NEW JERSEY:

Philadelphia-Wilmington-Atlantic City, PA-NJ-MD-DE Nonattainment Area

Intended Area Designations for the 2015 Ozone National Ambient Air Quality Standards Technical Support Document (TSD)

1.0 Summary

This technical support document (TSD) describes EPA's intent to designate Atlantic, Burlington, Camden, Cape May, Cumberland, Gloucester, Mercer, Ocean, and Salem Counties in New Jersey as part of the Philadelphia-Wilmington-Atlantic City, PA-NJ-MD-DE nonattainment area for the 2015 ozone national ambient air quality standards (NAAQS).

On October 1, 2015, EPA promulgated revised primary and secondary ozone NAAQS (80 FR 65292; October 26, 2015). EPA strengthened both standards to a level of 0.070 parts per million (ppm). In accordance with Section 107(d) of the Clean Air Act (CAA), whenever EPA establishes a new or revised NAAQS, EPA must promulgate designations for all areas of the country for that NAAQS. EPA must complete this process within 2 years of promulgating the NAAQS, unless the Administrator has insufficient information to make the initial designations decisions in that time frame. In such circumstances, EPA may take up to 1 additional year to complete the designations.

Under section 107(d), states were required to submit area designation recommendations to EPA for the 2015 ozone NAAQS no later than 1 year following promulgation of the standards, i.e., by October 1, 2016. Tribes were also invited to submit area designation recommendations. On September 29, 2016, the State of New Jersey recommended that the counties identified in Table 1 be designated as nonattainment for the 2015 ozone NAAQS based on air quality data from 2013-2015 and preliminary data from 2014-2016.

After considering these recommendations and based on EPA's technical analysis as described in this TSD, EPA intends to designate the counties listed in the third column of Table 1 as nonattainment for the 2015 ozone NAAQS. EPA must designate an area nonattainment if it has an air quality monitor that is violating the standard or if it has sources of emissions that are contributing to a violation of the NAAQS in a nearby area. Detailed descriptions of the intended nonattainment boundaries for these areas are found in the supporting technical analysis for each area in Section 3.

Table 1. New Jersey's Recommended Nonattainment Counties and the EPA's Intended Designated Nonattainment Counties for the 2015 Ozone NAAQS in the Philadelphia-Wilmington-Atlantic City, PA-NJ-MD-DE Area

Area	New Jersey's Recommended Nonattainment Counties	EPA's Intended Nonattainment Counties
Philadelphia-Wilmington-Atlantic City, PA-NJ-MD-DE	Atlantic, Burlington, Camden, Cape May, Cumberland, Gloucester, Mercer, Ocean, Salem	Atlantic, Burlington, Camden, Cape May, Cumberland, Gloucester, Mercer, Ocean, Salem

In its recommendation letter, New Jersey recommended that EPA designate a single nonattainment area that encompasses New Jersey, Connecticut, southeastern New York, eastern Pennsylvania, Delaware, Maryland,

District of Columbia, and northeastern Virginia.[1] Under the designation provision, only "nearby" areas that contribute to the violation must be included as part of the nonattainment area. There are other provisions of the CAA that address longer range transport of ozone pollution, such as sections 110(a)(2)(D), 126, and 184. The phenomenon of ozone transport must be balanced against the need to have smaller areas that can focus on local control measures. We note that most of the states that New Jersey seeks to include as part of this large nonattainment area did not make a similar request. While a few other states did request that EPA designate a broad area in the eastern part of the United States as nonattainment, each of those recommendations varied from the others. In the absence of broad agreement among all affected states to recommend such a large nonattainment, we do not intend to designate a large nonattainment area as suggested by New Jersey, and instead intend to adhere to a common-sense interpretation of the term "nearby".

Please note that the Philadelphia-Wilmington-Atlantic City, PA-NJ-DE-MD nonattainment area is a multi-state area composed of counties in Pennsylvania, New Jersey, Delaware, and Maryland.

2.0 Nonattainment Area Analyses and Intended Boundary Determination

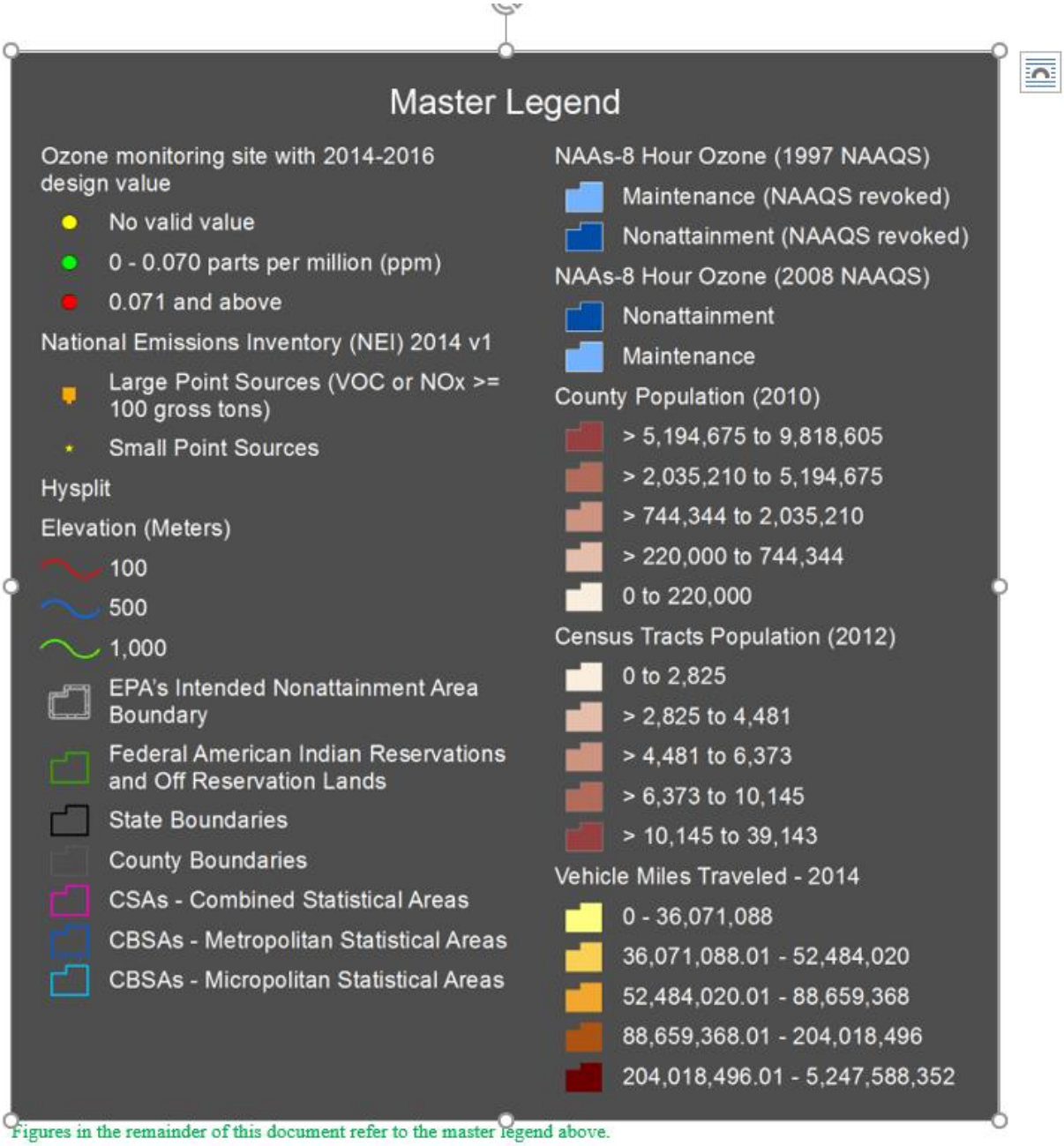
The EPA evaluated and determined the intended boundaries for each nonattainment area on a case-by-case basis, considering the specific facts and circumstances of the area. In accordance with the CAA section 107(d), the EPA intends to designate as nonattainment the areas with the monitors that are violating the 2015 ozone NAAQS and nearby areas with emissions sources (i.e., stationary, mobile, and/or area sources) that contribute to the violations. As described in the EPA's designations guidance for the 2015 NAAQS (hereafter referred to as the "ozone designations guidance"[2] after identifying each monitor indicating a violation of the ozone NAAQS in an area, the EPA analyzed those nearby areas with emissions potentially contributing to the violating area. In guidance issued in February 2016, the EPA provided that using the Core Based Statistical Area (CBSA) or Combined Statistical Area (CSA)[3] as a starting point for the contribution analysis is a reasonable approach to ensure that the nearby areas most likely to contribute to a violating area are evaluated. The area-specific analyses may support nonattainment boundaries that are smaller or larger than the CBSA or CSA.

On November 6, 2017, the EPA issued attainment/unclassifiable designations for approximately 85% of the United States and one unclassifiable area designation.[4] At that time, consistent with statements in the designations guidance regarding the scope of the area the EPA would analyze in determining nonattainment boundaries, EPA deferred designation for any counties in the larger of a CSA or CBSA where one or more counties in the CSA or CBSA was violating the standard and any counties with a violating monitor not located in a CSA or CBSA. In addition, the EPA deferred designation for any other counties adjacent to a county with a violating monitor. The EPA also deferred designation for any county that had incomplete monitoring data, any

[1] All other counties in the State of New Jersey that are included in New Jersey's broader nonattainment recommendation are addressed in a separate TSD for the New York-Northern New Jersey-Long Island, NY-NJ-CT Nonattainment Area.
[2] The EPA issued guidance on February 25, 2016 that identified important factors that the EPA intends to evaluate in determining appropriate area designations and nonattainment boundaries for the 2015 ozone NAAQS. Available at *https://www.epa.gov/ozone-designations/epa-guidance-area-designations-2015-ozone-naaqs*
[3] Lists of CBSAs and CSAs and their geographic components are provided at www.census.gov/population/www/metroareas/metrodef.html. The Office of Management and Budget (OMB) adopts standards for defining statistical areas. The statistical areas are delineated based on U.S. Census Bureau data. The lists are periodically updated by the OMB. The EPA used the most recent July 2015 update (OMB Bulletin No. 15-01), which is based on application of the 2010 OMB standards to the 2010 Census, 2006-2010 American Community Survey, as well as 2013 Population Estimates Program data.
[4] Air Quality Designations for the 2015 Ozone National Ambient Air Quality Standards published on November 16, 2017(82 FR 54232).

county in the larger of the CSA or CBSA where such a county was located, and any county located adjacent to a county with incomplete monitoring data.

The EPA is proceeding to complete the remaining designations consistent with the designations guidance (and EPA's past practice) regarding the scope of the area EPA would analyze in determining nonattainment boundaries for the ozone NAAQS as outlined above. For those deferred areas where one or more counties violating the ozone NAAQS or with incomplete data are located in a CSA or CBSA, in most cases the technical analysis for the nonattainment area includes any counties in the larger of the relevant CSA or CBSA. For counties with a violating monitor not located in a CSA or CBSA, EPA explains in the 3.0 Technical Analysis section, its decision whether to consider in the five-factor analysis for each area any other adjacent counties for which EPA previously deferred action. We intend to designate all counties not included in five-factor analyses for a specific nonattainment or unclassifiable area analyses, as attainment/unclassifiable. These deferred areas are identified in a separate document entitled "Intended Designations for Deferred Counties and Partial Counties Not Addressed in the Technical Analyses." which is available in the docket.



Figures in the remainder of this document refer to the master legend above.

3.0 Technical Analyses for Nonattainment Areas

This technical analysis identifies the area with monitors that violate the 2015 ozone NAAQS. It also provides EPA's evaluation of this area and any nearby areas to determine whether those nearby areas have emissions sources that potentially contribute to ambient ozone concentrations at the violating monitors in the area, based on the weight-of-evidence of the five factors recommended in EPA's ozone designations guidance and any other relevant information. In developing this technical analysis, EPA used the latest data and information available to EPA (and to the states and tribes through the Ozone Designations Mapping Tool and EPA Ozone Designations Guidance and Data web page).[5] In addition, EPA considered any additional data or information provided to EPA by states or tribes.

[5] EPA's Ozone Designations Guidance and Data web page can be found at *https://www.epa.gov/ozone-designations/ozone-designations-guidance-and-data.*

3.1 Technical Analysis for the Philadelphia-Wilmington-Atlantic City, PA-NJ-MD-DE Area and the Reading, PA Area

The area of analysis for this technical support document is the Philadelphia-Reading-Camden, PA-NJ-DE-MD CSA, plus two counties in New Jersey (Mercer and Ocean) that are in the New York-Newark, NY-NJ-CT-PA CSA, and are in the Philadelphia-Wilmington-Atlantic City, PA-NJ-MD-DE nonattainment area for the 2008 ozone NAAQS. Based on EPA's analysis for the 2008 ozone NAAQS, Ocean and Mercer Counties, NJ were more affected by emissions from counties in the Philadelphia metropolitan area than emissions from counties in the New York-Northern New Jersey-Long Island, NY-NJ-CT Nonattainment Area, also referred to as the New York Metro nonattainment Area, thus EPA concluded that Ocean and Mercer Counties, NJ should be included in the Philadelphia-Wilmington-Atlantic City, PA-NJ-DE-MD nonattainment area. The Philadelphia-Reading-Camden CSA includes several CBSAs in Pennsylvania (PA), New Jersey (NJ), Delaware (DE), and Maryland (MD). The largest CBSA is the Philadelphia-Camden-Wilmington CBSA which includes Bucks, Chester, Delaware, Montgomery, and Philadelphia Counties in Pennsylvania; Burlington, Camden, Gloucester, and Salem Counties in New Jersey; New Castle County in Delaware; and Cecil County in Maryland. In addition, the CSA includes three smaller CBSAs in New Jersey. The Atlantic City-Hammonton, Ocean City, and Vineland-Bridgeton CBSAs include Atlantic, Cape May, and Cumberland Counties, respectively. Finally, the Dover CBSA includes Kent County in Delaware, and the Reading CBSA includes Berks County in Pennsylvania.

The five factors recommended in EPA's guidance are:

1. Air Quality Data (including the design value calculated for each Federal Reference Method (FRM) or Federal Equivalent Method (FEM) monitor;
2. Emissions and Emissions-Related Data (including locations of sources, population, amount of emissions, and urban growth patterns);
3. Meteorology (weather/transport patterns);
4. Geography/Topography (including mountain ranges or other physical features that may influence the fate and transport of emissions and ozone concentrations); and
5. Jurisdictional Boundaries (e.g., counties, air districts, existing nonattainment areas, areas of Indian country, Metropolitan Planning Organizations (MPOs)).

Figure 1 is a map of EPA's intended nonattainment boundaries for the Philadelphia-Wilmington-Atlantic City, PA-NJ-MD-DE Area and the Reading, PA Area. The map shows the location of the air quality monitors, counties, and other jurisdictional boundaries for the area. It also shows the 2008 nonattainment boundary for the Philadelphia-Wilmington-Atlantic City, PA-NJ-MD-DE Area and the separate Reading, PA nonattainment area.

For purposes of the 1997 and 2008 ozone NAAQS, the Philadelphia-Wilmington-Atlantic City Area and the Reading Area were designated as nonattainment. The boundary for the Philadelphia-Wilmington-Atlantic City, PA-NJ-MD-DE nonattainment area for the 1997 and 2008 ozone NAAQS included the entire counties of Bucks, Chester, Delaware, Montgomery, and Philadelphia in Pennsylvania. Atlantic, Burlington, Camden, Cape May, Cumberland, Gloucester, Mercer, Ocean, and Salem Counties in New Jersey; New Castle County in Delaware, and Cecil County in Maryland (Figure 1). For the Philadelphia-Wilmington-Atlantic City, the intended boundaries for the 2015 ozone NAAQS are the same as the boundaries for the 1997 and 2008 ozone NAAQS. The boundary for the Reading, PA nonattainment area for the 1997 and 2008 ozone NAAQS included the entire county of Berks County, PA (Figure 1a).

Exceptional Events

Pennsylvania has submitted an Exceptional Events (EE) package for the Berks County monitor. EPA is reviewing the EE package. If EPA approves the EE package, the 2014-2016 design value for that monitor would move from violating to attaining the 2015 ozone NAAQS. If EPA concurs on the EE package, EPA intends to designate Berks County as attainment/unclassifiable. Pennsylvania recommended attainment for Berks County, PA.

Figure 1. EPA's Intended 2015 Ozone Nonattainment Boundaries for the Philadelphia-Wilmington-Atlantic City, PA-NJ-MD-DE Area

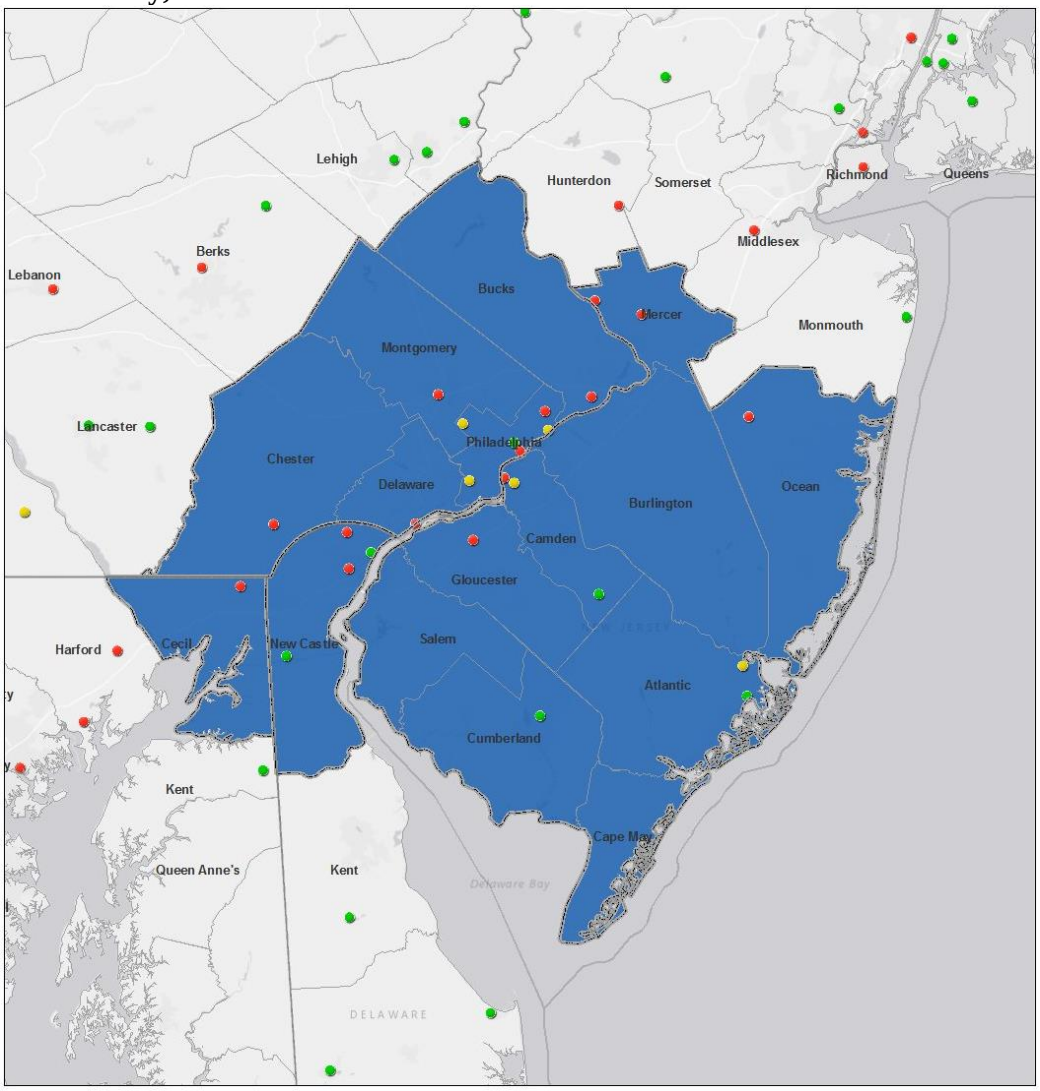
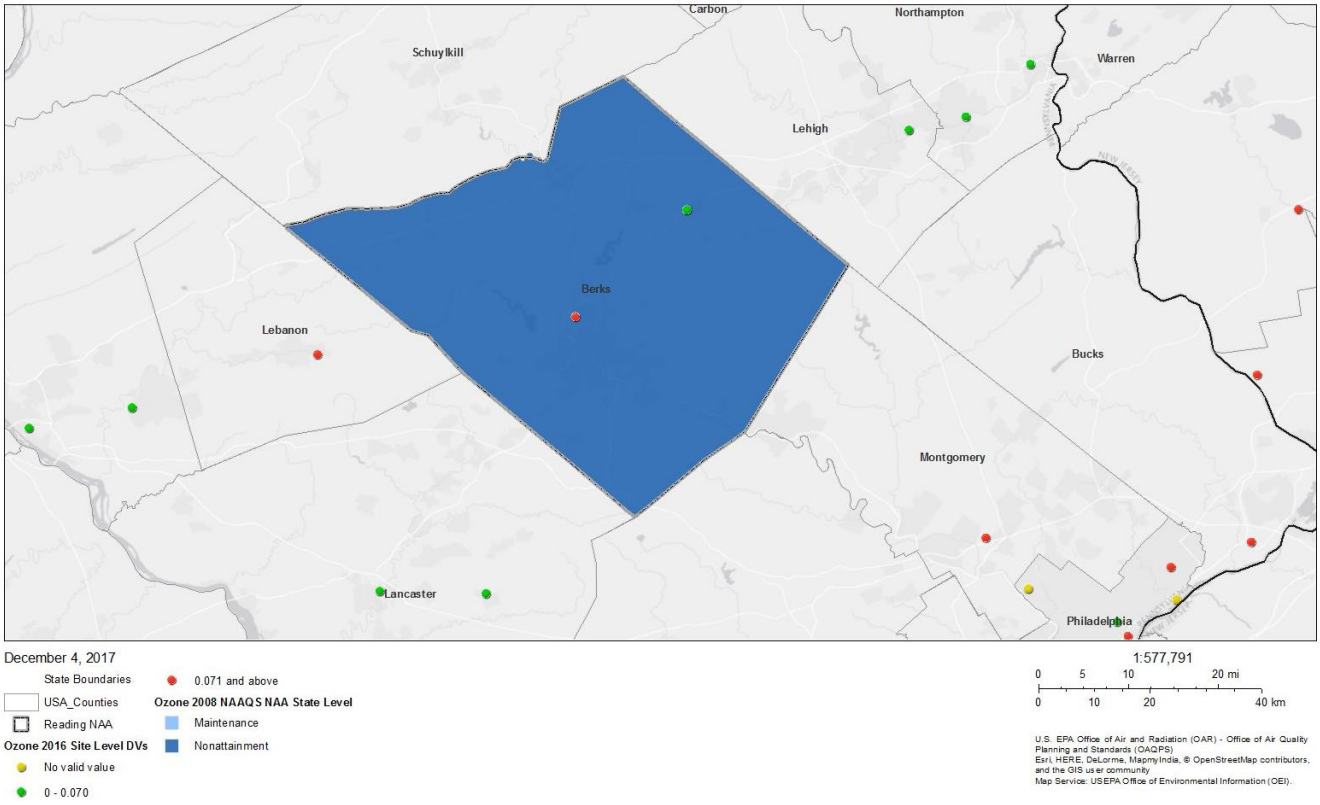


Figure 1a. EPA's Intended 2015 Ozone Nonattainment Boundaries for the Reading, PA Area (Berks County)



EPA must designate as nonattainment any area that violates the NAAQS and any nearby areas that contribute to the violation in the violating area. New Castle County, DE; Cecil County, MD; Berks, Bucks, Chester, Delaware, Montgomery, and Philadelphia Counties in PA, and Camden, Gloucester, Mercer, and Ocean Counties in NJ, all have monitors in violation of the 2015 ozone NAAQS, therefore these counties are included in the intended nonattainment areas. The following sections describe the five factor analysis. While the factors are presented individually, they are not independent. The five factor analysis process carefully considers the interconnections among the different factors and the dependence of each factor on one or more of the others, such as the interaction between emissions and meteorology for the area being evaluated.

Factor Assessment

Factor 1: Air Quality Data

EPA considered 8-hour ozone design values in ppm for air quality monitors in the area of analysis based on data for the 2014-2016 period (i.e., the 2016 design value, or DV). This is the most recent three-year period with fully-certified air quality data. The design value is the 3-year average of the annual 4th highest daily maximum 8-hour average ozone concentration.[6] The 2015 NAAQS are met when the design value is 0.070 ppm or less. Only ozone measurement data collected in accordance with the quality assurance (QA) requirements using approved (FRM/FEM) monitors are used for NAAQS compliance determinations.[7] EPA uses FRM/FEM measurement data residing in EPA's Air Quality System (AQS) database to calculate the ozone design values. Individual violations of the 2015 ozone NAAQS that EPA determines have been caused by an exceptional event

[6] The specific methodology for calculating the 2015 and 2016 ozone design values, including computational formulas and data completeness requirements, is described in 40 CFR part 50, appendix U.

[7] The QA requirements for ozone monitoring data are specified in 40 CFR part 58, appendix A. The performance test requirements for candidate FEMs are provided in 40 CFR part 53, subpart B.

that meets the administrative and technical criteria in the Exceptional Events Rule[8] are not included in these calculations. Whenever several monitors are located in a county (or designated nonattainment area), the design value for the county or area is determined by the monitor with the highest valid design value. The presence of one or more violating monitors (i.e. monitors with design values greater than 0.070 ppm) in a county or other geographic area forms the basis for designating that county or area as nonattainment. The remaining four factors are then used as the technical basis for determining the spatial extent of the designated nonattainment area surrounding the violating monitors based on a consideration of what nearby areas are contributing to a violation of the NAAQS.

EPA identified monitors where the most recent design values violate the NAAQS, and examined historical ozone air quality measurement data (including previous design values) to understand the nature of the ozone ambient air quality problem in the area. Eligible monitors for providing design value data generally include State and Local Air Monitoring Stations (SLAMS) that are operated in accordance with 40 CFR part 58, appendix A, C, D and E and operating with an FRM or FEM monitor. These requirements must be met in order to be acceptable for comparison to the 2015 ozone NAAQS for designation purposes. All data from Special Purpose Monitors (SPMs) using an FRM or FEM are eligible for comparison to the NAAQS, subject to the requirements given in the March 28, 2016 Revision to Ambient Monitoring Quality Assurance and Other Requirements Rule (81 FR 17248).

The 2014-2016 design values for counties in the Philadelphia-Reading-Camden, PA-NJ-DE-MD CSA (area of analysis) are shown in Table 2.

Table 2. Air Quality Data (all values in ppm)[a]

County, State	State Recommended Nonattainment?	AQS Site ID	2014-2016 DV	2014 4th highest daily max value	2015 4th highest daily max value	2016 4th highest daily max value
Kent, DE	No	100010002	0.066	0.066	0.066	0.068
New Castle, DE	Yes	100031007	0.068	0.071	0.065	0.069
		100031010	**0.074**	0.074	0.071	0.078
		100031013	0.070	0.069	0.069	0.074
		100032004	0.071	0.068	0.072	0.073
Cecil, MD	No	240150003	**0.076**	0.074	0.074	0.080
Atlantic, NJ	Yes	340010006	0.064	0.061	0.068	0.063
Burlington, NJ	Yes	No monitor				
Camden, NJ	Yes	340070002	**0.075**	0.068	0.079	0.078
		340071001	0.069	0.068	0.072	0.069
Cape May, NJ	Yes	No monitor				
Cumberland, NJ	Yes	340110007	0.068	0.067	0.068	0.069
Gloucester, NJ	Yes	340150002	**0.074**	0.070	0.076	0.076
Mercer, NJ	Yes	340210005	0.072	0.071	0.073	0.074
		340219991	**0.073**	0.071	0.075	0.074
Ocean, NJ	Yes	340290006	**0.073**	0.072	0.075	0.072
Salem, NJ	Yes	No monitor				
Berks, PA	No	420110006	0.066	0.063	0.066	0.070
		420110011	**0.071**	0.068	0.071	0.075

[8] EPA finalized the rule on the Treatment of Data Influenced by Exceptional Events (81 FR 68513) and the guidance on the Preparation of Exceptional Events Demonstrations for Wildfire Events in September of 2016. For more information, see *https://www.epa.gov/air-quality-analysis/exceptional-events-rule-and-guidance.*

Bucks, PA	Yes	420170012	**0.077**	0.071	0.082	0.080
Chester, PA	Yes	420290100	**0.073**	0.071	0.068	0.080
Delaware, PA	Yes	420450002	**0.072**	0.073	0.074	0.071
Montgomery, PA	Yes	420910013	**0.072**	0.072	0.073	0.073
Philadelphia, PA	Yes	421010004	0.061	0.058	0.057	0.069
		421010024	**0.077**	0.072	0.079	0.080
		421010048	0.074	0.068	0.078	0.076

[a] The highest design value in each county is indicated in bold type.

New Castle County, DE; Cecil County, MD; Berks, Bucks, Chester, Delaware, Montgomery, and Philadelphia, PA; and Camden, Gloucester, Mercer, and Ocean Counties, NJ all show violations of the 2015 ozone NAAQS, therefore, these counties are included in the intended nonattainment areas. A county (or partial county) must also be designated nonattainment if it contributes to a violation in a nearby area. Each county without a violating monitor that is located near a county with a violating monitor has been evaluated based on the weight-of-evidence of the five factors and other relevant information to determine whether it contributes to the nearby violation.

Figures 1 and 1a, shown previously, identify the Philadelphia-Wilmington-Atlantic City and Reading intended nonattainment areas and the violating monitors. Table 2 identifies the design values for all monitors in the area of analysis. Figure 2a, below, shows the historical trends of design values for the violating monitors except for monitor 421010048 (in Philadelphia), which is a new monitor that started operating in October 2013. The 2014-2016 design value of 0.074 ppm is the first valid design value for this monitor. Figures 2b and 2c, below, show more detail by separating the monitors into two groups, those with design values equal to or greater than 0.074 ppm and less than 0.074 ppm, respectively.

As indicated on the maps in Figures 1 and 1.a, there are 15 violating monitors located in 12 counties in the area of analysis. The violating monitor in Berks County, PA is located in the City of Reading, at the Reading Regional Airport. The violating monitor in Montgomery County is located adjacent to the Pennsylvania Turnpike (Interstate 76 or I-76) in the City of Norristown, approximately nine miles northwest of Philadelphia. Seven violating monitors are located adjacent to Interstate 95 (I-95), one in Bucks County, PA, two in the City of Philadelphia, PA, one in the City of Chester, in Delaware County, PA, one in Camden County, NJ, one in Mercer County, NJ at Rider University in Lawrenceville, and one in New Castle County, DE in the City of Wilmington. Another violating monitor in New Castle County, DE is located due north of the City of Wilmington, near U.S. Route 202. Another violating monitor in Mercer County, NJ is located along the Delaware River in Washington Crossing State Park. The violating monitor in Ocean County, NJ is located in the Colliers Mills Wildlife Management Area. The violating monitor in Gloucester County, NJ is located adjacent to the New Jersey Turnpike. The violating monitor in Delaware County, PA is adjacent to U.S. Route 1. The violating monitor in Cecil County, MD is located in the Fair Hill Natural Resource Management Area, a Maryland state park.

Figure 2a. Three-Year Design Values for Violating Monitors (2006-2016).

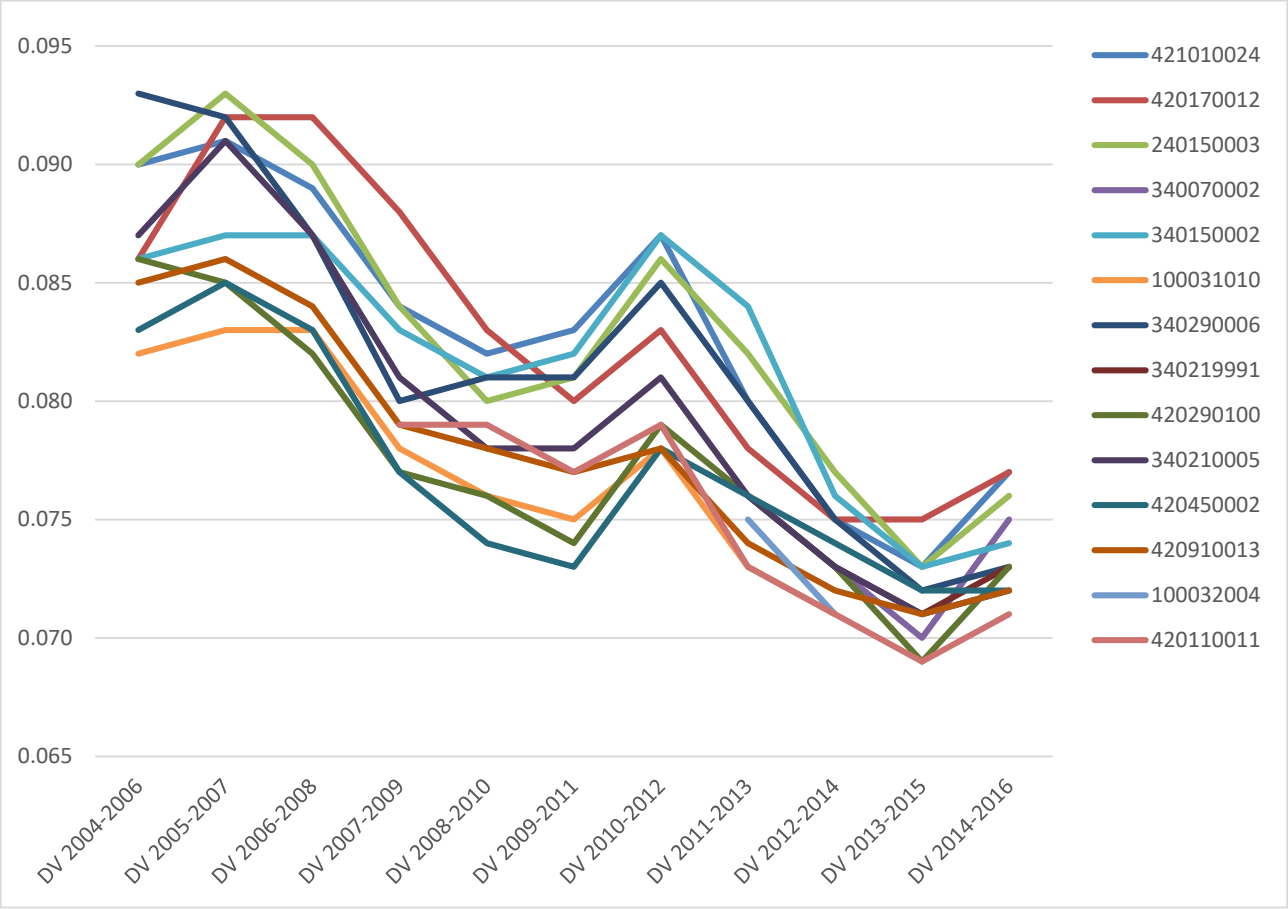
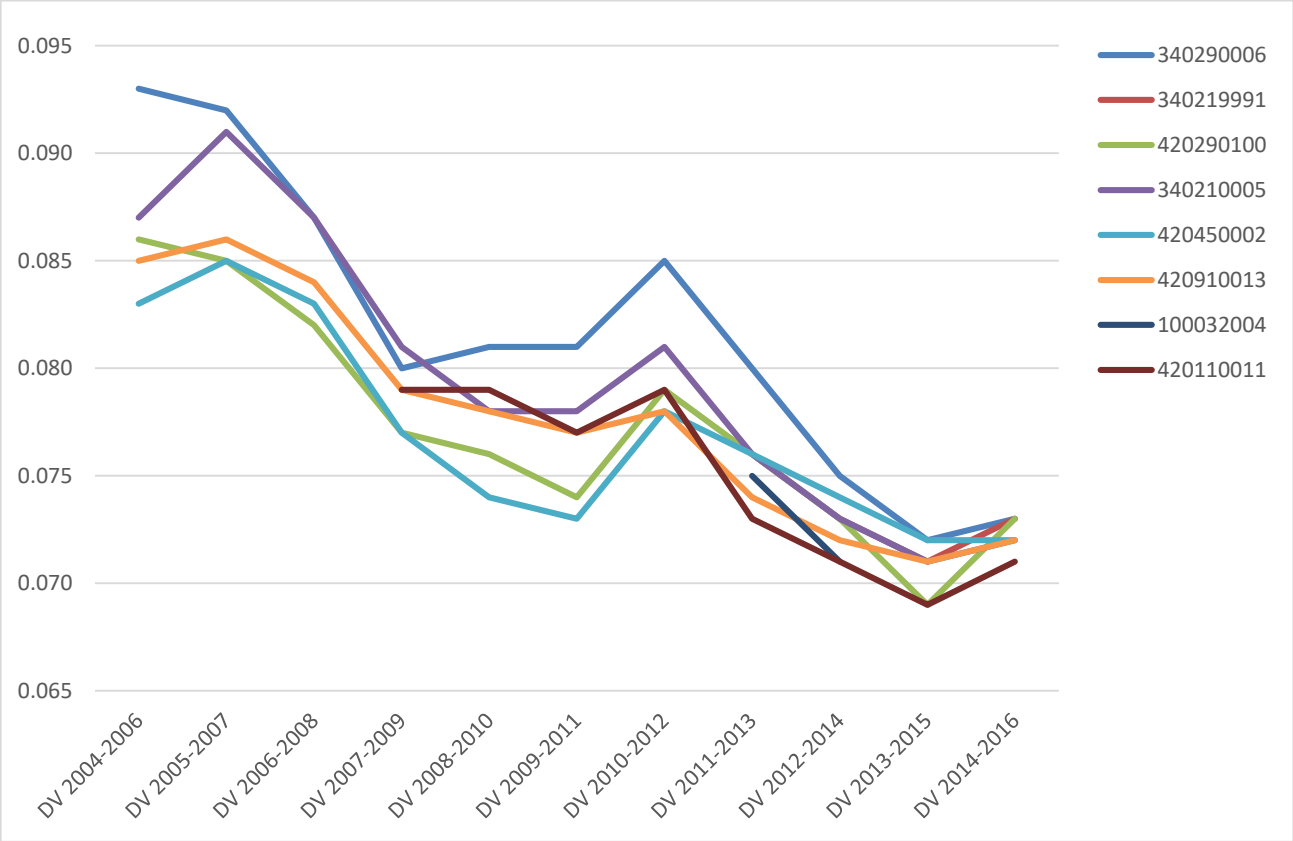


Figure 2b. Three-Year Design Values for Violating Monitors (2006-2016) – Highest Violating Monitors.

Figure 2c. Three-Year Design Values for Violating Monitors (2006-2016) – Other Violating Monitors



Almost all the violating monitors in the area of analysis show design value peaks in 2007, 2012, and 2016 and lows in 2011 and 2015. The Berks County, PA violating monitor (420110011) has the lowest 2014-2016 design value, just above the 2015 ozone NAAQS at 0.071 ppm, and has DVs among the lowest in the area from 2013 through 2016. Monitors in Bucks (420170012) and Philadelphia (421010024) Counties in Pennsylvania have the highest 2014-2016 design values, at 0.077 ppm, with the Cecil County, MD monitor (240150003) close behind at 0.076 ppm.

Factor 2: Emissions and Emissions-Related Data

EPA evaluated ozone precursor emissions of nitrogen oxides (NO_x) and volatile organic compounds (VOC) and other emissions-related data that provide information on areas contributing to violating monitors.

Emissions Data

EPA reviewed data from the 2014 National Emissions Inventory (NEI). For each county in the area of analysis, EPA examined the magnitude of large sources (NO_x or VOC emissions greater than 100 tons per year) and small point sources and the magnitude of county-level emissions reported in the NEI. These county-level emissions represent the sum of emissions from the following general source categories: point sources, non-point (i.e., area) sources, non-road mobile, on-road mobile, and fires. Emissions levels from sources in a nearby area indicate the potential for the area to contribute to monitored violations.

Table 3a provides a county-level emissions summary of NO_x and VOC (given in tons per year (tpy)) emissions for the area of analysis considered for inclusion in the intended Philadelphia-Wilmington-Atlantic City and Reading nonattainment areas.

Table 3a. Total County-Level NO_x and VOC Emissions.

County	State Recommended Nonattainment?	Total NO_x (tpy)	Total VOC (tpy)
Kent, DE	No	6,760	5,255
New Castle, DE	Yes	15,115	9,191
Cecil, MD	No	3,662	2,794
Atlantic, NJ	Yes	5,795	6,351
Burlington, NJ	Yes	7,900	15,844
Camden, NJ	Yes	7,243	9,311
Cape May, NJ	Yes	3,645	4,122
Cumberland, NJ	Yes	3,445	6,173
Gloucester, NJ	Yes	6,168	8,640
Mercer, NJ	Yes	6,400	6,134
Ocean, NJ	Yes	12,990	16,317
Salem, NJ	Yes	2,919	1,945
Berks, PA	No	13,379	13,067
Bucks, PA	Yes	13,311	16,700
Chester, PA	Yes	11,246	13,627
Delaware, PA	Yes	13,144	11,009
Montgomery, PA	Yes	18,285	21,117
Philadelphia, PA	Yes	20,210	21,732
	Area wide	171,617	189,329

In addition to reviewing county-wide emissions of NO_x and VOC in the area of analysis, EPA also reviewed emissions from large point sources. The location of these sources, together with the other factors, can help inform nonattainment boundaries. The locations of the large point sources are shown in Figures 3a and large and small point sources are shown in figure 3b, below. The intended nonattainment boundaries are also shown.

Figure 3a. Large Point Sources in the Area of Analysis.

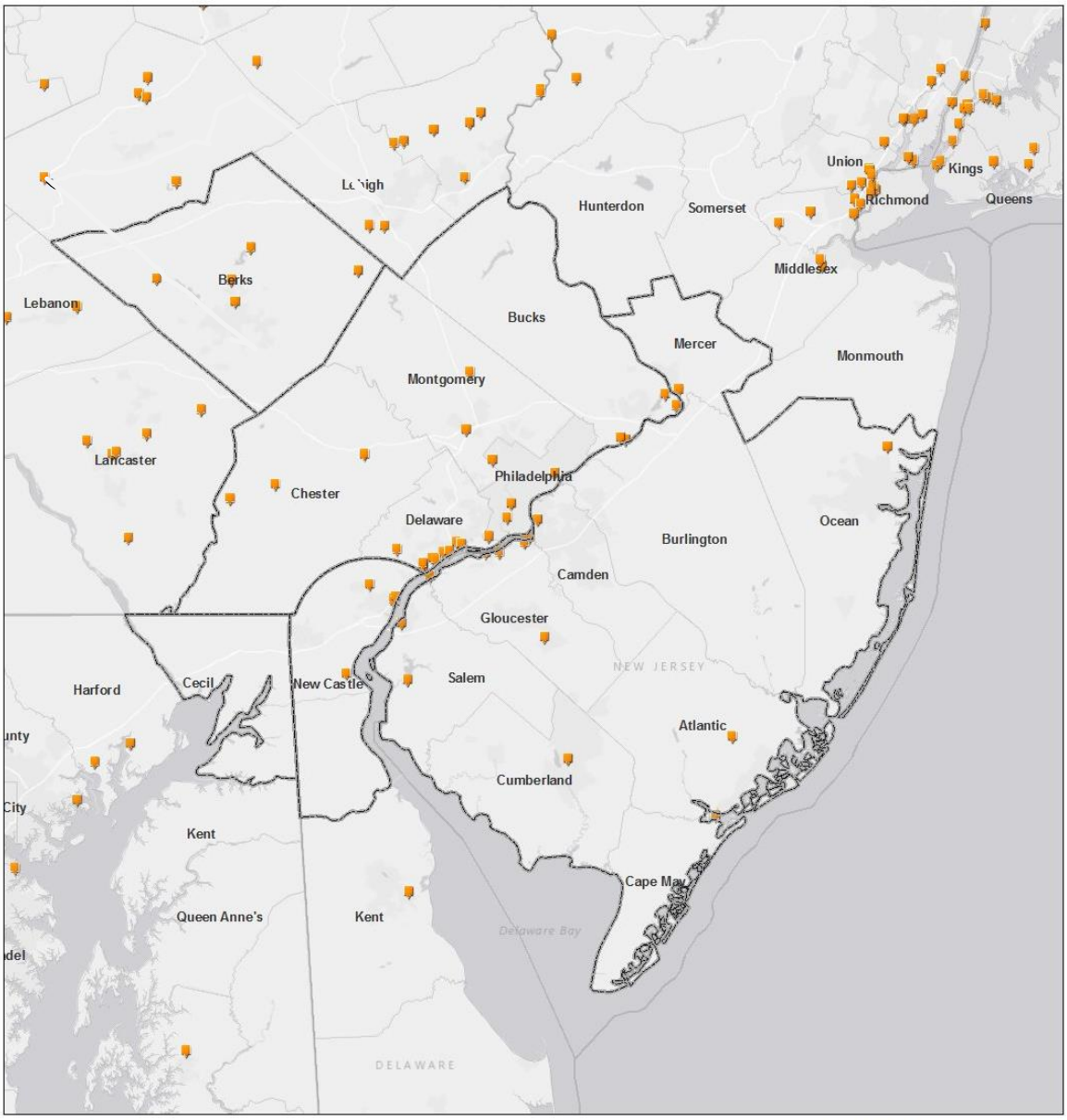
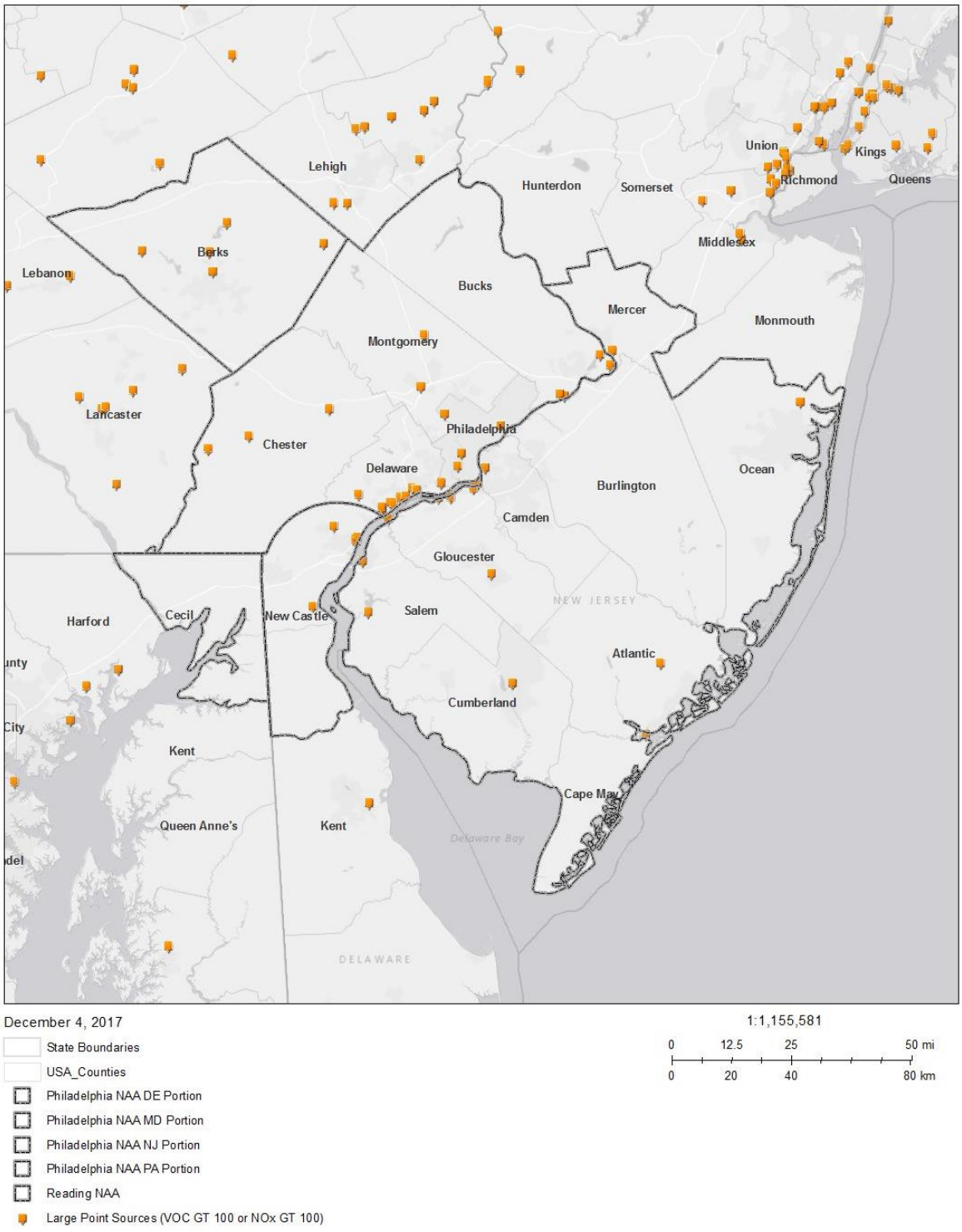


Figure 3b. Large and Small Point Sources in the Area of Analysis.



As shown in Table 3a, Philadelphia County, PA has the highest NO_x and VOC emissions in the area of analysis – over 20,000 tpy for each pollutant. Montgomery County, PA has a similar level of VOC emissions and slightly lower NO_x emissions at almost 18,300 tpy. Cecil County, MD and Cape May, Cumberland, and Salem Counties, NJ have the lowest NO_x emissions in the area of analysis. Salem County, NJ and Cecil County, MD also have the lowest VOC emissions. Cape May and Cumberland, NJ also have relatively low VOC emissions for the area as do Kent, DE and Mercer, NJ. New Castle County, DE, Burlington and Ocean Counties, NJ, and Berks, Bucks, Chester, Delaware, Montgomery, and Philadelphia Counties, PA all have over 13,000 tons of NO_x and/or

VOC emissions. Camden and Gloucester NJ respectively have total NO_x and VOC emissions of approximately 16,600 tpy and 14,800 tpy. Figures 3c and 3d respectively depict county-level NO_x and VOC emissions.

As shown in Figure 3a and Table 3b, Kent County, DE, and Atlantic, Burlington, Camden, Cape May, Cumberland, Mercer, and Ocean Counties, NJ each have only one large point source. The other counties in the area of analysis have multiple large sources. The Delaware City Refinery in New Castle County, DE and the Philadelphia International Airport in Delaware County, PA have the highest NOx emissions in the area of analysis. Both sources emit over 1900 tons of NO_x. Other sources in Berks, Delaware and Philadelphia Counties, PA have NO_x emissions over 1000 tons. As can be seen in Figure 3b, all counties in the area of analysis have numerous small NO_x and VOC sources. Philadelphia and Montgomery Counties, PA appear to have the highest density of small sources, while Atlantic County, NJ has the lowest density of small sources.

Table 3b. Large Point Sources and Emissions (tpy)

County	Facility Site Name	Facility Source Description	NO_x	VOC
Kent, DE	Dover Airforce Base Airport	Airport	693	337
New Castle, DE	Delaware City Refinery	Petroleum Refinery	1968	192
	Hay Road Energy Center	Electricity Generation via Combustion	886	38
	Edge Moor Energy Center	Electricity Generation via Combustion	334	27
	Dupont Edge Moor	Chemical Plant	33	114
	Dupont Experimental Station		198	11
Atlantic, NJ	Atlantic City International	Airport	283	119
Burlington, NJ	Burlington Generating Station	Electricity Generation via Combustion	119	4
Camden, NJ	Camden County Energy Recovery Associates, L.P.	Municipal Waste Combustor	327	2
Cape May, NJ	B. L. England Generating Station	Electricity Generation via Combustion	538	11
Cumberland, NJ	Gerresheimer Glass Inc.	Glass Plant	119	2
Gloucester, NJ	Eagle Point Tank Farm and Dock		6	124
	West Deptford Energy Station	Electricity Generation via Combustion	122	4
	Aleris Rolled Products, Inc		5	166
	Paulsboro Refining Company LLC	Petroleum Refinery	649	322
	Wheelabrator Gloucester Company L P	Municipal Waste Combustor	229	1
	Logan Generating Plant	Electricity Generation via Combustion	546	2
Mercer, NJ	PSEG Fossil LLC Mercer Generating Station	Electricity Generation via Combustion	236	20
Ocean, NJ	Essential Power Operating Company LLC	Electricity Generation via Combustion	152	10
Salem, NJ	Ardagh Glass Containers Inc.	Glass Plant	353	10
	Carneys Point Generating Plant	Electricity Generation via Combustion	896	3
Berks, PA	Texas Eastern Trans/Bernville Sta	Compressor Station	155	6
	Texas Eastern Trans/Bechtelsville	Compressor Station	171	29
	Novipax Llc/Reading			541
	Lehigh Cement Co LLC/ Evansville Cement Plant & Quarry	Portland Cement Manufacturing	1419	24
	Carpenter Tech Corp/Reading Plt	Steel Mill	246	72
Bucks, PA	Exelon Generation Co/Croydon Gen Station	Electricity Generation via Combustion	130	0

	Wheelabrator Falls Inc/Falls Twp	Municipal Waste Combustor	793	7
	Fairless Energy Llc/Falls Twp	Electricity Generation via Combustion	194	35
Chester, PA	Transcontinental Gas/Frazer Station 200	Compressor Station	138	15
	Quad / Graphics Atglen	Printing/Publishing Facility	11	288
	Arcelormittal Plate LLC/Coatesville	Steel Mill	235	135
Delaware, PA	FPL Energy Marcus Hook LP/750 MW	Electricity Generation via Combustion	274	20
	Laurel Pipeline Co LP/Boothwyn Breakout Station			115
	Liberty Elec Power LLC/Eddystone Plt	Electricity Generation via Combustion	155	15
	Braskem Amer Inc/Marcus Hook	Plastic, Resin, Syn Fiber or Rubber Products Plant	9	180
	PQ Corp/Chester	Chemical Plant	243	1
	Kimberly Clark Pa LLC/Chester Opr	Pulp and Paper Plant	220	14
	Exelon Generation Co/Eddystone	Electricity Generation via Combustion	161	5
	Monroe Energy LLC/Trainer	Petroleum Refinery	696	334
	Covanta Delaware Valley LP/Delaware Valley Res Rec	Municipal Waste Combustor	1231	11
	Philadelphia International	Airport	1980	388
Montgomery, PA	Merck Sharp & Dohme / West Point	Pharmaceutical Manufacturing	119	30
	Covanta Plymouth Renewable Energy/ Plymouth	Municipal Waste Combustor	793	2
Philadelphia, PA	Honeywell/Frankford Plant		239	106
	Grays Ferry Cogen Partnership/Phila	Electricity Generation via Combustion	216	10
	Paperworks Ind Inc/Mill Div	Pulp and Paper Plant	109	8
	Phila Energy Sol Ref/ Pes	Petroleum Refinery	1458	593

Figure 3c. Total County-Level NO_x Emissions in the Area of Analysis

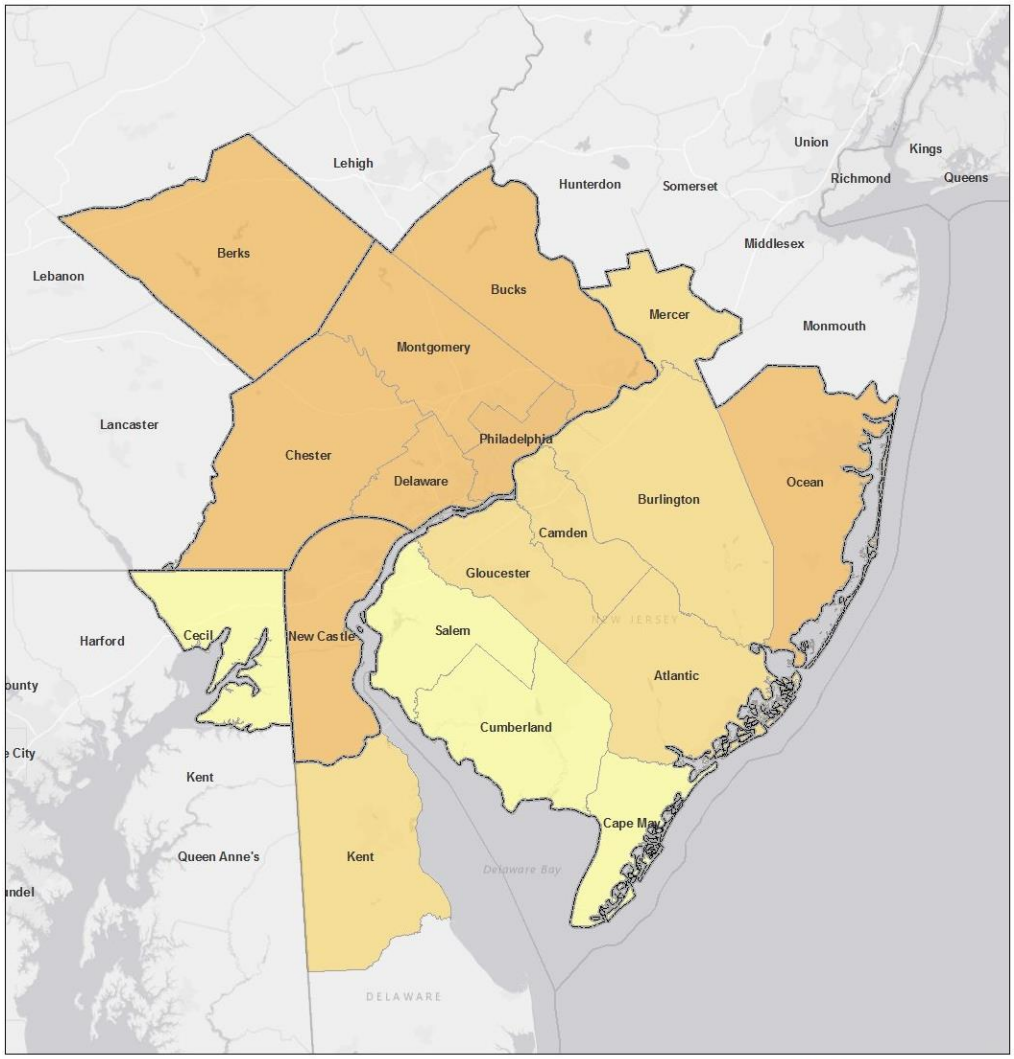
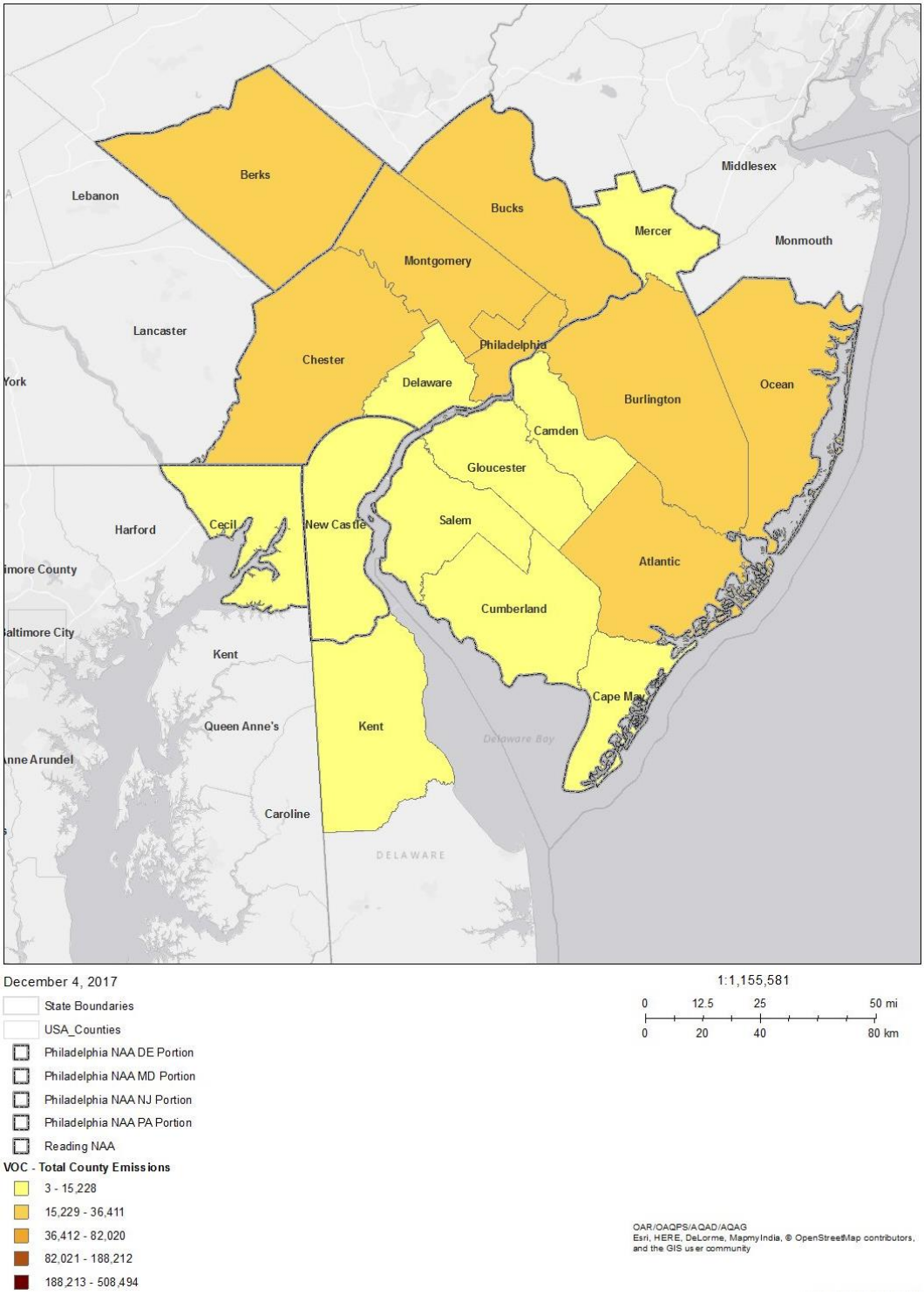


Figure 3d. Total County-Level VOC Emissions in the Area of Analysis



Population density and degree of urbanization

In this part of the factor analysis, EPA evaluated the population and vehicle use characteristics and trends of the area as indicators of the probable location and magnitude of non-point source emissions. These include emissions of NO_x and VOC from on-road and non-road vehicles and engines, consumer products, residential fuel combustion, and consumer services. Areas of dense population or commercial development are an

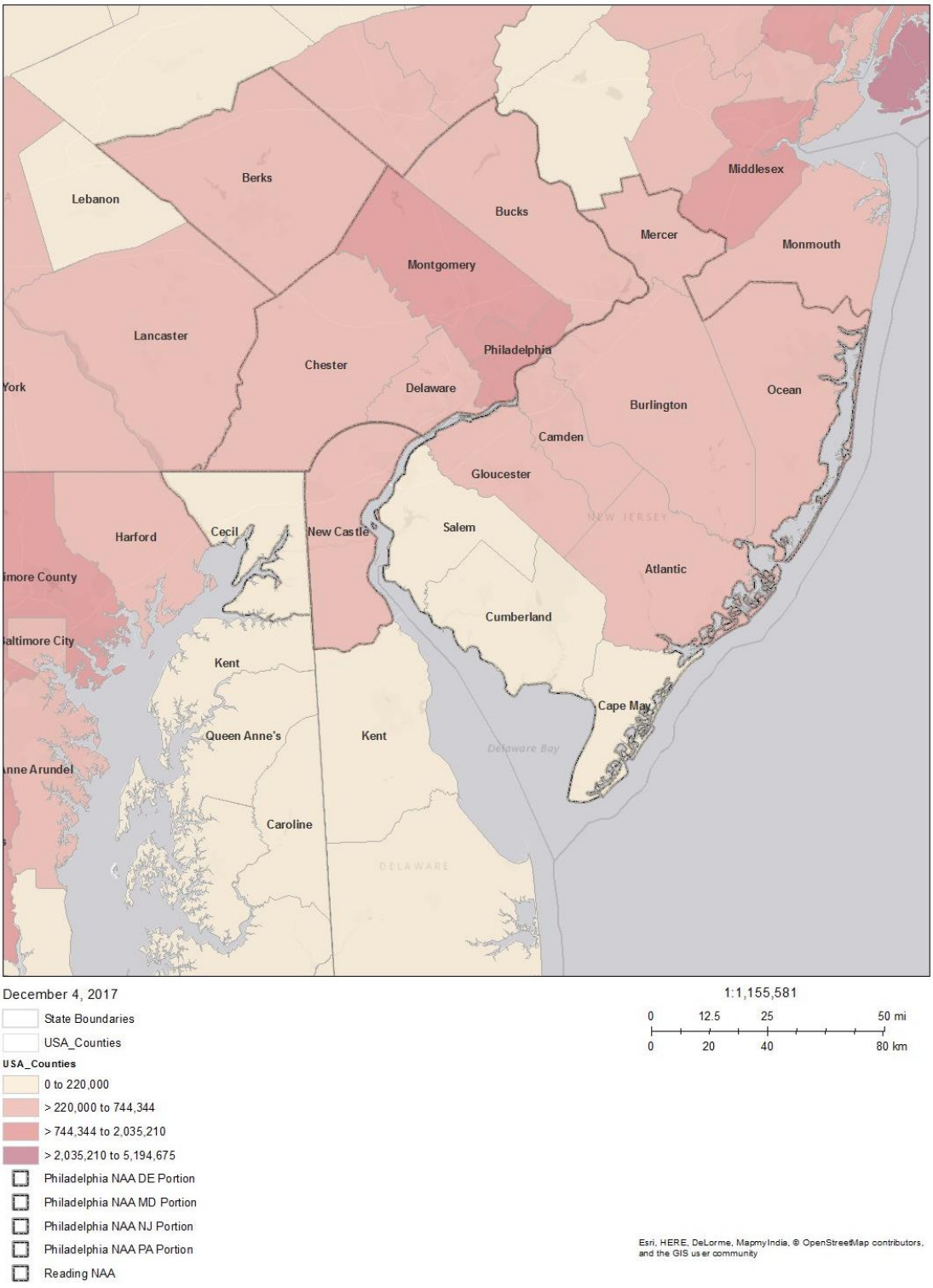
indicator of area source and mobile source NO_x and VOC emissions that may contribute to violations of the NAAQS. Table 4 shows the population, population density, and population growth information for each county in the area of analysis. Figure 4 depicts the county-level population.

Table 4. Population and Growth.

County	State Recommended Nonattainment?	2010 Population	2015 Population	2015 Population Density (per sq. mi.)	Absolute change in population (2010-2015)	Population % change (2010-2015)
Kent, DE	No	162,310	173,533	296	11,223	7
New Castle, DE	Yes	538,479	556,779	1,306	18,300	3
Cecil, MD	No	101,108	102,382	296	1,274	1
Atlantic, NJ	Yes	274,549	274,219	493	-330	-0.1
Burlington, NJ	Yes	448,734	450,226	564	1,492	0.3
Camden, NJ	Yes	513,657	510,923	2,309	-2,734	-0.5
Cape May, NJ	Yes	97,265	94,727	377	-2,538	-2
Cumberland, NJ	Yes	156,898	155,854	322	-1,044	-0.7
Gloucester, NJ	Yes	288,288	291,479	905	3,191	1
Mercer, NJ	Yes	366,513	371,398	1,654	4,885	1
Ocean, NJ	Yes	576,567	588,721	936	12,154	2
Salem, NJ	Yes	66,083	64,180	193	-1,903	-3
Berks, PA	No	411,442	415,271	485	3,829	0.9
Bucks, PA	Yes	625,249	627,367	1,038	2,118	0.3
Chester, PA	Yes	498,886	515,939	687	17,053	3
Delaware, PA	Yes	558,979	563,894	3067	4,915	0.9
Montgomery, PA	Yes	799,874	819,264	1696	19,390	2
Philadelphia, PA	Yes	1,526,006	1,567,442	11,689	41,436	3
	Area wide	8,010,887	8,143,598	994	132,711	2

Source: U.S. Census Bureau population estimates for 2010 and 2015. https://www.census.gov/data.html.

Figure 4. County-Level Population.



Philadelphia County, PA has the highest population in the area of analysis at over 1,500,000. Montgomery County just shy of 800,000. Eight Counties, in order of highest to lowest population have between 400,000 and just over 625,000 people. Kent County, DE, Cecil County, MD, and Cape May, Cumberland, and Salem Counties, NJ have the lowest population, each with less than 165,000 people. The area as a whole is relatively densely populated. Philadelphia, PA has the highest population density, at 11,689. Delaware, PA has the second highest density of 3067 and Camden, NJ has the third highest level at 2309 while New Castle, DE. Two other counties each have a density of over 1000: Mercer, NJ and Bucks, PA. Salem, NJ has the lowest density of 193 and Cecil County, MD and Kent County, DE are tied for the second lowest, at a density at 296. Atlantic,

Camden, Cape May Cumberland and Salem Counties experienced a decrease in population between 2010 and 2015. Philadelphia, PA experienced the biggest absolute increase in population in the same time period, while Kent County, DE experienced the largest percent increase in population.

Traffic and Vehicle Miles Travelled (VMT)

EPA evaluated the commuting patterns of residents, as well as the total vehicle miles traveled (VMT) for each county in the area of analysis. In combination with the population/population density data and the location of main transportation arteries, this information helps identify the probable location of non-point source emissions. A county with high VMT and/or a high number of commuters is generally an integral part of an urban area and high VMT and/or high number of commuters indicates the presence of motor vehicle emissions that may contribute to violations of the NAAQS. Rapid population or VMT growth in a county on the urban perimeter may signify increasing integration with the core urban area, and thus could indicate that the associated area source and mobile source emissions may be appropriate to include in the nonattainment area. In addition to VMT, EPA evaluated worker data collected by the U.S. Census Bureau[9] for the area of analysis. Table 5a shows the traffic and commuting pattern data, including total VMT for each county, number of residents who work in each county, number of residents that work in counties with violating monitors, and the percent of residents working in counties with violating monitors. In addition, Table 5b shows the number and percentage of residents who commute within their county of residence. The data in Tables 5a and 5b are 2014 data.

Table 5a. Traffic and Commuting Patterns.

County	State Recommended Nonattainment?	2014 Total VMT (Million Miles)	Number of County Residents Who Work	Number Commuting to or Within Counties with Violating Monitors	Percentage Commuting to or Within Counties with Violating Monitors
Kent, DE	No	1,650	68,246	16,485	24.2%
New Castle, DE	**Yes**	**5,546**	**255,431**	**227,862**	**89.2%**
Cecil, MD	**No**	**1,275**	**44,500**	**27,437**	**61.7%**
Atlantic, NJ	Yes	2,759	125,197	15,904	12.7%
Burlington, NJ	Yes	4,699	223,456	95,006	42.5%
Camden, NJ	**Yes**	**3,941**	**238,179**	**161,840**	**67.9%**
Cape May, NJ	Yes	996	38,277	4,905	12.8%
Cumberland, NJ	Yes	1,162	60,502	11,847	19.6%
Gloucester, NJ	**Yes**	**2,746**	**143,718**	**104,033**	**72.4%**
Mercer, NJ	**Yes**	**3,390**	**164236**	**93,117**	**56.7%**
Ocean, NJ	**Yes**	**4,827**	**231657**	**119,427**	**51.6%**
Salem, NJ	Yes	786	33,649	15,628	46.4%
Berks, PA	**No**	**3,298**	**194,993**	**147,822**	**75.8%**
Bucks, PA	**Yes**	**4,652**	**317,908**	**263,321**	**82.8%**
Chester, PA	**Yes**	**4,193**	**246,357**	**217,427**	**88.3%**
Delaware, PA	**Yes**	**3,278**	**265,338**	**244,659**	**92.2%**
Montgomery, PA	**Yes**	**6,458**	**405,300**	**365,300**	**90.1%**
Philadelphia, PA	**Yes**	**5,496**	**572,291**	**521,674**	**91.16%**
	Total:	61,152	3,629,235	2,574,558	70.9%

* Counties with a monitors violating the NAAQS are indicated in bold.

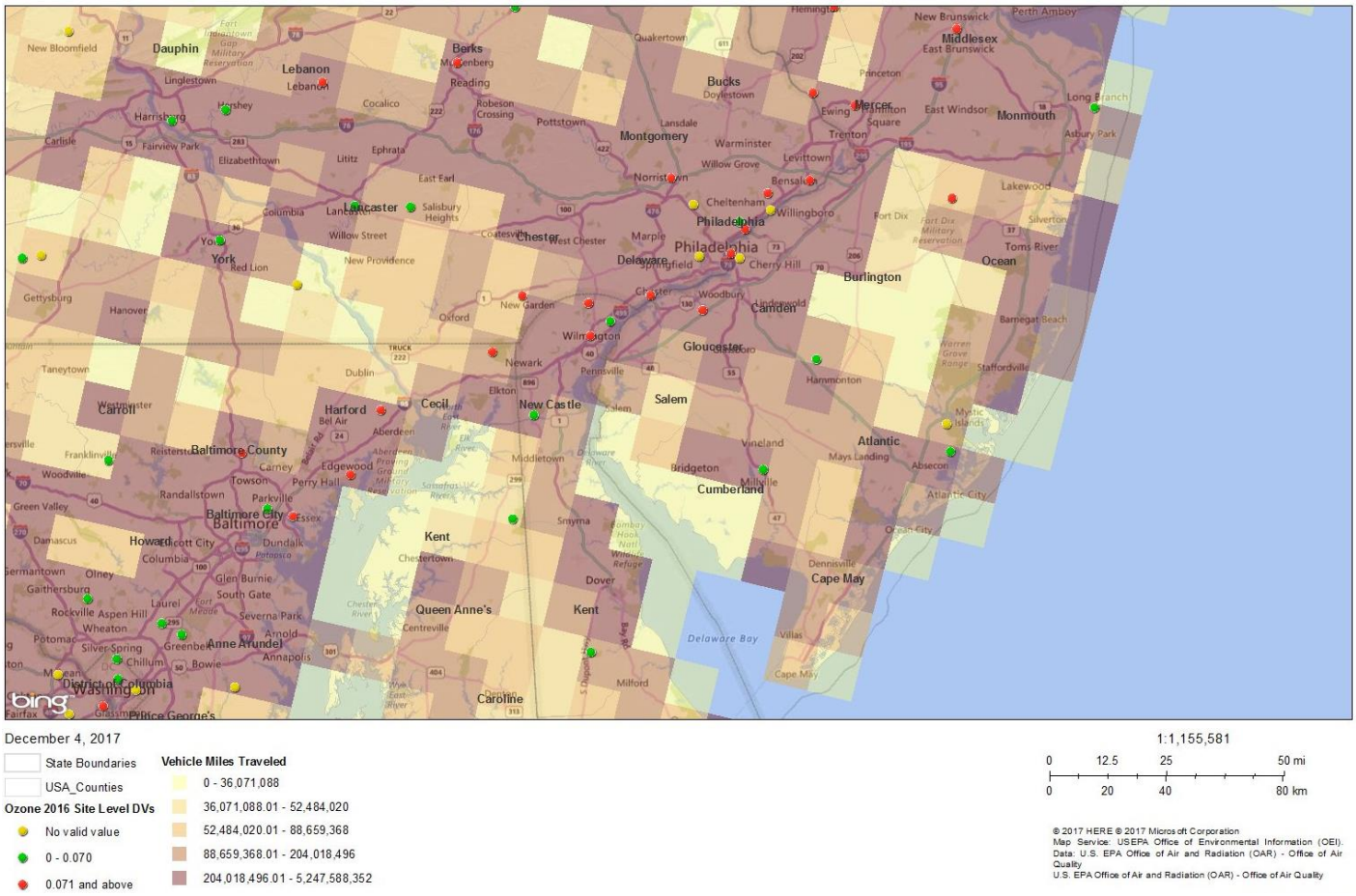
[9] The worker data can be accessed at: http://onthemap.ces.census.gov/.

Table 5b. Commuting Patterns Including Commuting Within County of Residence.

County	State Recommended Nonattainment?	Number of County Residents Who Work	Number Commuting to or Within Counties with Violating Monitors	Percentage Commuting to or Within Counties with Violating Monitors	Number Commuting Within County of Residence	Percentage Commuting Within the County of Residence
Kent, DE	No	68,246	16,485	24.2%	39,070	57.2%
New Castle, DE	Yes	255,431	227,862	89.2%	192,971	75.5%
Cecil, MD	No	44,500	27,437	61.7%	13,908	31.3%
Atlantic, NJ	Yes	125,197	15,904	12.7%	84,158	67.2%
Burlington, NJ	Yes	223,456	95,006	42.5%	83,745	37.5%
Camden, NJ	Yes	238,179	161,840	67.9%	90,701	38.1%
Cape May, NJ	Yes	38,277	4,905	12.8%	20,793	54.3%
Cumberland, NJ	Yes	60,502	11,847	19.6%	31,385	51.9%
Gloucester, NJ	Yes	143,718	104,033	72.4%	43,131	30.0%
Mercer, NJ	Yes	164236	93,117	56.7%	78,888	48.0%
Ocean, NJ	Yes	231657	119,427	51.6%	102,034	44.0%
Salem, NJ	Yes	33,649	15,628	46.4%	9,130	27.1%
Berks, PA	No	194,993	147,822	75.8%	111,542	57.2%
Bucks, PA	Yes	317,908	263,321	82.8%	130,805	41.1%
Chester, PA	Yes	246,357	217,427	88.3%	112,313	45.6%
Delaware, PA	Yes	265,338	244,659	92.2%	104,298	39.3%
Montgomery, PA	Yes	405,300	365,300	90.1%	194,295	47.9%
Philadelphia, PA	Yes	572,291	521,674	91.16%	348,108	60.8%
	Total:	3,629,235	2,574,558	70.9%	1,791,275	49.4%

To show traffic and commuting patterns, Figure 5 overlays twelve-kilometer gridded VMT from the 2014 NEI with a map of the transportation arteries.

Figure 5. Twelve Kilometer Gridded VMT (Miles) Overlaid with Transportation Arteries.



As can be seen in Tables 5a and 5b, Montgomery County, PA, New Castle County, DE, and Philadelphia, PA have the highest VMT in the area of analysis, and Salem County, NJ has the lowest.

Cape May and Salem Counties, NJ have the fewest residents who work, while Philadelphia and Montgomery Counties, PA have the most. Atlantic and Cape May Counties, NJ have the lowest percentage of workers commuting into counties with violating monitors, with the majority of their residents commuting within their own counties. Chester, Delaware, Montgomery, Philadelphia Counties, PA and New Castle County, DE have the highest percentage of workers commuting into counties with violating monitors. However, 60.8% of Philadelphians and 75.5% of residents of New Castle County commute within their own counties.

As shown in Figure 5, I-95 runs through the area of analysis from Cecil County, MD northeast through New Castle County, DE, and Delaware, Philadelphia, and Buck Counties, PA, and into Mercer County, NJ. The New Jersey Turnpike and I-295 parallel I-95 on the east side of the Delaware River, through Mercer, Burlington, Camden, Gloucester, and Salem Counties, NJ. The Pennsylvania Turnpike (I-76) starts in Philadelphia and extends west through Montgomery, Chester Counties, PA, and through the southern tip of Berks County, PA into Lancaster County, PA. Figure 5 shows high VMT through these traffic corridors, where the majority of violating monitors in the area of analysis are located.

Factor 3: Meteorology

Evaluation of meteorological data helps to assess the fate and transport of emissions contributing to ozone concentrations and to identify areas potentially contributing to the monitored violations. Results of meteorological data analysis may inform the determination of nonattainment area boundaries. In order to determine how meteorological conditions, including, but not limited to, weather, transport patterns, and stagnation conditions, could affect the fate and transport of ozone and precursor emissions from sources in the area., EPA evaluated 2014-2016 HYSPLIT (HYbrid Single-Particle Lagrangian Integrated Trajectory)

trajectories at 100, 500, and 1000 meters (m) above ground level (AGL) that illustrate the three-dimensional paths traveled by air parcels to a violating monitor. Figure 6 shows the 24-hour HYSPLIT back trajectories in red, blue and green, representing 100, 500, and 1000 m AGL, respectively, for each exceedance day (i.e., daily maximum 8 hour values that exceed the 2015 ozone NAAQS) for the violating monitors. Figures 6a through 6o show the HYSPLIT back trajectories for the violating monitors.

Figure 6a. HYPLIT Back Trajectories for Monitor 100031010 New Castle County, Delaware

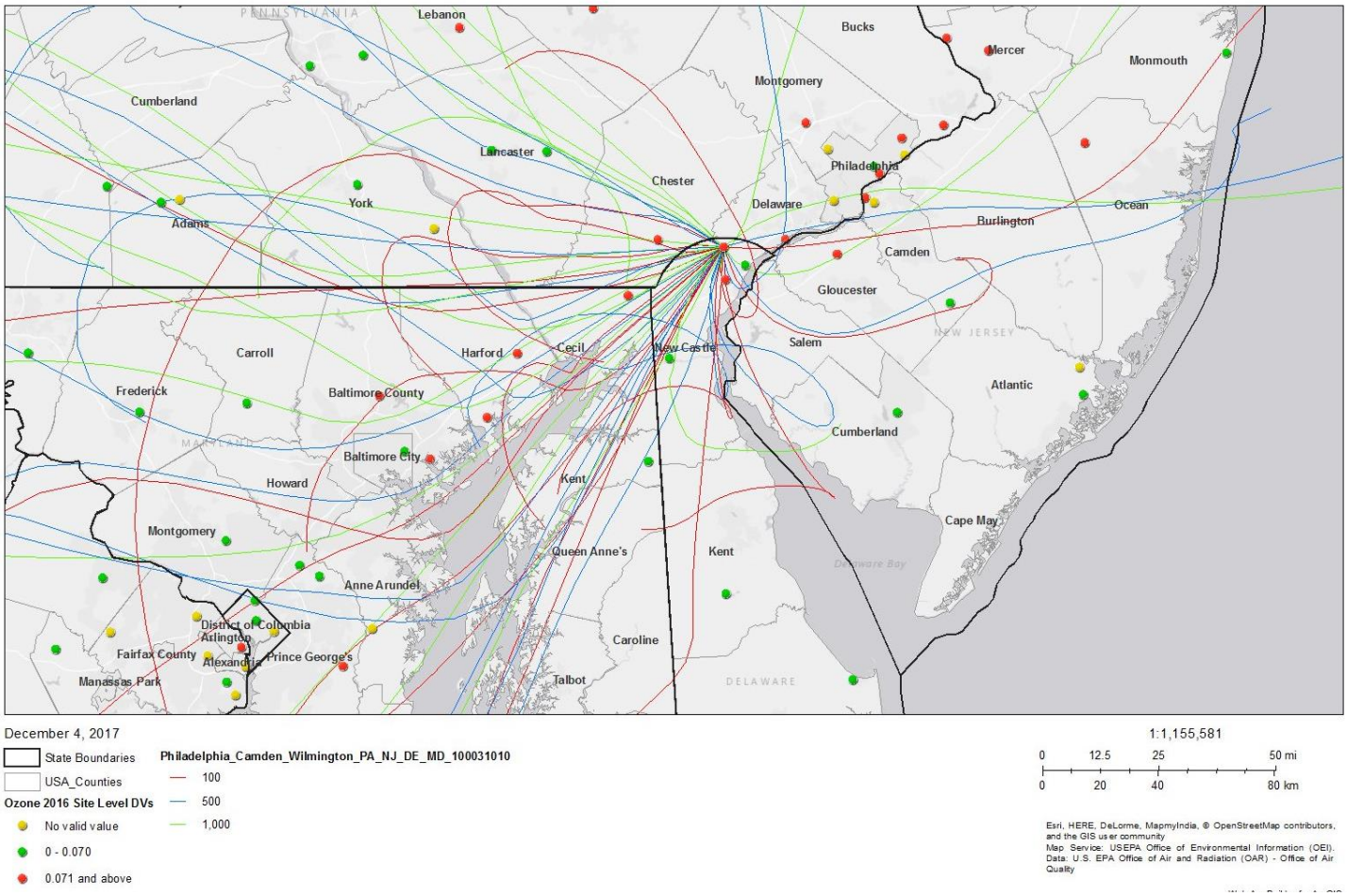


Figure 6b. HYPLIT Back Trajectories for Monitor 100032004 New Castle County, Delaware

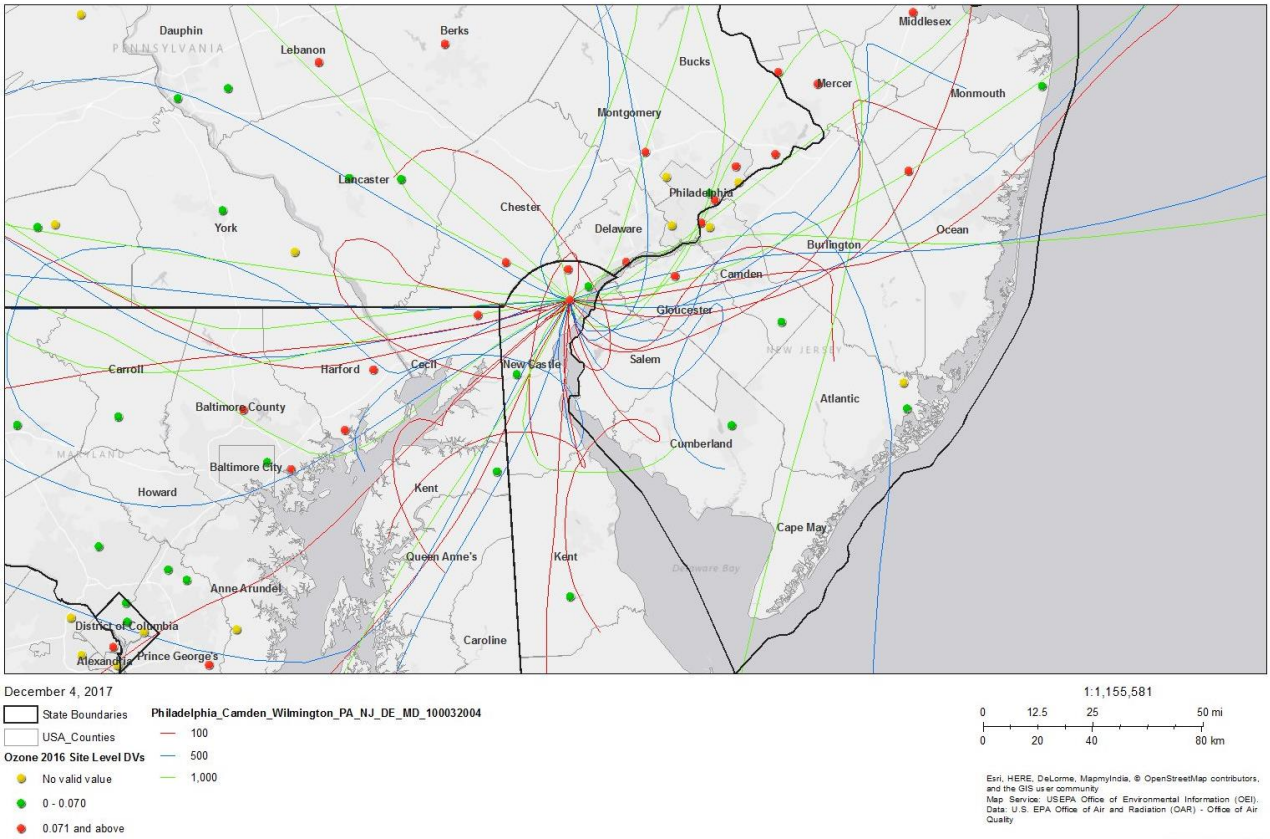


Figure 6c. HYPLIT Back Trajectories for Monitor 240150003 Cecil County, Maryland

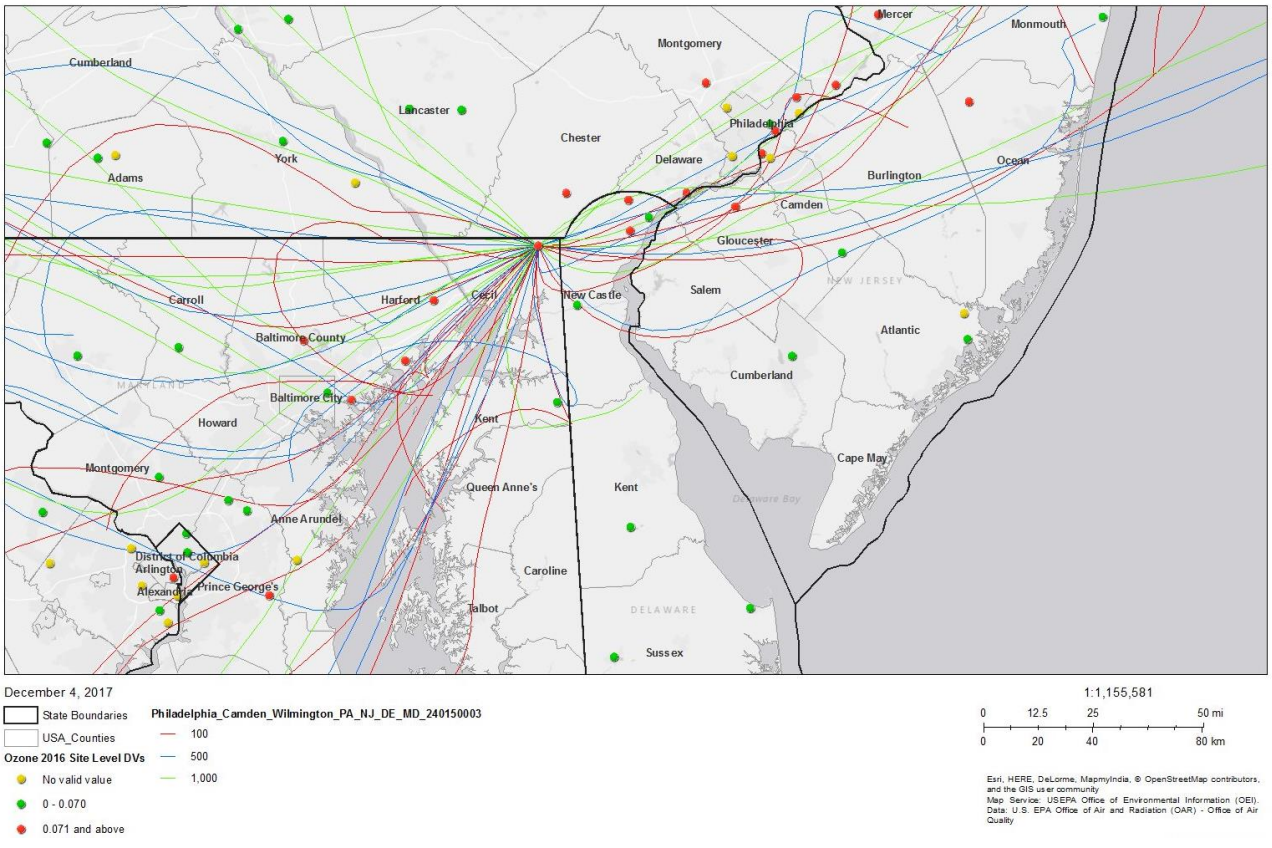


Figure 6d. HYPLIT Back Trajectories for Monitor 340070002 Camden County, New Jersey

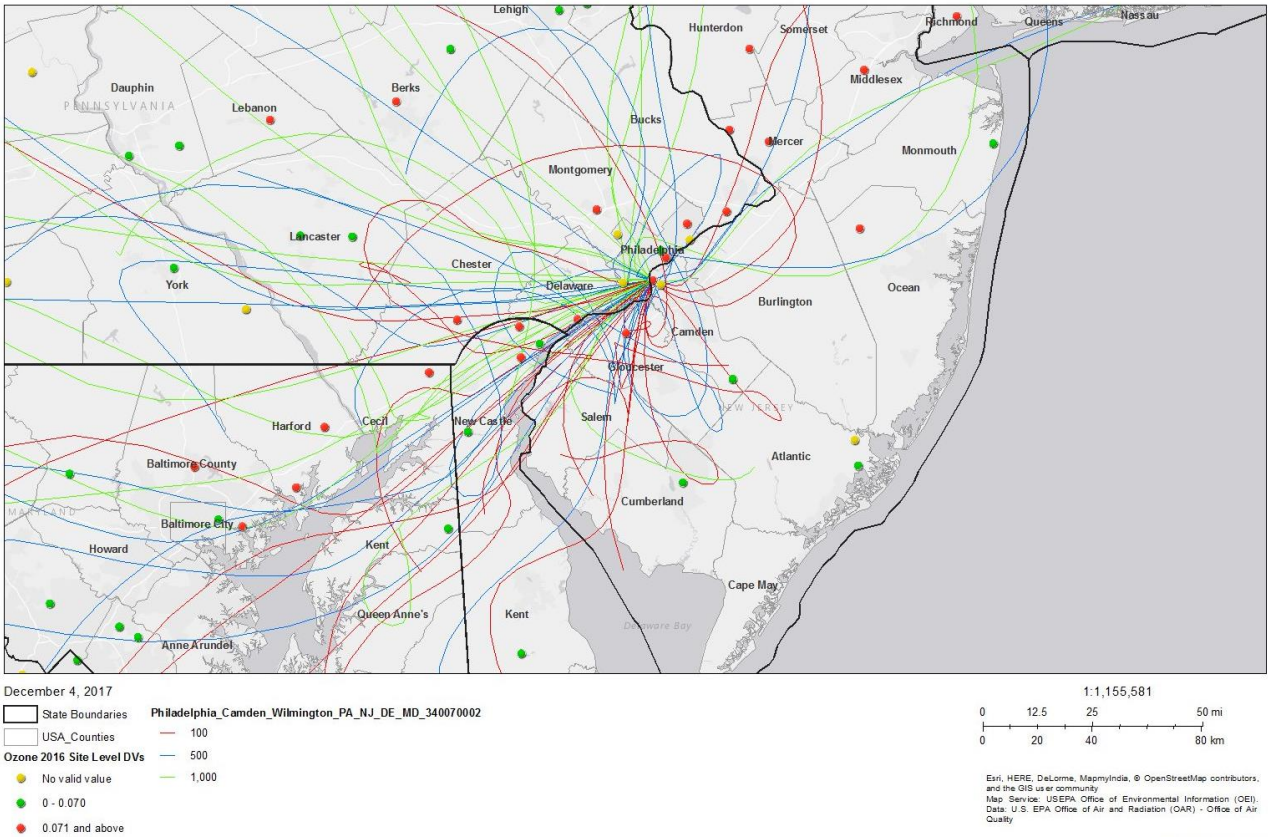


Figure 6e. HYPLIT Back Trajectories for Monitor 340150002 Gloucester County, New Jersey

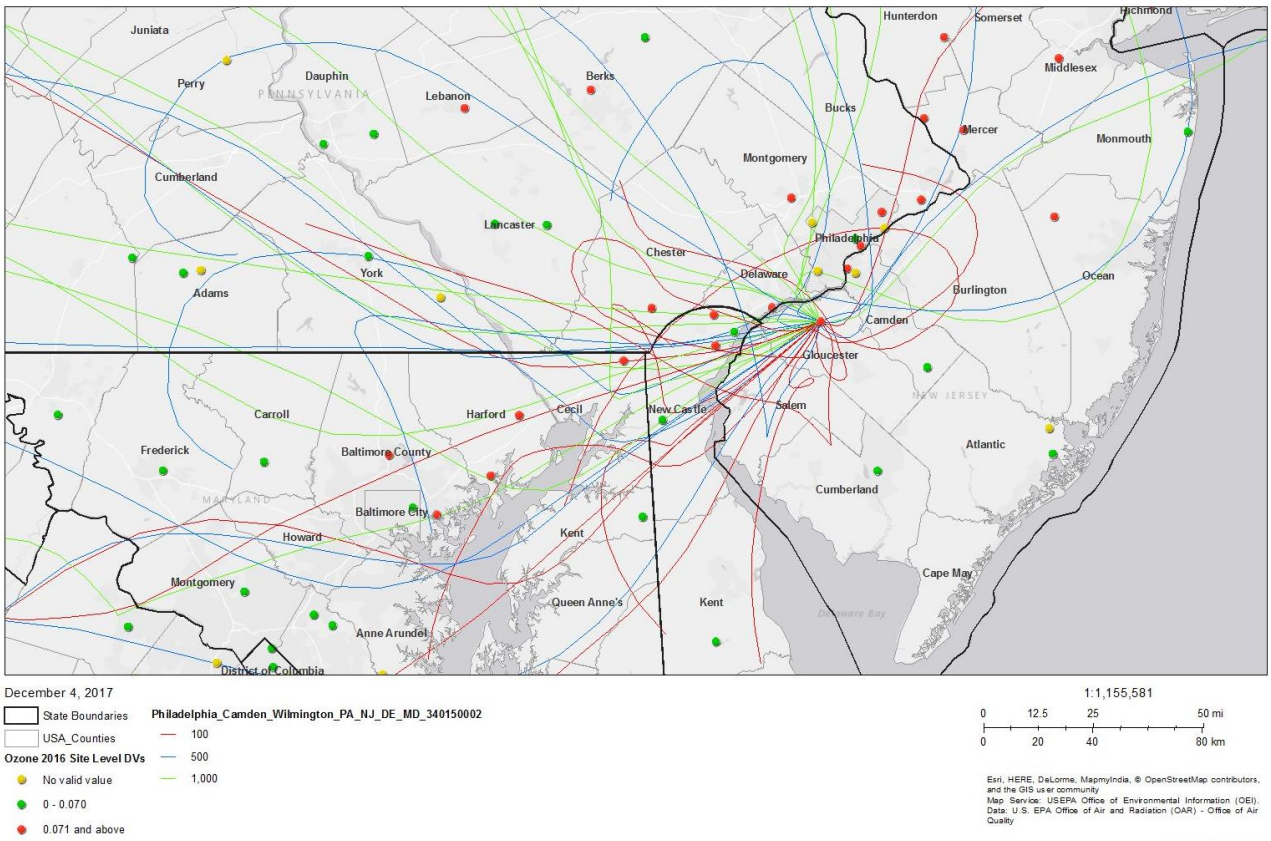


Figure 6f. HYPLIT Back Trajectories for Monitor 420110011 Berks County, Pennsylvania

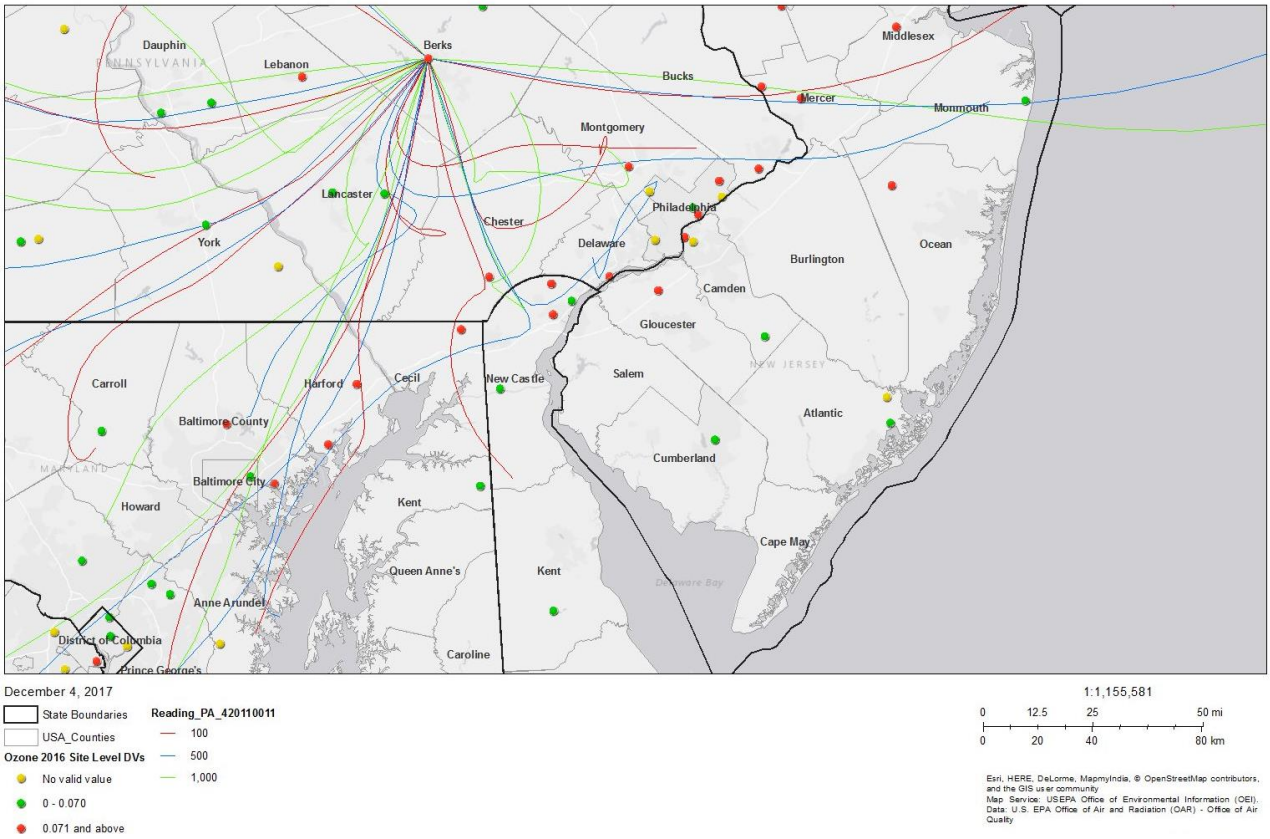


Figure 6g. HYPLIT Back Trajectories for Monitor 420170012 Bucks County, Pennsylvania

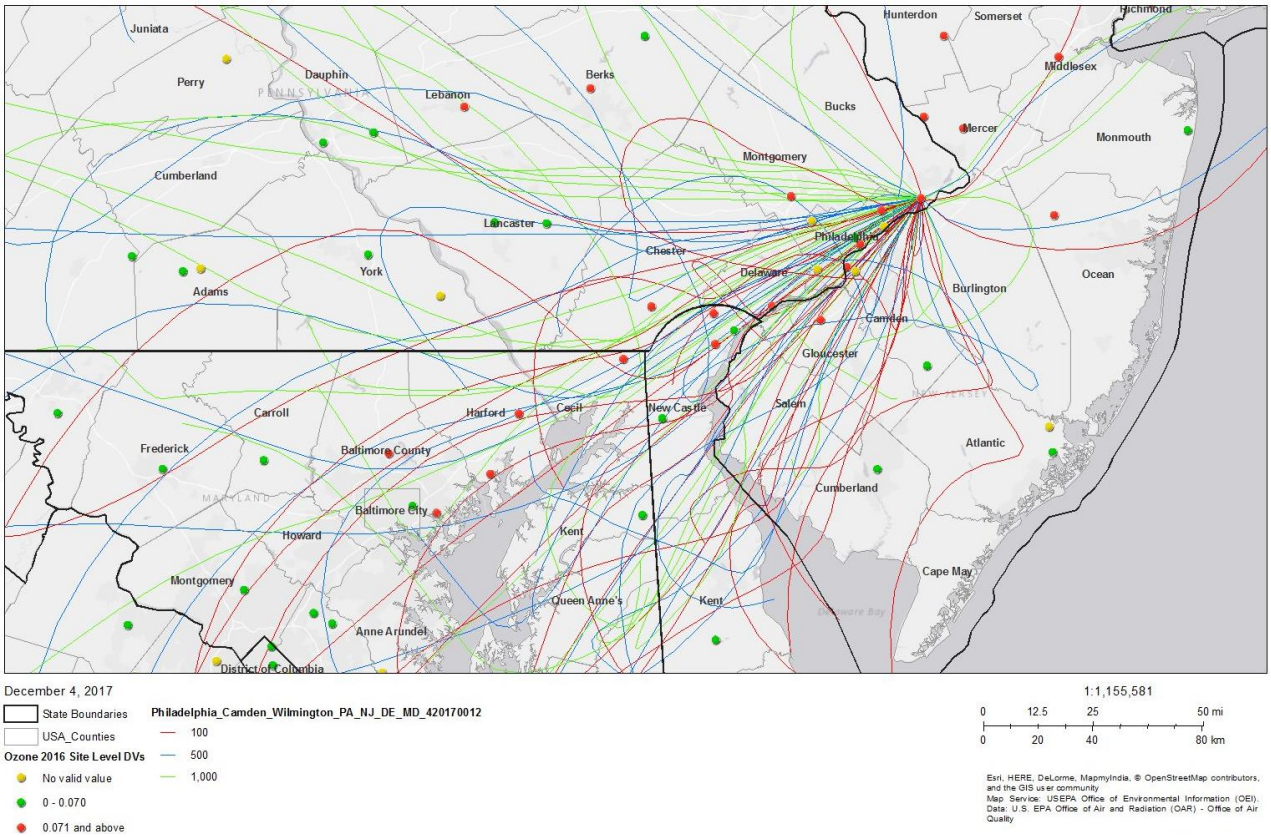


Figure 6h. HYPLIT Back Trajectories for Monitor 420290100 Chester County, Pennsylvania

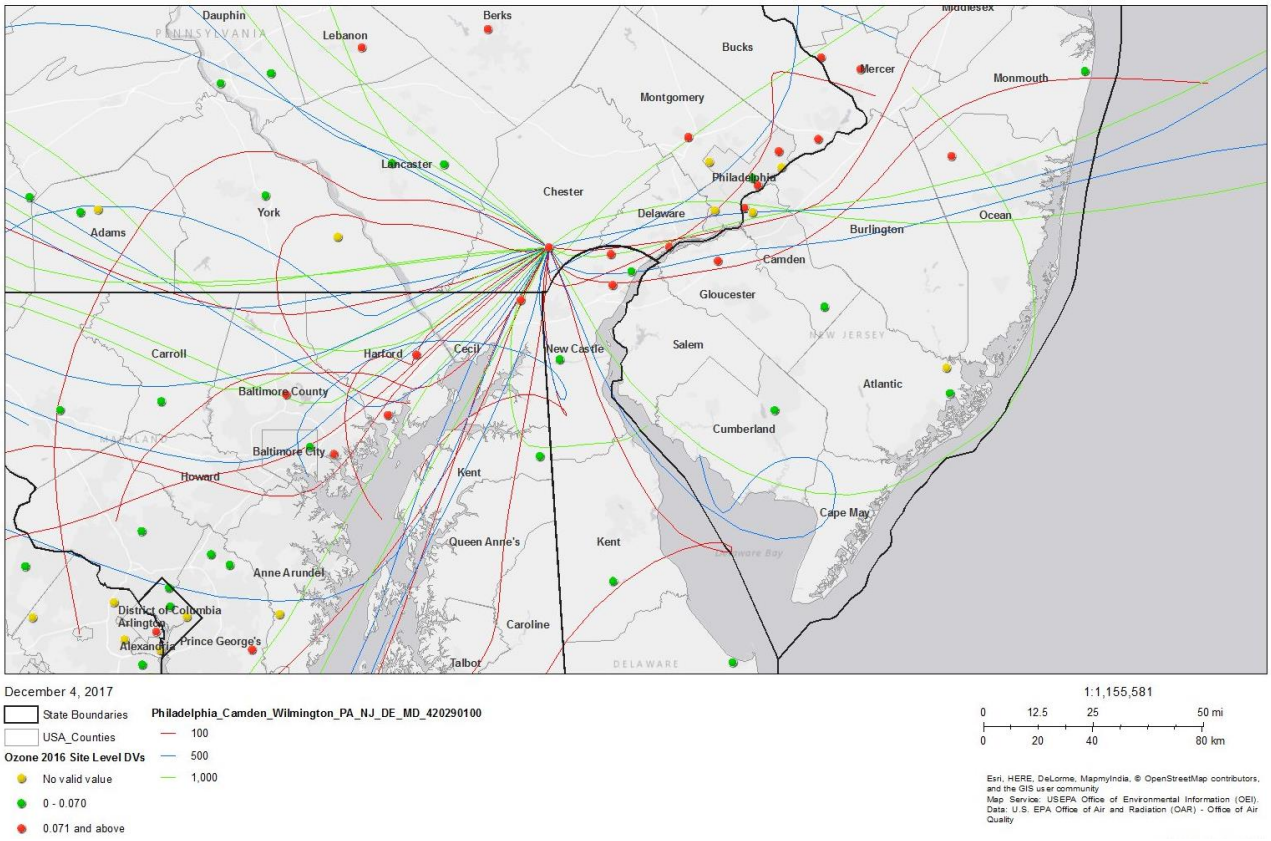


Figure 6i. HYPLIT Back Trajectories for Monitor 420450002 Delaware County, Pennsylvania

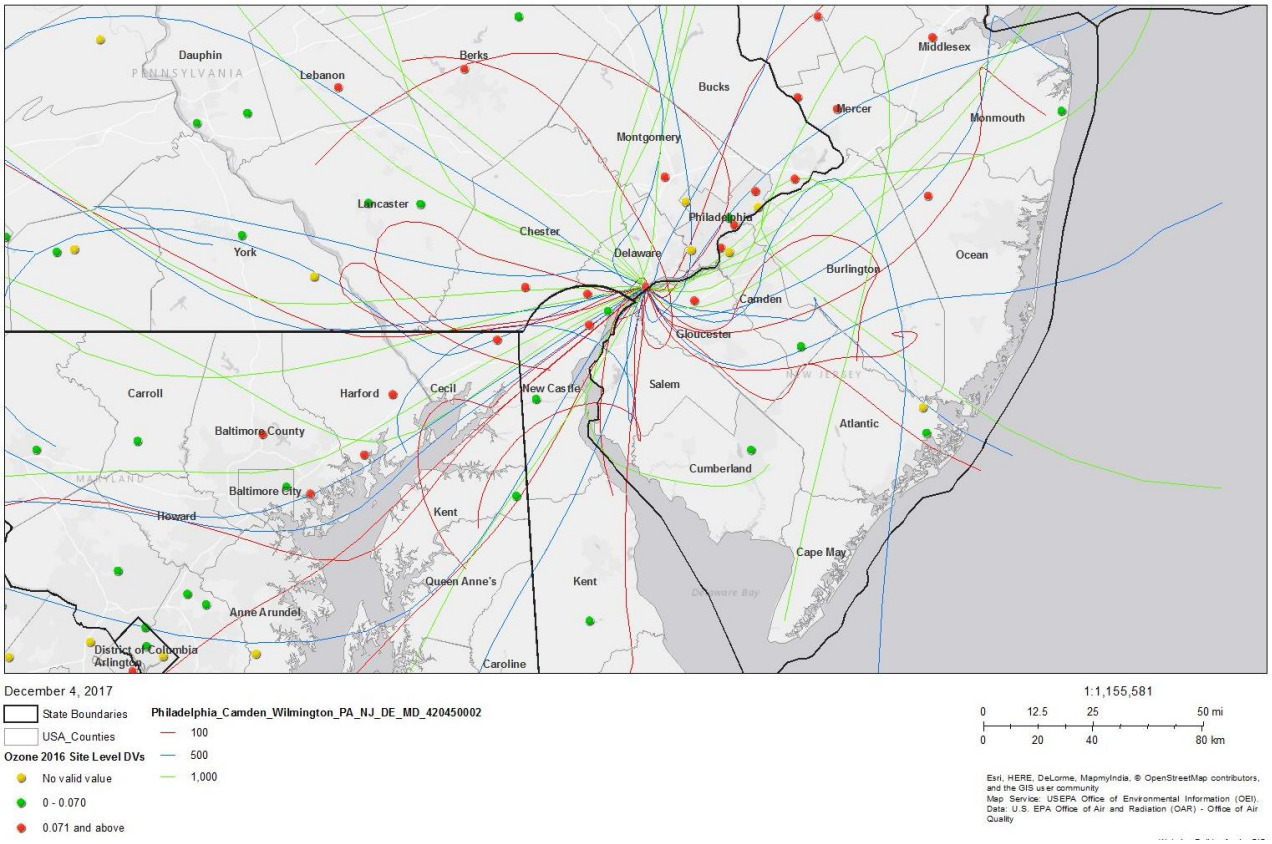


Figure 6j. HYPLIT Back Trajectories for Monitor 420910013 Montgomery County, Pennsylvania

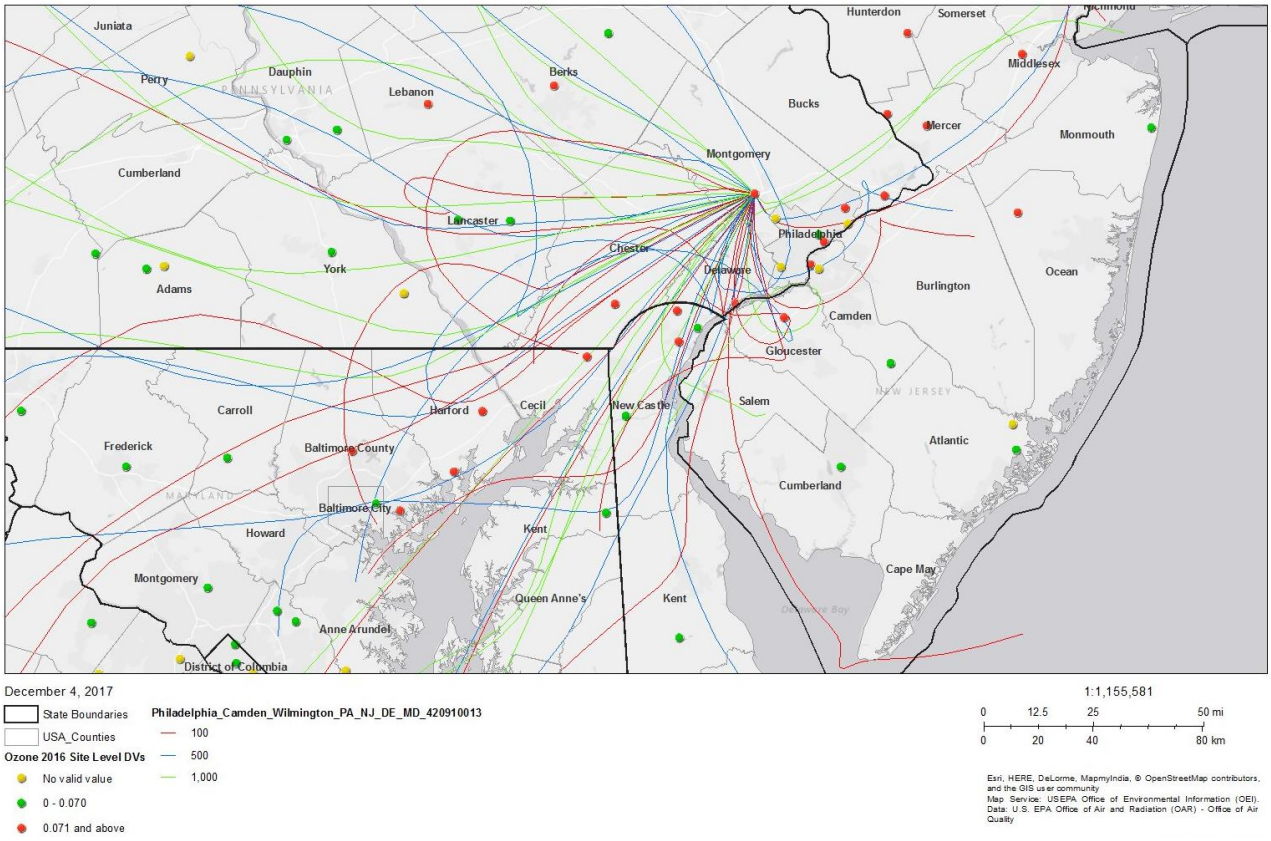


Figure 6k. HYPLIT Back Trajectories for Monitor 421010024 Philadelphia County, Pennsylvania

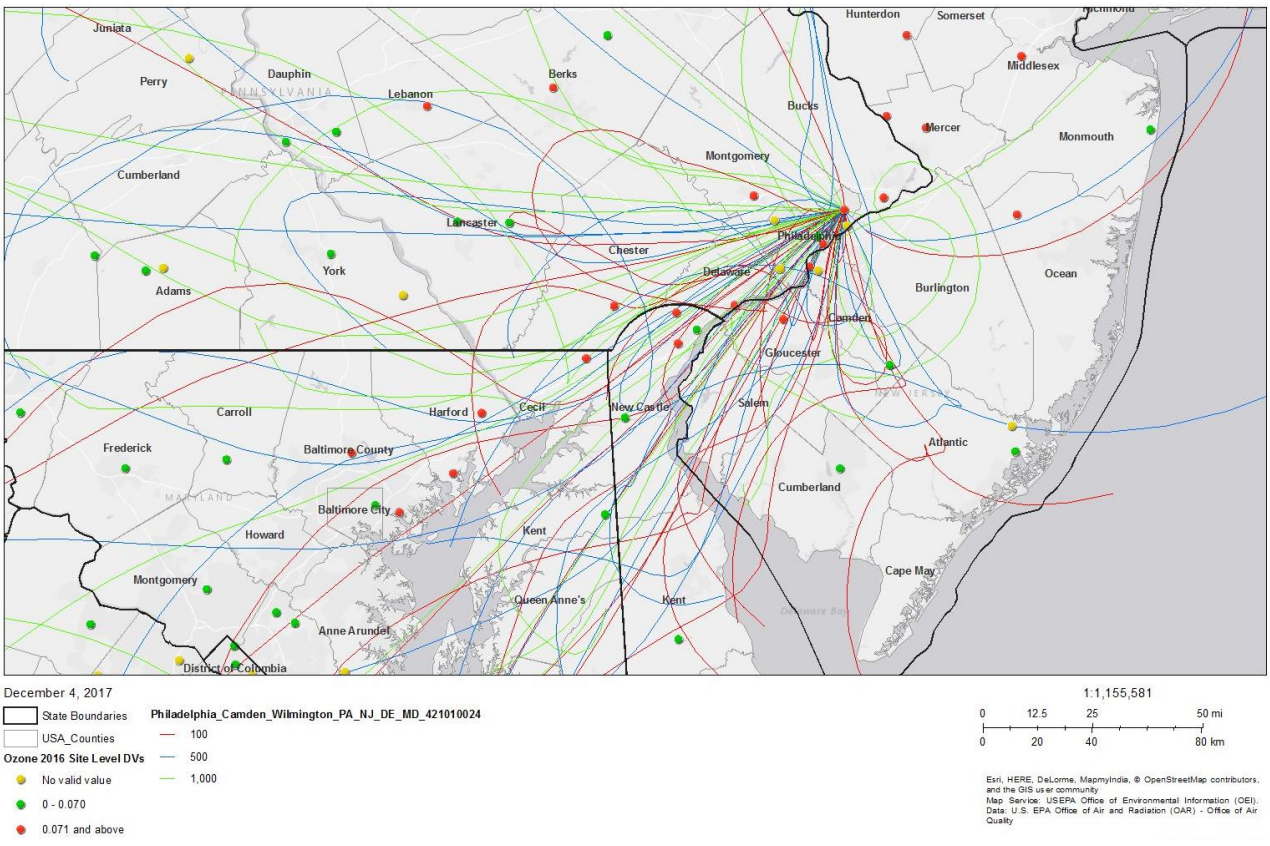


Figure 6l. HYPLIT Back Trajectories for Monitor 421010048 Philadelphia County, Pennsylvania

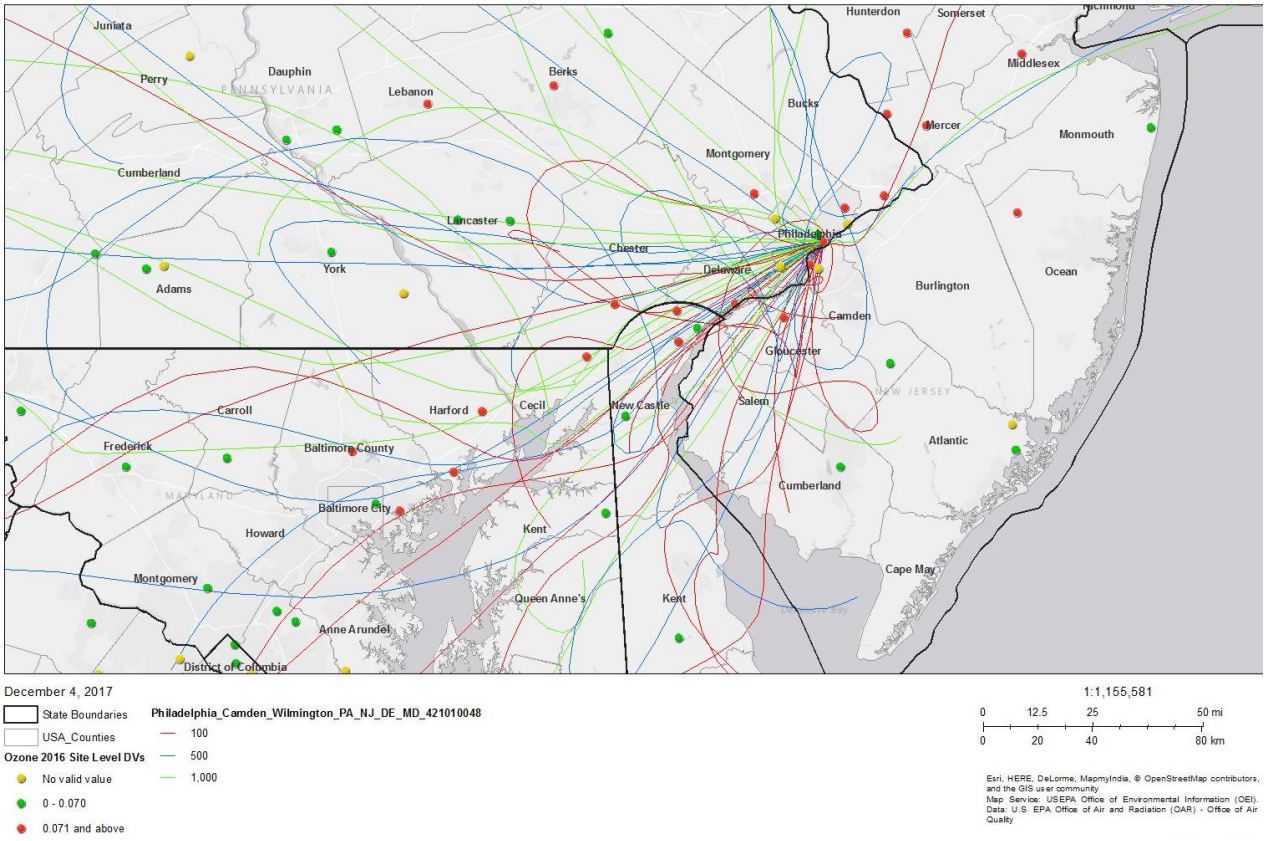


Figure 6m. HYPLIT Back Trajectories for Monitor 340210005 Mercer County, New Jersey

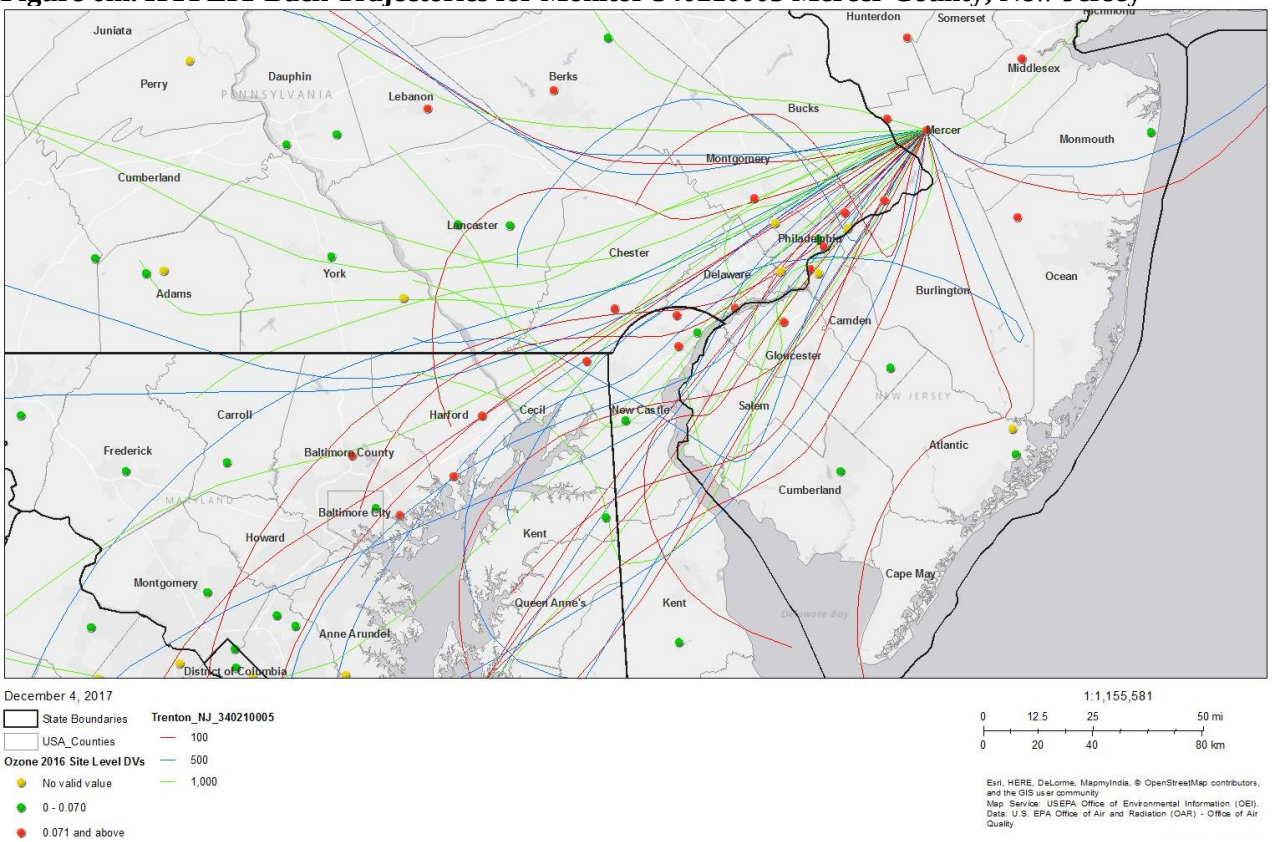


Figure 6n. HYPLIT Back Trajectories for Monitor 340219991 Mercer County, New Jersey

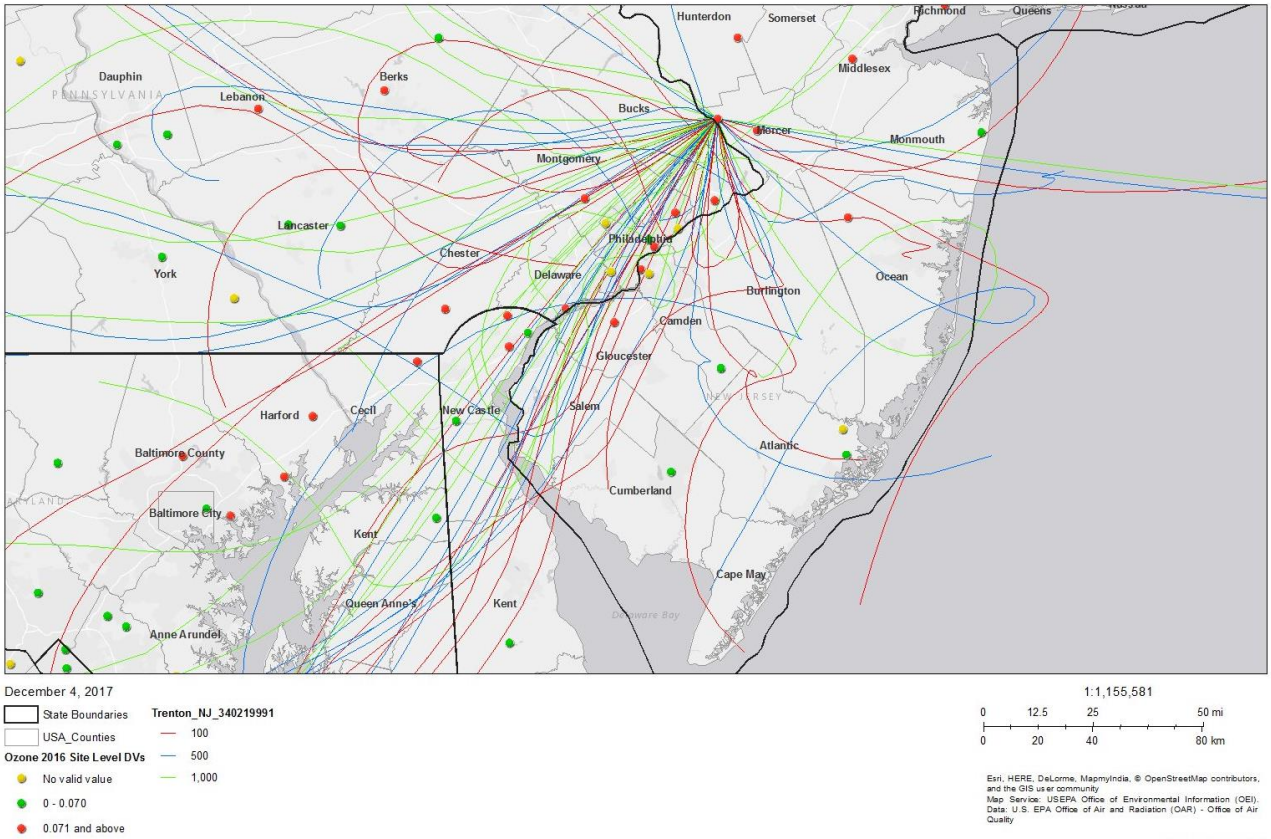
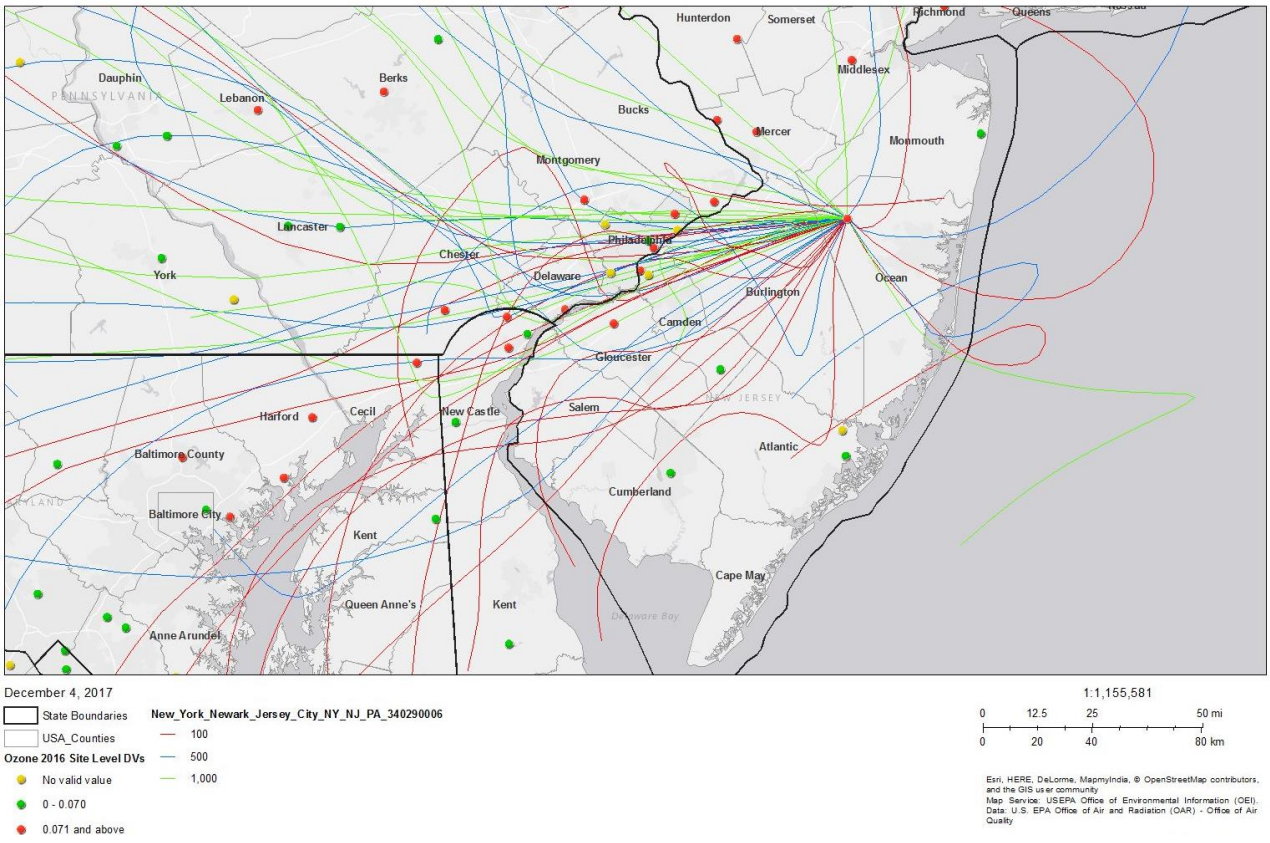


Figure 6o. HYPLIT Back Trajectories for Monitor 340290006 Ocean County, New Jersey



Figures 6a and 6b show HYSPLIT back trajectories for the two violating monitors in New Castle County, DE. Figure 6a shows that for most violating days, winds were coming generally from the west and southwest, through Chester County, PA and Cecil County, MD as well as the Eastern Shore of Maryland. Figure 6b shows southwestern winds, but also contribution from the east, through Salem, Gloucester, Camden, and Burlington Counties, NJ.

Figures 6c shows HYSPLIT back trajectories for the violating monitor in Cecil County, MD. This figure shows predominant winds from the southwest, but also contribution from the northeast, through New Castle County, DE, and Salem, Gloucester, Camden, Burlington, and Mercer Counties, NJ and Delaware and Philadelphia Counties, PA, and from the northwest through Chester, Lancaster, and York Counties, PA.

Figures 6d and 6e show HYSPLIT back trajectories for the violating monitors in Camden and Gloucester Counties, NJ. Both figures show southwestern winds, but also contribution from almost every direction including circular wind patterns. The back trajectories in Figure 6d show contribution to the violating monitor in Camden County, NJ from Gloucester and Salem Counties, NJ, New Castle County, DE, and Chester, Delaware, Montgomery, Bucks and Berks Counties, PA, and to a lesser extent from Cumberland, Atlantic, and Burlington Counties, NJ. The back trajectories in Figure 6e show contribution to the violating monitor in Gloucester County, NJ from Salem, Camden, and Burlington Counties, NJ, New Castle County, DE, and Chester, Delaware, and Bucks Counties, PA, and to a lesser extent from Montgomery and Berks Counties, PA.

Figure 6f shows HYSPLIT back trajectories for the violating monitor in Berks County, PA. This figure shows that on violating days, winds are predominantly southwest and south through Lancaster and York Counties, PA. There are also westerly winds, through Lebanon County, PA, and less contribution from the southeast, east, and northwest, through Chester, Montgomery, and Schuylkill Counties, PA, respectively.

Figure 6g shows HYSPLIT back trajectories for the violating monitor in Bucks County, PA. This figure shows that on violating days, winds are predominantly from the southwest, through Montgomery, Philadelphia, Delaware, and Chester Counties, PA, Burlington, Camden, Gloucester, Salem, and Cumberland Counties, NJ, New Castle County, DE, and Cecil County, MD. There is a lesser northeasterly contribution, through Mercer County, NJ.

Figure 6h shows HYSPLIT back trajectories for the violating monitor in Chester County, PA. The back trajectories in this figure show that on violating days, the predominant wind direction is from the southwest, through New Castle County, DE. There is also northwesterly contribution through Lancaster County, PA, and a lesser easterly component, through New Castle County, DE, Delaware and Philadelphia Counties, PA, and Gloucester, Camden, and Burlington Counties, NJ.

Figures 6i shows HYSPLIT back trajectories for the violating monitor in Delaware County, PA. The back trajectories in this figure show that on violating days at the Delaware County, PA monitor, winds are from almost every direction. However, there are western, southwestern, and southern winds, through Delaware and Chester Counties, PA, New Castle County, DE, and Salem and Gloucester Counties, NJ. There are also eastern, northeastern, and northern winds, through Gloucester, Camden, Burlington, and Mercer Counties, NJ, and Delaware, Philadelphia, Montgomery, and Bucks Counties, PA.

Figures 6j shows HYSPLIT back trajectories for the violating monitor in Montgomery County, PA. This figure shows that on violating days, winds are mainly coming into Montgomery County from the southwest, through Chester and Delaware Counties, PA, New Castle County, DE, and Cecil County, MD. The back trajectories also show lesser contribution from the northeast, west, and northwest through Philadelphia, Bucks, and Lancaster Counties, PA.

Figures 6k and 6l show HYSPLIT back trajectories for the two violating monitors in Philadelphia County, PA. Both figures show that the predominant wind direction into Philadelphia on violating days is from the southwest, through Chester and Delaware Counties, PA, New Castle County, DE, and Camden, Gloucester, and Salem Counties, NJ. The back trajectories also show contribution from Montgomery, Bucks, and Lancaster Counties, PA, and, to a lesser extent, Burlington, Cumberland, and Atlantic Counties, NJ.

Figures 6m and 6n show HYSPLIT back trajectories for the two violating monitors in Mercer County, NJ. Both figures show that the predominant wind direction on violating days in Mercer County, NJ is southwest, through Bucks, Montgomery, Philadelphia, Chester, and Delaware counties, PA, and Burlington, Camden, Gloucester, and Salem Counties, NJ, New Castle and Kent Counties, DE, and Cecil County, MD.

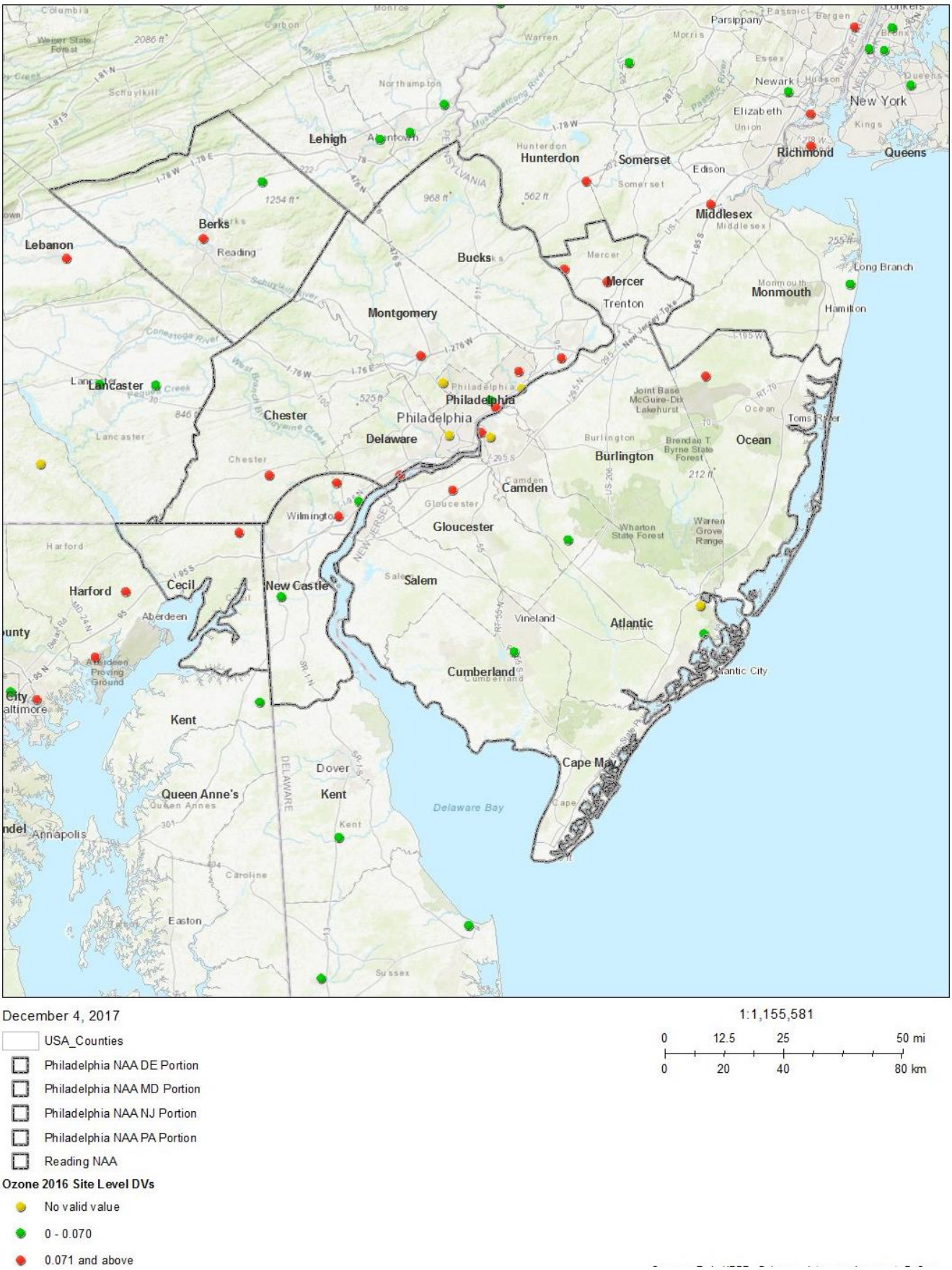
Figures 6o shows HYSPLIT back trajectories for the violating monitor in Ocean County, NJ. This figures show predominant winds from the west-southwest, through Burlington, Camden, Gloucester, and Salem Counties, NJ, Philadelphia, Chester, and Delaware Counties, PA, New Castle County, DE, and Cecil County, MD on days when the Ocean County, NJ monitor is violating.

Factor 4: Geography/topography

Consideration of geography or topography can provide additional information relevant to defining nonattainment area boundaries. Analyses should examine the physical features of the land that might define the air shed. Mountains or other physical features may influence the fate and transport of emissions as well as the formation and distribution of ozone concentrations. The absence of any such geographic or topographic features may also be a relevant consideration in selecting boundaries for a given area.

EPA used geography/topography analysis to evaluate the physical features of the land that might affect the air shed and, therefore, the distribution of ozone over the area. The Philadelphia-Wilmington-Atlantic City and Reading Areas do not have any geographical or topographical features significantly limiting air pollution transport within its air shed. Therefore, this factor did not play a role in this evaluation.

Figure 7. Topographic Illustration of the Physical Features.



Factor 5: Jurisdictional boundaries

Once the geographic extent of the violating area and the nearby area contributing to violations is determined, EPA considered existing jurisdictional boundaries for the purposes of providing a clearly defined legal boundary to carry out the air quality planning and enforcement functions for nonattainment areas. In defining the boundaries of the intended Philadelphia-Wilmington-Atlantic City and Reading nonattainment areas, EPA considered existing jurisdictional boundaries, which can provide easily identifiable and recognized boundaries for purposes of implementing the NAAQS. Examples of jurisdictional boundaries include, but are not limited to: counties, air districts, areas of Indian country, metropolitan planning organizations, and existing nonattainment areas. If an existing jurisdictional boundary is used to help define the nonattainment area, it must encompass all of the area that has been identified as meeting the nonattainment definition. Where existing jurisdictional boundaries are not adequate or appropriate to describe the nonattainment area, EPA considered other clearly defined and permanent landmarks or geographic coordinates for purposes of identifying the boundaries of the intended designated areas.

The Philadelphia-Wilmington-Atlantic City and Reading Areas have previously established nonattainment boundaries associated with the 1997 and 2008 ozone NAAQS. Pennsylvania and Maryland have recommended the same boundary for the Philadelphia-Wilmington-Atlantic City Area for the 2015 ozone NAAQS. Delaware and New Jersey have recommended different boundaries for the 2015 ozone NAAQS. As discussed in more detail in section 1.0, Delaware recommended that EPA either establish a large nonattainment area or alternatively designate New Castle County as a single county nonattainment area, separate from the Philadelphia-Wilmington-Atlantic City Area. New Jersey recommended that the entire state be designated nonattainment in an expanded nonattainment area, extending from Connecticut to northern Virginia, and containing the entire States of Connecticut, New Jersey, and Delaware, along with eastern New York State and eastern Pennsylvania, the Baltimore nonattainment area, and the Washington, DC-MD-VA nonattainment area. Pennsylvania recommended attainment for the Reading Area (Berks County) based on 2013-2015 air quality monitoring data. However, the area is violating the 2015 NAAQS based on 2014-2016 air quality monitoring data.

The Delaware Valley Regional Planning Commission (DVRPC), the MPO in the greater Philadelphia area, serves Bucks, Chester, Delaware, Montgomery, and Philadelphia Counties in Pennsylvania, and Burlington, Camden, Gloucester, and Mercer Counties in New Jersey. The MPO for Atlantic, Cape May, Cumberland, and Salem Counties is the South Jersey Transportation Planning Organization. Ocean County is part of the North Jersey Transportation Planning Organization, which also includes Bergen, Essex, Newark, Hudson, Hunterdon, Middlesex, Monmouth, Morris, Passaic, Somerset, Sussex, Union, and Warren Counties, including Newark and Jersey City. New Castle County, DE and Cecil County, MD are in the Wilmington Area Planning Council (WILMAPCO) MPO. Kent County, DE is served by the Dover/Kent County MPO. Berks County is covered by a separate MPO, the Berks County Planning Commission.

Conclusion for the Philadelphia-Wilmington-Atlantic City Area and Reading Area

After consideration of the recommendations from the States and the assessment of factors described above, EPA intends to include the following counties in the intended Philadelphia-Wilmington-Atlantic City Area: Bucks, Chester, Delaware, Montgomery, and Philadelphia Counties, PA: Atlantic, Burlington, Camden, Cape May, Cumberland, Gloucester, Mercer, Ocean, and Salem Counties, NJ: New Castle County, DE: and Cecil County, MD. These are the same counties that are included in the Philadelphia-Wilmington-Atlantic City nonattainment area for the 1997 and 2008 ozone NAAQS. The air quality monitors in Bucks, Chester, Delaware, Montgomery, and Philadelphia Counties, PA, Camden, Gloucester, Mercer, and Ocean Counties, NJ, New Castle County, DE, and Cecil County, MD indicate violations of the 2015 ozone NAAQS based on the 2014-2016 design values, therefore these counties are included in the intended nonattainment area. New Jersey has recommended that Atlantic, Burlington, Cape May, Cumberland, and Salem Counties, NJ be designated nonattainment and that the assessment of factors above support inclusion in the Philadelphia-Wilmington-Atlantic City Area.

Delaware recommended that New Castle County be designated as a single-county nonattainment area, separate from the Philadelphia-Wilmington-Atlantic City area. However, considering the five factors above, EPA has

determined that New Castle County is closely tied to the greater Philadelphia area, and contributes to other nearby violating monitors in the area. Therefore, EPA intends to designate New Castle County as nonattainment as part of the Philadelphia-Wilmington-Atlantic City Area. New Castle County, DE has relatively high emissions, high population, and high VMT compared to the other counties in the area of analysis. As shown in Figures 6c-e, 6g, and 6j-o, the prevailing winds from the southwest show that emissions in New Castle County contribute to most counties with violating monitors in the greater Philadelphia area. Furthermore, New Castle County is part of the Philadelphia-Wilmington-Atlantic City nonattainment area for the 1997 and 2008 ozone NAAQS. Based on its relatively high emissions and meteorology that indicates that it is upwind of nearby violating counties in the Philadelphia-Wilmington-Atlantic City area, EPA determines that it is contributing to those violations and should be part of that nonattainment area. Furthermore, New Castle County is served by DVRPC, the MPO for the greater Philadelphia area, and is part of the Philadelphia-Camden-Wilmington CBSA, which includes the Bucks, Chester, Delaware, Montgomery, and Philadelphia Counties, PA, four counties in southern New Jersey, and Cecil County, MD.

Delaware also recommended attainment for Kent County, and EPA does not intend to modify the state's recommendation. Kent County has relatively low NOx & VOC emissions, population, and VMT compared with most counties in the area of analysis. It is served by a separate MPO than the rest of the area, the Dover/Kent County MPO, and is in a separate CBSA, the Dover CBSA. In addition, meteorology shows relatively little contribution to violating monitors in New Castle County, DE, Cecil County, MD, Camden and Gloucester Counties, NJ, and Chester and Delaware Counties, PA, as shown in Figures 6a – 6e, 6h, and 6i.

New Jersey has recommended that the entire state be designated as nonattainment, as part of an expanded nonattainment area extending from Connecticut to northern Virginia, and containing the entire States of Connecticut, New Jersey, and Delaware, along with eastern New York State and eastern Pennsylvania, the Baltimore nonattainment area, and the Washington, DC-MD-VA nonattainment area. For the reasons provided above in section 1.0, EPA does not intend to designate one large nonattainment area along the eastern seaboard. EPA has determined that the nine New Jersey counties that were included in the Philadelphia-Wilmington-Atlantic City nonattainment area for the 1997 and 2008 ozone NAAQS should be designated nonattainment as part of the Philadelphia-Atlantic City nonattainment area for the 2015 NAAQS. This would facilitate continuity in planning. Seven of these counties, Atlantic, Burlington, Camden, Cape May, Cumberland, Gloucester, and Salem, are in the Philadelphia-Reading-Camden CSA, and four of those are in the Philadelphia-Camden-Wilmington CBSA, which includes Bucks, Chester, Delaware, Montgomery, and Philadelphia Counties, PA, New Castle County, DE, and Cecil County, MD. Burlington, Camden, Gloucester, and Mercer Counties are part of the DVRPC, the MPO for the greater Philadelphia area. Atlantic, Cape May, Cumberland, and Salem Counties are served by the South Jersey Transportation Planning Organization., Other counties in New Jersey, which we intend to include in the New York City-New Jersey-Northern Long Island NY-NJ-CT nonattainment area are part of the North Jersey Transportation Planning Organization. Furthermore, as shown in Figures 6a-o, meteorology indicates that counties in the greater Philadelphia area in Pennsylvania, Delaware, and Maryland are contributing to the violating monitors in Camden, Gloucester, Mercer, and Ocean Counties, NJ, and New Jersey counties EPA intends to include as part of the Philadelphia-Wilmington-Atlantic City nonattainment area are contributing to counties in the greater Philadelphia area in Pennsylvania, Delaware, and Maryland.

EPA has determined that Berks County (Reading, PA) should be designated nonattainment as a single-county area separate from the Philadelphia-Wilmington-Atlantic City area. Berks County is a single-county CBSA, the Reading CBSA, and is served by a single-county MPO, the Berks County Planning Commission. Importantly, meteorology shows, in Figures 6a-e and 6g-o, that violating monitors in the Philadelphia-Wilmington-Atlantic City area are generally not impacted by Berks County relative to other counties in the area of analysis. The HYSPLIT back trajectories for the violating monitors in the area of analysis are predominantly from the south and southwest and Berks County is to the west or northwest of the other counties in the area of analysis. Furthermore, as shown in Figure 6f, emissions from the other counties in the area of analysis which are to the east of Berks County are not significantly impacting air quality at the Berks County monitor.

Exceptional Events (EE)

As stated above, if EPA approves Pennsylvania's pending EE package, EPA intends to designate Berks County as attainment/unclassifiable.