PM2.5 National Ambient Air Quality Standard Health Exceedances on June 8, 2023

Exceedance Locations and Levels

On Thursday, June 8, 2023, there were fifteen (15) sites 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 6/8/2023

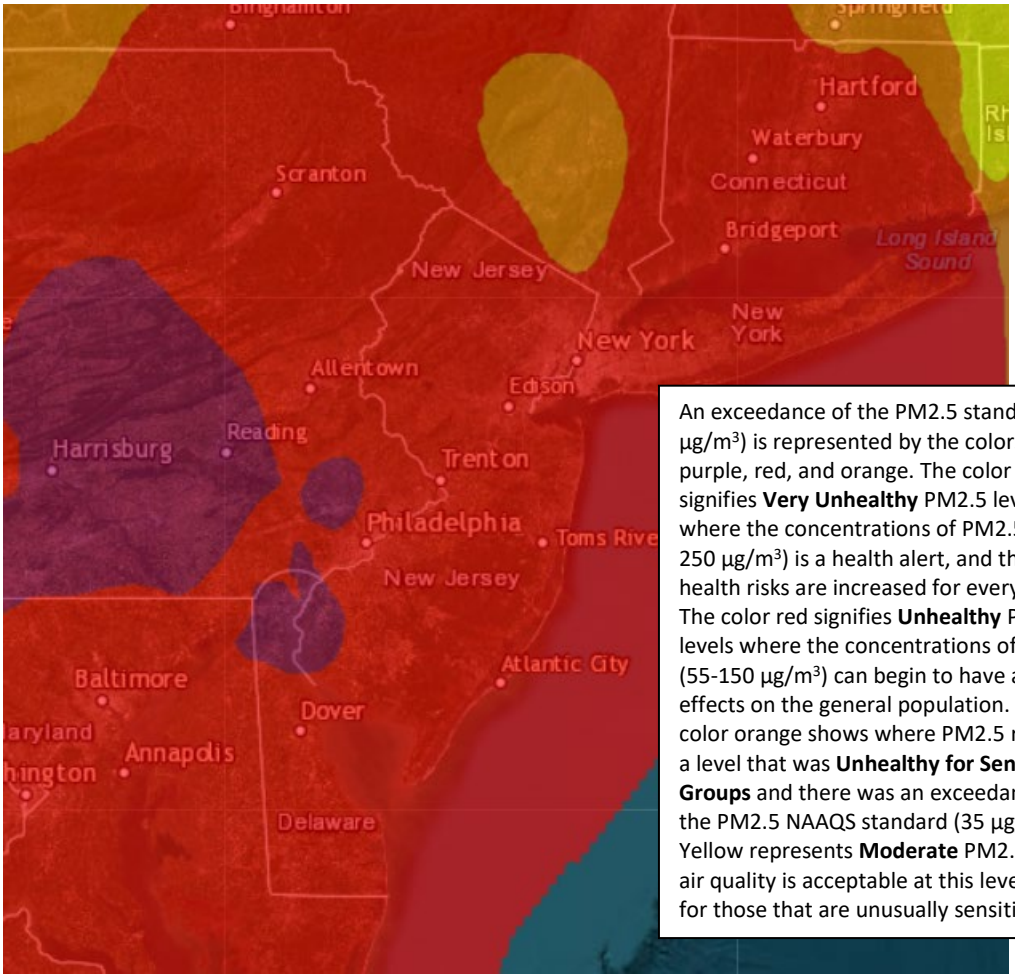
STATION	24-Hour Average (ug/m^3)
Brigantine	139.8
Camden Spruce St	107.8
Columbia	60.1
Elizabeth Lab	95.6
Flemington	108.8
Fort Lee Near Road	73.7
Jersey City Firehouse	60.5
Millville	128.0
Paterson	65.9
Rahway	77.5
Rider University	101.5
Rutgers University	107.8
Toms River	112.6
Trenton	89.6
Union City High School	63.4
TOTAL EXCEEDANCES	**15**

From the out-of-state stations adjacent to New Jersey, there were 25 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 6/8/2023

STATE	STATION	24-Hour Average (ug/m^3)
CT	Bridgeport	94.3
CT	Danbury	65.6
CT	New Haven - Criscuolo Park	82.2
CT	Waterbury	73.2
DE	KILLENS (Kent Co.)	129.2
DE	LUMS 2 (New Castle Co.)	171.1
DE	MLK (New Castle Co.)	148.9
DE	Rte 9 Del City	166.0
DE	SEAFORD (Sussex Co.)	109.8
MD	Fair Hill	109.2
NY	Bklyn - PS274	85.4
NY	CCNY	No Data
NY	Division Street	No Data
NY	Eisenhower Park	No Data
NY	Fresh Kills	74.9
NY	Holtsville	60.6
NY	Manhattan/IS143	63.3
NY	Maspeth	59.5
NY	Queens	106.9
NY	Queens Near-Road	66.1
NY	White Plains	58.3
PA	Allentown	116.0
PA	Chester	147.0
PA	Freemansburg	124.2
PA	Marcus Hook	146.6
PA	New Garden	132.0
PA	Norristown	153.6
PA	FAB (Philadelphia Co.)	No Data
PA	MON (Philadelphia Co.)	No Data
PA	NEW (Philadelphia Co.)	133.3
PA	RIT (Philadelphia Co.)	No Data
PA	TOR (Philadelphia Co.)	No Data
	TOTAL EXCEEDANCES	**25**

Figure 1. PM2.5 Air Quality Index for June 8, 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 June 8th, widespread PM2.5 exceedances continued to occur throughout the region as residual wildfire smoke from Quebec, Canada lingered throughout the day, marking the third day of this regional PM2.5 exceedance event. PM2.5 levels in central and southern NJ remained in the Very Unhealthy range during the overnight and early morning hours as the dense smoke plume pushed southeastward, with levels in northern NJ lingering in the Unhealthy range. Advancing high pressure to the northwest allowed for light northwest winds and temperatures in the low 70s throughout the day, with coastal sites seeing more of an onshore flow. With such high concentrations the day prior and light winds at the surface, residual wildfire smoke lingered and slowly tapered out as the day progressed. As a result, PM2.5 concentrations were still able to average out in the Unhealthy category for the majority of the region, with localized areas in PA and DE remaining in the Very Unhealthy range (Figure 1).

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

Widespread wildfires throughout southern portions of Quebec and Ontario ignited and/or continued to burn earlier in the week leading up to this regional PM2.5 exceedance event spanning 3 days. Warm temperatures and low dewpoints the week prior created an ideal environment for the rapid ignition and spread of hundreds of wildfires across southern Canada. The dense smoke from previous days remained blanketed over the region and lingered in the early morning hours before sunrise on Thursday morning, allowing for fine particle concentrations to remain elevated in the early hours of the day (Figure 3). This plume made a gradual migration southeastward allowing the highest concentrations to slowly exit the region and move along the coastline and offshore. At this time, the highest concentrations were observed at the Brigantine monitor where thick haze with limited visibility was still evident. Throughout the morning, a gradual decline in PM2.5 concentrations was observed as shown in Figure 3 before concentrations flatlined from 2pm into the evening. Additionally, a surface trough positioned itself along much of the Atlantic seaboard allowing additional smoke aloft to mix down to the surface and enhance residual PM2.5 concentrations at the surface.

Figure 2. AirNow Fire and Smoke Map, Smoke Plume for June 8, 2023

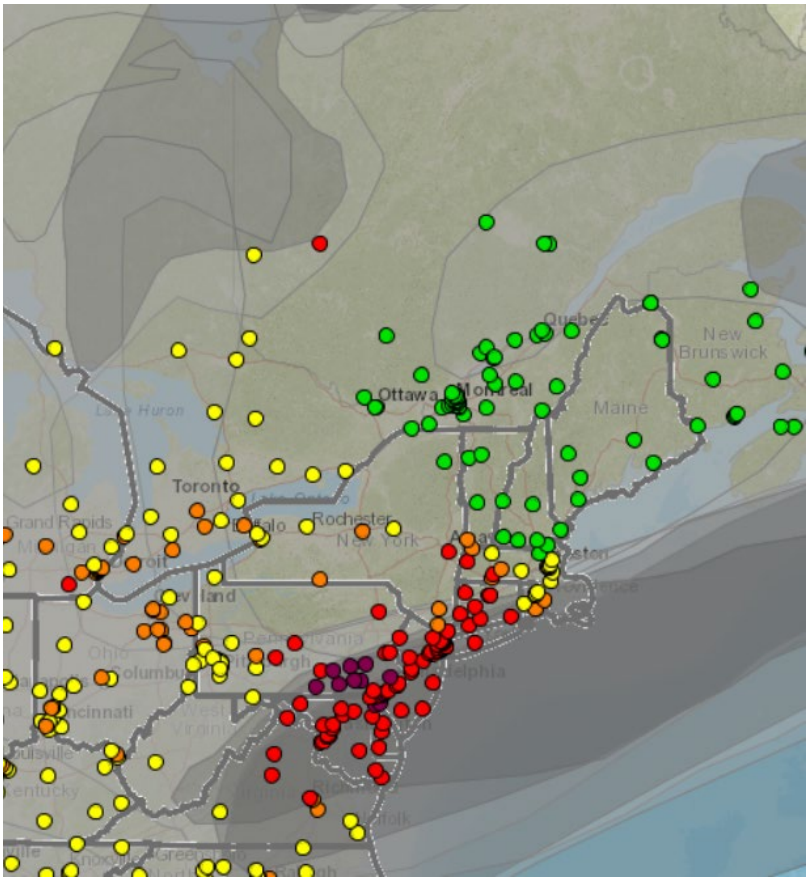
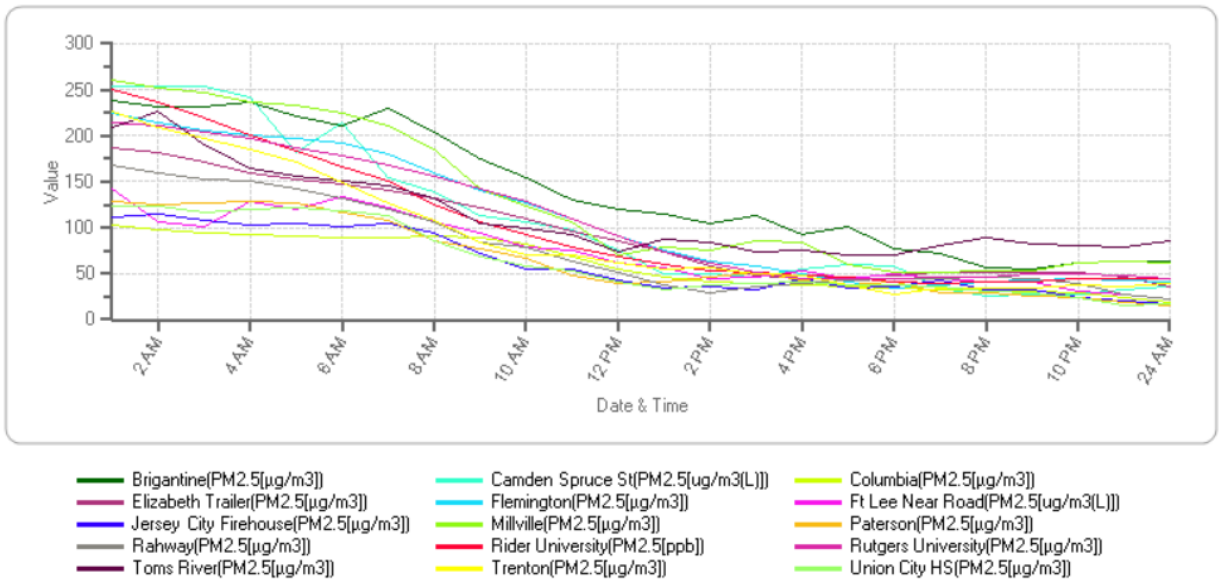


Figure 3. PM2.5 1-hr Concentrations for June 8, 2023



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). Figure 7 also shows the presence of residual Canadian wildfire smoke in the northeast, with the additional plume of smoke transporting in a southerly direction from southern Quebec and Ontario. 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)
CT	Bridgeport	94.3
CT	Waterbury	73.2
DE	KILLENS (Kent Co.)	129.2
NJ	Camden Spruce St	107.8
NJ	Elizabeth Lab	95.6
NJ	Rahway	77.5
NY	Queens	106.9
NY	Holtsville	60.6
PA	Chester	147.0
PA	Allentown	116.0

Figure 4. 48-hour Back Trajectories for June 8, 2023 at 10 meters

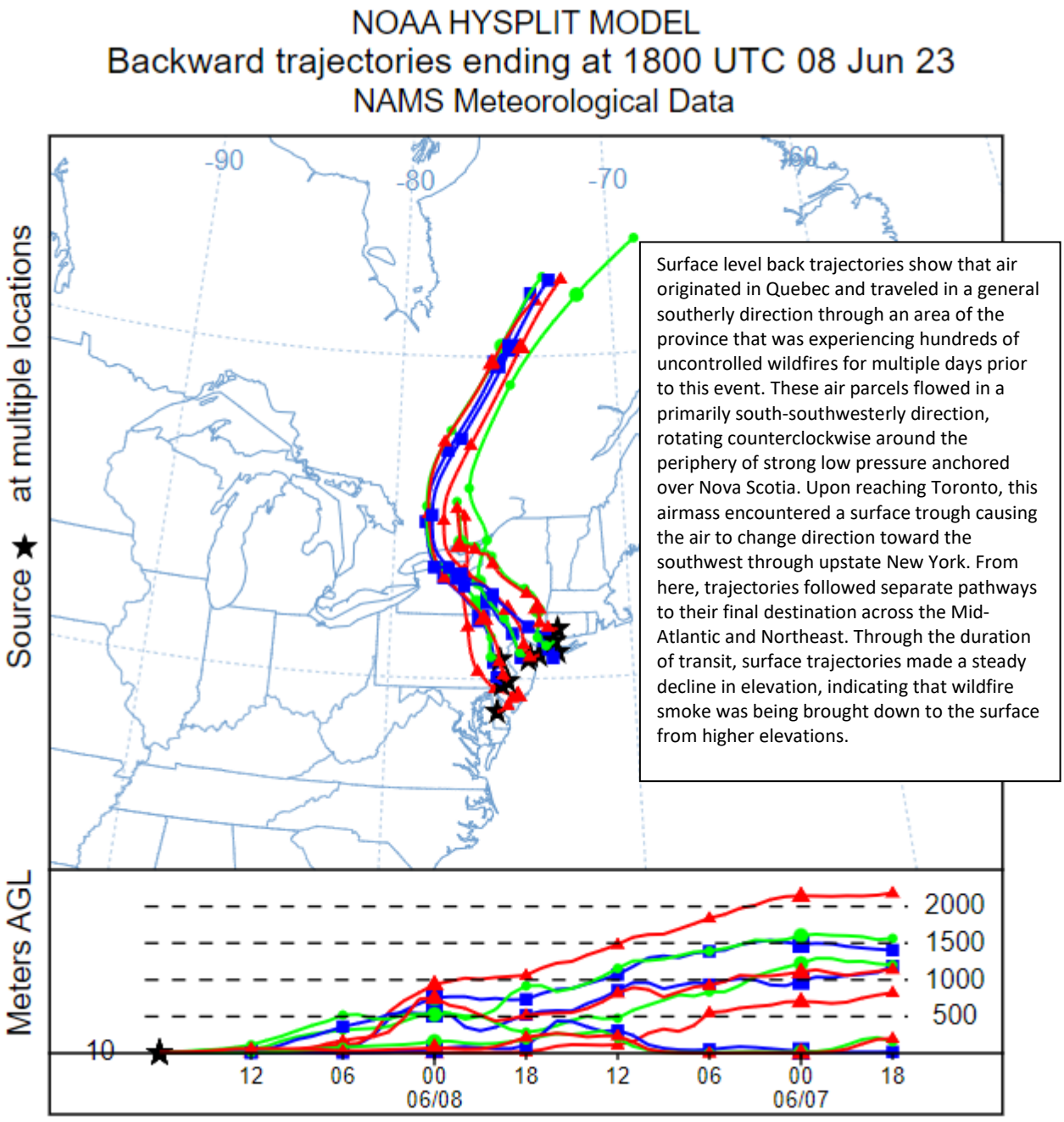


Figure 5. 48-hour Back Trajectories for June 8, 2023 at 500 meters

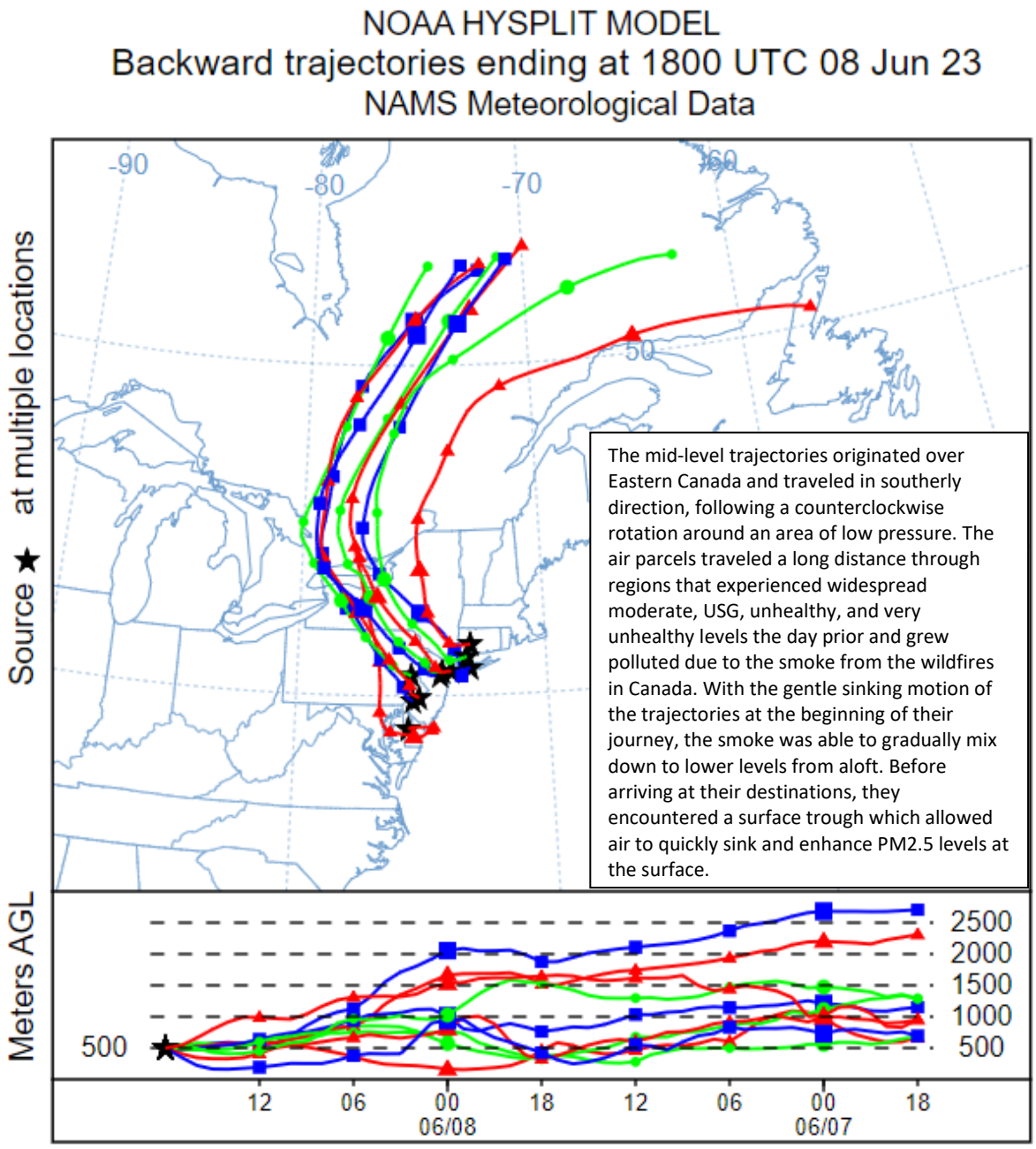


Figure 6. 48-hour Back Trajectories for June 8, 2023 at 1500 meters

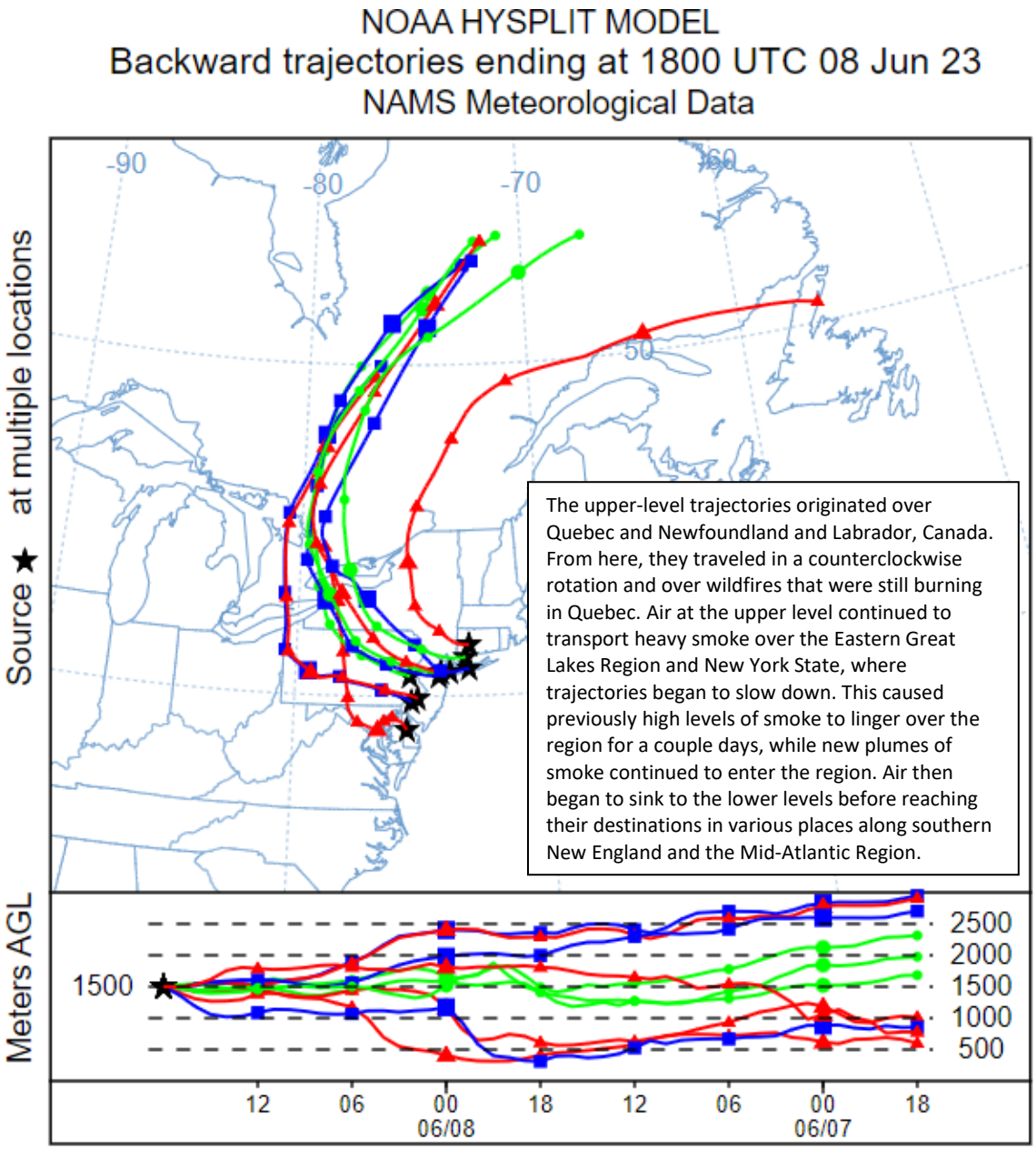
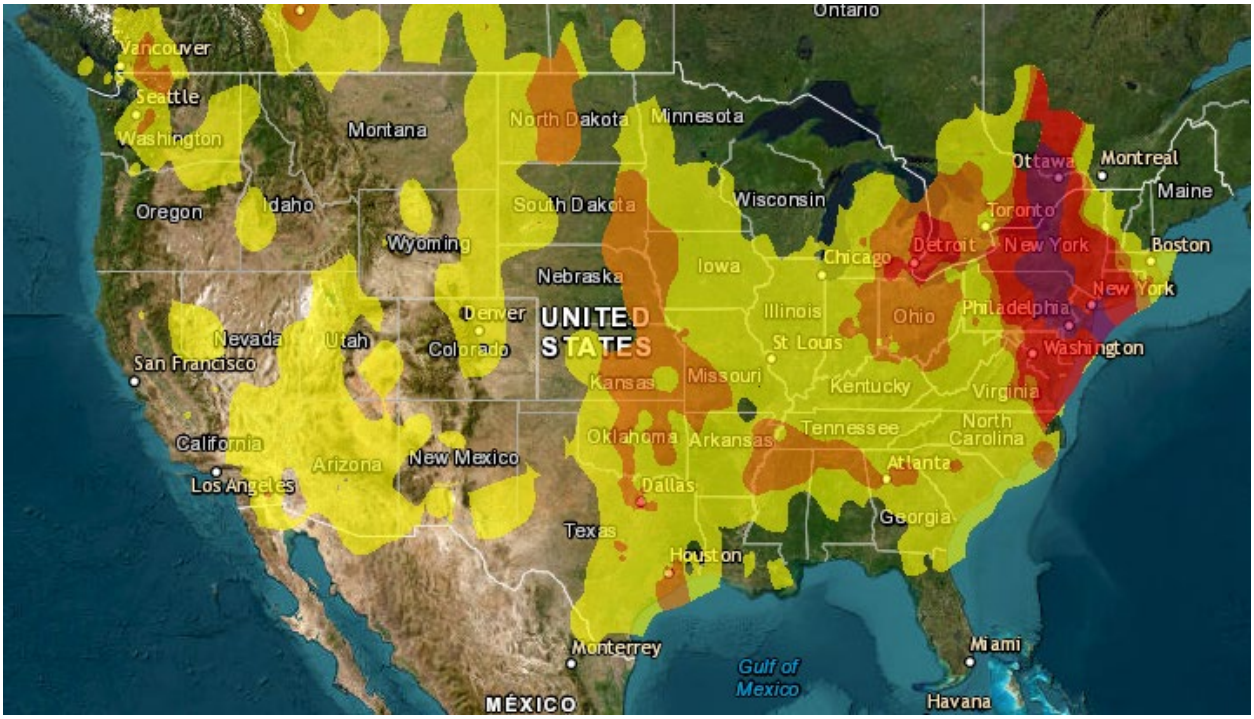


Figure 7. Air Quality Index for the United States on June 7, 2023



Source: www.airnow.gov

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 .