Ozone National Ambient Air Quality Standard Health Exceedances on June 29, 2023

Exceedance Locations and Levels

On Thursday, June 29, 2023, there were four (4) 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 6/29/2023

STATION	Daily Maximum 8-Hr Average (ppb)
Ancora State Hospital	73
Bayonne	59
Brigantine	51
Camden Spruce St	71
Chester	60
Clarksboro	78
Colliers Mills	63
Columbia	46
Flemington	67
Leonia	51
Millville	75
Monmouth University	63
Ramapo	48
Rider University	61
Rutgers University	63
Washington Crossing*	63
TOTAL EXCEEDANCES	4

*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 ten (10) 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 6/29/2023

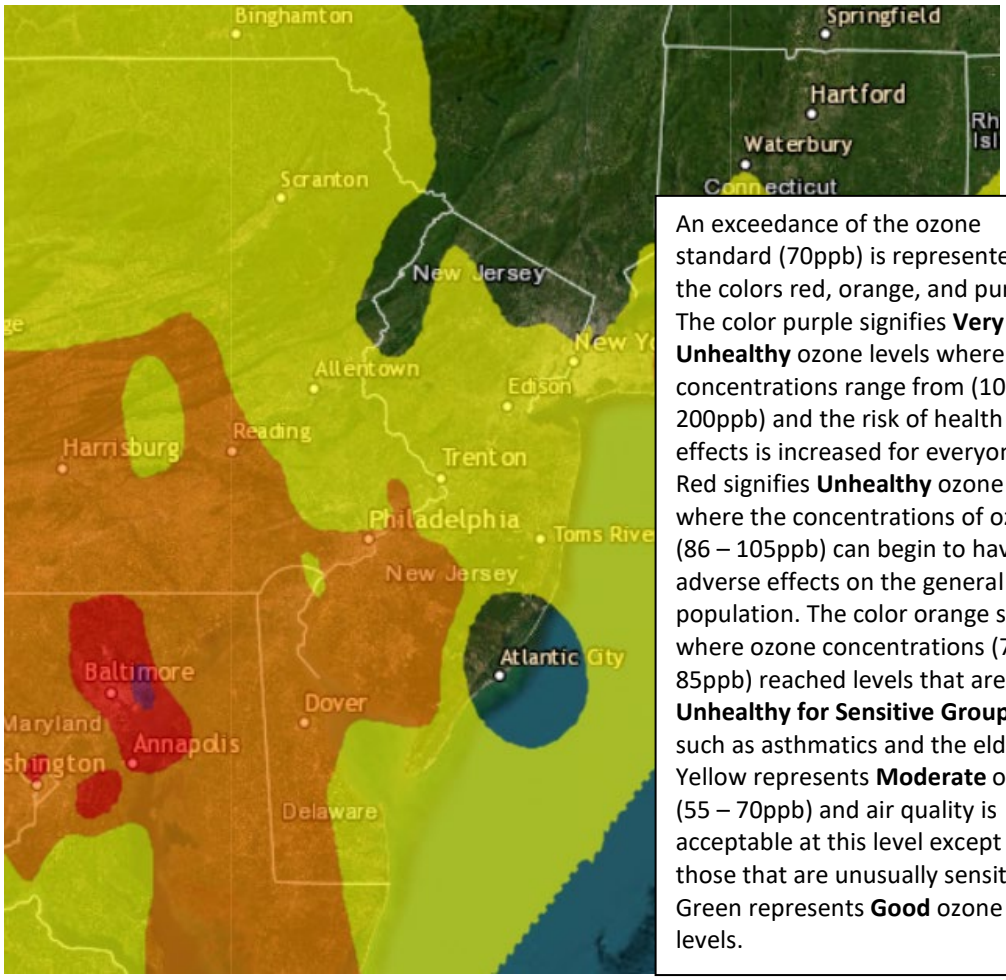
STATE	STATION	Daily Maximum 8-Hr Average (ppb)
CT	Danbury	45
CT	Greenwich	59
CT	Madison-Beach Road	56
CT	Middletown-CVH-Shed	41
CT	New Haven	54
CT	Stratford	66
CT	Westport	53
DE	BCSP (New Castle Co.)	70
DE	BELLFNT2 (New Castle Co.)	69
DE	KILLENS (Kent Co.)	73
DE	LEWES (Sussex Co.)	57
DE	LUMS 2 (New Castle Co.)	74
DE	MLK (New Castle Co.)	71
DE	SEAFORD (Sussex Co.)	79
MD	Fair Hill	72
NY	Babylon	74
NY	Bronx - IS52	52
NY	CCNY	55
NY	Flax Pond	63
NY	Fresh Kills	58
NY	Holtsville	69
NY	Pfizer Lab	53
NY	Queens	63
NY	Riverhead	56
NY	Rockland Cty	45
NY	White Plains	52
PA	BRIS (Bucks Co.)	69
PA	CHES (Delaware Co.)	74
PA	NEWG (Chester Co.)	75
PA	NORR (Montgomery Co.)	62
PA	LAB (Philadelphia Co.)	65
PA	NEA (Philadelphia Co.)	71
PA	NEW (Philadelphia Co.)	73
	TOTAL EXCEEDANCES	10

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 – June 29, 2023 NAAQS = 70 ppb
Connecticut	6
Delaware	3
Maryland	3
New Jersey	7
New York	5
Pennsylvania	5

Figure 1. Ozone Air Quality Index for June 29, 2023



An exceedance of the ozone standard (70ppb) is represented by the colors red, orange, and purple. The color purple signifies **Very Unhealthy** ozone levels where concentrations range from (106 – 200ppb) and the risk of health effects is increased for everyone. Red signifies **Unhealthy** ozone levels where the concentrations of ozone (86 – 105ppb) can begin to have adverse effects on the general population. 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.

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

In the early morning hours of Thursday June 29th, the region saw humid conditions and above average overnight temperatures. Low pressure was situated over northern New England and southern portions of Quebec, giving the area winds out of the northwest, which allowed funneling of residual wildfire smoke from southeastern Canada. As the morning progressed, high pressure began building into the southwesterly region of the nonattainment zone, allowing for clouds to begin to clear in southern portions of the state. This caused sunlight and temperatures to increase to the mid-80s, along with winds shifting to a west-southwesterly flow, giving favorable conditions for ozone formation. A weak surface trough was observed pushing off the coast throughout the day, which aided in additional mixing of wildfire smoke aloft. Hazy and smokey conditions were noted throughout the day and it is possible that the age of the wildfire smoke impacting the region may have played a role in the ozone levels observed on this day. By the afternoon, a sea breeze developed, and with the lack of smoke offshore, it brought cleaner conditions to coastal regions. Smoke, along with favorable meteorological conditions, led to ozone exceedances throughout 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)
DE	KILLENS (Kent Co.)	73
DE	SEAFORD (Sussex Co.)	79
MD	Fair Hill	72
NJ	Ancora State Hospital	73
NJ	Camden Spruce St	71
NJ	Clarksboro	78
NJ	Millville	75
NY	Babylon	74
PA	CHES (Delaware Co.)	74
PA	NEA (Philadelphia Co.)	71

Figure 2. 48-hour Back Trajectories for June 29, 2023 at 10 meters

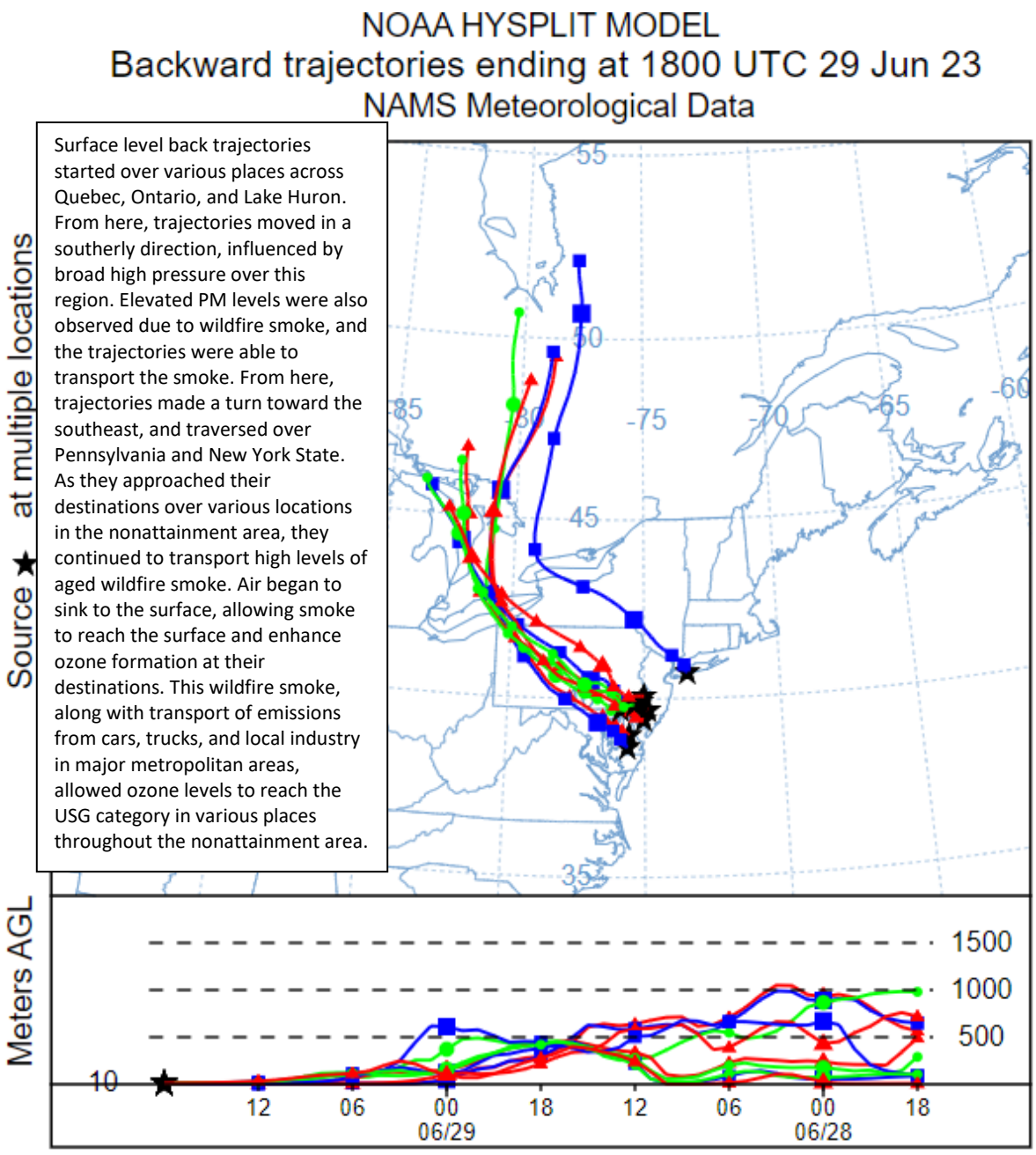


Figure 3. 48-hour Back Trajectories for June 29, 2023 at 500 meters

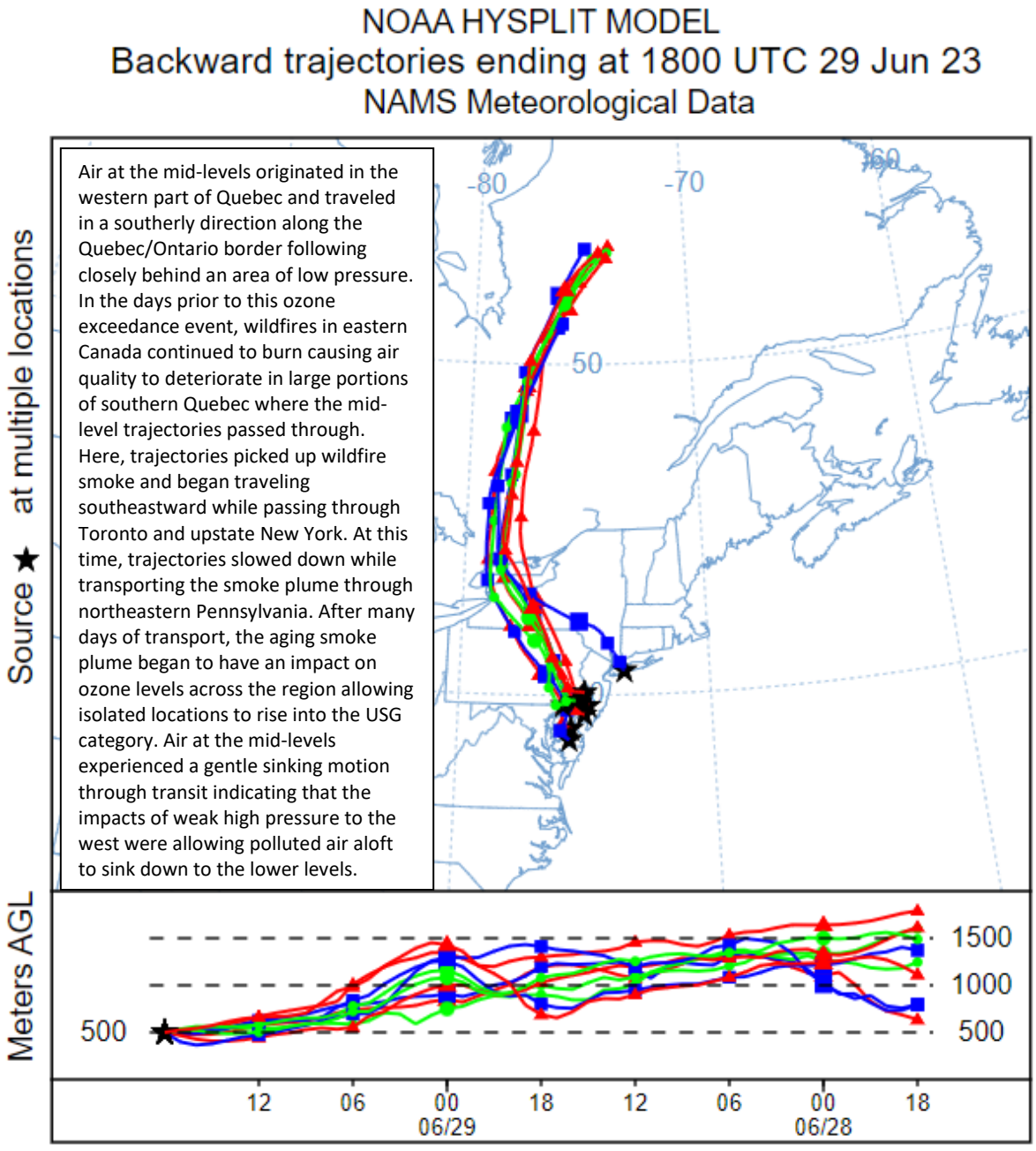


Figure 4. 48-hour Back Trajectories for June 29, 2023 at 1500 meters

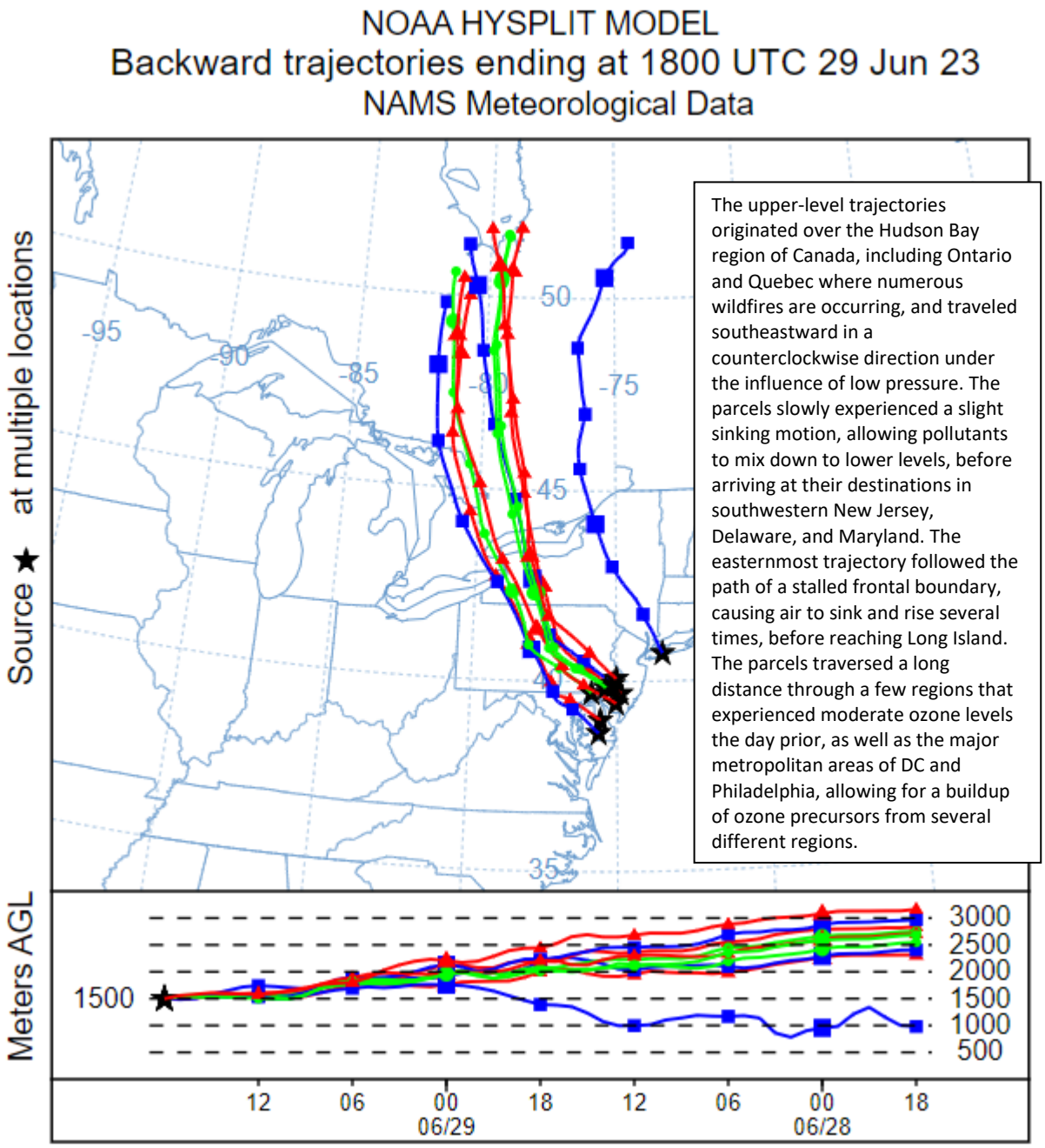
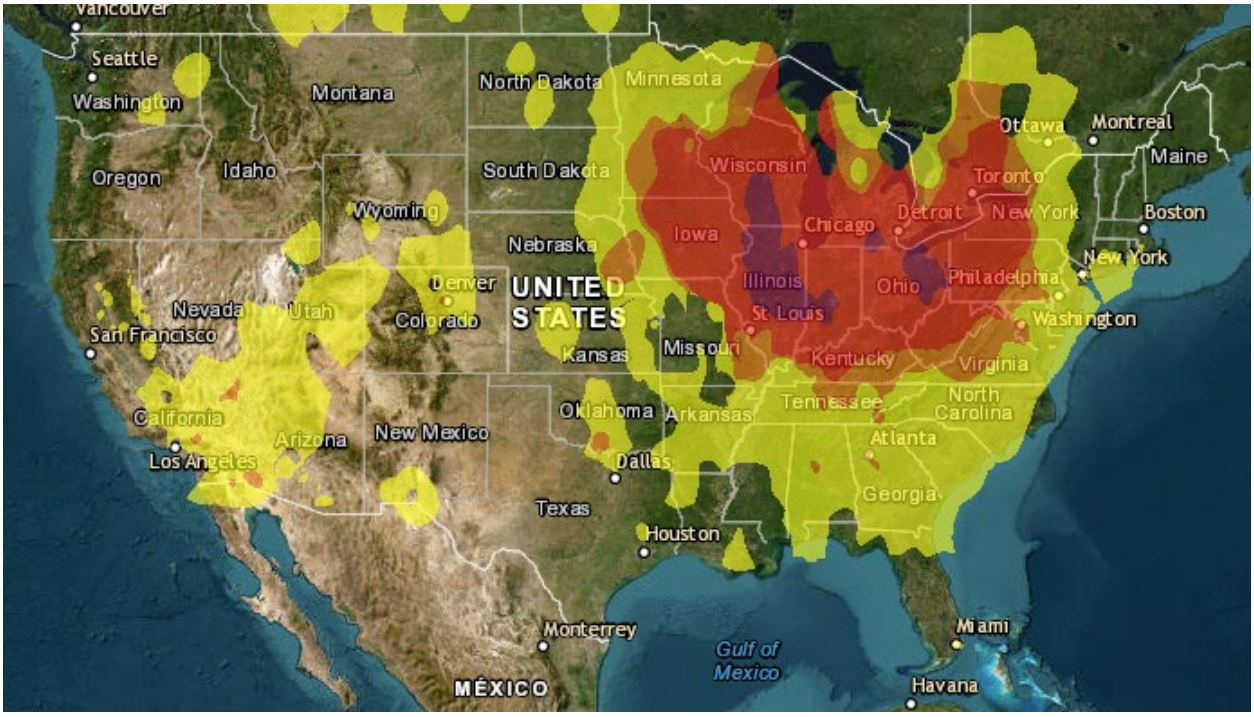


Figure 5. Air Quality Index for the United States on June 28, 2023



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 .