PM2.5 National Ambient Air Quality Standard Health Exceedances on July 1, 2023

On Saturday, July 1, 2023, 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 are being impacted by smoke from wildfires in Canada. See Table 1.

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

Table 1. New Jersey PM2.5 Concentrations on 7/1/2023

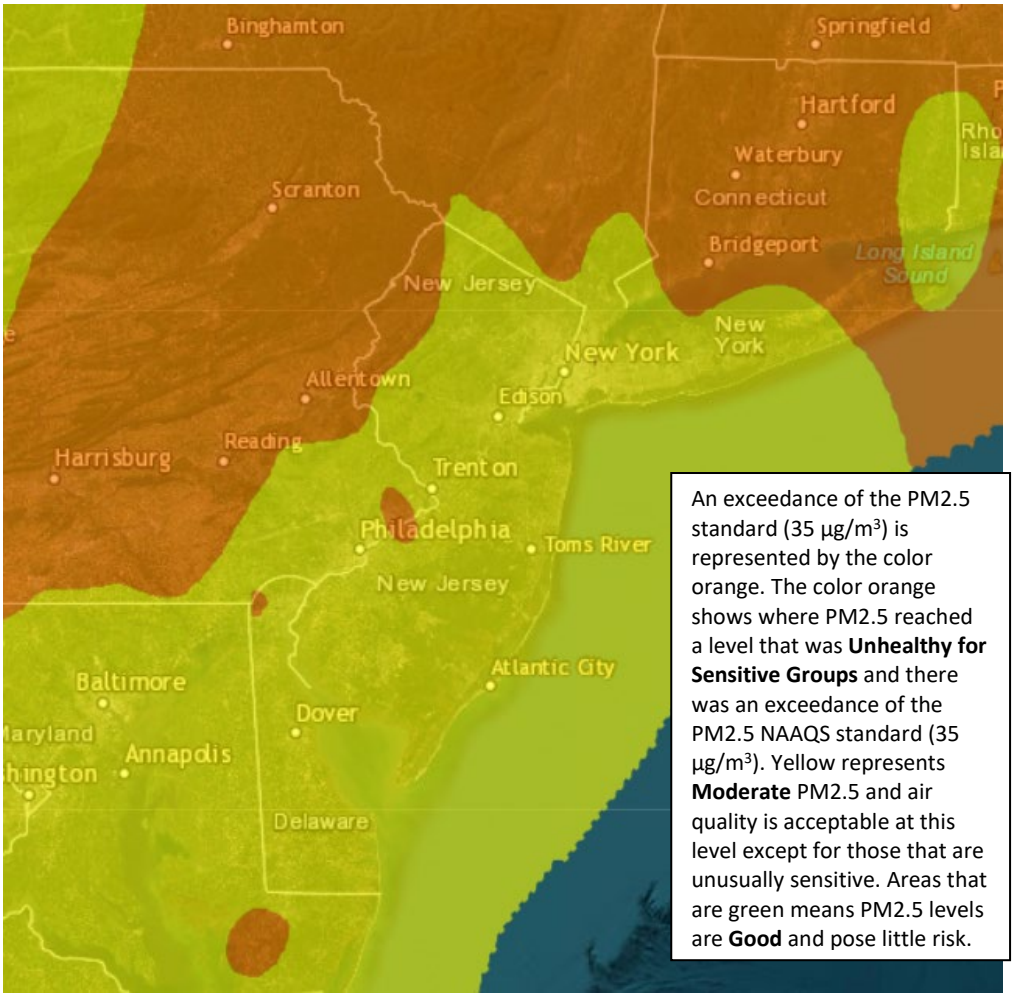
STATION	24-Hour Average (ug/m^3)
Brigantine	16.0
Camden Spruce St	25.5
Columbia	39.0
Elizabeth Lab	30.8
Flemington	27.6
Fort Lee Near Road	31.7
Jersey City Firehouse	27.7
Millville	20.0
Paterson	33.6
Rahway	28.3
Rider University	28.8
Rutgers University	30.8
Toms River	20.6
Trenton	26.4
Union City High School	28.6
TOTAL EXCEEDANCES	**1**

From the out-of-state stations adjacent to New Jersey, there were four (4) exceedances of the PM2.5 NAAQS. See Table 2.

Table 2. PM2.5 Concentrations at Out-of-State Monitoring Stations Adjacent to New Jersey on 7/1/2023

STATE	STATION	24-Hour Average (ug/m^3)
CT	Bridgeport	No Data
CT	Danbury	No Data
CT	New Haven - Criscuolo Park	No Data
CT	Waterbury	No Data
DE	KILLENS (Kent Co.)	22.4
DE	LUMS 2 (New Castle Co.)	28.6
DE	MLK (New Castle Co.)	29.0
DE	Rte 9 Del City	25.4
DE	SEAFORD (Sussex Co.)	26.1
MD	Fair Hill	29.2
NY	Bklyn - PS274	31.9
NY	CCNY	27.0
NY	Division Street	No Data
NY	Eisenhower Park	24.5
NY	Fresh Kills	24.5
NY	Holtsville	27.3
NY	Manhattan/IS143	30.7
NY	Maspeth	25.6
NY	Queens	39.5
NY	Queens Near-Road	28.6
NY	White Plains	32.3
PA	Allentown	35.9
PA	Chester	26.0
PA	Freemansburg	38.3
PA	Marcus Hook	27.5
PA	New Garden	31.5
PA	Norristown	28.0
PA	FAB (Philadelphia Co.)	28.9
PA	MON (Philadelphia Co.)	No Data
PA	NEW (Philadelphia Co.)	31.4
PA	RIT (Philadelphia Co.)	32.9
PA	TOR (Philadelphia Co.)	37.3
	TOTAL EXCEEDANCES	**4**

Figure 1. PM2.5 Air Quality Index for Saturday, July 1, 2023



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 Saturday, July 1st, high pressure continued to build into the Mid-Atlantic, providing warm temperatures and abundant sunshine to the region. Light winds blowing out of the southeast allowed wildfire smoke to slowly begin shifting northward and toward New England. Concentrations began to decline throughout the day, with most of the area observing PM2.5 averages in the moderate and USG category. This trend would continue throughout the weekend as southeasterly winds continued to push the smoke plume further north, and scattered storms helped to clear the remaining particulate matter from the region.

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

Widespread wildfires throughout eastern Canada have continued to burn for the last several weeks, with favorable weather patterns allowing smoke from these wildfires to move into the region and cause

widespread PM2.5 exceedances for an extended period, including on July 1st, 2023. Much of Canada has continued to see hot and dry conditions throughout the season, creating a favorable environment for wildfires to ignite and rapidly spread throughout the region. Canada and the United States have experienced elevated PM2.5 concentrations as the smoke moves throughout the atmosphere and is transported to different regions. Earlier in the week, high pressure transported a dense smoke plume from Canada into the Great Lakes region resulting in poor air quality in upwind locations. High pressure advanced this plume eastward allowing the smoke from Canadian wildfires to migrate into the Mid-Atlantic region while growing increasingly polluted as it slowly tracked toward the coast. This plume then made its way into New Jersey where it quicky increased PM2.5 concentrations on Thursday, June 29th. Following the 29th, the smoke plume lingered over New Jersey and the Mid-Atlantic for an additional two days impacting air quality across this area. By July 1st, southeasterly winds slowly started to provide cleaner air to the Garden State with PM2.5 concentrations dropping considerably from south to north.

Figure 2 shows the AirNow Fire and Smoke Map for July 1st, which depicts the smoke plume in gray and the AQI levels across the region. Figure 3 shows that PM2.5 concentrations remained elevated in the early morning hours on July 1st. Concentrations slowly started to decrease considerably throughout the daytime hours while dropping down into the upper moderate category by 10 PM.

Figure 2. AirNow Fire and Smoke Map, Smoke Plume for July 1, 2023

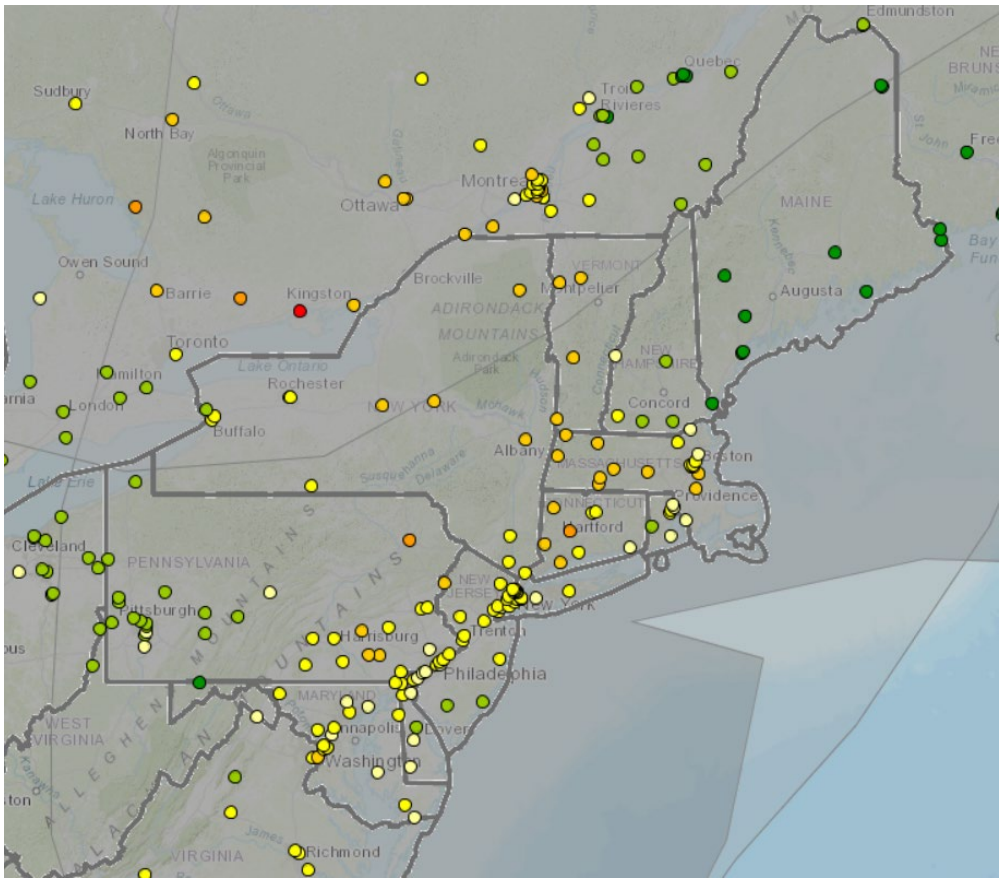
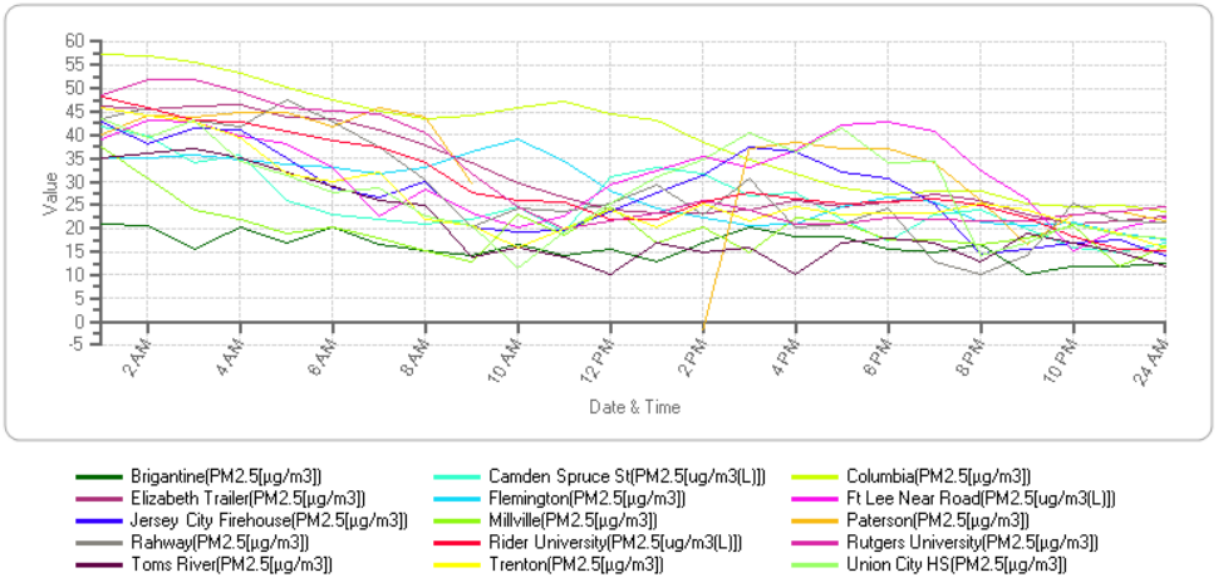


Figure 3. PM2.5 1-hr Concentrations for July 1, 2023



Figures 4, 5, and 6 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 7). 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	Columbia	39.0
NY	Queens	39.5
PA	Allentown	35.9
PA	Freemansburg	38.3
PA	TOR (Philadelphia Co.)	37.3

Figure 4. 48-hour Back Trajectories for July 1, 2023 at 10 meters

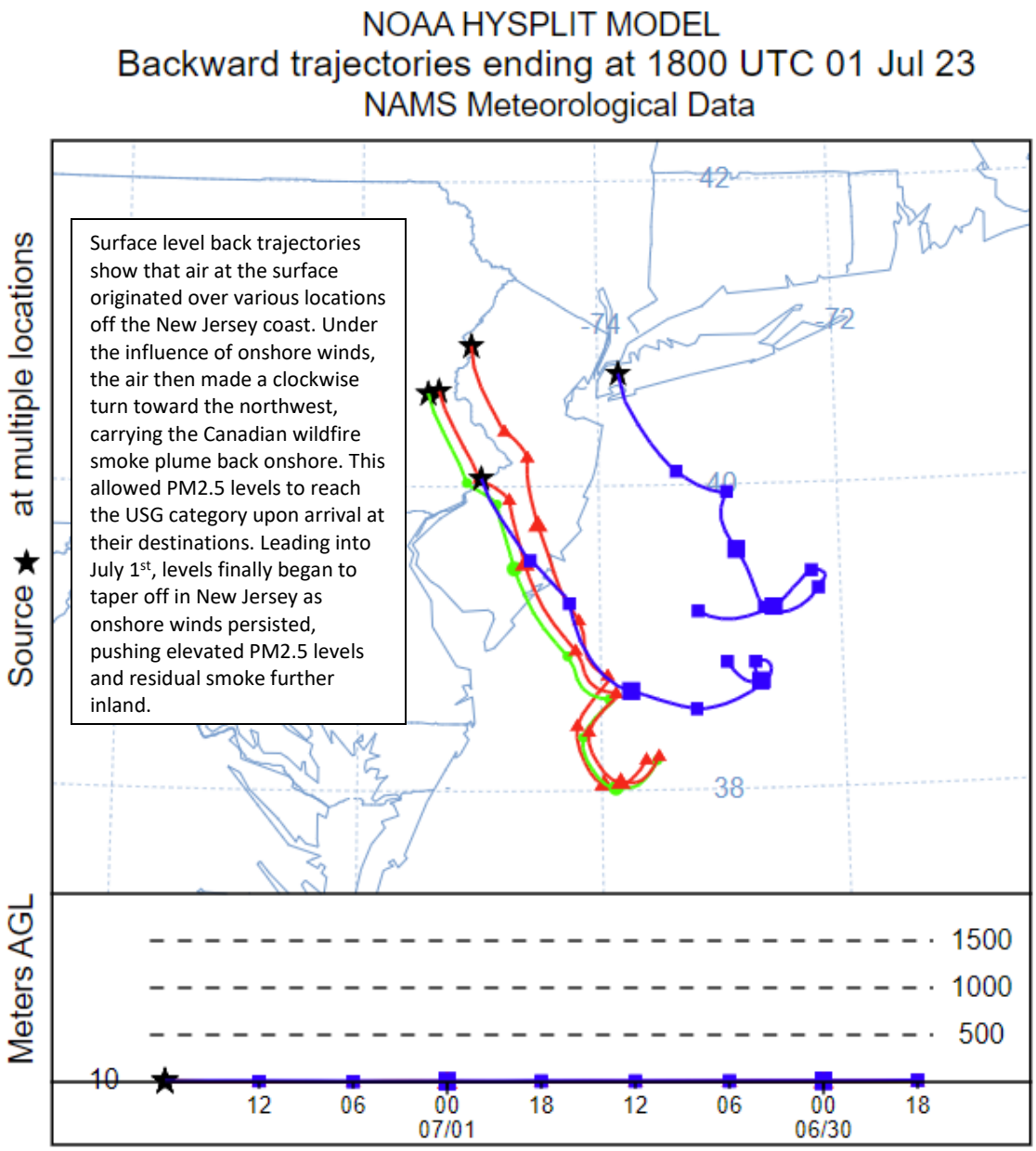


Figure 5. 48-hour Back Trajectories for July 1, 2023 at 500 meters

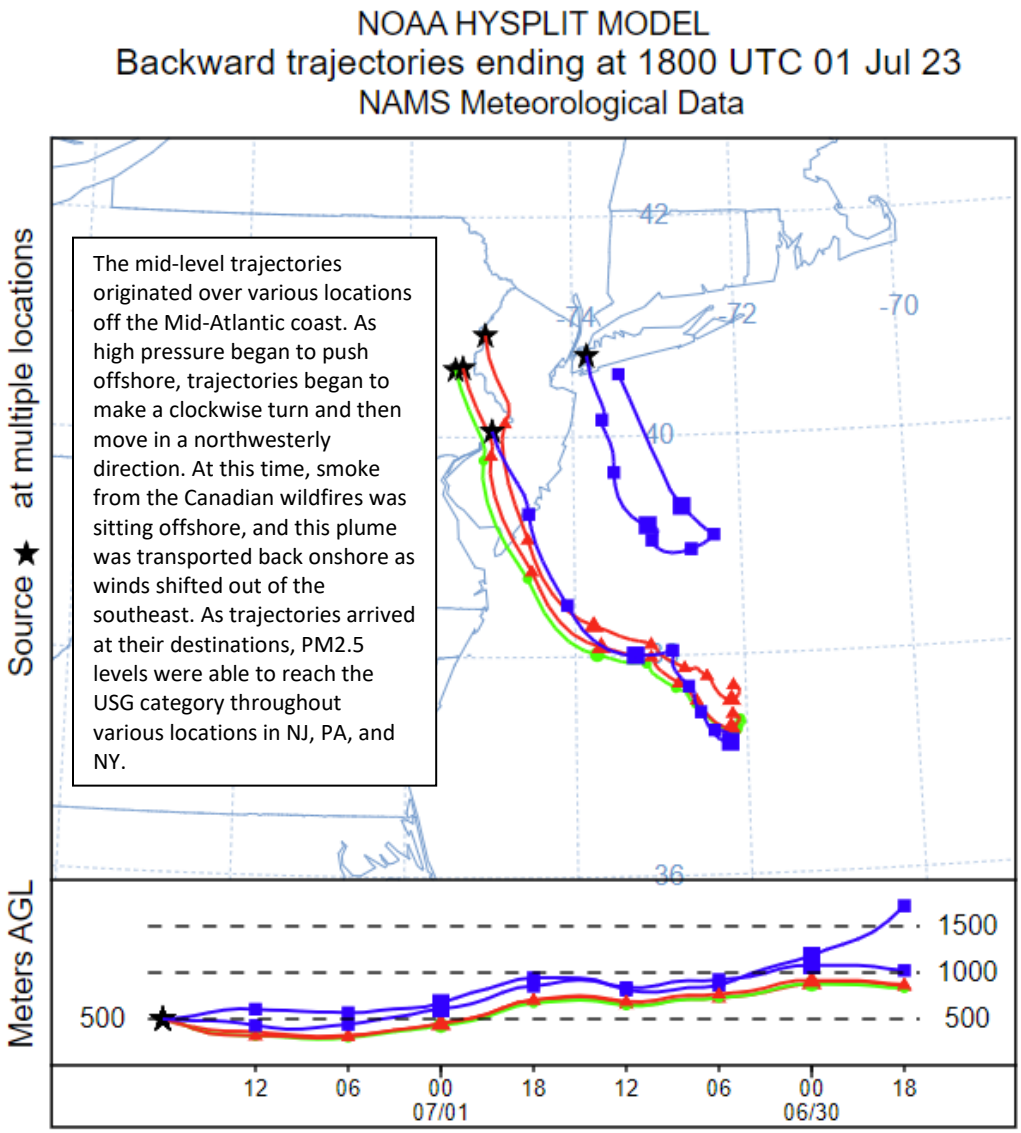


Figure 6. 48-hour Back Trajectories for July 1, 2023 at 1500 meters

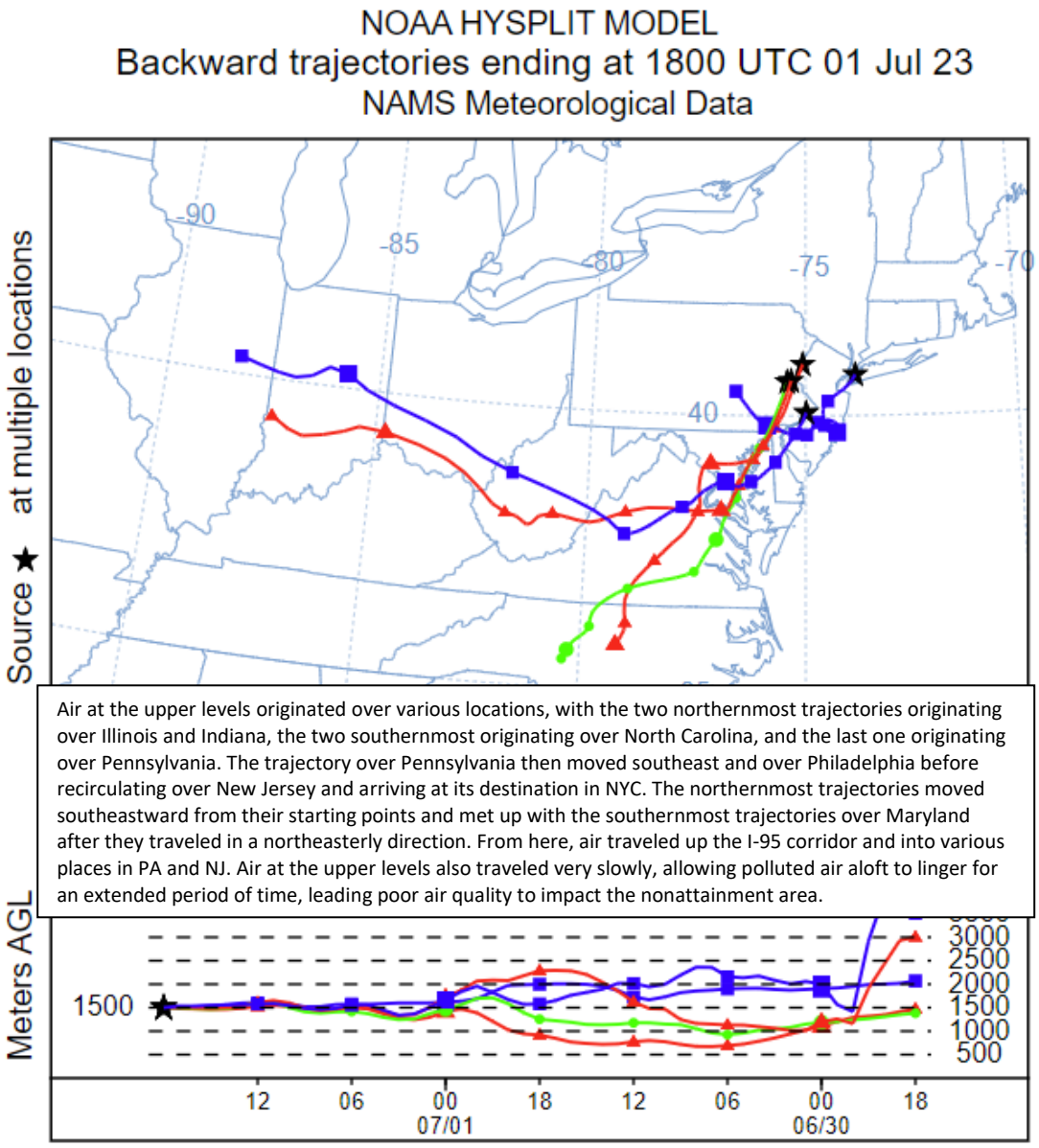
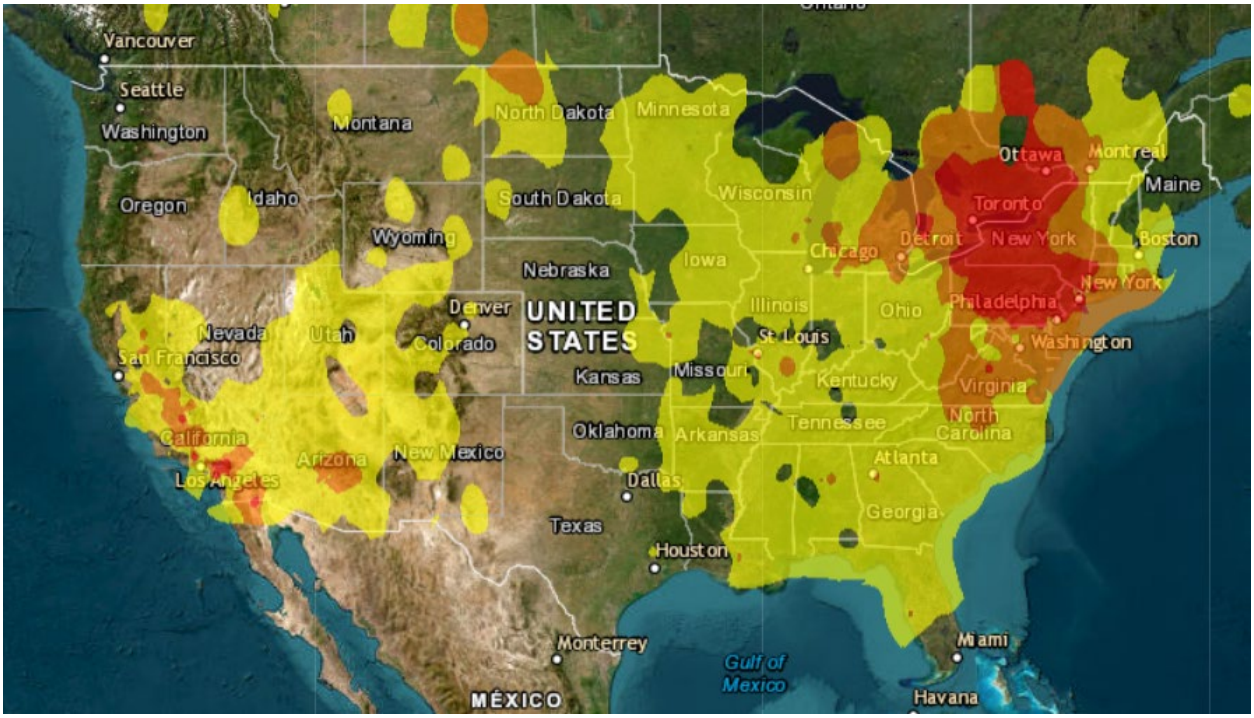


Figure 7. Air Quality Index for the United States on June 30, 2023



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 .