

**Ozone National Ambient Air Quality Standard Health Exceedances on June 26, 2020**

**Exceedance Locations and Levels**

On Friday, June 26, 2020, 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 6/26/2020**

STATION	Daily Maximum 8-Hr Average (ppb)
Ancora State Hospital	59
Bayonne	54
Brigantine	53
Camden Spruce St	54
Chester	48
Clarksboro	No data
Colliers Mills	57
Columbia	42
Flemington	56
Leonia	55
Millville	61
Monmouth University	60
Newark Firehouse	57
Ramapo	51
Rider University	57
Rutgers University	58
Washington Crossing*	54
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 non-attainment areas, there was one (1) exceedance of the ozone NAAQS. See Table 2.

**Table 2. Ozone Concentrations at Out-of-State Monitoring Stations in New Jersey’s Ozone Non-Attainment Areas on 6/26/2020**

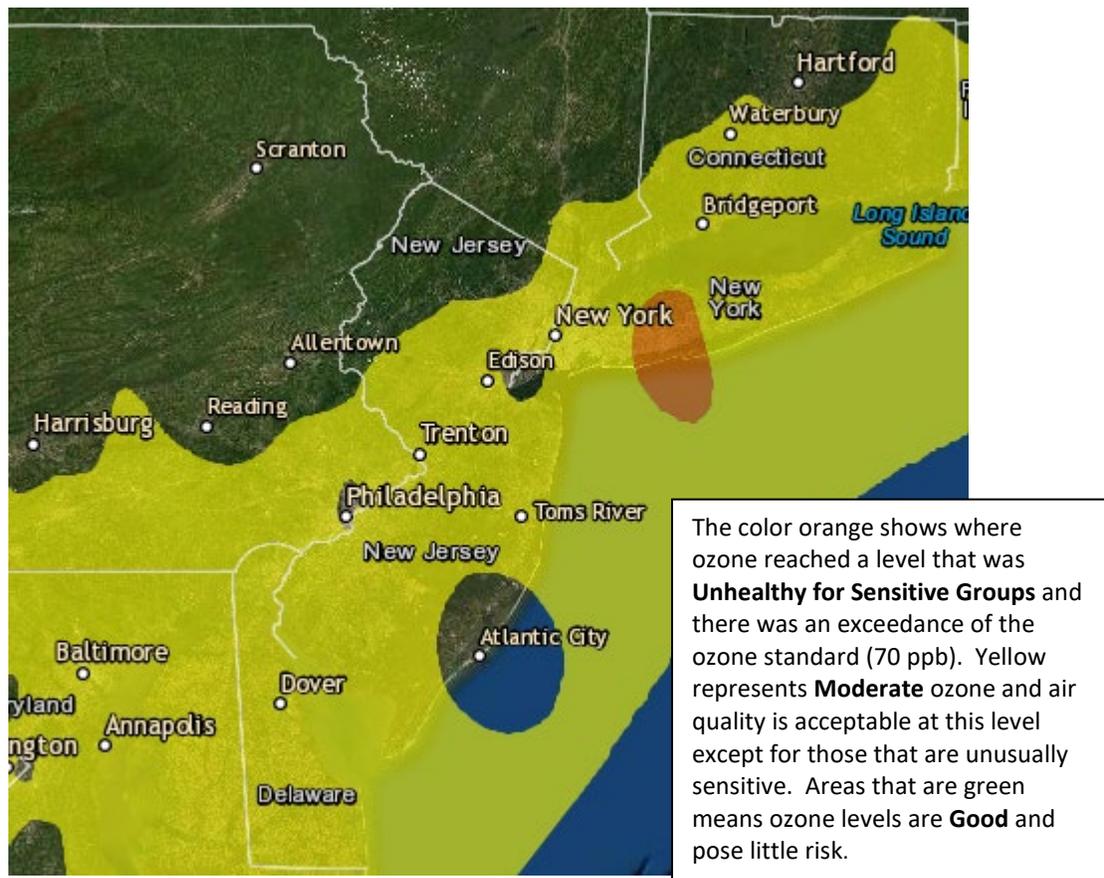
STATE	STATION	Daily Maximum 8-Hr Average (ppb)
CT	Danbury	54
CT	Greenwich	65
CT	Madison-Beach Road	70
CT	Middletown-CVH-Shed	55
CT	New Haven	60
CT	Stratford	67
CT	Westport	65
DE	BCSP (New Castle Co.)	59
DE	BELLFNT2 (New Castle Co.)	60
DE	KILLENS (Kent Co.)	64
DE	LEWES (Sussex Co.)	62
DE	LUMS 2 (New Castle Co.)	58
DE	MLK (New Castle Co.)	59
DE	SEAFORD (Sussex Co.)	62
MD	Fair Hill	55
NY	Babylon	73
NY	Bronx - IS52	56
NY	CCNY	56
NY	Fresh Kills	53
NY	Holtsville	69
NY	Pfizer Lab	57
NY	Queens	67
NY	Riverhead	65
NY	Rockland Cty	54
NY	White Plains	56
PA	BRIS (Bucks Co.)	56
PA	CHES (Delaware Co.)	59
PA	NEWG (Chester Co.)	60
PA	NORR (Montgomery Co.)	59
PA	LAB (Philadelphia Co.)	52
PA	NEA (Philadelphia Co.)	57
PA	NEW (Philadelphia Co.)	55
	TOTAL EXCEEDANCES	1

The number of days in 2020 on which exceedances of the ozone NAAQS were recorded for all the states within New Jersey’s ozone non-attainment areas is summarized in Table 3.

**Table 3. Number of Days Ozone NAAQS was Exceeded in NJ’s Non-Attainment Areas in 2020**

STATE	# of Days NAAQS was Exceeded January 1 – June 26, 2020 NAAQS = 70 ppb
Connecticut	2
Delaware	0
Maryland	0
New Jersey	1
New York	2
Pennsylvania	1

**Figure 1. Ozone Air Quality Index for June 26, 2020**



Source: [www.airnow.gov](http://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**

On Friday, June 26<sup>th</sup> an area of high pressure was in place over the region providing light winds out of the southwest, temperatures reaching the mid-80s, and mostly sunny skies. While many locations in the nonattainment area observed moderate air quality, ozone concentrations at the Babylon monitor in New York were able to reach the unhealthy for sensitive groups (USG) category due to localized transport and an increasingly polluted air mass from the previous day.

Beginning on June 25<sup>th</sup>, an area of high pressure began to strengthen over the region and remained in place throughout the day on June 26<sup>th</sup>. This area of high pressure allowed the region to experience two days of mostly sunny skies, warm temperatures, and light winds. As the day progressed, a surface trough developed along the I-95 corridor and extended northward through Long Island near the Babylon monitor. Upon this development, ozone concentrations quickly spiked at 1pm indicating that the surface trough allowed polluted air aloft to mix down to the surface. Meanwhile, a sea breeze front developed in the afternoon hours along the southern Long Island coast and progressed inland throughout the day. In this instance, polluted air from the previous day was likely pushed onshore and helped contribute to the already elevated ozone levels.

This exceedance occurring exclusively in Babylon, New York is likely due to a number of factors including the transport of elevated ozone down to the surface, a sea breeze front transporting pollutants inland, and favorable weather conditions for ozone production.

## **Where Did the Air Pollution that Caused Ozone Come From?**

Please note, this exceedance is occurring while COVID-19 restrictions in New Jersey are in place, which have impacted transportation, business operations and energy use. As more data becomes available, the Department may have a better characterization of the conditions that influenced elevated ozone pollution levels in 2020.

Figures 2, 3, and 4 show the back trajectories starting at different wind heights for the monitored exceedance on June 26<sup>th</sup>, 2020. The figures illustrate where the air came from during the 48 hours preceding the 8-hour ozone standard exceedance. One monitoring station was chosen to run back trajectories and is listed in Table 4 below.

**Table 4. Monitoring Station with an 8-hr Ozone Exceedance that was Selected to Run 48-hr Back Trajectories**

STATE	STATION	Daily Maximum 8-Hr Average (ppb)
NY	Babylon	73

Back trajectories from June 26<sup>th</sup> show that air at the surface and upper level air was heavily influenced by high pressure over the eastern United States, as well as a surface trough that lingered over the non-attainment zone for the majority of the 25<sup>th</sup> and 26<sup>th</sup>. These features allowed for transport from the Ohio River valley at mid and upper levels as well as transport at the surface along the urban I-95 corridor.

Figure 2 shows that our surface level air (10 meters) originated in northern Maryland and traveled in a northeasterly direction towards the Philadelphia metropolitan area. Winds became very calm overnight on the 25<sup>th</sup>, which allowed the surface level air to meander very slowly over the Philadelphia metropolitan area, picking up localized emissions from cars, trucks, and industry along the way. The air parcel then traveled into northern portions of New Jersey early on the 26<sup>th</sup>, where it encountered a westerly flow that allowed the air to travel through the New York City metropolitan area before arriving in Babylon, NY. Throughout the entirety of the trajectory path, surface level air traveled very slowly, which allowed the air parcel to gather additional pollutants from both the Philadelphia and NYC metropolitan areas.

The mid and upper level trajectories (Figures 3 & 4) followed similar transport pathways and originated in the Mid-West. Air traveling at the mid-levels originated in eastern Illinois while air at the upper levels originated in southeastern Minnesota. Air at both levels, traveled in a primarily easterly direction as it traversed the heavily industrialized Ohio River Valley transporting additional emissions from local industry and power plants. Air at the mid and upper level then passed through northeastern Pennsylvania including the city of Scranton and northern New Jersey before reaching its destination in Babylon, NY.

Figure 5 shows the national Air Quality Index observed on June 25<sup>th</sup>, the day prior to the exceedance. As shown in the figure, a few isolated areas in the Mid-West reached the moderate category the day before, indicating that previously polluted air may have been transported into the nonattainment area from this region. Despite the lack of widespread moderate and unhealthy for sensitive groups air quality, westerly upper level winds were able to transport a plume of ozone precursors from the Ohio River Valley into New York. Along with favorable weather conditions mentioned above, ozone levels were able to reach the unhealthy for sensitive groups category in Babylon, New York on June 26<sup>th</sup>.

Figure 2. 48-hour Back Trajectories for June 26, 2020 at 10 meters

NOAA HYSPLIT MODEL  
Backward trajectory ending at 1800 UTC 26 Jun 20  
NAMS Meteorological Data

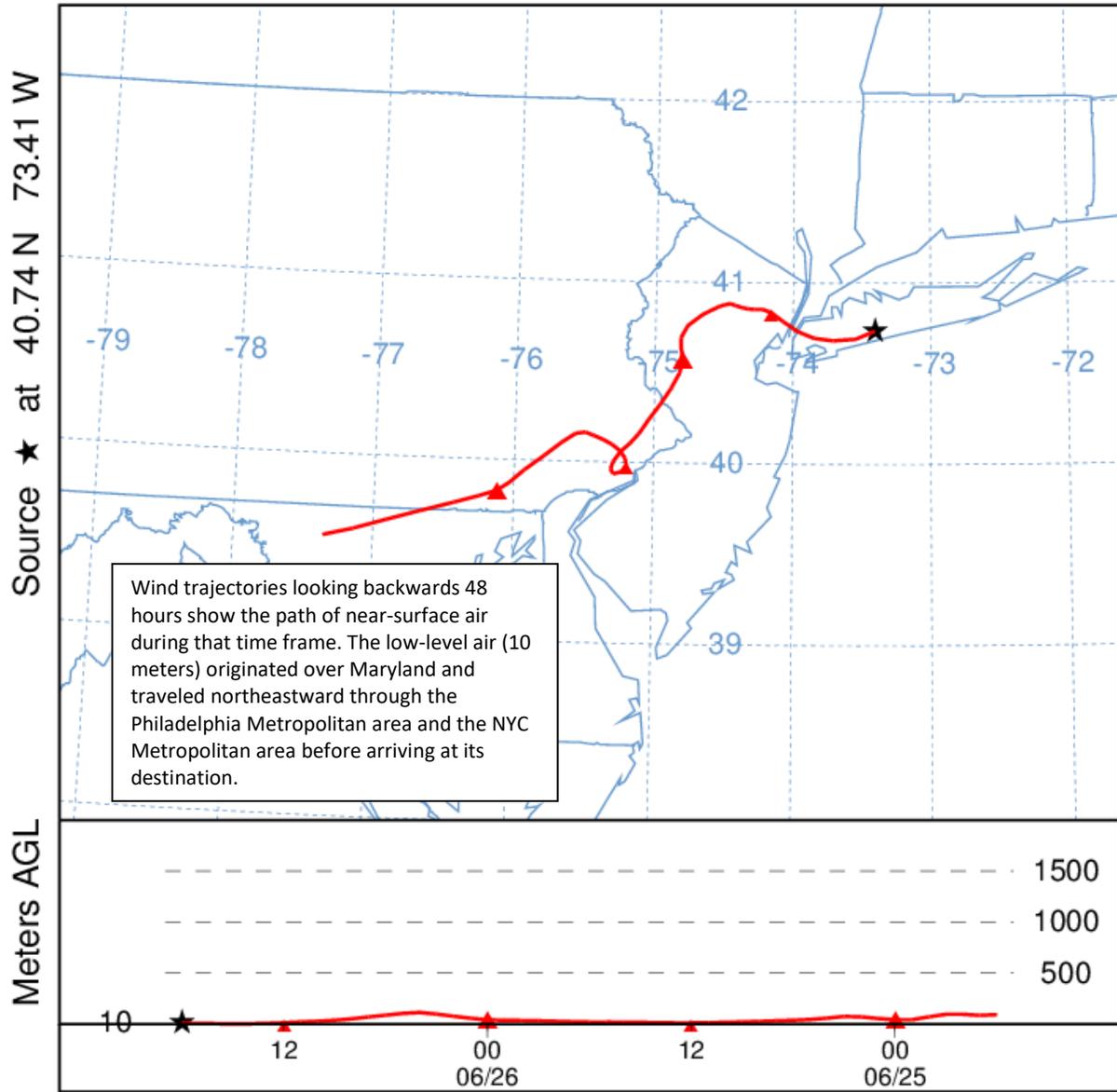


Figure 3. 48-hour Back Trajectories for June 26, 2020 at 500 meters

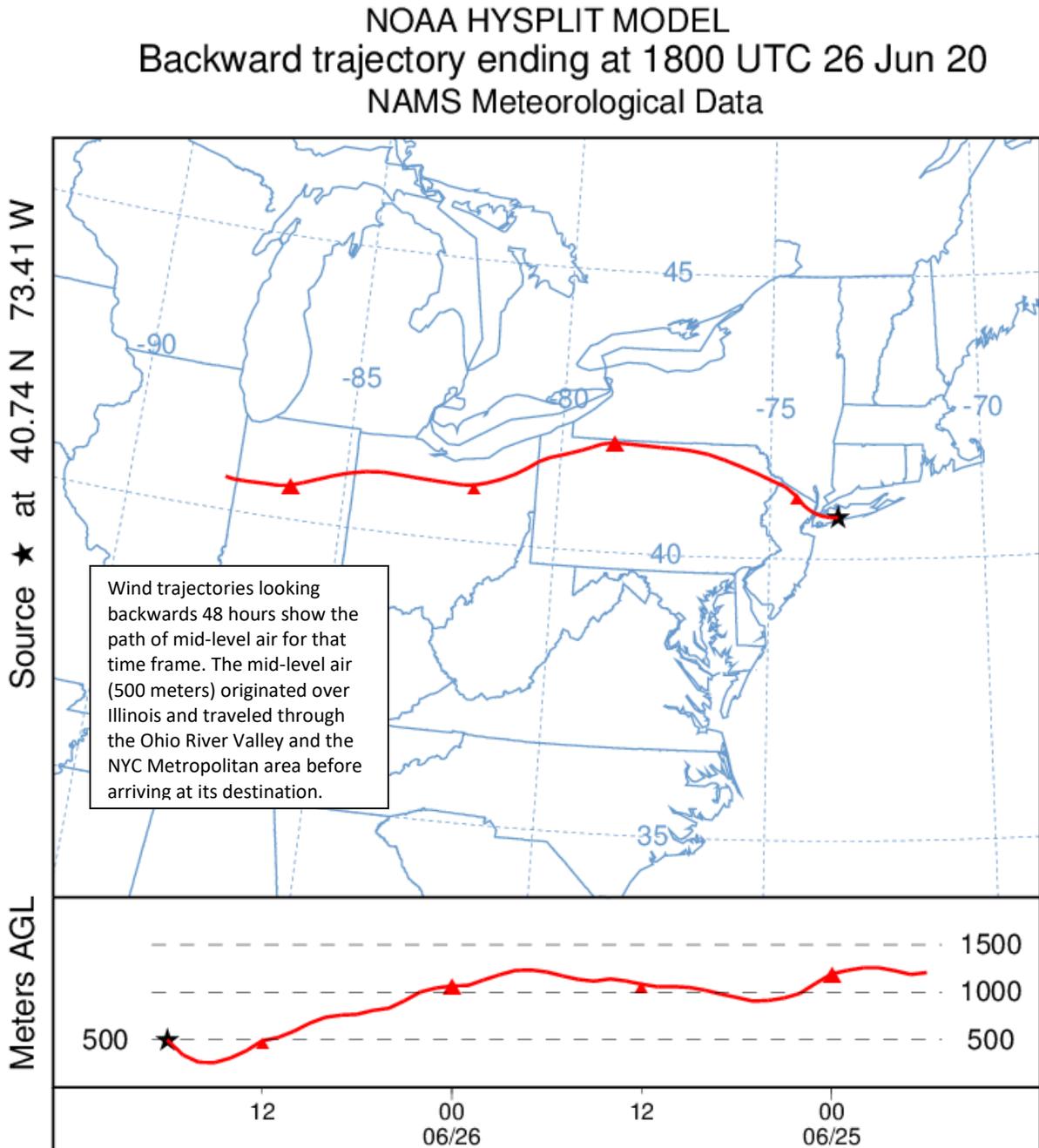


Figure 4. 48-hour Back Trajectories for June 26, 2020 at 1500 meters

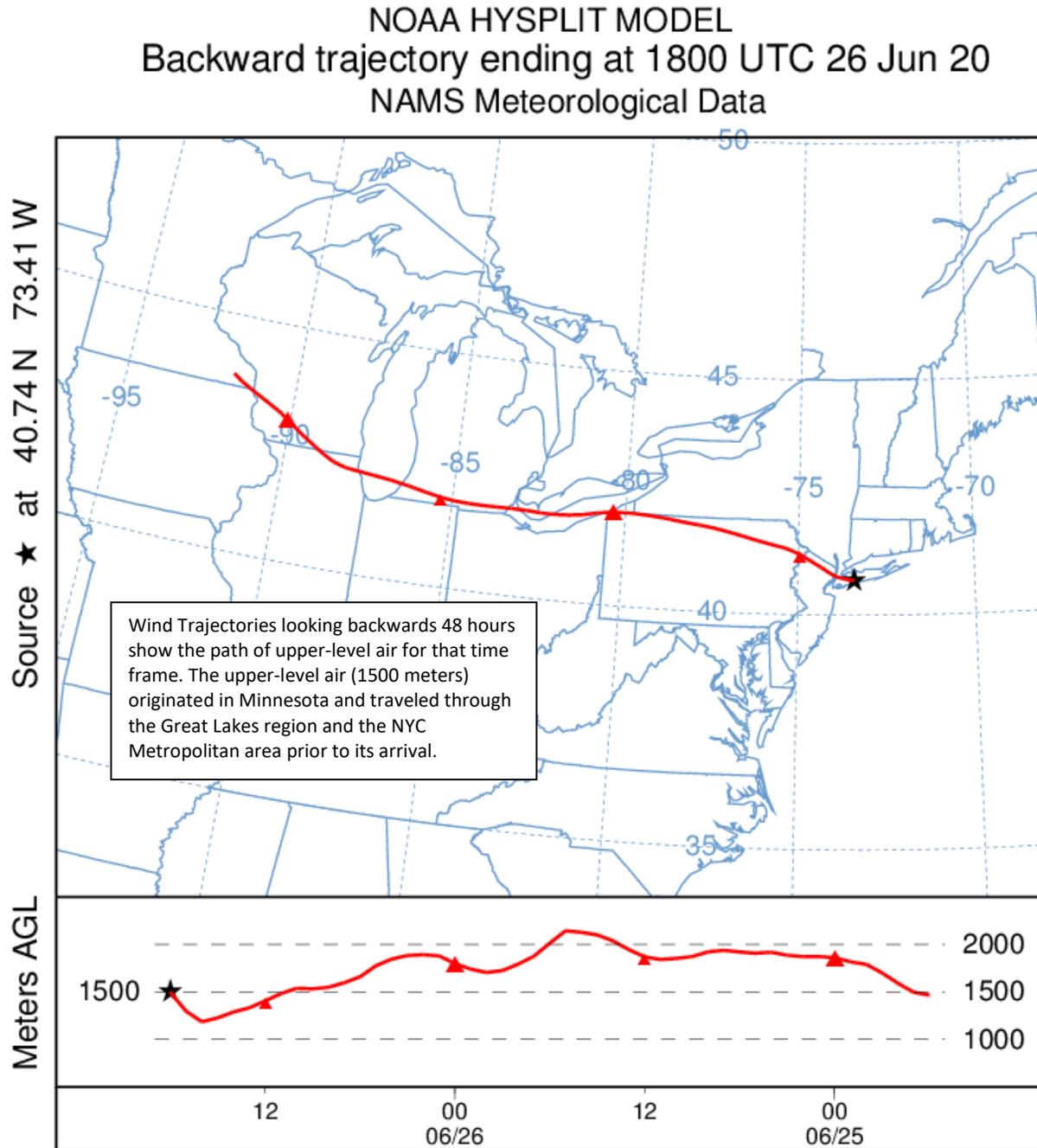
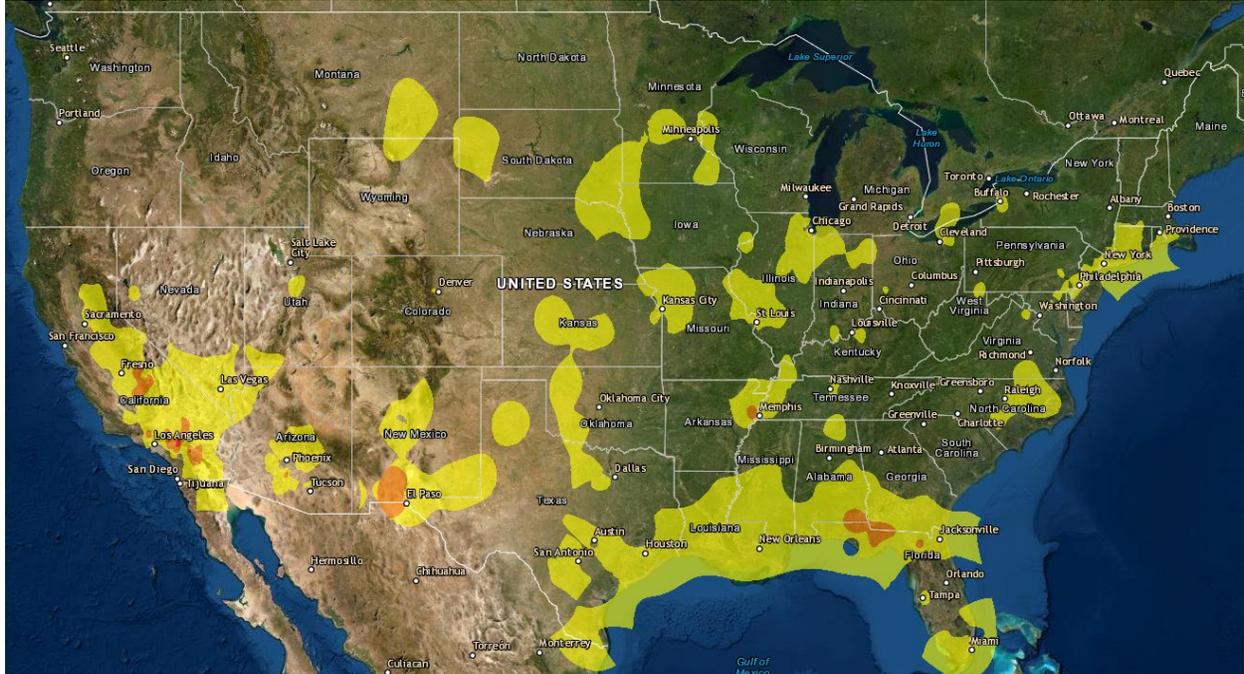


Figure 5. Combined Air Quality Index for the United States on June 25, 2020



Source: [www.airnow.gov](http://www.airnow.gov)

### **How is Ozone Created?**

Ground-level ozone is an air pollutant known to cause a number of health effects and negatively impact air quality and the environment in New Jersey. Ozone is formed when oxides of nitrogen (NO<sub>x</sub>) 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 <http://www.nj.gov/dep/cleanairnj/>.