Ozone National Ambient Air Quality Standard Health Exceedances on July 20, 2023

Exceedance Locations and Levels

On Thursday, July 20, 2023, there were two (2) 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 7/20/2023

STATION	Daily Maximum 8-Hr Average (ppb)
Ancora State Hospital	58
Bayonne	55
Brigantine	64
Camden Spruce St	64
Chester	65
Clarksboro	63
Colliers Mills	64
Columbia	40
Flemington	71
Leonia	58
Millville	56
Monmouth University	70
Ramapo	54
Rider University	69
Rutgers University	61
Washington Crossing*	74
TOTAL EXCEEDANCES	2

*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 three (3) 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 7/20/2023

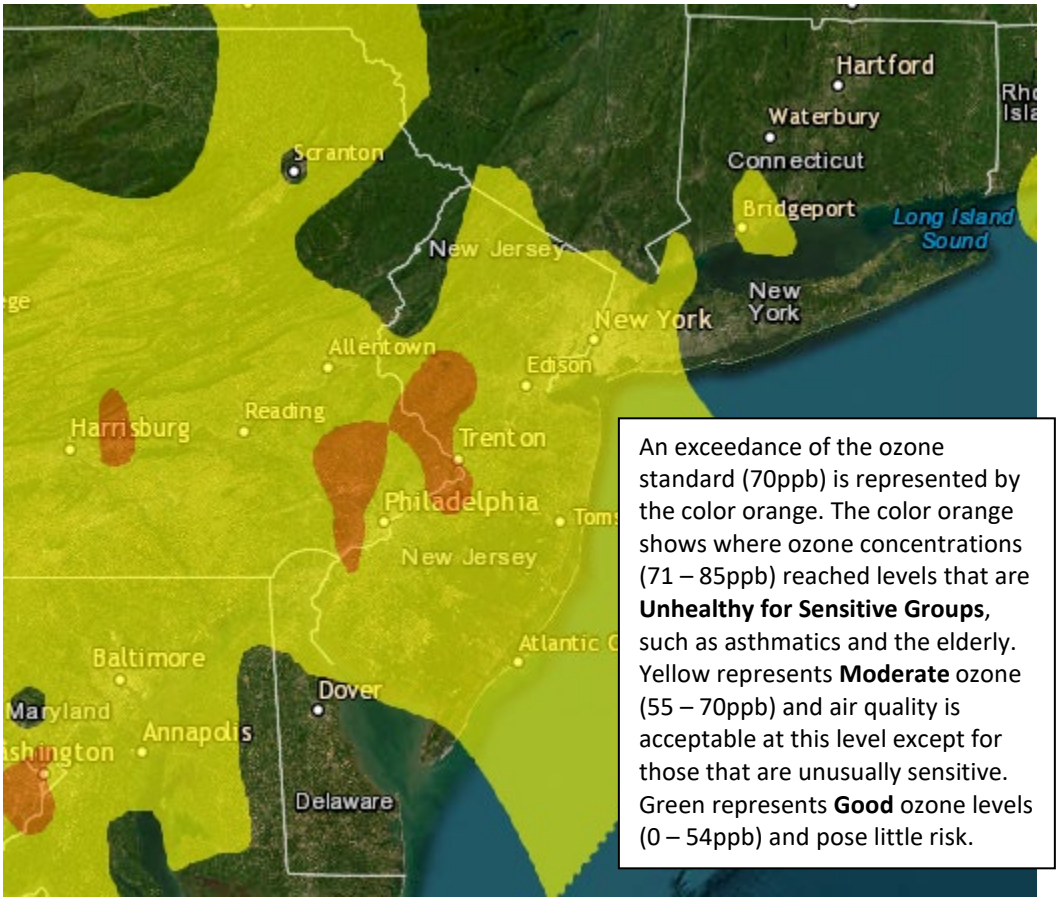
STATE	STATION	Daily Maximum 8-Hr Average (ppb)
CT	Danbury	48
CT	Greenwich	55
CT	Madison-Beach Road	52
CT	Middletown-CVH-Shed	44
CT	New Haven	49
CT	Stratford	63
CT	Westport	50
DE	BCSP (New Castle Co.)	59
DE	BELLFNT2 (New Castle Co.)	64
DE	KILLENS (Kent Co.)	50
DE	LEWES (Sussex Co.)	48
DE	LUMS 2 (New Castle Co.)	61
DE	MLK (New Castle Co.)	66
DE	SEAFORD (Sussex Co.)	50
MD	Fair Hill	59
NY	Babylon	53
NY	Bronx - IS52	57
NY	CCNY	57
NY	Flax Pond	46
NY	Fresh Kills	55
NY	Holtsville	51
NY	Pfizer Lab	57
NY	Queens	62
NY	Riverhead	48
NY	Rockland Cty	53
NY	White Plains	49
PA	BRIS (Bucks Co.)	73
PA	CHES (Delaware Co.)	76
PA	NEWG (Chester Co.)	58
PA	NORR (Montgomery Co.)	76
PA	LAB (Philadelphia Co.)	61
PA	NEA (Philadelphia Co.)	68
PA	NEW (Philadelphia Co.)	62
	TOTAL EXCEEDANCES	3

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 20, 2023 NAAQS = 70 ppb
Connecticut	13
Delaware	4
Maryland	3
New Jersey	13
New York	12
Pennsylvania	9

Figure 1. Ozone Air Quality Index for July 20, 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 Thursday, July 20th, several ozone exceedances were observed throughout central NJ and southeastern PA due to favorable meteorological conditions in combination with aged Canadian wildfire smoke. A broad swath of high pressure began to anchor itself along the eastern seaboard late Wednesday into Thursday morning, providing the region with warm temperatures and mostly clear skies. Light northeasterly winds in the morning allowed a previously deteriorated air mass from the Connecticut coastline and New York City metropolitan area to transport to the southwest, an area that observed widespread moderate and isolated Unhealthy for Sensitive Groups (USG) ozone levels the day prior. This allowed ozone levels in central New Jersey and the Philadelphia metropolitan area to rapidly spike into USG territory by 10 am. A stationary front draped across the northern nonattainment area also began to slowly push south as the morning progressed, allowing winds to pivot to a southeasterly onshore flow. This wind shift created a convergence of air masses around the Philadelphia metropolitan area, driving up ozone levels even further into the afternoon. Lingering aged wildfire smoke from western Canadian wildfires had also been present for multiple days throughout the region, likely enhancing the elevated ozone concentrations noted throughout the southern 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)
NJ	Flemington	71
NJ	Washington Crossing	74
PA	BRIS (Bucks Co.)	73
PA	CHES (Delaware Co.)	76
PA	NORR (Montgomery Co.)	76

Figure 2. 48-hour Back Trajectories for July 20, 2023 at 10 meters

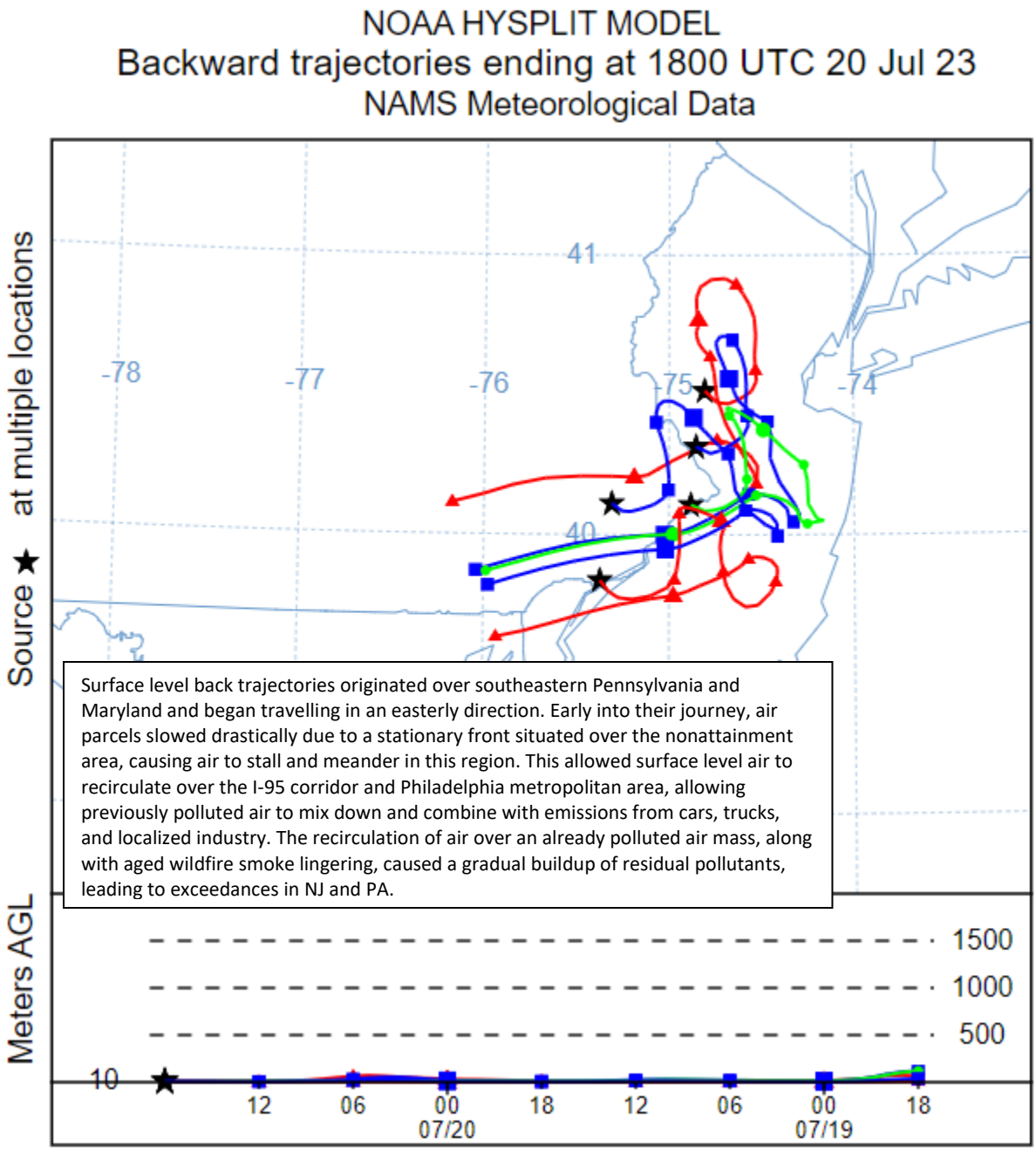


Figure 3. 48-hour Back Trajectories for July 20, 2023 at 500 meters

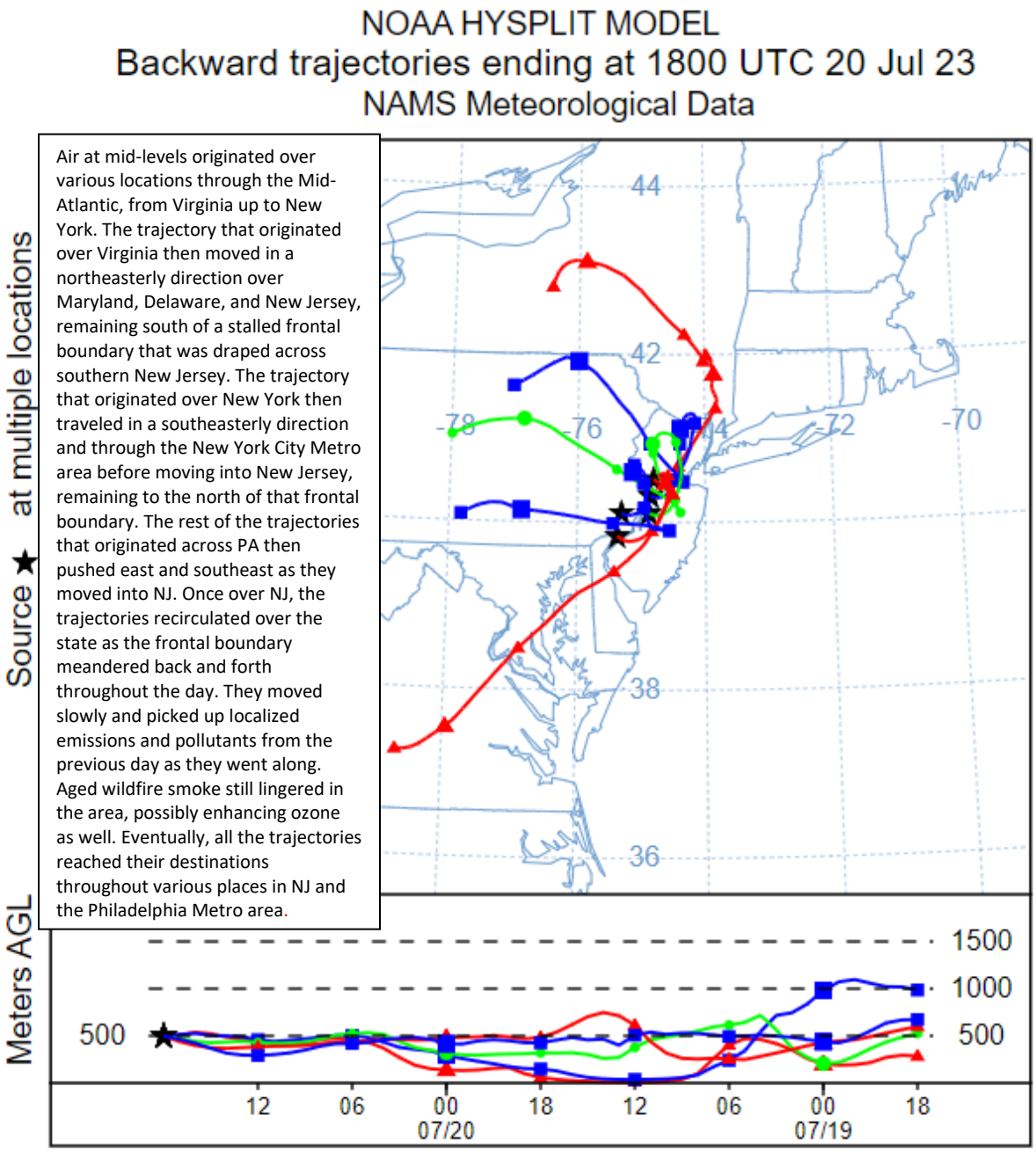


Figure 4. 48-hour Back Trajectories for July 20, 2023 at 1500 meters

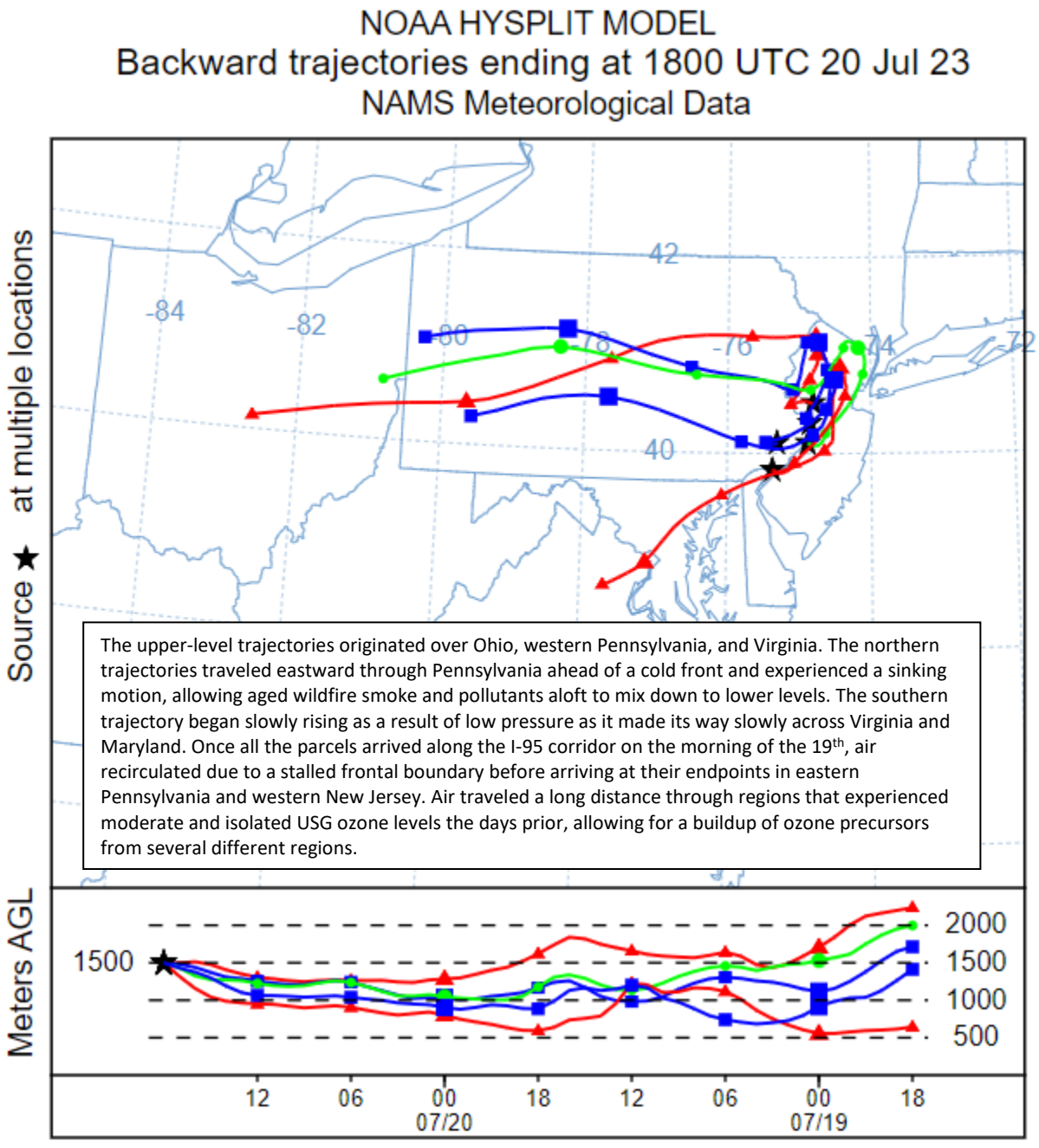
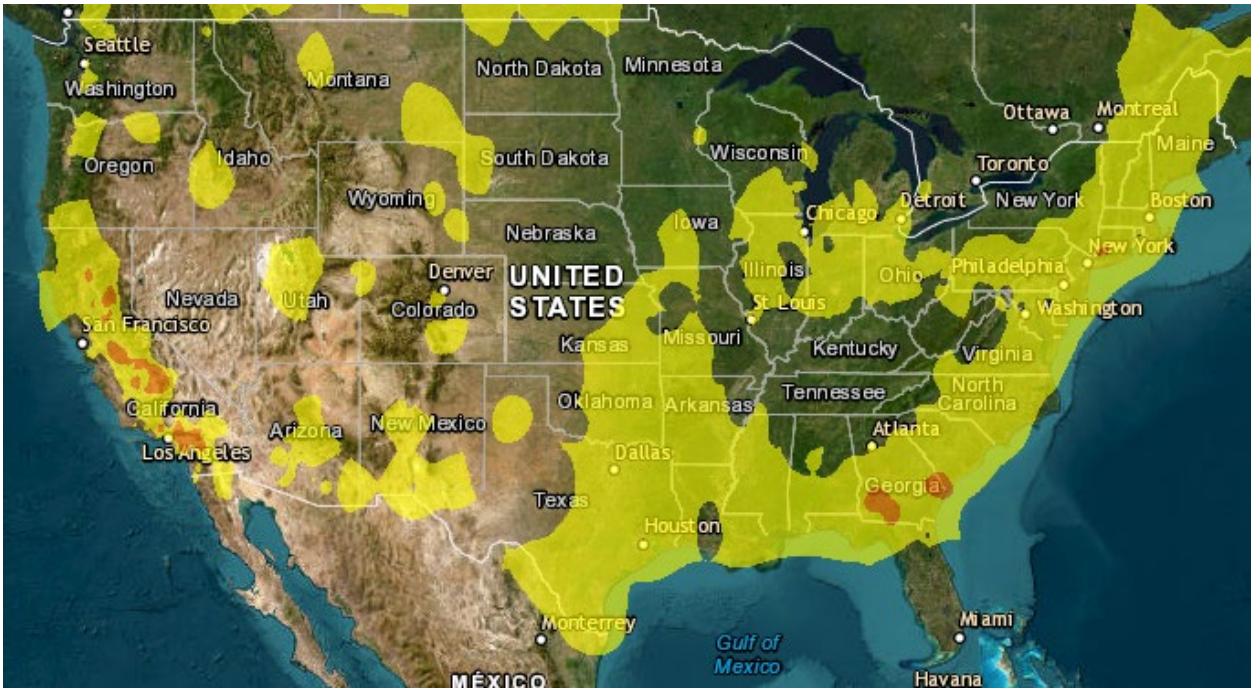


Figure 5. Air Quality Index for the United States on July 19, 2023



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 .