Fine Particulate Matter (PM2.5) National Ambient Air Quality Standard Health Exceedances on June 20, 2022 (Mullica River Wildfire)

Exceedance Locations and Levels

On Monday, June 20, 2022, there was one (1) exceedance in New Jersey of the National Ambient Air Quality Standard (NAAQS) for PM2.5 (24-hour average of 35 micrograms/cubic meter, ug/m3). A PM2.5 exceedance of the 24-hour NAAQS is measured when the concentration is 35.5 ug/m3 or greater. Smoke from the Mullica River Wildfire (Wharton State Park) that ignited on Sunday was transported by northwest winds and directly impacted the Brigantine PM2.5 monitor. 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 6/20/2022

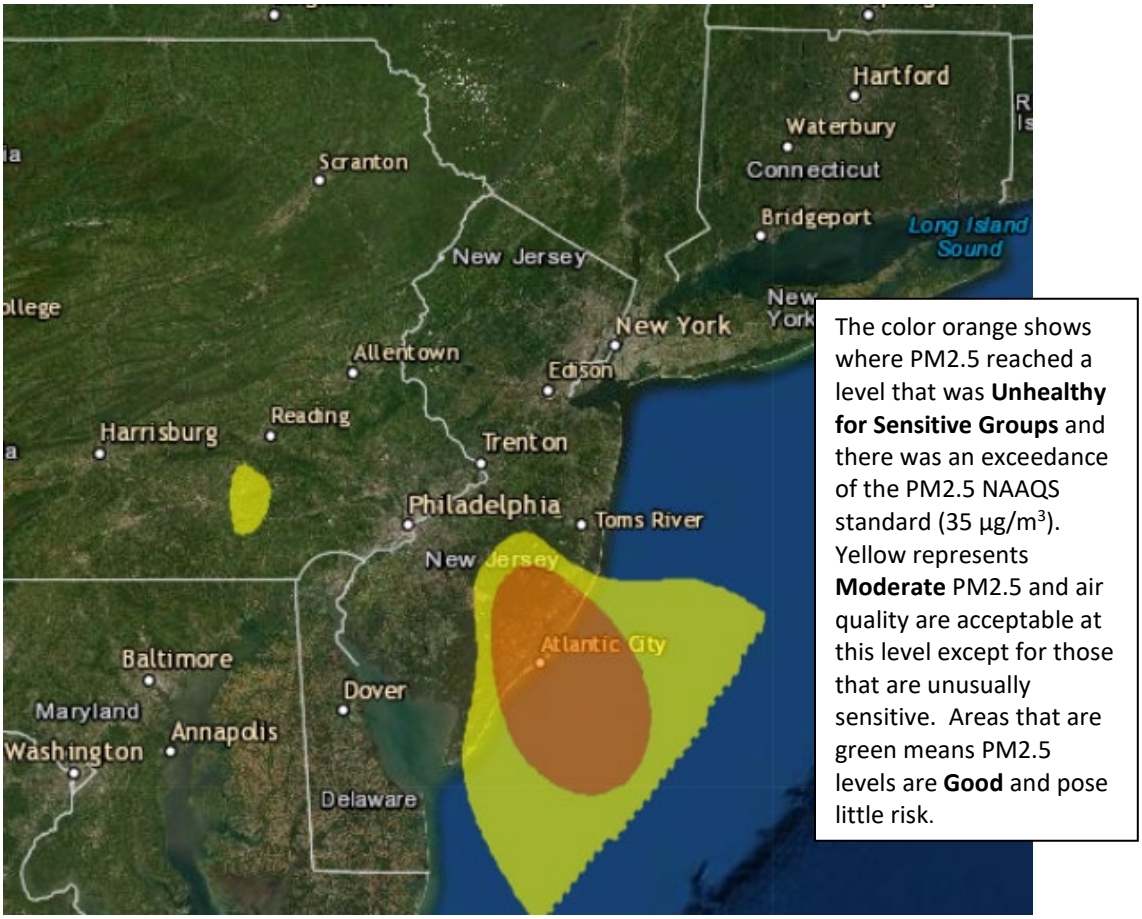
STATION	24-Hour Average (ug/m3)
Brigantine	103.6
Camden Spruce St	7.1
Columbia WMA	6.3
Elizabeth Lab	8.0
Flemington	6.5
Fort Lee Near Road	5.4
Jersey City Firehouse	8.1
Millville	7.1
Newark Firehouse	6.4
Paterson	7.0
Rahway	8.7
Rider University	6.6
Rutgers University	6.6
Toms River	6.7
Trenton	6.8
Union City HS	5.0
TOTAL EXCEEDANCES	1

From the out-of-state stations adjacent to New Jersey, there were no 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 6/20/2022

STATE	STATION	24-Hour Average (ug/m3)
CT	Bridgeport	6.5
CT	Danbury	6.1
CT	New Haven - Criscuolo Park	6.3
CT	Waterbury	6.6
DE	KILLENS (Kent Co.)	6.5
DE	LUMS 2 (New Castle Co.)	7.3
DE	MLK (New Castle Co.)	8.0
DE	Rte 9 Del City	7.0
DE	SEAFORD (Sussex Co.)	7.0
MD	Fair Hill	7.3
NY	Bklyn - PS274	No data
NY	CCNY	4.3
NY	Division Street	No data
NY	Eisenhower Park	7.4
NY	Fresh Kills	5.2
NY	Holtsville	6.3
NY	Manhattan/IS143	5.2
NY	Maspeth	6.3
NY	Queens	11.6
NY	Queens Near-Road	9.5
NY	White Plains	4.1
PA	Allentown	7.8
PA	Chester	9.9
PA	Freemansburg	8.0
PA	Marcus Hook	7.6
PA	New Garden	7.8
PA	Norristown	7.6
PA	FAB (Philadelphia Co.)	7.3
PA	MON (Philadelphia Co.)	No data
PA	NEW (Philadelphia Co.)	8.4
PA	RIT (Philadelphia Co.)	7.0
PA	TOR (Philadelphia Co.)	9.4
	TOTAL EXCEEDANCES	0

Figure 1. PM2.5 Air Quality Index for June 20, 2022



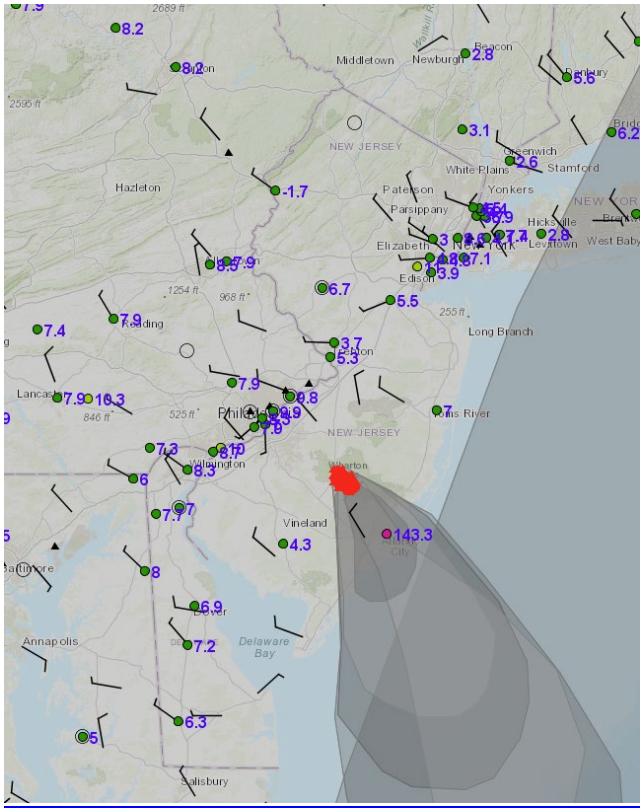
Source: www.airnow.gov

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

Weather

Weather conditions played an integral role in the spread of the Mullica River Wildfire and direction of the smoke plume that caused the highly elevated PM2.5 levels at the Brigantine monitor. High pressure situated over the Great Lakes began pushing east into the Mid-Atlantic region on Sunday June 19th, 2022. With strong low pressure centered over Nova Scotia and a clockwise flow around Mid-Atlantic high pressure, gusty northwesterly surface winds were able to impact the region on Sunday into Monday afternoon. This atmospheric setup allowed for the transport of an unseasonably dry continental air mass to New Jersey, causing surface-level dewpoint temperatures to drop into the low 40s. These conditions were ideal for the ignition and rapid spread of the Mullica River Wildfire, which allowed for the transport of wildfire smoke to coastal southeastern portions of New Jersey, as seen in Figure 2 below. This plume of wildfire smoke elevated PM2.5 concentrations in this region, resulting in an exceedance of the PM2.5 NAAQS at the Brigantine monitor on Monday, June 20th, 2022.

Figure 2. AirNow Fire and Smoke Map, Smoke Plume for June 20, 2022



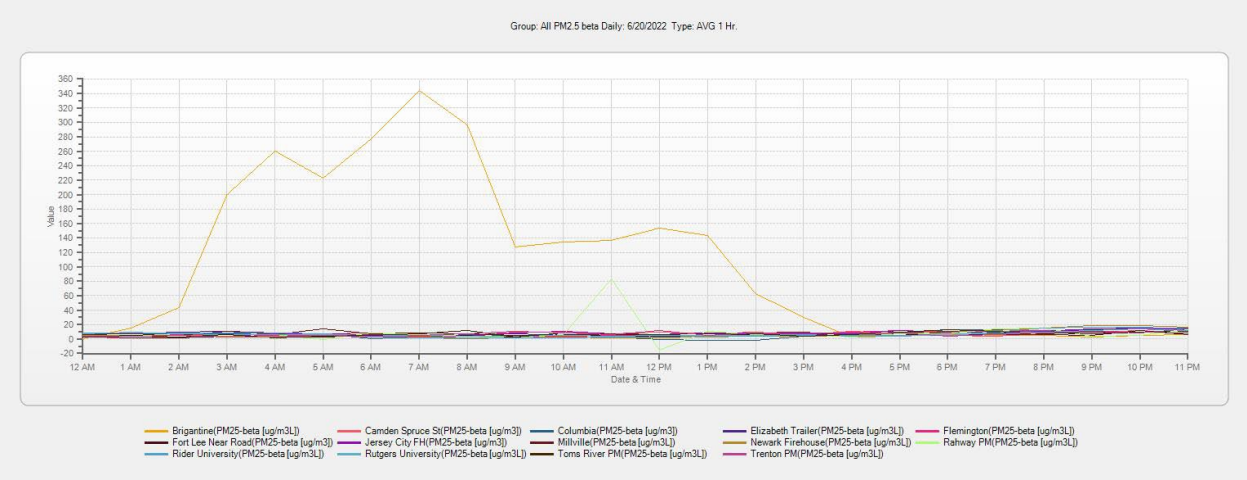
Where Did the Air Pollution that Caused PM2.5 Come From?

Mullica River Wildfire

The Mullica River Wildfire started in Southern New Jersey's Wharton State Forest on Sunday, June 19th. Over the course of the day the fire steadily advanced and by late Monday, June 20th, spread to 12,000 acres. At this time, New Jersey Forest Fire Service reported 85% containment.

Throughout the day on June 20th, northwesterly winds directed an associated smoke plume southeast toward the New Jersey coast and as a result, elevated fine particulate levels at the Brigantine monitor leading to an exceedance. Figure 3 below shows 1-hr average concentrations of PM2.5 at the Brigantine monitor on June 20th. Elevated levels were experienced for much of the day before significantly dropping in the evening and overnight hours. Figure 5 below shows that a regionally clean air mass was in place the day prior for most of the eastern United States, indicating that this was a locally generated exceedance event due to the dense plume of wildfire smoke from Wharton State Forest.

Figure 3. PM2.5 1-hr Concentrations for June 20, 2022

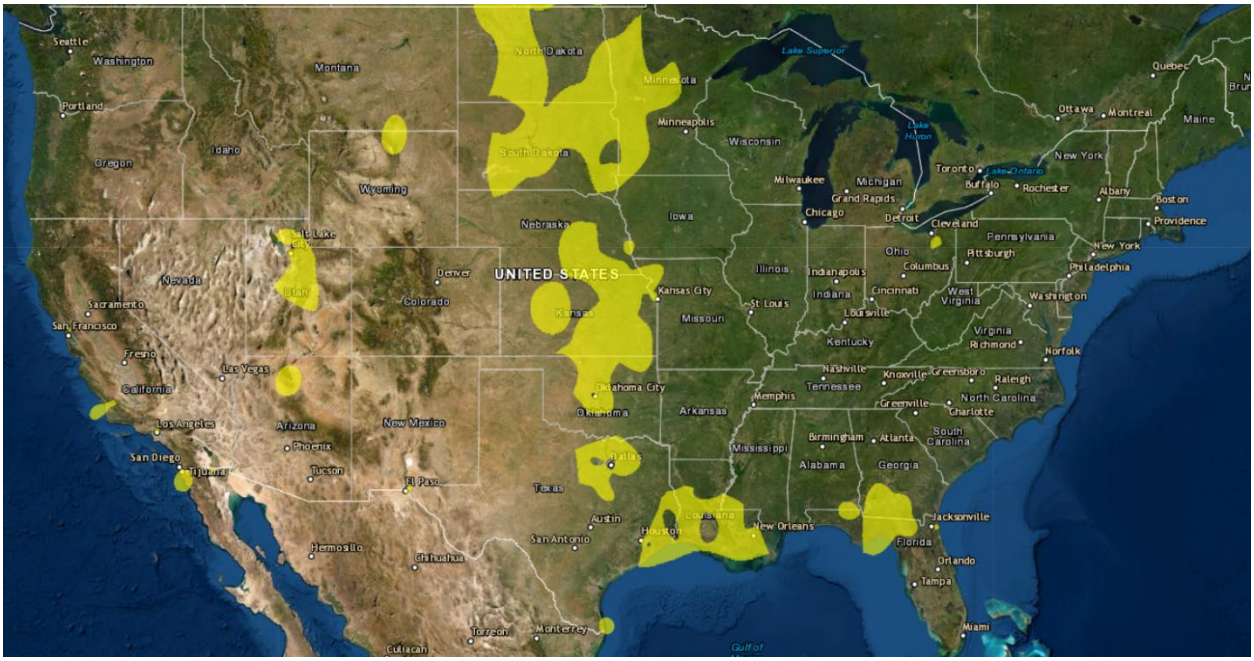


Regional Haze

Regional Haze is not caused by the air pollution from any one specific source but is caused by the emission of air pollution from numerous sources located over a wide geographic area. The fine particles that cause haze come from both natural and anthropogenic sources. Visibility at Brigantine Wilderness Area was impacted by wildfire smoke on June 20th, 2022 as seen in Figure 4. On a clear day, visibility can reach approximately 10 -12 miles. The Mullica River Wildfire reduced visibility at nearby reporting sites to approximately 2 miles on this day.

Figure 4. Brigantine Haze Cam June 20, 2022

Figure 5. Air Quality Index for the United States on June 19, 2022



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 .