Ozone National Ambient Air Quality Standard Health Exceedances on May 26, 2016

Exceedance Locations and Levels

On Thursday, May 26, 2016, eleven (11) exceedances were recorded in New Jersey of the new 8-hour average ozone National Ambient Air Quality Standard (NAAQS) of 70 ppb that became effective in December 2015 (See Table 1):

Table 1. Ozone NAAQS Exceedances in New Jersey on May 26, 2016

STATION	Daily Maximum 8-Hr Average (ppb)	Exceeds 70 ppb NAAQS	Exceeds 75 ppb NAAQS	Exceeds 84 ppb NAAQS
Ancora State Hospital	87	Yes	Yes	Yes
Bayonne	76	Yes	Yes	
Chester	86	Yes	Yes	Yes
Columbia	73	Yes		
Flemington	88	Yes	Yes	Yes
Leonia	85	Yes	Yes	Yes
Newark Firehouse	77	Yes	Yes	
Ramapo	81	Yes	Yes	
Rider University	82	Yes	Yes	
Rutgers University	86	Yes	Yes	Yes
Washington Crossing*	86	Yes	Yes	Yes

*The Washington Crossing station is operated and maintained by EPA as part of the nationwide Clear Air Status and Trends Network (CASTNET).

Ten (10) stations also exceeded the 75 ppb 8-hour ozone NAAQS of 2008, and six (6) stations exceeded the 84 ppb 8-hour ozone NAAQS of 1997. The highest 1-hour average ozone concentration recorded on May 26, 2016 in New Jersey was 101 ppb at the Leonia station, which is below the 1-hour ozone NAAQS of 120 ppb.

Thursday marks the third day in 2016 on which exceedances of the new 8-hour ozone NAAQS of 70 ppb were recorded in New Jersey. By the 26th of May in 2015, there were a total of 2 days on which ozone exceedances were measured in New Jersey (based on the 75 ppb NAAQS of 2008), and there were zero days by this same date in 2014.

There is a group of monitoring stations in designated counties of 5 states, New York, Connecticut, Pennsylvania, Delaware and Maryland, which are included in New Jersey's ozone nonattainment areas. From this group of stations in the other neighboring states, there were 27 exceedances of the new 8-hour ozone NAAQS of 70 ppb recorded on Thursday, May 26, 2016 (See Table 2):

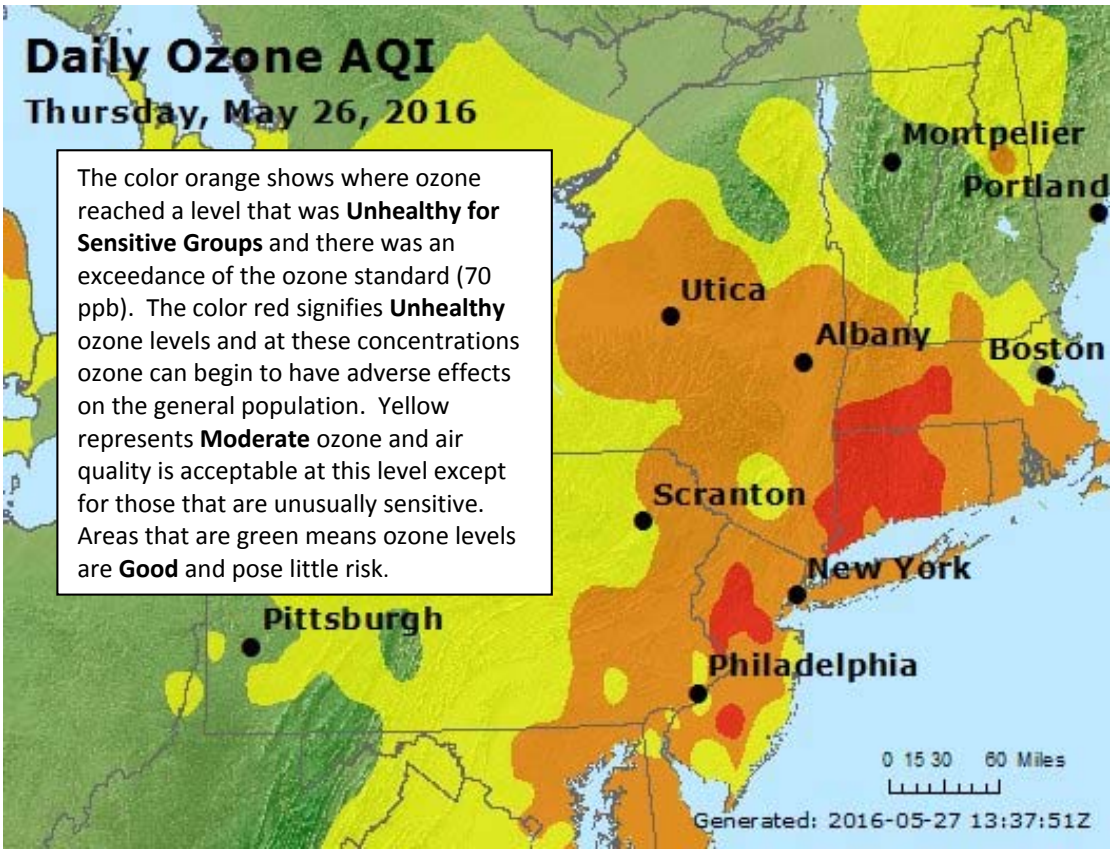
Table 2: Ozone NAAQS Exceedances at other Monitoring Stations in New Jersey's Ozone Nonattainment Areas on May 26, 2016

STATE	STATION	Daily Maximum 8-Hr Average (ppb)	Exceeds 70 ppb NAAQS	Exceeds 75 ppb NAAQS	Exceeds 84 ppb NAAQS
CT	Danbury	99	Yes	Yes	Yes
CT	Greenwich	91	Yes	Yes	Yes
CT	Madison-Beach Road	86	Yes	Yes	Yes
CT	Middletown	91	Yes	Yes	Yes
CT	New Haven	88	Yes	Yes	Yes
CT	Stratford	76	Yes	Yes	
CT	Westport	90	Yes	Yes	Yes
DE	BCSP (New Castle Co.)	75	Yes		
DE	KILLENS (Kent Co.)	73	Yes		
DE	LEWES (Sussex Co.)	71	Yes		
DE	SEAFORD (Sussex Co.)	71	Yes		
MD	Fair Hill	76	Yes	Yes	
NY	Babylon	73	Yes		
NY	CCNY	76	Yes	Yes	
NY	Holtsville	76	Yes	Yes	
NY	Pfizer Lab	71	Yes		
NY	Queens	71	Yes		
NY	Riverhead	79	Yes	Yes	
NY	Rockland Cty	81	Yes	Yes	
NY	Susan Wagner	78	Yes	Yes	
NY	White Plains	80	Yes	Yes	
PA	BRIS (Bucks Co.)	81	Yes	Yes	
PA	CHES (Delaware Co.)	71	Yes		
PA	NEWG (Chester Co.)	73	Yes		
PA	NORR (Montgomery Co.)	74	Yes		
PA	NEA (Philadelphia Co.)	79	Yes	Yes	
PA	NEW (Philadelphia Co.)	71	Yes		

Sixteen (16) stations also exceeded the 75 ppb ozone NAAQS of 2008, and six (6) stations exceeded the 84 ppb ozone NAAQS of 1997. The highest 1-hour average ozone concentration recorded was 126 ppb at Danbury, CT, which is an exceedance of the 1-hour ozone NAAQS of 120 ppb.

Thursday marks the 4th day in 2016 on which exceedances of the new 8-hour ozone NAAQS of 70 ppb were recorded in Connecticut, and the 2nd day for Delaware, Maryland, New York and Pennsylvania.

Figure 1. Ozone Air Quality Index for May 26, 2016



Source: 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

Meteorological data from across the region showed temperatures reached into the high 80°F's-low 90°F's, while winds were light and from the south/ southwest. A high pressure system was centered over the eastern Atlantic Seaboard leading to mostly sunny conditions across the region. A low pressure surface trough was also in place along the I-95 corridor from North Carolina all the way up through New Jersey, which creates conditions that allow polluted air aloft to mix down to the surface. This feature in combination with abundant sunlight, warm temperatures and light south/southwesterly winds, are all features commonly seen with an ozone exceedance.

Where Did the Air Pollution that Caused Ozone Come From?

Figures 2, 3, and 4 show the back trajectories at different wind heights for selected monitored exceedances on May 26, 2016. The figures illustrate where the winds came from during the 48 hours preceding the high ozone event. Fourteen (14) monitoring stations with the highest 8-hr ozone readings from each state were chosen to run back trajectories. The selected sites and the maximum 8-hr ozone levels recorded are listed in Table 3 below.

Table 3. Monitoring Stations with 8-hr Ozone Exceedances that Were Selected to Run 48-hr Back Trajectories

Agency	Site Name	Maximum 8-hr Ozone Conc. (ppb)
CT	Danbury	99
CT	Greenwich	91
CT	Middletown	91
CT	Westport	90
DE	New Castle (BCSP)	75
MD	Fair Hill	76
NJ	Ancora Hosptial	87
NJ	Chester	86
NJ	Flemington	88
NJ	Rutgers Univ.	86
NY	Rockland Cty	81
NY	White Plains	80
PA	Bucks (BRIS)	81
PA	Montgomery (NORR)	74

The back trajectory maps (Figures 2 and 3) for the low level (10 meter) and mid-level (500 meter) winds illustrate similar transport pathways to the exceedance monitors. Winds traveling to monitors located in New Jersey's southern nonattainment area (Maryland, Delaware, Pennsylvania, and southern New Jersey) traveled along the I-95 corridor, while winds migrating to the monitors in New Jersey's northern nonattainment area (northern New Jersey, New York, and Connecticut) originated in the Ohio River Valley and traveled across Pennsylvania and New York. In both cases the winds brought in dirty air from a region that had ozone exceedances the day before, and combined with local emissions from cars trucks, and industry. The 1500 meter winds (Figure 4) came from a more westerly flow across the Ohio River Valley, bringing additional pollution from power plants and a region that had high ozone levels to start with. Figure 5 illustrates the ozone exceedances recorded in the Mid-Atlantic and Northeast regions on May 25, 2016, the day before the high ozone event in our area.

The long range transport from the Ohio River Valley, Pennsylvania, and New York mixed with local pollution created from cars, trucks, and industry along the I-95 corridor to cause the regional ozone exceedance event that occurred on May 26, 2016. This is the second day in a row that there have been widespread ozone exceedances across the region.

Smoke from fires burning in western Canada and the southeastern United States may have been transported over and enhanced the formation of ground-level ozone across the region. Further evaluation will be required to determine if wildfire smoke was a contributing factor to the high ozone in New Jersey's nonattainment areas on May 26, 2016.

Figure 2. 48-hour Back Trajectories for May 26, 2016 at 10 meters

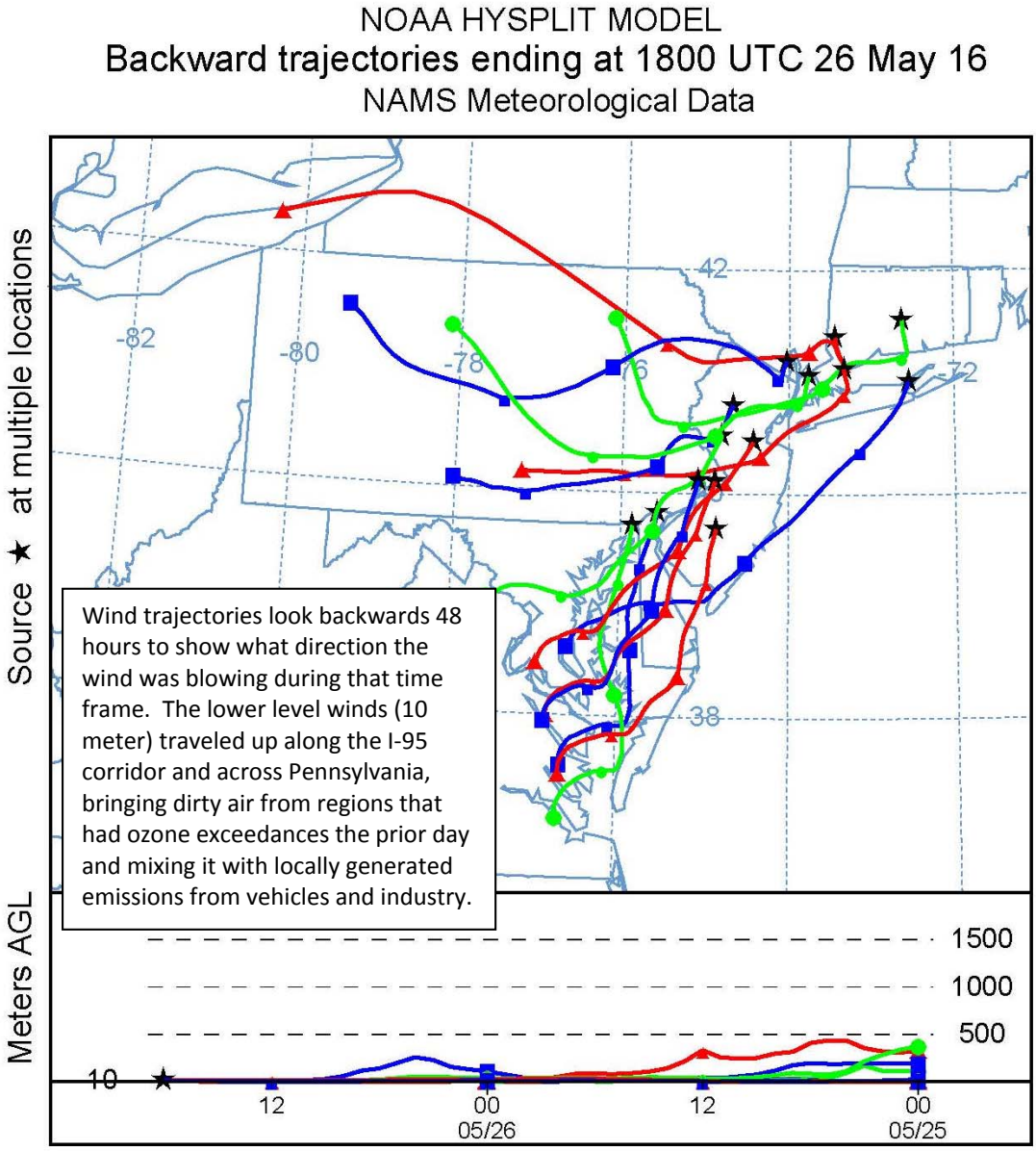


Figure 3. 48-hour Back Trajectories for May 26, 2016 at 500 meters

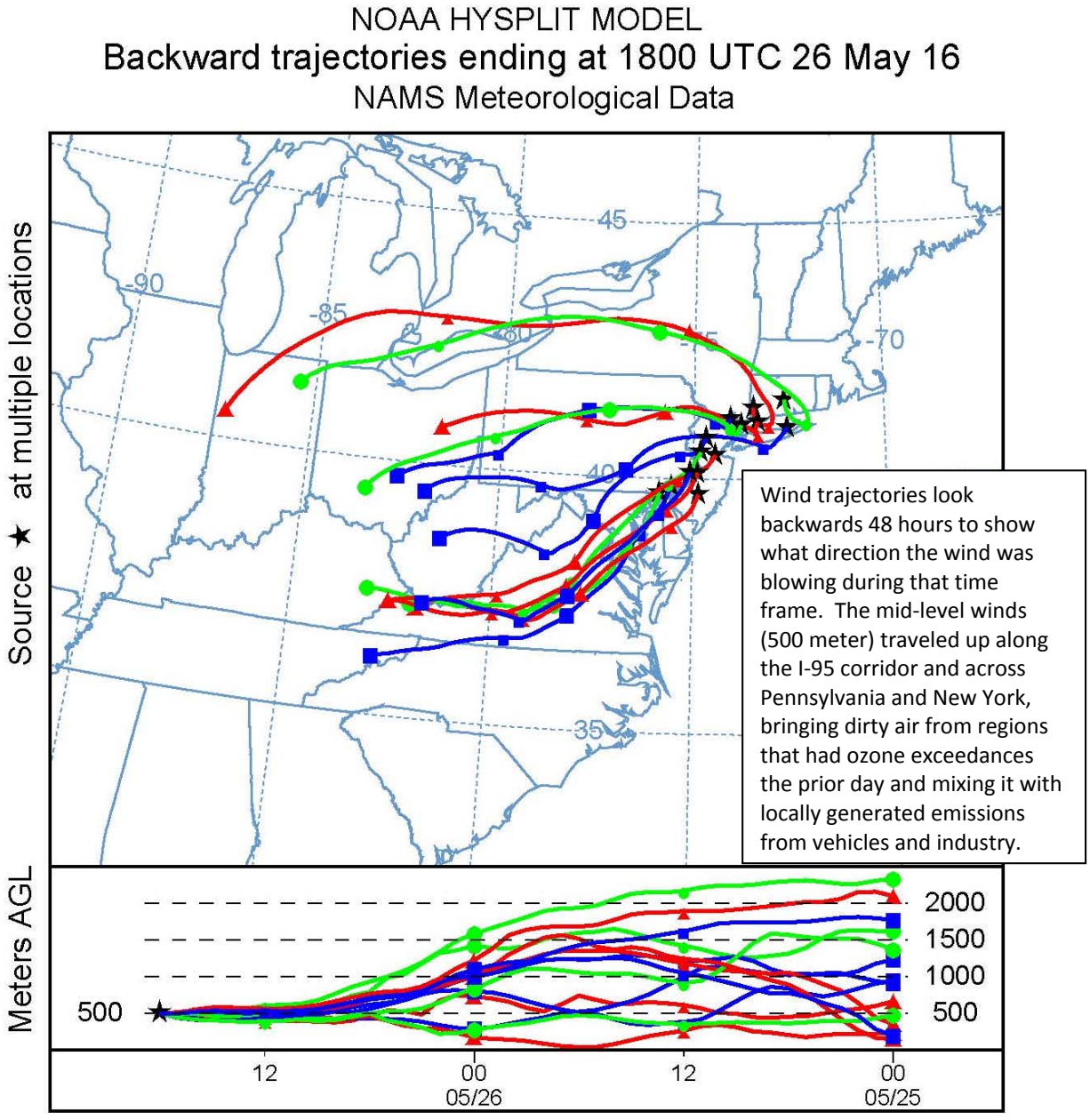


Figure 4. 48-hour Back Trajectories for May 26, 2016 at 1500 meters

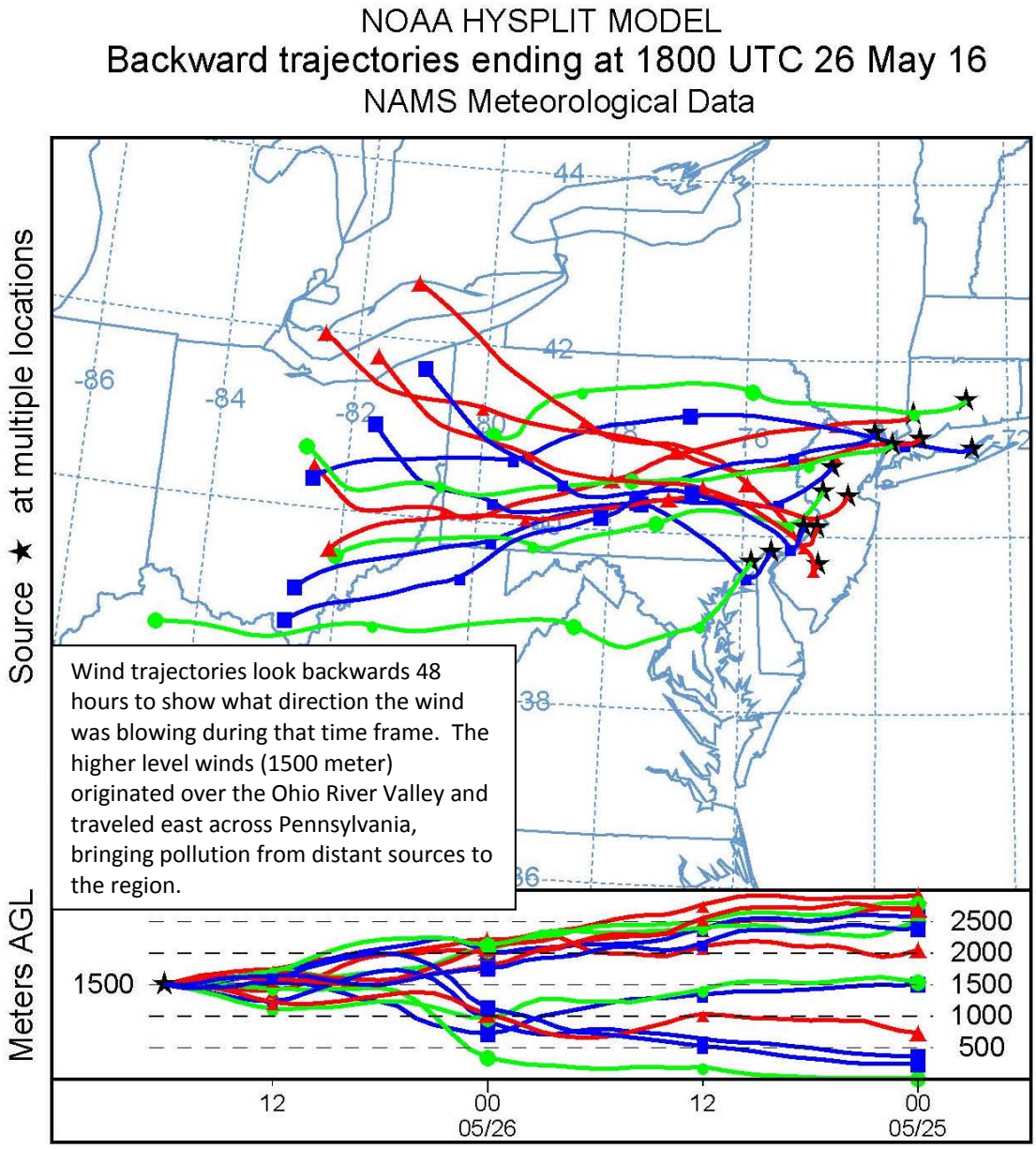
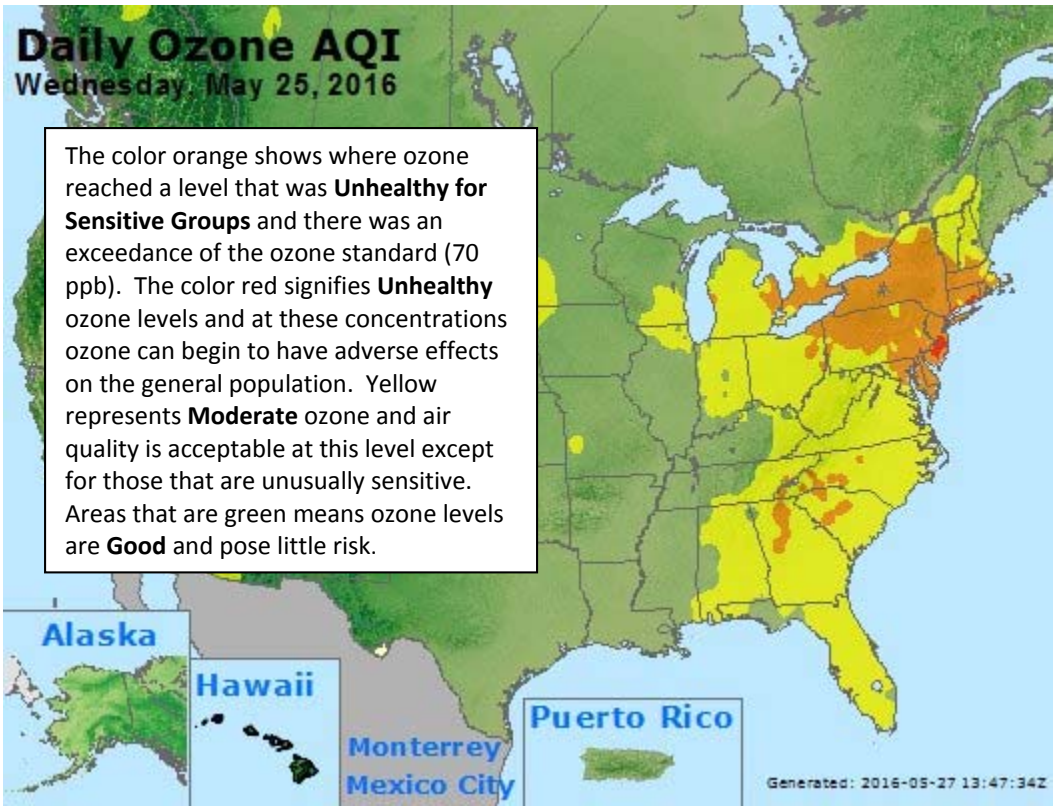


Figure 5. Ozone Air Quality Index for the Mid-Atlantic and Northeast Regions on May 25, 2016



How is Smog Created?

Ground-level ozone, also known as smog, is an air pollutant known to cause a number of health effects and negatively impact air quality and the environment in the state of New Jersey. Smog is formed when oxides of nitrogen (NOx) and volatile organic compounds (VOCs) react in the presence of sunlight. Smog can irritate any set of lungs, but those with lung-related deficiencies should take extra precautions on bad ozone days.

Find Out About Air Quality Every Day

The "What's Your Air Quality Today?" page at http://www.nj.gov/dep/cleanairnj/ tells you how to sign up to receive notifications and find out when your local air has reached unhealthy ozone levels.