PM2.5 National Ambient Air Quality Standard Health Exceedances on July 5, 2024

On Friday, July 5, 2024, there was one (1) site in New Jersey that exceeded the National Ambient Air Quality Standard (NAAQS) for PM2.5 (24-hour average of 35 micrograms/cubic meter, ug/m^3). A PM2.5 exceedance of the 24-hour NAAQS is measured when the concentration is 35.5 ug/m^3 or greater. The PM2.5 levels were impacted by fireworks from July 4th celebrations. See Table 1.

Note, all of NJ is in attainment for the PM2.5 24-hour NAAQS and there are no downwind nonattainment areas from NJ.

Table 1. New Jersey PM2.5 Concentrations on 7/5/2024

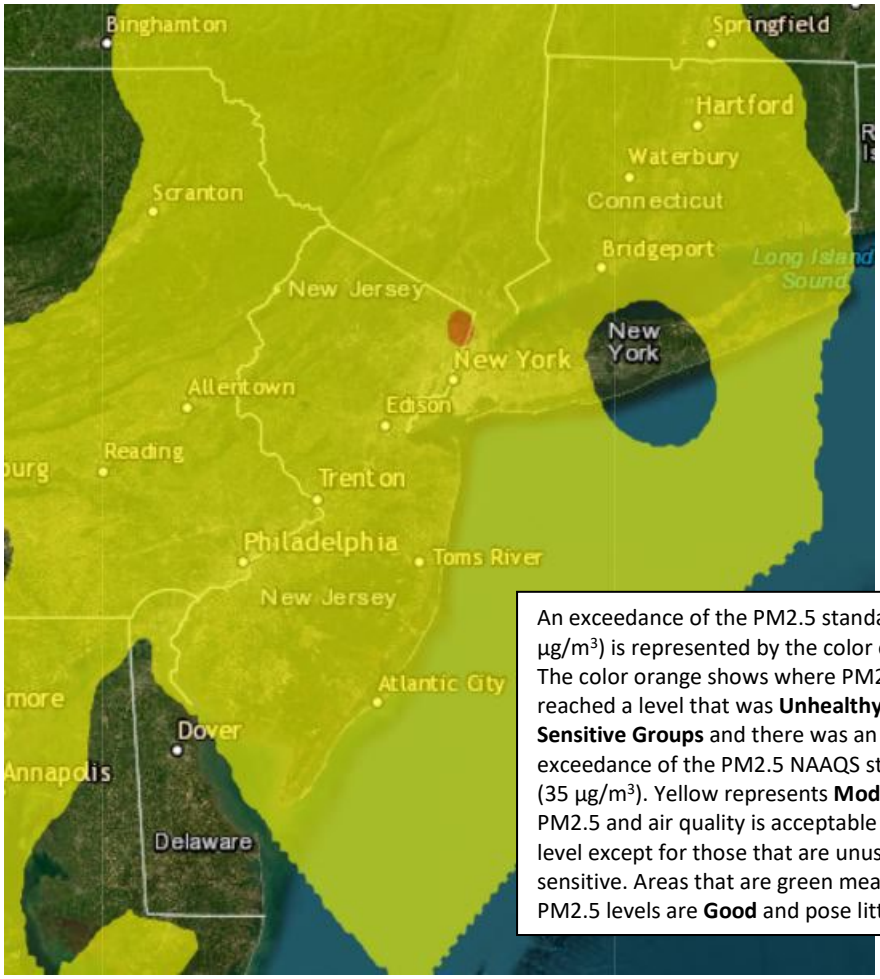
STATION	24-Hour Average (ug/m^3)
Atlantic City	9.2
Brigantine	No Data
Camden Spruce St	No Data
Chester	No Data
Clarksboro	22.0
Columbia	14.9
Elizabeth Lab	34.0
Flemington	9.9
Fort Lee Near Road	45.6
Jersey City Firehouse	30.1
Millville	10.9
Paterson	31.7
Rahway	16.9
Rider University	13.5
Rutgers University	14.5
Toms River	11.3
Trenton	15.1
Union City High School	23.4
TOTAL EXCEEDANCES	**1**

From the out-of-state stations adjacent to New Jersey, there was one (1) exceedance of the PM2.5 NAAQS. See Table 2.

Table 2. PM2.5 Concentrations at Out-of-State Monitoring Stations Adjacent to New Jersey on 7/5/2024

STATE	STATION	24-Hour Average (ug/m^3)
CT	Bridgeport	12.5
CT	Danbury	17.9
CT	New Haven - Criscuolo Park	10.1
CT	Waterbury	13.6
DE	KILLENS (Kent Co.)	8.8
DE	LUMS 2 (New Castle Co.)	8.7
DE	MLK (New Castle Co.)	9.2
DE	Rte 9 Del City	10.5
DE	SEAFORD (Sussex Co.)	8.3
MD	Fair Hill	12.5
NY	Bklyn - PS274	19.2
NY	CCNY	26.7
NY	Division Street	No Data
NY	Eisenhower Park	No Data
NY	Fresh Kills	No Data
NY	Holtsville	7.9
NY	Manhattan/IS143	38.8
NY	Maspeth	16.3
NY	Queens	17
NY	Queens Near-Road	No Data
NY	White Plains	21.5
PA	Allentown	10.2
PA	Chester	13.2
PA	Freemansburg	9.1
PA	Marcus Hook	10.2
PA	New Garden	12.8
PA	Norristown	10.8
PA	FAB (Philadelphia Co.)	13.1
PA	MON (Philadelphia Co.)	No Data
PA	NEW (Philadelphia Co.)	14.2
PA	RIT (Philadelphia Co.)	14.4
PA	TOR (Philadelphia Co.)	11.5
	TOTAL EXCEEDANCES	**1**

Figure 1. PM2.5 Air Quality Index for July 5, 2024



Source: www.airnow.gov

For PM2.5 terminology definitions see NJDEP Air Quality Planning's Glossary and Acronyms webpage: https://www.nj.gov/dep/airmon/glossary.html

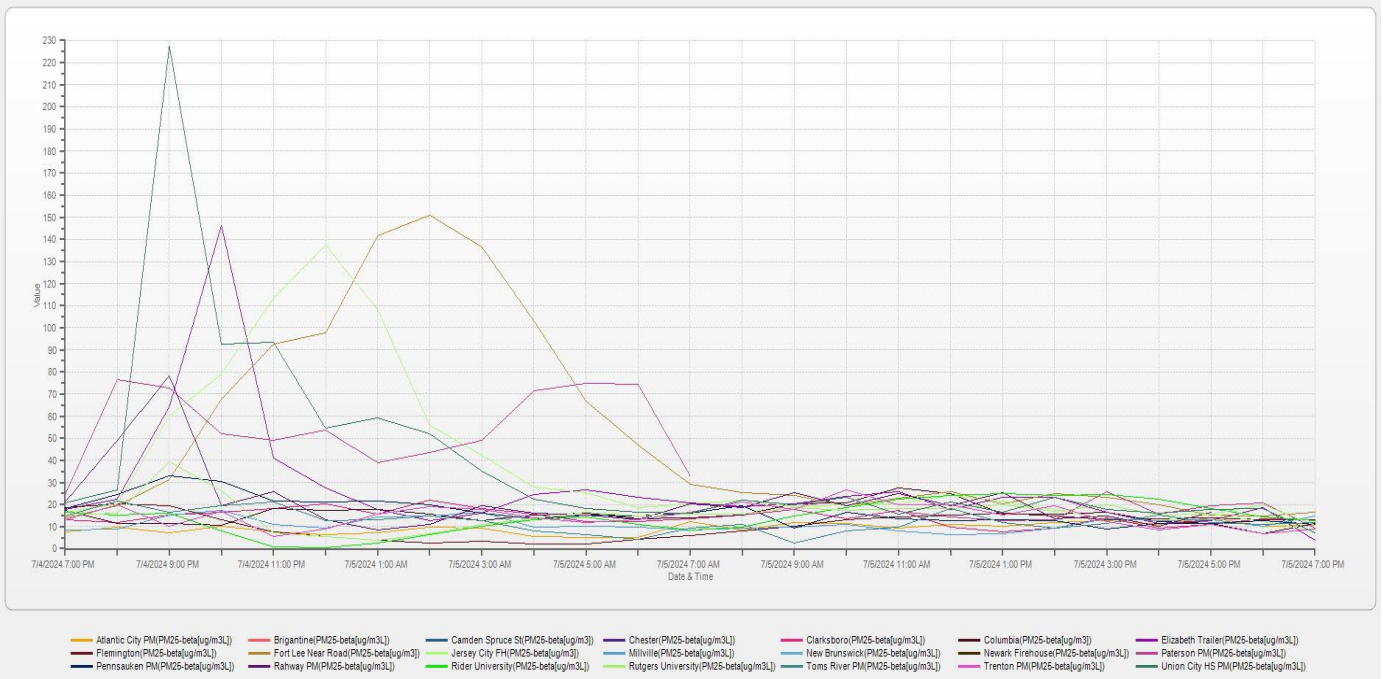
Weather

On Friday July 5th, a broad swath of high pressure centered off the Mid-Atlantic coast persisted in dominating the region. With a moist and hot air mass in place, excessive heat warnings were in effect across New Jersey due to temperatures in mid 90s and dewpoints reaching the upper 70s. A weak frontal boundary draped west of New Jersey during the early hours of the 5th began lifting northward by the afternoon hours, allowing residual firework smoke aloft to mix down to the surface. The firework smoke lingered due to light and variable winds, which further enhanced PM2.5 levels at the surface. The particulate matter exceedances noted on this day were very localized to the NYC metropolitan area, indicating that firework smoke was likely the cause of this brief spike in PM2.5 concentrations. As the day progressed winds strengthened, allowing any leftover smoke to dissipate or transport to the north.

Where Did the Air Pollution that Caused PM2.5 Come From?

With the July 4th holiday the day prior, many firework displays were observed throughout the New York City metropolitan area in the evening and into the overnight hours. The monitor in Leonia, New Jersey is located across from New York City at Overpeck Park, 40 Fort Lee Road near the on-ramp to the George Washington Bridge. Limited atmospheric ventilation as a result of high pressure and light winds allowed smoke from the firework displays to hover near the surface and aloft. PM2.5 concentrations at the surface remained in the good/moderate range except for the exceedance locations. Figure 2 shows that hourly PM2.5 concentrations in the regions near New York City remained elevated in the overnight and early morning hours on July 5th and gradually came down as the day progressed.

Figure 2. PM2.5 1-hr Concentrations for July 4 & 5, 2024



Figures 3, 4, and 5 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 24-hour PM2.5 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 6). The monitoring station(s) that were chosen to model back trajectories are listed in Table 3.

Table 3. Monitoring Stations with a 24-hr PM2.5 Exceedance that were selected to Run 48-hr Back Trajectories

STATE	STATION	Daily Maximum 24-Hr Average (ug/m^3)
NJ	Fort Lee Near Road	45.6
NY	Manhattan/IS143	38.8

Figure 3. 48-hour Back Trajectories for July 5, 2024 at 10 meters

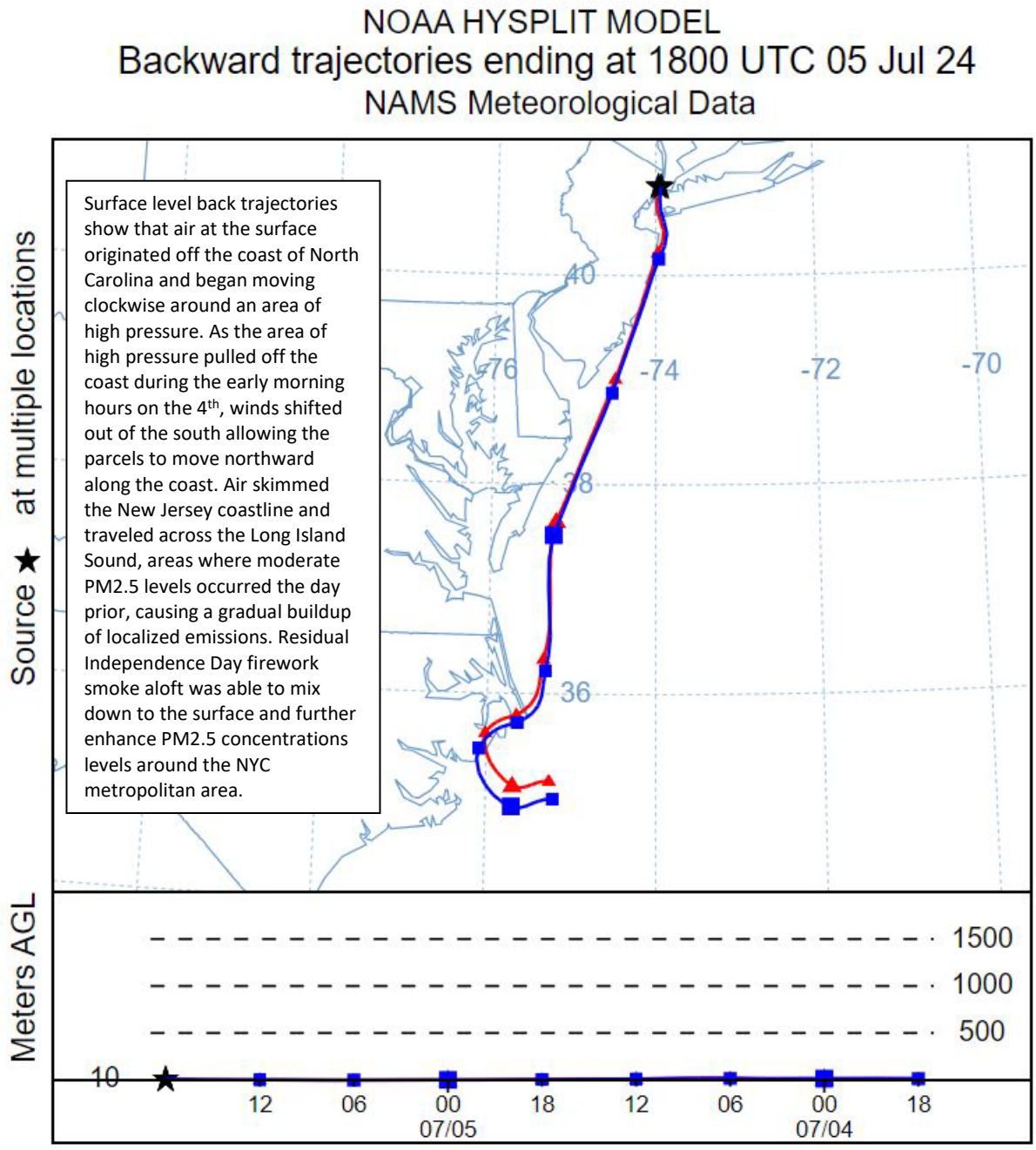


Figure 4. 48-hour Back Trajectories for July 5, 2024 at 500 meters

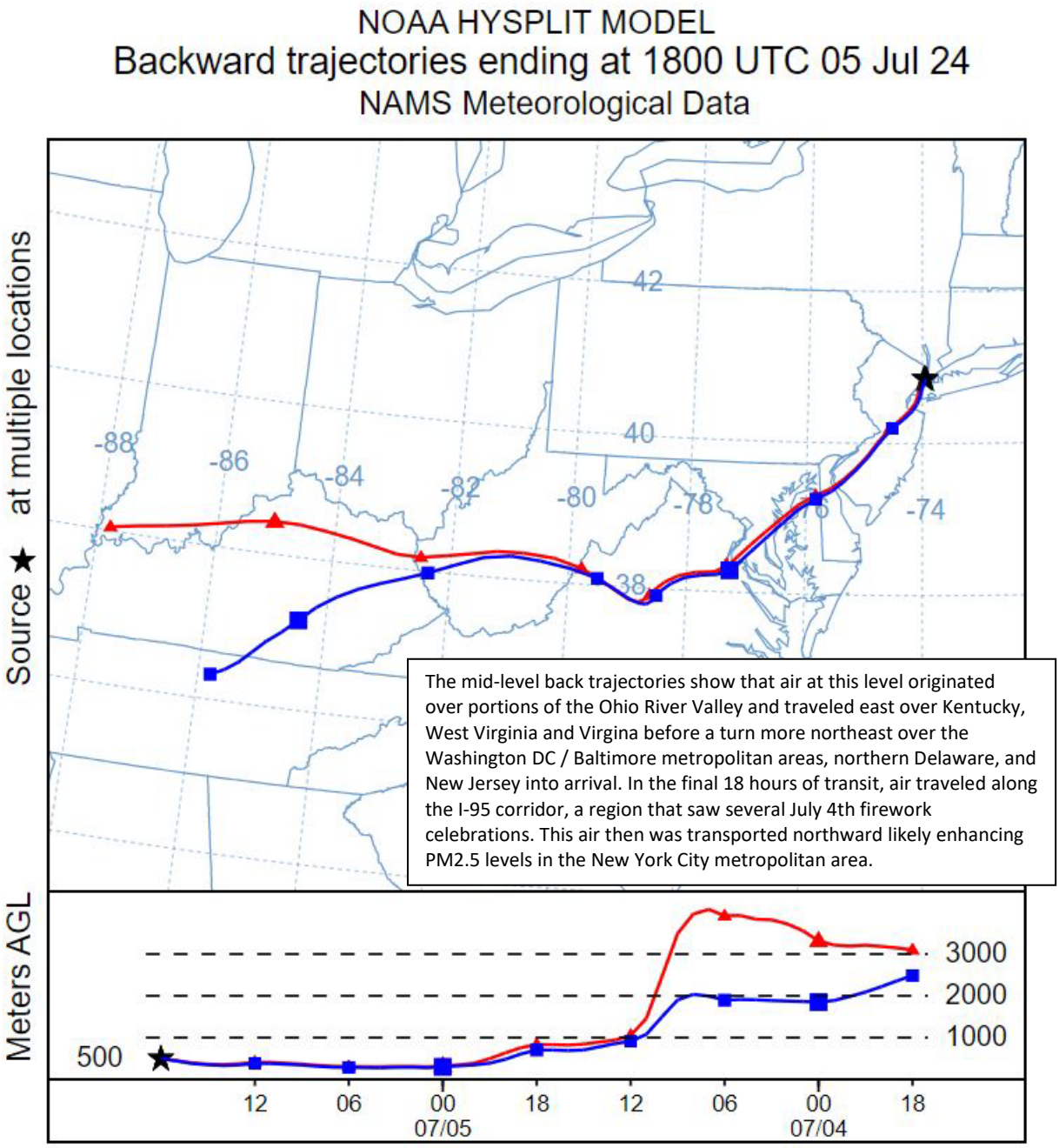


Figure 5. 48-hour Back Trajectories for July 5, 2024 at 1500 meters

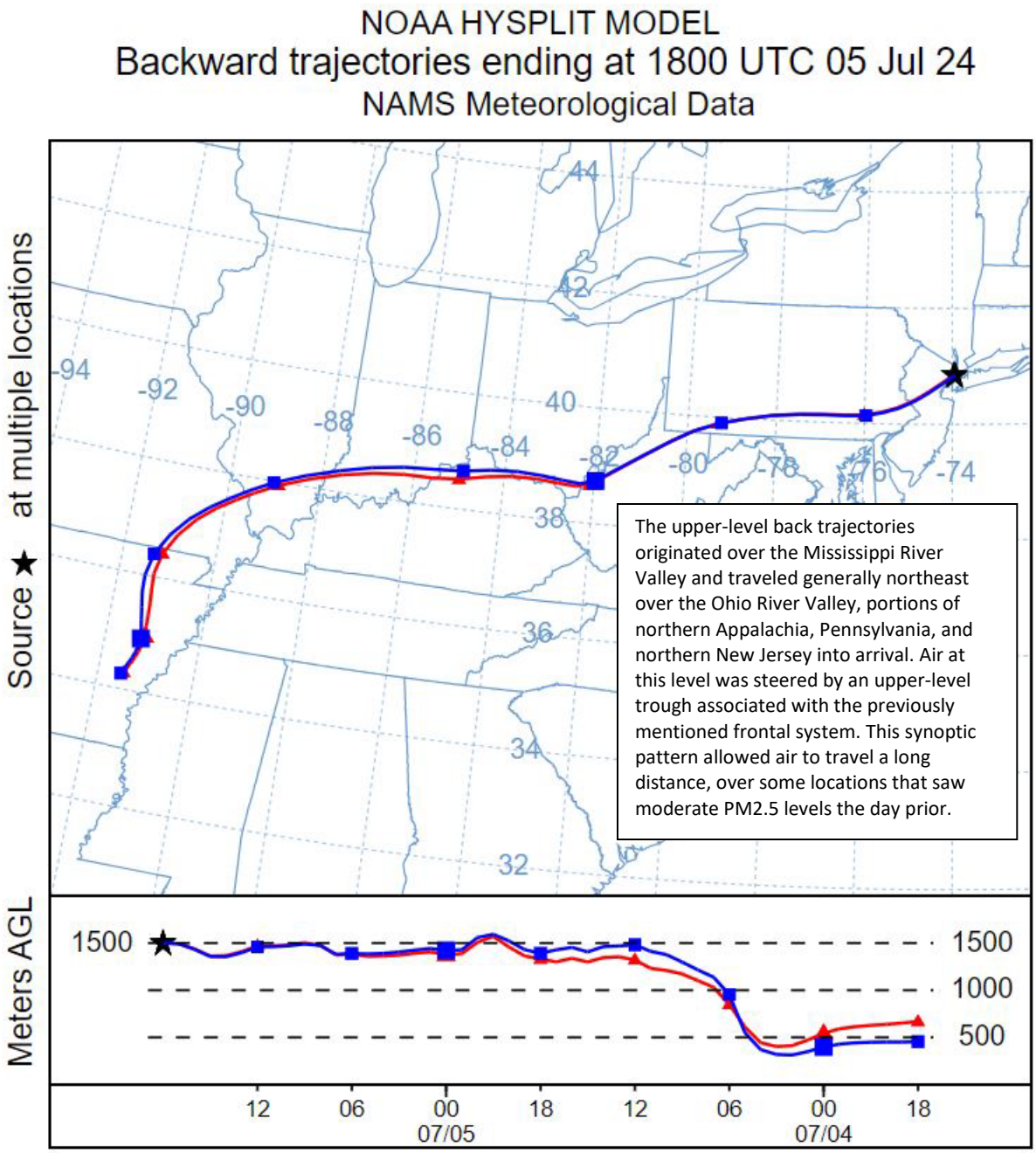
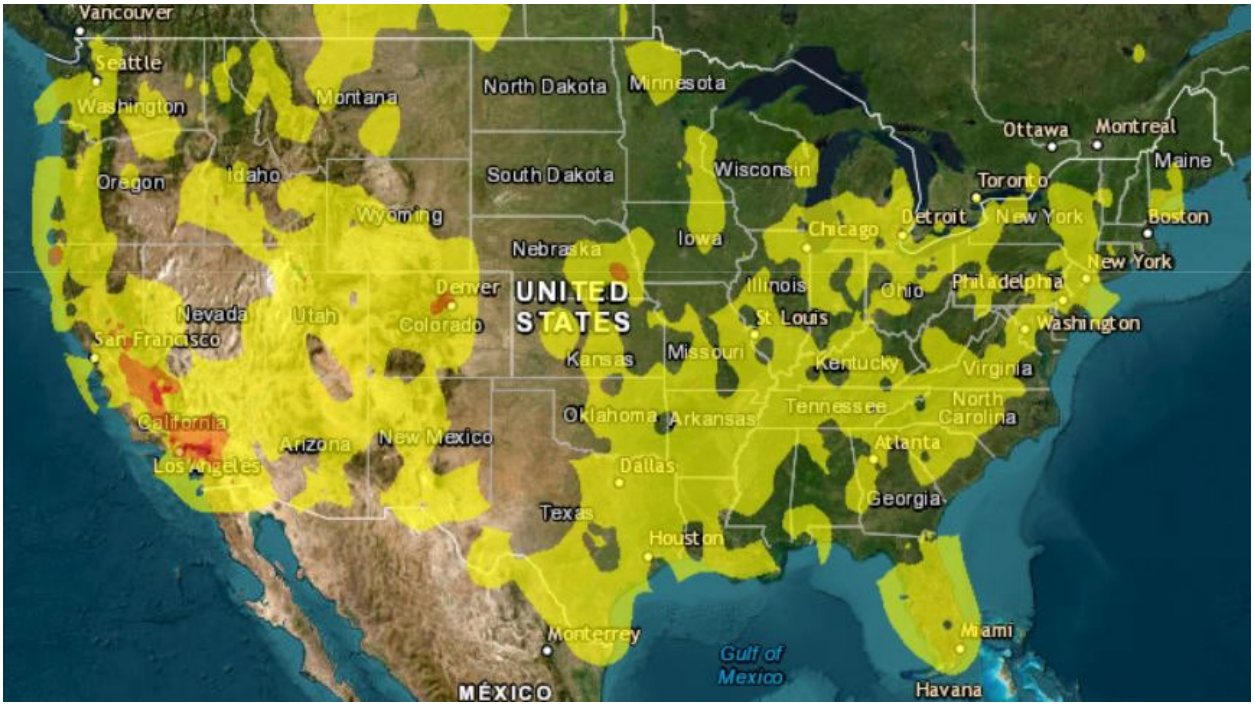


Figure 6. Air Quality Index for the United States on July 4, 2024



Source: www.airnow.gov

Find Out About Air Quality Every Day

Learn more about your local PM2.5 air quality forecast by visiting the "What's Your Air Quality Today?" page at https://www.nj.gov/dep/baqp/aqitoday.html .