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

Exceedance Locations and Levels

On Sunday, September 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 9/3/2023

STATION	Daily Maximum 8-Hr Average (ppb)
Ancora State Hospital	56
Bayonne	50
Brigantine	49
Camden Spruce St	61
Chester	50
Clarksboro	60
Colliers Mills	61
Columbia	38
Flemington	54
Leonia	52
Millville	54
Monmouth University	50
Ramapo	44
Rider University	54
Rutgers University	55
Washington Crossing*	52
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 9/3/2023

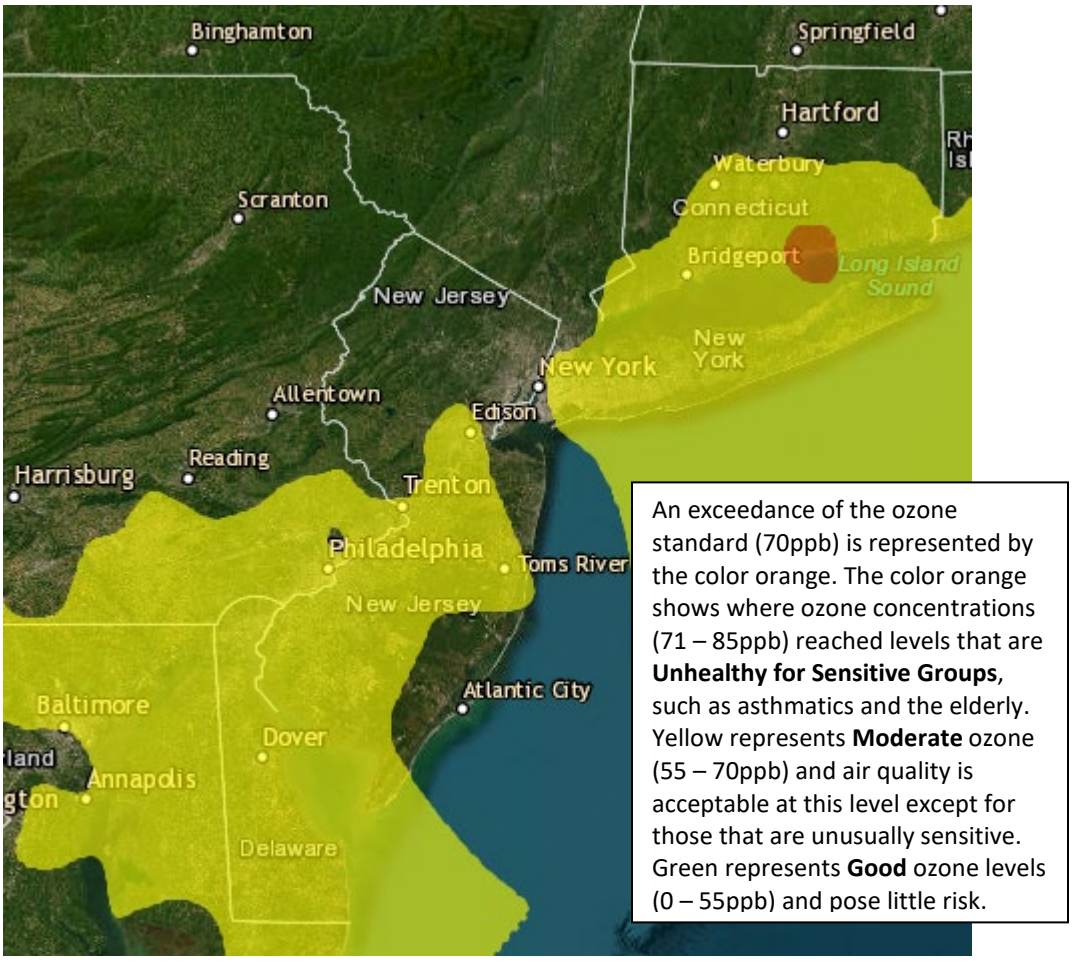
STATE	STATION	Daily Maximum 8-Hr Average (ppb)
CT	Danbury	50
CT	Greenwich	61
CT	Madison-Beach Road	71
CT	Middletown-CVH-Shed	55
CT	New Haven	60
CT	Stratford	66
CT	Westport	60
DE	BCSP (New Castle Co.)	55
DE	BELLFNT2 (New Castle Co.)	57
DE	KILLENS (Kent Co.)	57
DE	LEWES (Sussex Co.)	58
DE	LUMS 2 (New Castle Co.)	56
DE	MLK (New Castle Co.)	56
DE	SEAFORD (Sussex Co.)	54
MD	Fair Hill	57
NY	Babylon	69
NY	Bronx - IS52	55
NY	CCNY	54
NY	Flax Pond	59
NY	Fresh Kills	49
NY	Holtsville	No Data
NY	Pfizer Lab	53
NY	Queens	61
NY	Riverhead	60
NY	Rockland Cty	46
NY	White Plains	48
PA	BRIS (Bucks Co.)	57
PA	CHES (Delaware Co.)	61
PA	NEWG (Chester Co.)	55
PA	NORR (Montgomery Co.)	55
PA	LAB (Philadelphia Co.)	51
PA	NEA (Philadelphia Co.)	59
PA	NEW (Philadelphia Co.)	56
	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 – September 3, 2023 NAAQS = 70 ppb
Connecticut	19
Delaware	4
Maryland	3
New Jersey	15
New York	14
Pennsylvania	10

Figure 1. Ozone Air Quality Index for September 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 Sunday, September 3rd, favorable meteorological conditions throughout the nonattainment zone resulted in an isolated ozone exceedance along the Connecticut coastline. High pressure remained anchored over the eastern seaboard on Sunday for the third day in a row, allowing for a persistent west-southwesterly flow across the region. As the morning progressed, temperatures were able to quickly rise into the upper 80s to low 90s as little to no cloud cover was observed. Additionally, a surface trough draped from South Carolina up to the coast to Maine was in place, allowing any localized pollution aloft from days prior to mix down to the surface and enhance rising ozone levels. These conducive meteorological factors, paired with transport from the New York City metropolitan and Long Island Sound areas, created a favorable environment for Unhealthy for Sensitive Groups (USG) levels along the Connecticut coastline.

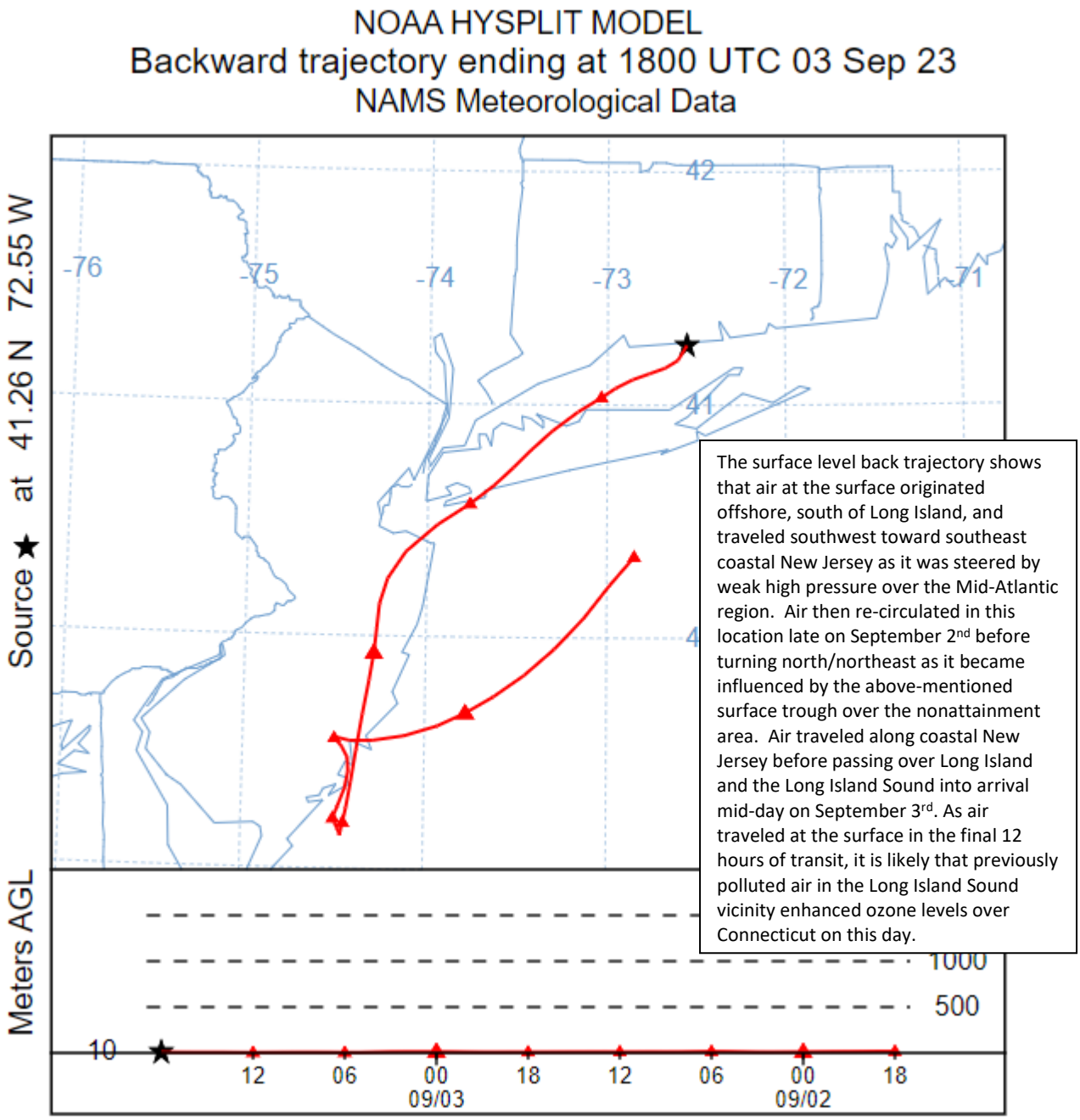
Where Did the Air Pollution that Caused Ozone Come From?

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	Madison–Beach Road	71

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



The surface level back trajectory shows that air at the surface originated offshore, south of Long Island, and traveled southwest toward southeast coastal New Jersey as it was steered by weak high pressure over the Mid-Atlantic region. Air then re-circulated in this location late on September 2nd before turning north/northeast as it became influenced by the above-mentioned surface trough over the nonattainment area. Air traveled along coastal New Jersey before passing over Long Island and the Long Island Sound into arrival mid-day on September 3rd. As air traveled at the surface in the final 12 hours of transit, it is likely that previously polluted air in the Long Island Sound vicinity enhanced ozone levels over Connecticut on this day.

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

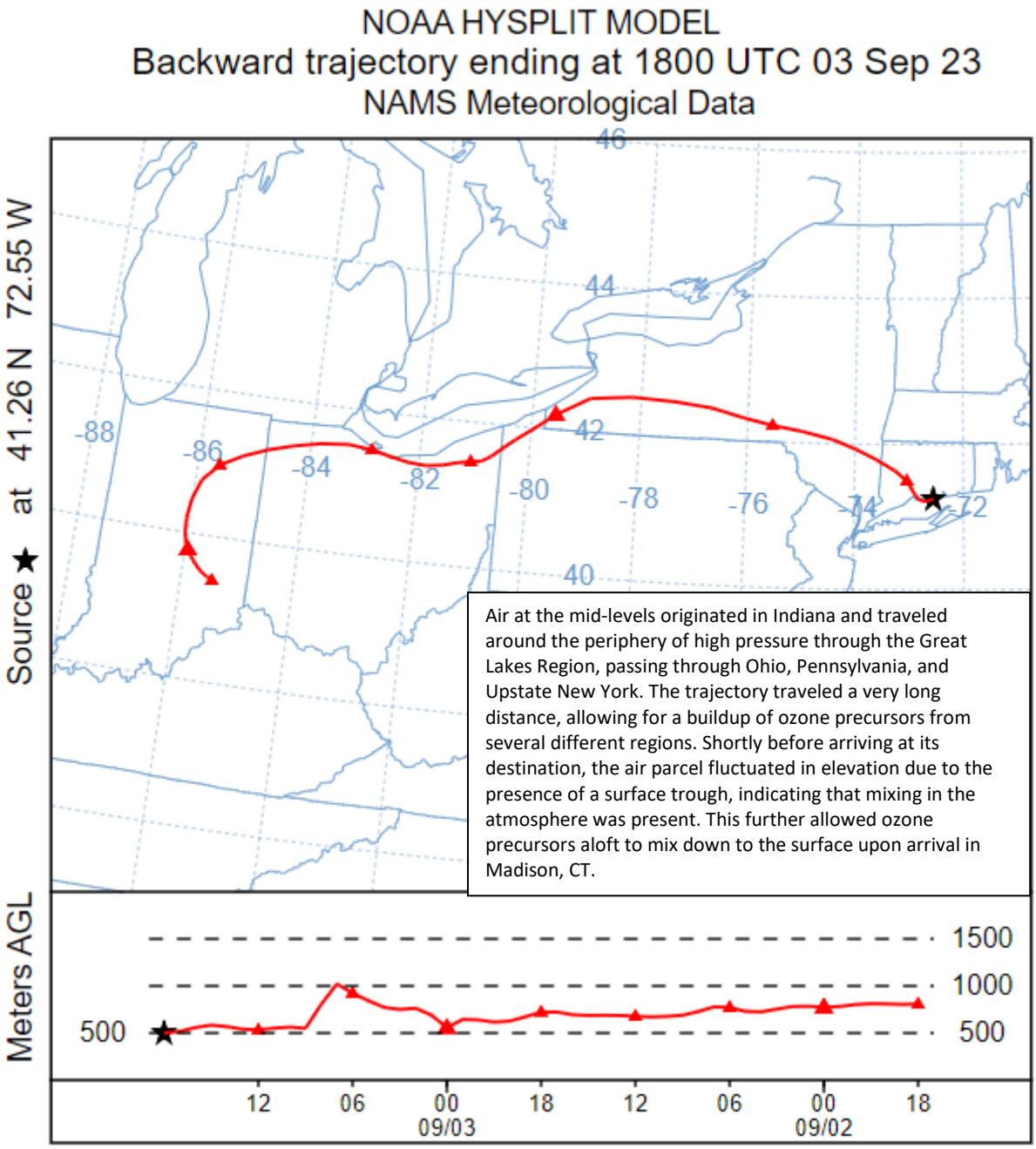


Figure 4. 48-hour Back Trajectories for September 3, 2023 at 1500 meters

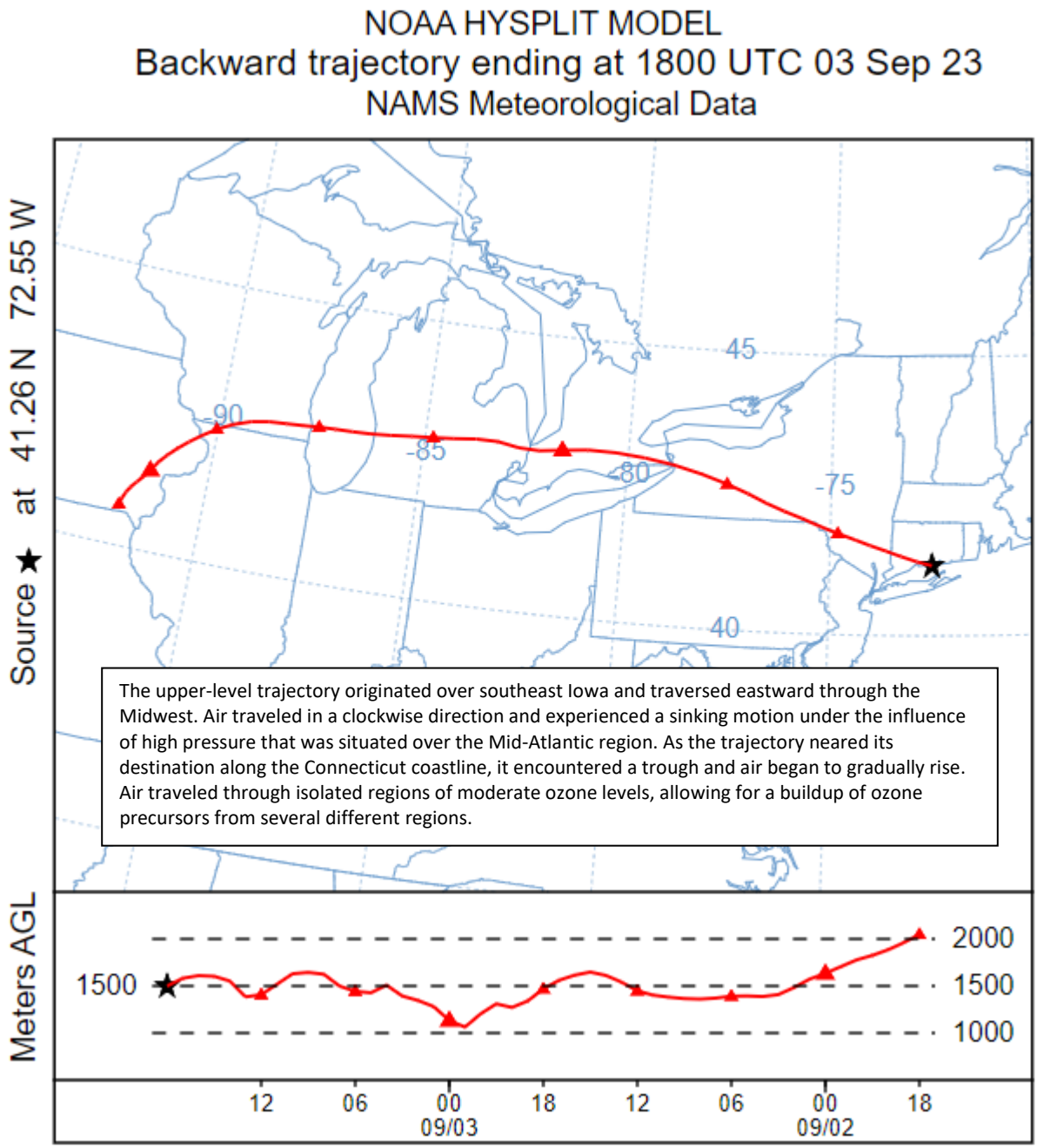
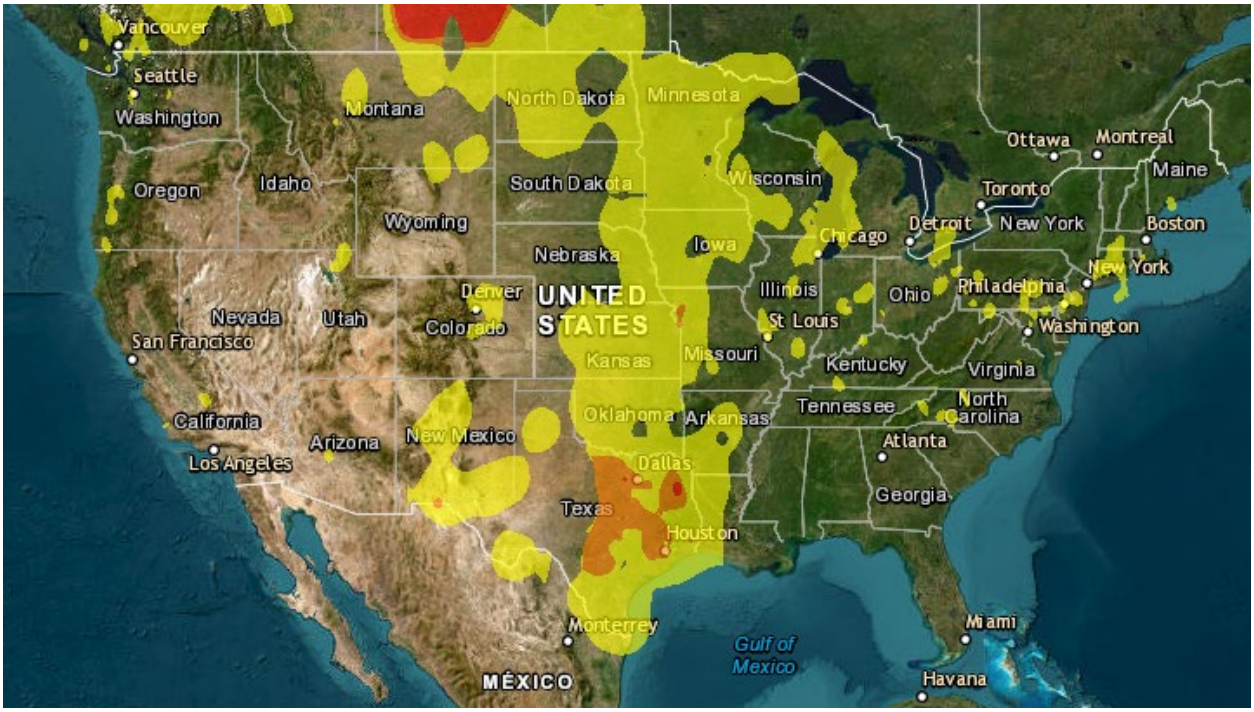


Figure 5. Air Quality Index for the United States on September 2, 2023



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 .