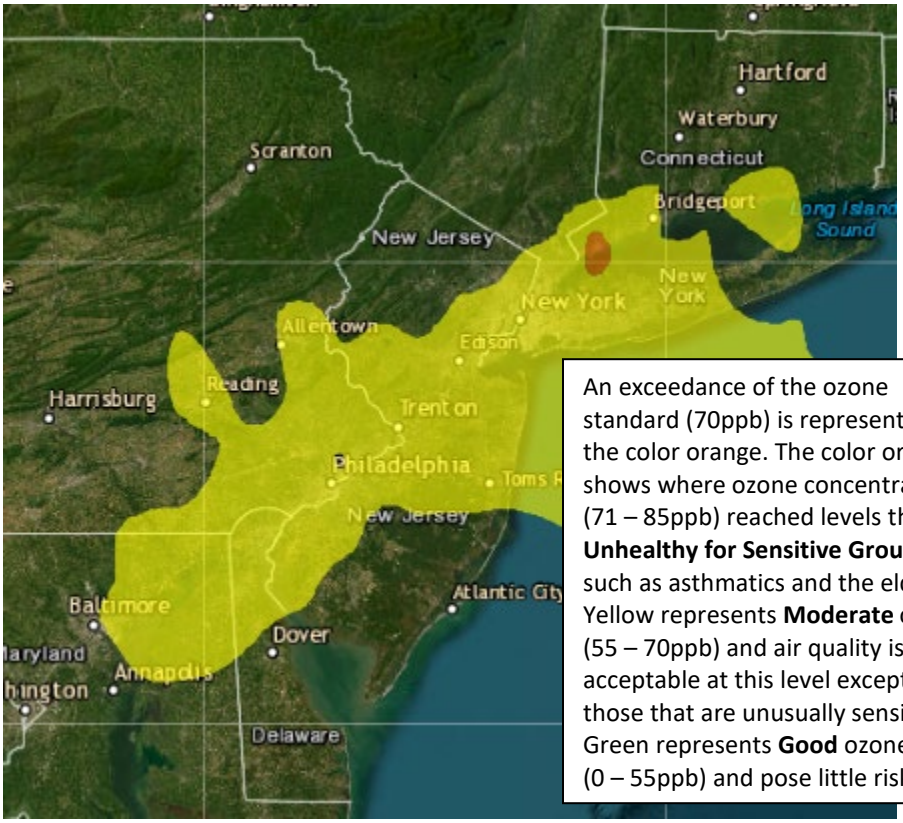
STATE	STATION	Daily Maximum 8-Hr Average (ppb)
CT	Danbury	46
CT	Greenwich	71
CT	Madison-Beach Road	55
CT	Middletown-CVH-Shed	50
CT	New Haven	No Data
CT	Stratford	53
CT	Westport	62
DE	BCSP (New Castle Co.)	No Data
DE	BELLFNT2 (New Castle Co.)	57
DE	KILLENS (Kent Co.)	43
DE	LEWES (Sussex Co.)	46
DE	LUMS 2 (New Castle Co.)	61
DE	MLK (New Castle Co.)	58
DE	SEAFORD (Sussex Co.)	48
MD	Fair Hill	58
NY	Babylon	59
NY	Bronx - IS52	57
NY	CCNY	61
NY	Flax Pond	55
NY	Fresh Kills	67
NY	Holtsville	63
NY	Pfizer Lab	61
NY	Queens	57
NY	Riverhead	53
NY	Rockland Cty	42
NY	White Plains	54
PA	BRIS (Bucks Co.)	66
PA	CHES (Delaware Co.)	57
PA	NEWG (Chester Co.)	57
PA	NORR (Montgomery Co.)	50
PA	LAB (Philadelphia Co.)	51
PA	NEA (Philadelphia Co.)	60
PA	NEW (Philadelphia Co.)	62
	TOTAL EXCEEDANCES	1

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 3, 2023 NAAQS = 70 ppb
Connecticut	9
Delaware	4
Maryland	3
New Jersey	9
New York	7
Pennsylvania	6

Figure 1. Ozone Air Quality Index for July 3, 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 Monday, July 3rd, a broad area of low pressure was influencing the Northeast with a stationary front draped across New England and into the Mid-Atlantic. This allowed an unsettled weather pattern to remain in place for several days leading up to this exceedance. This set-up allowed for many hot and humid days with partly cloudy skies to conclude with isolated showers and thunderstorms across the region. On Monday, light and variable winds along the Connecticut coastline allowed a weak sea breeze to develop which may have enhanced ozone concentrations on Connecticut's western coastline by blowing any residual ozone occurring over The Long Island Sound back onshore. In addition, a surface trough developed overhead allowing isolated thunderstorms to pop up along this boundary. The combination of a thunderstorm nearby, and the surface trough overhead was likely enough to bring any polluted air aloft down to the surface and cause a rapid spike in ozone concentrations in the afternoon. These favorable meteorological conditions, led to one isolated exceedance in the nonattainment area.

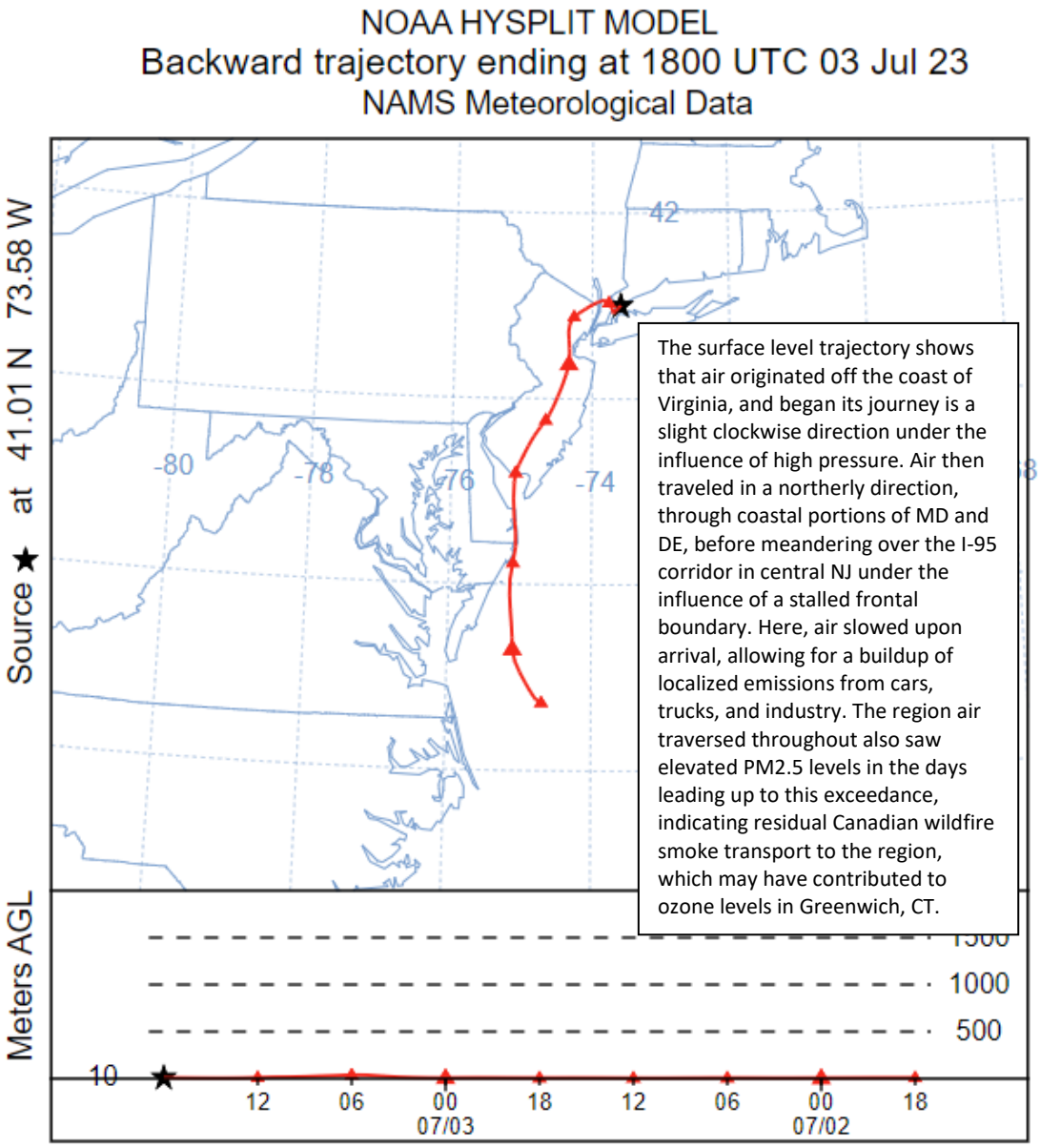
Where Did the Air Pollution that Caused Ozone Come From?

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	71

Figure 2. 48-hour Back Trajectories for July 3, 2023 at 10 meters



The surface level trajectory shows that air originated off the coast of Virginia, and began its journey is a slight clockwise direction under the influence of high pressure. Air then traveled in a northerly direction, through coastal portions of MD and DE, before meandering over the I-95 corridor in central NJ under the influence of a stalled frontal boundary. Here, air slowed upon arrival, allowing for a buildup of localized emissions from cars, trucks, and industry. The region air traversed throughout also saw elevated PM2.5 levels in the days leading up to this exceedance, indicating residual Canadian wildfire smoke transport to the region, which may have contributed to ozone levels in Greenwich, CT.

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

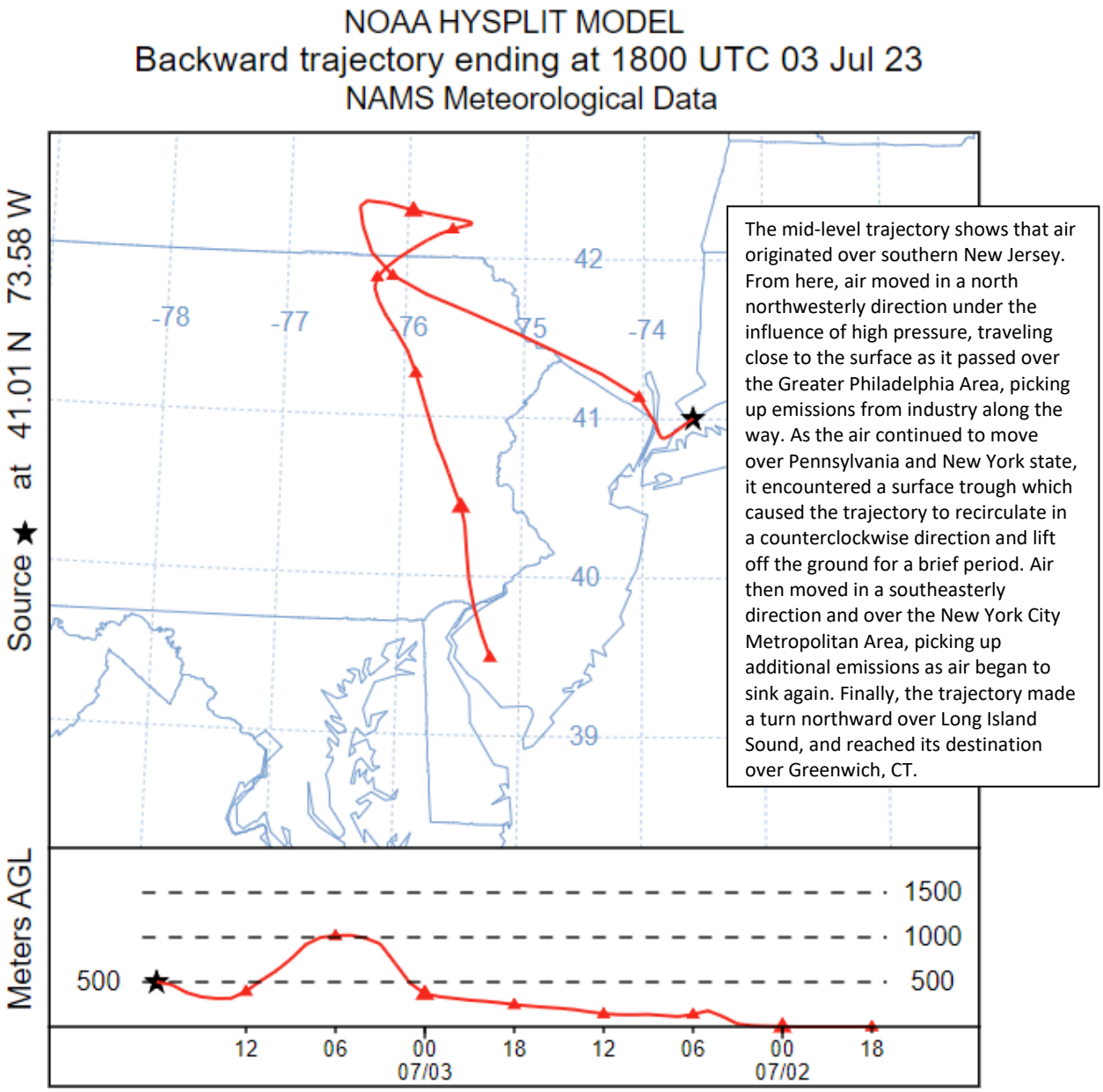


Figure 4. 48-hour Back Trajectories for July 3, 2023 at 1500 meters

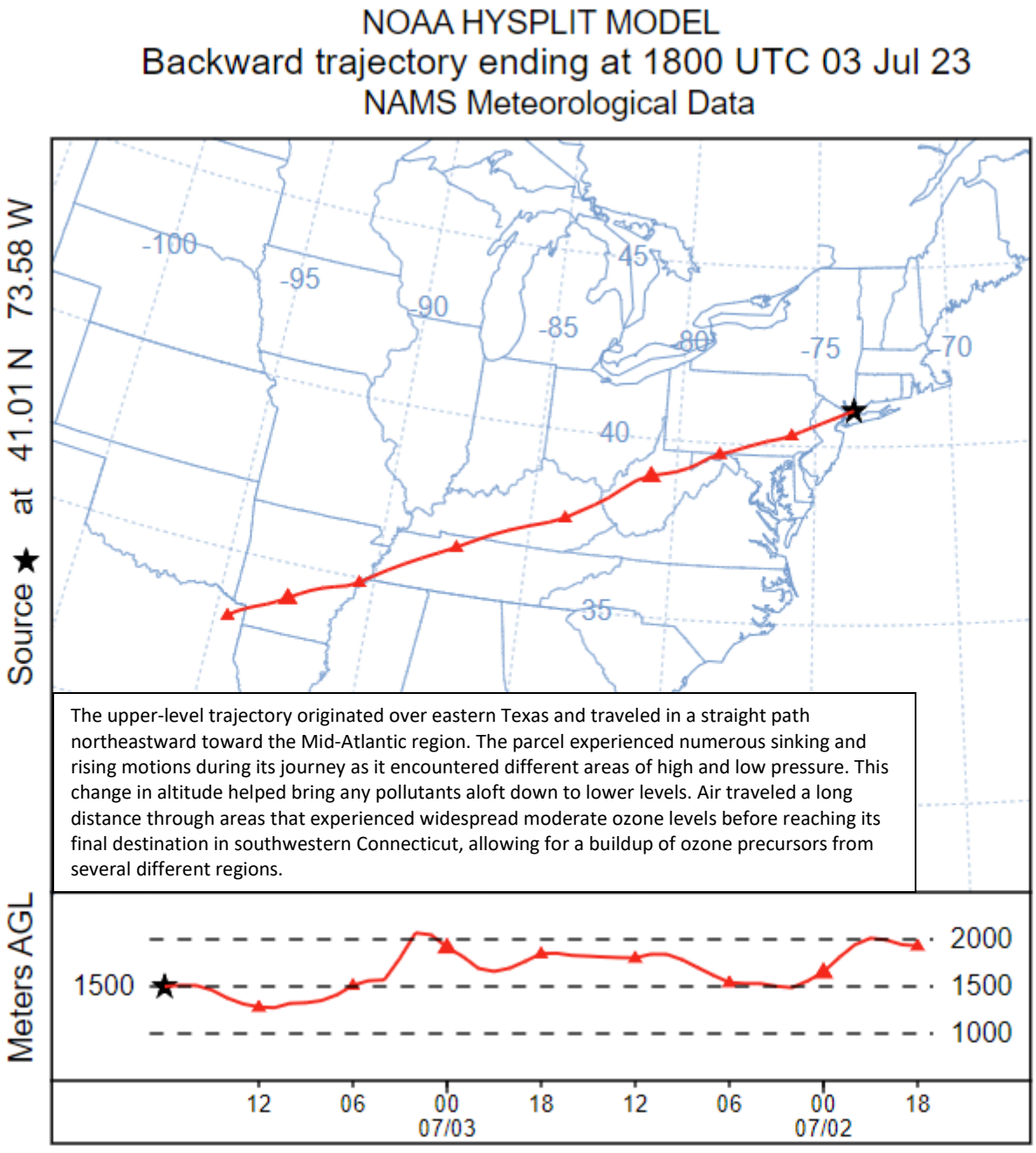
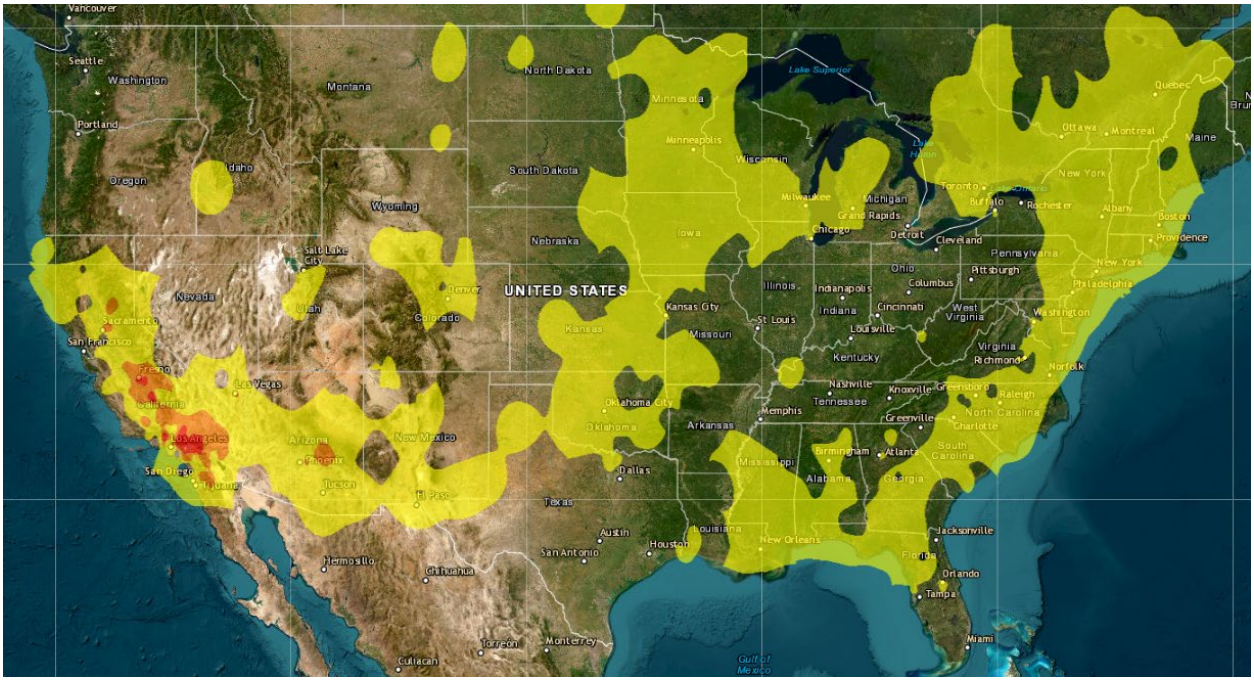


Figure 5. Air Quality Index for the United States on July 2, 2023



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 .