OFFICE OF THE COMMISSIONER

New York State Department of Environmental Conservation
625 Broadway, 14th Floor, Albany, New York 12233-1010
P: (518) 402-8545 | F: (518) 402-8541
www.dec.ny.gov

MAR 12 2018

Scott Pruitt
Administrator
U.S. Environmental Protection Agency
Mail Code 1101A
1200 Pennsylvania Avenue, N.W.
Washington, DC 20460

Dear Administrator Pruitt:

The New York State Department of Environmental Conservation (DEC) is submitting the enclosed petition pursuant to section 126(b) of the Clean Air Act (CAA) because pollution from upwind sources significantly contributes to nonattainment and interferes with maintenance of the ozone National Ambient Air Quality Standards (NAAQS) in New York State. The New York-Northern New Jersey-Long Island, NY-NJ-CT area remains in nonattainment of the 2008 ozone NAAQS and is expected to be similarly designated for the 2015 ozone NAAQS; meanwhile, Chautauqua and Erie Counties in western New York are on the cusp of exceeding the 2015 NAAQS. Approval of this section 126(b) petition by the U.S. Environmental Protection Agency (EPA) would benefit the health and welfare of the millions of people that live and work in these areas.

DEC performed a modeling analysis that identified certain high-emitting stationary sources (i.e., sources that were projected to emit at least 400 tons of nitrogen oxides (NOx) in 2017 from the following nine states that significantly contribute to nonattainment or interfere with maintenance in New York State: Illinois, Indiana, Kentucky, Maryland, Michigan, Ohio, Pennsylvania, Virginia, and West Virginia. In accordance with CAA section 126(b), DEC requests that EPA make a finding that these sources are in violation of the "good neighbor" provision of CAA section 110(a)(2)(D)(i) and that EPA establish adequate emission limits to eliminate the significant contribution from these sources to nonattainment and interference with maintenance in New York State.

New York requires its stationary sources to meet high standards of NOx control through the application of stringent Reasonably Available Control Technology emission limits. Requiring the same of upwind sources that significantly contribute to nonattainment and interfere with maintenance in New York State will provide ample public health benefits and reduce the disproportionate economic burden to NOx sources in New York State.

In accordance with EPA's endorsement of CAA section 126(b) as an effective pathway for limiting upwind states' ozone contributions in its November 3, 2017 denial of the multi-state CAA section 176A petition, DEC requests a timely approval of this petition.

Please contact Mr. Steven Flint, Director, Division of Air Resources, at (518) 402-8452 if you have any questions.

Sincerely,

Basil Seggos
Commissioner

Enclosure

c: R. Ruvo, EPA
C. McCabe, EPA
M. Koerber, EPA
R. Wayland, EPA
S. Flint

NEW YORK STATE | STATE OF OPPORTUNITY | Department of Environmental Conservation

NEW YORK STATE PETITION FOR A FINDING PURSUANT TO CLEAN AIR ACT SECTION 126(b)

March 2018

DIVISION OF AIR RESOURCES
Bureau of Air Quality Planning

Albany, NY 12233-3251
P: (518) 402-8396 | F: (518) 402-9035 | dar.sips@dec.ny.gov

Executive Summary

This is a petition by New York State through its Department of Environmental Conservation (DEC) for a finding under Clean Air Act (CAA) section 126(b) that certain stationary sources located in upwind states impact the ability of New York State to attain the National Ambient Air Quality Standards (NAAQS) for ozone. Specifically, upwind sources interfere with the New York-Northern New Jersey-Long Island, NY-NJ-CT area (hereafter the New York metropolitan area or NYMA) attaining the 2008 and 2015 ozone NAAQS and threaten the ability of Chautauqua County in western New York to maintain attainment of the 2008 and 2015 ozone NAAQS. This petition identifies stationary sources from the following nine states as interfering with attainment or maintenance of the 2008 and 2015 ozone NAAQS in New York State: Illinois, Indiana, Kentucky, Maryland, Michigan, Ohio, Pennsylvania, Virginia, and West Virginia.

The NYMA remains in nonattainment of the 2008 ozone NAAQS as the area failed to attain by its initial marginal classification deadline of July 20, 2015 and monitoring data indicate it will again fail to attain by the moderate classification deadline of July 20, 2018 (based on preliminary 2015-2017 data). Chautauqua County was designated as nonattainment for the 2008 ozone NAAQS, though it currently monitors attainment. Significant levels of transported ozone will interfere with the area's ability to continue monitoring attainment and will negatively impact the area's future chances of being redesignated to attainment.

Furthermore, the NYMA is expected to be designated nonattainment for the 2015 ozone NAAQS once EPA finalizes its designations. Preliminary 2017 design values demonstrate that multiple monitors in the New York, Connecticut, and New Jersey portions of the NYMA exceed the 2015 NAAQS, which was set at a level of 0.070 parts per million (ppm).

Modeling analyses have repeatedly confirmed that there are significant ozone impacts in New York State from the upwind states whose sources are named in this petition. These sources interfere with the ability of the NYMA to attain the ozone NAAQS and Chautauqua County to maintain the NAAQS. DEC completed a modeling exercise in support of this petition that analyzed emissions from the collection of 400 ton-per-year sources in the electric generating unit (EGU), non-EGU, and oil and gas sectors, in each significantly contributing state – i.e., those states that were identified in EPA's modeling for the Cross-State Air Pollution Rule (CSAPR) as contributing ozone concentrations of at least one percent of the 2008 NAAQS (or 0.75 parts per billion (ppb) or more) to a monitor in a downwind state. The results show impacts from individual states' collection of 400 ton-per-year sources of up to 6.34 ppb in Chautauqua County and 4.97 ppb in the NYMA nonattainment area. The upwind sources' significant contributions compromise the health and welfare of the 20 million citizens living within the NYMA and the 135,000 citizens in Chautauqua County and create a disproportionate economic burden for sources of ozone precursors in New York State.

DEC is calling upon EPA to require the significantly contributing states to impose suitable emission limits on these large stationary sources that are affecting air quality in New York within the three years allowed for under section 126(c). These sources should be operating with modern nitrogen oxide (NOx) emission controls (e.g. selective catalytic or non-catalytic reduction systems) and at emission rates commensurate with New York State's Reasonably Available Control Technology (RACT) standards, which are based on a control cost efficiency of $5,000 per ton of NOx removed. Given EPA's endorsement of the section 126(b) statutory option in its November 3, 2017 denial of the section 176A petition, DEC expects a timely approval of this petition.

Statutory Authority

CAA section 126(b) provides that:

> *Any State or political subdivision may petition the Administrator for a finding that any major source or group of stationary sources emits or would emit any air pollutant in violation of the prohibition of section 110(a)(2)(D)(i) or this section. Within 60 days after receipt of any petition under this subsection and after public hearing, the Administrator shall make such a finding or deny the petition.*[1]

Section 110(a)(2)(D)(i) is also known as the "good neighbor" provision. It requires each state's SIP to contain provisions prohibiting any source or other type of emissions activity within the state from emitting any air pollutant in amounts that will contribute significantly to nonattainment in, or interfere with maintenance by, any other state with respect to a NAAQS. Consistent with these provisions, the burden on a state filing a petition pursuant to section 126(b) is to demonstrate that any major stationary source or group of stationary sources emits or would emit an air pollutant that leads to difficulty attaining or maintaining a NAAQS.

Within 60 days after receipt of the section 126(b) petition and after a public hearing, the Administrator must make the requested finding or deny the petition. Pursuant to CAA section 126(c), if the Administrator finds that a major source or group of sources is emitting a pollutant in violation of section 110, any source subject to the finding must cease its operation within three months, unless the Administrator permits the continued operation of the source beyond the time, conditioned on the source complying with such emission limitations and compliance schedules (containing increments of progress) as the Administrator may direct to bring about compliance with section 110. Such compliance must be brought about as expeditiously as practicable but in no case later than three years after the date of the Administrator's finding.

The term "emission limitation" means a requirement established by the state or the Administrator which limits the quantity, rate, or concentration of emissions of air pollutants on a continuous basis, including any requirement relating to the operation or

[1] Note that CAA section 126(b) references section 110(a)(2)(D)(ii); EPA attributes this to a scrivener's error, whereas the correct citation is section 110(a)(2)(D)(i). See "Findings of Significant Contribution and Rulemaking on Section 126 Petitions for Purposes of Reducing Interstate Ozone Transport," Final Rule; May 25, 1999; 64 FR 28267.

maintenance of a source to assure continuous emission reduction, and any design, equipment, work practice or operational standard promulgated under the CAA.[2] The term "compliance schedule" means a schedule of required measures including an enforceable sequence of actions or operations leading to compliance with an emission limitation, other limitation, prohibition, or standard.[3]

Background and Necessity

Ozone Formation and Health/Welfare Effects

Ozone is formed when NOx and volatile organic compounds (VOCs) react with oxygen in the presence of sunlight and heat. Peak ozone concentrations in New York State typically occur during the May to September period when temperatures are highest. NOx and VOC emissions from local urban sources over successive hot days combine with high-level concentrations of ozone and precursors that have been transported into the area from sources located outside the state by westerly to southerly winds.

EPA's most recent Integrated Science Assessment (ISA) for ozone determined that a ''causal'' relationship exists between short-term exposure to ozone in ambient air and negative effects on the respiratory system, and that a ''likely to be causal'' relationship exists between long-term exposure to ozone in ambient air and respiratory effects.[4] The ISA also determined that the relationships between short-term exposures to ozone in ambient air and both total mortality and cardiovascular effects are likely to be causal, based on expanded evidence in the recent review.[5] Additionally, the latest review strengthened the body of evidence indicating the occurrence of respiratory effects due to long-term ozone exposure,[6] and recent studies have increased the certainty of the association between short-term ozone concentrations and mortality in adults.[7]

Ground-level ozone can irritate lung airways and cause skin inflammation much like sunburn. Other symptoms from exposure include wheezing, coughing, pain when taking a deep breath, and breathing difficulties during exercise or outdoor activities. Even at very low levels, exposure to ground-level ozone can result in decreased lung function, primarily in children who are active outdoors, as well as increased hospital admissions and emergency room visits for respiratory illnesses among children and adults with pre-existing respiratory diseases (e.g., asthma). People with respiratory problems are most vulnerable to the health effects associated with ozone exposure, but even healthy people that are active outdoors can be affected when ozone levels are high.

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[2] CAA Section 302(k)
[3] CAA Section 302(p)
[4] U.S. EPA; "Final Report: Integrated Science Assessment of Ozone and Related Photochemical Oxidants." 2013. EPA/600/R-10/076F. P. 1-6 to 1-7.
[5] Ibid. P. 1-7 to 1-8.
[6] Ibid. Chapter 7.
[7] "National Ambient Air Quality Standards for Ozone." Final Rule. Published October 26, 2015. 80 FR 65309.

In addition to its health effects, ozone interferes with the ability of plants to produce and store nutrients, which makes them more susceptible to disease, insects, harsh weather, and other pollutants. This impacts annual crop production throughout the United States, resulting in significant losses and injury to native vegetation and ecosystems. Furthermore, ozone damages the leaves of trees and other plants, ruining the appearance of cities, national parks, and recreation areas. Ozone can also damage certain man-made materials, such as textile fibers, dyes, rubber products, and paints.

Ozone Air Quality in the NYMA and Western New York

EPA revised the primary and secondary NAAQS for ozone in 2008 to levels of 0.075 ppm, measured over an 8-hour period. Effective July 20, 2012, EPA designated the New York-N. New Jersey-Long Island, NY-NJ-CT metropolitan area as a nonattainment area for the 2008 ozone NAAQS with a marginal classification. This area consists of nine counties within New York – Bronx, Kings, Nassau, New York, Queens, Richmond, Rockland, Suffolk, and Westchester – along with twelve counties in New Jersey and three in Connecticut. The Jamestown, New York area, consisting solely of Chautauqua County, was also designated as marginal nonattainment.[8]

The NYMA failed to attain the 2008 NAAQS by the marginal attainment deadline of July 20, 2015 and was reclassified by EPA to moderate nonattainment effective June 3, 2016, providing another three years to attain.[9] This established a new attainment deadline of July 20, 2018, determined with data from 2015-2017. The Jamestown nonattainment area attained the NAAQS by the marginal attainment deadline of July 20, 2015 though it remains in danger of exceeding the ozone NAAQS, particularly the 2015 standard.

New York, New Jersey, and Connecticut have all been surpassing their three-percent-per-year emission reduction requirements for the 2008 NAAQS, but are still far from reaching attainment in the NYMA. Certified monitoring data through 2016 and preliminary 2017 data indicate that the NYMA did not attain the 2008 ozone NAAQS by the moderate area deadline (effectively the end of 2017). The area's "design value monitor" (i.e., the highest-recording monitor in the area) is located in southern Connecticut and had both a 2016 design value and preliminary 2017 design value of 83 ppb. DEC submitted a reclassification request to serious nonattainment on November 13, 2017; a serious classification would provide an additional three years, until July 20, 2021 (based on 2018-2020 monitoring data), to attain the NAAQS.

EPA revised the primary and secondary ozone NAAQS again in 2015 to 0.070 ppm, measured over an 8-hour period, because the 0.075 ppm standard was not sufficiently protective of human health. DEC expects a similar nonattainment designation for the

[8] "Air Quality Designations for the 2008 Ozone National Ambient Air Quality Standards." Final Rule. Published May 21, 2012; effective July 20, 2012. 77 FR 30088-30160.

[9] "Determinations of Attainment by the Attainment Date, Extensions of the Attainment Date, and Reclassification of Several Areas for the 2008 Ozone National Ambient Air Quality Standards." Final Rule. Published May 4, 2016; effective June 3, 2016. 81 FR 26697-26722.

New York-N. New Jersey-Long Island, NY-NJ-CT area as stated in the “120-day letter” issued by EPA on December 20, 2017 to Governor Andrew Cuomo, based on recent design values. This designation was expected by the October 1, 2017 statutory deadline, though as of this filing EPA has yet to issue final designations.

Given the continued inability to attain the 2008 NAAQS, the upcoming nonattainment designation for the NYMA for the 2015 NAAQS, and the potential for areas in western New York to exceed the 2008 and 2015 NAAQS, New York State requires relief from the upwind contributors named in this petition.

Transported Ozone Pollution

Complicating the strategy to reduce ground-level ozone in the NYMA is the fact that the chemical reactions that create ozone can take place while the pollutants are being transported through the air by the wind. This means elevated levels of ozone can exist many miles away from the source of their original precursor emissions. Therefore, unlike more traditional criteria pollutants (e.g., sulfur dioxide and lead, which are emitted directly and can be controlled at their source), reducing ozone concentrations locally poses additional challenges.

The high concentrations of ozone that are transported to New York State are largely the result of emissions from major stationary sources of NOx located out-of-state. These sources are often characterized by the operation of large boilers and other units that require very tall stacks to emit the exhaust from their combustion processes. Because of the use of these tall stacks and the high temperatures of the exiting gases, enormous volumes of NOx emissions are sent high into the atmosphere. These high concentrations of NOx and the subsequently-formed ozone are transported aloft during the night to downwind areas like western New York and the NYMA where they combine with locally-formed ozone and precursors during the day to result in exceedances of the NAAQS.

New York State has been involved in efforts to mitigate regional transport of NOx for decades, beginning with its participation in the Ozone Transport Commission which developed the original NOx Budget Program. New York’s efforts continued with the Ozone Transport Assessment Group (OTAG) – a partnership between EPA, the Environmental Council of States, and various industry and environmental groups to study the effects of ozone precursor emissions on downwind areas. This partnership resulted in EPA’s October 1998 finding (commonly known as the “NOx SIP Call”) that 22 states and the District of Columbia significantly contributed to nonattainment and maintenance issues in downwind areas and to the ozone-related health issues therein, therefore violating their “good neighbor” obligations under CAA section

110(a)(2)(D)(i)(I).[10] EPA included a model NOx Budget Trading Program rule with this finding as a tool for states to meet their trading obligations.

The NOx Budget Trading Program was the first of multiple iterations of ozone-season NOx trading programs that have been implemented at the federal level in an attempt to alleviate eastern states' interstate contributions pursuant to section 110(a)(2)(D)(i)(I). The most recent of these federal programs is CSAPR, which was originally released on August 8, 2011 for the 1997 ozone NAAQS[11] and subsequently updated on October 26, 2016 for the 2008 ozone NAAQS.[12] CSAPR is the result of states failing to fulfill their good neighbor obligations for transport; it represents the coordinated issuance of Federal Implementation Plans (FIPs) for 22 eastern states that are linked to downwind nonattainment or maintenance areas. These FIPs require affected EGUs in each covered state to comply with the program's seasonal emissions budgets.

While the CSAPR program provides the legal and technical basis for states to eliminate their significant contributions to excessive ozone pollution, EPA has failed to implement a full, federal-level remedy to completely address the issue of transported ozone. In the CSAPR Update, EPA stated that "the EGU NOx ozone season emission budgets finalized in this action represent a *partial remedy* to address interstate emission transport for the 2008 ozone NAAQS" (emphasis added).[13] The NYMA was one of the areas that was projected to remain in nonattainment beyond the application of the rule's NOx budgets, with monitors in Fairfield and New Haven Counties in the Connecticut portion of the area continuing to project nonattainment in 2017. Additionally, multiple additional monitors in the Connecticut and New York portions of the NYMA were projected as maintenance monitors.

Since the CSAPR Update does not fully address states' transport obligations, EPA has issued findings that all nine states named in this petition (in addition to others) failed to submit adequate good neighbor SIPs for the 2008 ozone NAAQS. Moreover, EPA has failed to fulfill its duty to issue FIPs by the two-year deadline in certain instances:

- June 2, 2016 – FIP deadline for Kentucky (EPA is under a District Court order to finalize by June 30, 2018);
- August 12, 2017 – FIP deadline for Illinois, Michigan, Pennsylvania, Virginia, West Virginia;
- July 15, 2018 – FIP deadline for Indiana, Ohio;
- August 19, 2018 – FIP deadline for Maryland.

EPA's failure to enforce states' good neighbor obligations necessitates that New York take further action for relief from interstate transport.

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[10] "Finding of Significant Contribution and Rulemaking for Certain States in the Ozone Transport Assessment Group Region for Purposes of Reducing Regional Transport of Ozone." Final Rule. Published October 27, 1998; effective December 28, 1998. 63 FR 57356-57538.
[11] "Federal Implementation Plans: Interstate Transport of Fine Particulate Matter and Ozone and Correction of SIP Approvals. Final Rule. Published August 8, 2011; effective October 7, 2011. 76 FR 48208-48483.
[12] "Cross-State Air Pollution Rule Update for the 2008 Ozone NAAQS." Final Rule. Published October 26, 2016; effective December 27, 2016. 81 FR 74504-74650.
[13] Ibid., 81 FR 74508.

Dunkirk Monitor (Chautauqua County) Transport Study

A recent DEC study quantified the effect of transport on the ozone design value at the Dunkirk monitor (ID 36-013-0006). This monitor, which is located in Chautauqua County in Western New York, is officially designated nonattainment for the 2008 ozone NAAQS and has the potential to exceed the 2015 ozone NAAQS. This study used a synoptic analysis including back-trajectories and ozone concentration data from EPA's Air Quality System to identify upwind pollution contributions.

The study finds that air transported into Chautauqua County on the worst air quality days is already, on average, within two ppb of – and often exceeds – the 2015 ozone standard. Consequently, given the absence of major sources in the area, this study highlights the need for ozone precursor emissions reductions from upwind states, especially sources identified in this petition that are located in Ohio, Indiana, Michigan, Kentucky, and Illinois. The study results are summarized in Table 1, while a more comprehensive discussion of the analysis is contained in Appendix A.

Table 1. Maximum Daily 8-Hour Ozone Concentrations (ppb) for Design Days with Direct Inflow

Date	Erie, PA	Dunkirk, NY	Upwind source areas
05/15/13	69	66	Chicago, Detroit
05/29/13	62	69	Ohio Valley, Cleveland
06/22/13	64	70	Ohio Valley, Cleveland
09/10/13	70	76	Chicago, Detroit, Cleveland
05/26/14	71	74	Detroit, Cleveland
06/16/14	61	71	Chicago, Detroit, Cleveland
05/03/15	65	74	Chicago, Detroit, Cleveland
05/24/15	65	71	Chicago, Detroit, Cleveland, Ohio Valley
05/24/16	70	69	Detroit
05/25/16	79	82	Chicago, Detroit, Cleveland, Ohio Valley, Pittsburgh
06/11/16	73	80	Chicago, Detroit, Cleveland, Ohio Valley
07/19/17	78	79	Chicago, Detroit
08/01/17	63	67	Detroit, Cleveland
Average	**68**	**73**	

New York State's Efforts to Control its Major Stationary Sources

The request made to EPA in this petition is to require upwind states to control major EGU and non-EGU stationary sources to an extent that mirrors the level of control for similar sources in New York. New York's inclusion in the Ozone Transport Region (OTR) requires RACT to be implemented statewide, and the severity of NYMA's ozone nonattainment results in even stricter emissions thresholds for RACT applicability in that area.

The threshold to determine economic feasibility for NOx RACT in New York State is an inflation-adjusted $5,000 per ton of NOx reduced. DEC has promulgated some regulations with emission limits specific to a source category (e.g., industrial boilers under 6 NYCRR Subpart 227-2), and others that require facility-specific analyses to determine technically feasible controls within this cost threshold (e.g., cement and glass plants under 6 NYCRR Subparts 220-1 and 220-2, respectively). DEC also adopts all federal Control Techniques Guidelines and Alternative Control Techniques, except in instances where no sources exist for a particular source category, statewide.

Upwind non-OTR states have no similar mandate for installing controls at major non-EGU sources outside of moderate (or above) nonattainment areas. Emissions from EGUs are typically dictated by NOx budgets through CSAPR rather than through state regulations. As discussed above, the CSAPR update for the 2008 ozone NAAQS is only a partial remedy to states' ozone transport obligations, since EPA focused on "immediately available and cost-effective emissions reductions that are achievable by the 2017 ozone season."[14] EPA considered "cost-effective" controls to be within a threshold of $1,400 per ton of NOx reduced – less than a third of the economic standard that New York's major sources are held to. And by focusing only on short-term emission reductions, EPA ruled out potentially cost-effective controls that would have benefited the NYMA albeit on a slightly longer timeframe.

Additionally, CSAPR is a seasonal trading program, with compliance averaged over the entire ozone season. This method does not ensure relief to downwind states on the high electric demand days in which NOx emissions are highest and ozone formation is at its peak. To address that concern, New York's RACT limits are based on daily (24-hour block) averages. This shorter-term averaging scheme requires emissions controls to be run continuously to meet the regulatory limits.

New York State's Attempts to Address Upwind Transport

Because EPA's NOx trading programs do not provide a full remedy to upwind states' section 110(a)(2)(D)(i)(I) obligations, New York State has taken additional actions to curtail the ozone pollution from upwind states that is impacting public health in the NYMA.

On December 9, 2013, New York and seven other states submitted a petition to EPA pursuant to CAA section 176A to expand the OTR to include nine additional states: Illinois, Indiana, Kentucky, Michigan, North Carolina, Ohio, Tennessee, Virginia, and West Virginia. (Note that the petition was amended on December 10, 2013 to add Pennsylvania to the list of petitioners.) The petitioning states utilized EPA's air quality contribution modeling along with their own technical analysis to demonstrate the need for the upwind states to control emissions of their ozone precursors that impact nonattainment and maintenance areas in downwind states. Expansion of the OTR

[14] 81 FR 74521

would require these additional states to engage in planning discussions, and to implement control measures commensurate with those already in place in the petitioning states (e.g., vehicle inspection and maintenance programs, New Source Review, and RACT) in order to reduce emissions of ozone precursors.

However, on November 3, 2017, EPA denied the petitioning states' request, stating there are more appropriate statutory options available to address interstate transport, specifically citing CAA sections 110(a)(2)(D)(i) and 126(b). DEC is submitting this section 126(b) petition for relief from harmful and unlawful ozone pollution from upwind states consistent with EPA recommendations.[15]

In addition, New York State joined as plaintiff-intervenor in a suit brought by Sierra Club that addressed the "undisputed failure" of EPA to perform its CAA-mandated duty to issue a FIP to address the interstate transport from Kentucky that significantly contributes to other states' nonattainment or maintenance issues. The suit was decided in favor of Sierra Club and New York, with the decision declaring that the statute "imposed an absolute duty on the EPA to issue the FIP within two years of Kentucky's failure to adopt an adequate [SIP]."[16] The court ordered EPA to complete its FIP by June 30, 2018.

Furthermore, plaintiffs New York and Connecticut filed suit on January 17, 2018 against EPA and Administrator Pruitt for similarly failing to complete transport FIPs for an additional group of 24 states, which includes five that significantly contribute to ozone nonattainment in the NYMA: Illinois, Michigan, Pennsylvania, Virginia, and West Virginia. August 12, 2017 marked the two-year deadline for EPA to issue a FIP to cover the good neighbor obligations for these states. EPA has not taken any action to fulfill its obligation. The court decision in the Kentucky suit has established that these timeframes are not negotiable.

Analysis of Significant Ozone Contributions

Methodology

New York State's analysis for this section 126(b) petition considered the highest-emitting facilities – specifically, EGU and non-EGU facilities, including from the oil and gas sector, that emit 400 tons per year or more of NOx – from each state that significantly contributed to nonattainment or interfered with maintenance in the NYMA and/or interfered with maintenance in Chautauqua County. (DEC used a threshold of one percent of the NAAQS to determine "significant" contributions or interference,

[15] A group of the petitioning states, including New York, is challenging EPA and Administrator Pruitt's denial of the section 176A petition as arbitrary and capricious and not supported by the record.
[16] Order re Partial Consent Decree and Summary Judgment. U.S. District Court – Northern District of California. Sierra Club, Plaintiff, State of New York, Plaintiff-Intervenor, v. Scott Pruitt, Defendant. Case No. 3:15-cv-04328-JD. Filed May 23, 2017.

following EPA precedent.[17]) These high-emitting facilities are expected to have the greatest impact on the ability of the NYMA and Chautauqua County to attain and maintain the 2008 and 2015 NAAQS, and therefore can reasonably be retrofitted with control equipment or can operate existing controls more frequently in an effort to reduce NOx.

EPA's ozone contribution modeling for the 2008 ozone NAAQS, released on September 7, 2016 in conjunction with the final CSAPR Update rule, provided the necessary information for DEC to determine which states significantly contribute to ozone nonattainment issues in the NYMA.[18] Ten states were projected to contribute at least one percent of the 2008 NAAQS (i.e., 0.75 ppb) at nonattainment monitors in the NYMA in 2017: Illinois, Indiana, Kentucky, Maryland, Michigan, New Jersey, Ohio, Pennsylvania, Virginia, and West Virginia. These 10 significantly contributing states formed the basis of DEC's analysis, as they violate the good neighbor provision of CAA section 110(a)(2)(D)(i).

While EPA released additional air quality modeling in October 2017 to serve as the basis for good neighbor SIPs for the 2015 NAAQS, DEC has significant concerns about the assumptions and results of this modeling – for example, the expectation that uncontrolled EGUs will greatly reduce their emission rates in the absence of enforceable limits, and the treatment of model cells containing a land/water interface. Without further analysis and enforceable commitments to support the modeled reductions, EPA's modeling does not fulfill states' obligations under CAA section 110(a)(2)(D)(i). Furthermore, CAA section 126(c) explicitly states that compliance must be met "in no case later than three years after the date of [a section 126(b)] finding." EPA's 2023 modeling does not fit this timeframe and cannot be used to support a review of this petition.

DEC utilized the 2017 Beta 2 projection inventory developed by the Mid-Atlantic Regional Air Management Association (MARAMA) to identify the facilities emitting 400 tons per year or more of NOx in each of the 10 significantly contributing states. The 2017 EGU projection was done by MARAMA using the Eastern Regional Technical Advisory Committee (ERTAC) tool, as opposed to the Integrated Planning Model typically used by EPA in its EGU projection modeling. To ensure a complete facility list, DEC also identified sources greater than 400 tons in the 2014 National Emissions Inventory (NEI), to be accounted for in the contribution modeling with their MARAMA projected 2017 emissions, where still operating. (This explains the inclusion of some sources with projected 2017 emissions less than 400 tons.) The list of facilities included in the contribution modeling, and their projected 2017 emissions, are included as Appendix B.

[17] "Cross-State Air Pollution Rule Update for the 2008 Ozone NAAQS." Final Rule. Published October 26, 2016; effective December 27, 2016. 81 FR 74508.
[18] "Final CSAPR Update_Ozone Design Values & Contributions_All Sites.xlsx." Available at EPA's "Final Cross-State Air Pollution Rule Update" website: https://www.epa.gov/airmarkets/final-cross-state-air-pollution-rule-update

Once identified, the facilities' emissions were processed for modeling. The sources emitting at least 400 tons per year in the 2017 Beta 2 emission files were processed through the Sparse Matrix Operator Kernel Emissions (SMOKE) processor on a state-by-state basis. A baseline run was performed with the MARAMA Beta 2 emission files; a control run was then performed with the high-emitting sources for each state "zeroed out." The difference between the base and control runs represents the emissions impact from each state's collection of 400 ton-per-year sources.

The Community Multiscale Air Quality (CMAQ) model runs utilized model version 5.0.2 with CB05 gas chemistry. EPA's WRF 2011 meteorological data were used.

DEC's CMAQ modeling analysis generally followed the method described for ozone contribution modeling in EPA's Technical Support Document for the CSAPR Update, with some adjustments.[19] DEC used a methodology that would represent days when ozone concentrations are approaching the NAAQS, as follows: Modeled hourly ozone concentrations were used to calculate the 8-hour daily maximum ozone (MDA8) concentration in each grid cell on each day of the two-and-a-half month modeling period. If a monitor grid cell had five days or more with MDA8 of at least 71 ppb, the maximum MDA8 difference (between the baseline and control runs) was selected. If a monitor grid cell had fewer than five days with MDA8 of at least 71 ppb, but at least five days with MDA8 of at least 60 ppb, the maximum difference of those days was selected. If there were fewer than five such days, the monitor was disregarded.

DEC chose to model a period of May 18 through July 30; while resource constraints prevented DEC from performing a complete ozone-season or annual analysis for each significantly contributing state, this scenario provides an adequate approximation of ozone impacts by capturing the majority of ozone exceedance days at the monitors of interest.

Modeled Impacts that Form Basis of Petition

The model output, summarized in Table 2, represents the maximum influence from the combined 400 ton-per-year sources from an individual state on a particular monitor. This maximum influence can be from any day over the two-and-a-half month modeling period. Due to the 60-ppb threshold utilized at each monitor described above, impacts at some monitors were not reported.

DEC's focus is on two monitors for which EPA's 2016 contribution modeling showed continued nonattainment or maintenance issues for the 2008 and 2015 NAAQS, in part attributable to upwind state contributions. It is also worth noting that the Riverhead monitor was predicted by EPA's modeling to be well below the 2008 NAAQS in 2017, but continues to exceed the standard. States contributing significant amounts of ozone to these monitors would therefore be considered in violation of the good neighbor

[19] "Air Quality Modeling Technical Support Document for the Final Cross State Air Pollution Rule Update." EPA Office of Air Quality Planning and Standards. August 2016.

provision for the 2008 and 2015 NAAQS and subject to a petition pursuant to CAA section 126(b). Preliminary 2017 monitored data are also provided here as a confirmation of the continuing ozone issues and their relation to EPA's modeling predictions.

- Babylon (ID 36-103-0002), Suffolk County:
  - projected 2017 design value of 76 ppb, indicating nonattainment;
  - preliminary monitored 2017 design value of 76 ppb.
- Susan Wagner (ID 36-085-0067), Richmond County:
  - projected *maximum* design value of 77 ppb, which EPA uses to indicate maintenance;
  - preliminary monitored 2017 design value of 76 ppb.
- Riverhead (ID 36-103-0004), Suffolk County:
  - Projected 2017 design value of 70 ppb, indicating attainment;
  - Preliminary monitored 2017 design value of 76 ppb

DEC also analyzed upwind contributions to the Dunkirk monitor (ID 36-013-0006) in Chautauqua County, which is designated nonattainment for the 2008 ozone NAAQS. Although the area preliminarily monitored attainment of the NAAQS in 2017, it continues to have the potential to exceed the NAAQS – particularly the updated 2015 standards – due to transported ozone pollution.

The 400 ton-per-year sources from nine individual states were shown to have impacts that exceeded the significant contribution thresholds for the 2008 ozone NAAQS (0.75 ppb) and the 2015 ozone NAAQS (0.70 ppb) at the NYMA and/or Chautauqua County monitors described above: Illinois, Indiana, Kentucky, Maryland, Michigan, Ohio, Pennsylvania, Virginia, and West Virginia. Modeled impacts from the 400 ton-per-year sources in New Jersey proved to not significantly contribute to any nonattainment or maintenance monitors.

Table 2. NYMA and Upstate Impacts from 400 Ton-per-Year Sources (Contributions in ppb)

	Monitoring Site	County	AQS Code	Latitude	Longitude	IL	IN	KY	MD	MI	NJ	OH	PA	VA	WV
NYMA	IS 52*	Bronx	36-005-0110	40.81618	-73.9020	0.192	0.348	0.264	0.716	0.773	0.526	1.077	4.401	0.911	2.006
	Pfizer Lab	Bronx	36-005-0133	40.86790	-73.8781	0.183	1.037	0.693	0.559	0.807	0.145	1.197	2.441	0.624	1.888
	CCNY*	New York	36-061-0135	40.81976	-73.9483	0.192	0.348	0.264	0.716	0.773	0.526	1.077	4.401	0.911	2.006
	Queens College 2	Queens	36-081-0124	40.73614	-73.8215	0.221	0.351	0.404	0.848	0.729	0.594	0.928	3.760	0.847	1.280
	Susan Wagner HS	Richmond	36-085-0067	40.59664	-74.1253	0.205	1.012	0.727	1.509	0.684	0.477	1.350	4.660	0.807	2.273
	Rockland County	Rockland	36-087-0005	41.18208	-74.0282	0.043	0.088	0.065	0.454	0.494	0.283	0.681	4.968	0.346	1.448
	Babylon	Suffolk	36-103-0002	40.74529	-73.4192	0.257	0.516	0.476	0.873	0.641	0.328	0.910	1.978	0.586	0.578
	Riverhead	Suffolk	36-103-0004	40.96078	-72.7124	0.300	0.559	0.252	1.416	0.354	0.450	0.684	1.331	0.929	0.528
	Holtsville	Suffolk	36-103-0009	40.82799	-73.0575	0.159	0.339	0.228	1.160	0.617	0.364	0.739	1.266	0.456	0.335
	White Plains	Westchester	36-119-2004	41.05192	-73.7637	0.040	0.350	0.627	0.798	0.464	0.147	1.109	3.638	0.350	1.554
Upstate	Dunkirk	Chautauqua	36-013-0006	42.49963	-79.3188	0.806	2.794	1.379	0.049	1.498	0.000	6.343	0.049	0.819	0.155
	Millbrook	Dutchess	36-02-70007	41.78555	-73.7414	0.037	0.087	0.044	0.875	0.186	0.250	1.658	3.486	0.167	0.571
	Amherst	Erie	36-029-0002	42.99328	-78.7715	0.644	4.207	1.479	0.053	1.449	0.000	4.936	0.021	0.323	0.095
	Whiteface Mt.	Essex	36-031-0002	44.36608	-73.9031	0.740	1.072	0.227	0.029	1.402	0.002	1.424	0.133	0.220	0.569
	Rochester 2	Monroe	36-055-1007	43.14618	-77.5482	0.370	1.195	0.365	0.035	1.770	0.005	2.497	0.194	0.355	0.973
	Middleport	Niagara	36-063-1006	43.22386	-78.4789	0.350	1.005	1.550	0.155	1.524	0.005	3.076	0.138	0.303	0.836
	East Syracuse	Onondaga	36-067-1015	43.05235	-76.0592	0.986	1.127	0.367	0.238	0.482	0.003	1.033	0.677	0.338	1.058
	Valley Central HS	Orange	36-071-5001	41.52375	-74.2153	0.010	0.028	0.028	0.190	0.280	0.743	1.771	3.641	0.153	0.520
	Fulton	Oswego	36-075-0003	43.28428	-76.4632	0.790	0.819	0.176	0.050	0.799	0.003	1.167	0.351	0.311	0.977
	Mt. Ninham	Putnam	36-079-0005	41.45589	-73.7098	0.040	0.082	0.046	0.847	0.340	0.169	0.627	4.223	0.320	1.148
	Williamson	Wayne	36-117-3001	43.23086	-77.1714	0.526	0.592	0.102	0.054	1.209	0.004	1.980	0.331	0.283	0.887

Significant contribution under 2008 NAAQS (> 0.75 ppb)

Significant contribution under 2015 NAAQS (> 0.70 ppb)

*Shared grid cell for IS52 and CCNY results in identical concentrations

Significant transport contributions are projected to occur at all ozone monitors within the NYMA. The Susan Wagner monitor in Staten Island is of particular interest to DEC because it often records the highest ozone concentrations in the area despite being upwind of New York City's central business district, indicating a heavy transport component. EPA's 2016 transport modeling for the 2008 NAAQS attributed a mere 7.0 percent of the 2017 average design value to New York State. These modeling results demonstrate a significant transport contribution from the high-emitting stationary sources in states as far away as Indiana.

Upstate monitors are also impacted by the high-emitting stationary sources in these significantly contributing states. The monitors in western New York exhibit especially high impacts – particularly the Amherst (Erie County) and Dunkirk (Chautauqua County) monitors, which show major contributions from upwind states. Per EPA's 2016 contribution modeling, 11.8 percent of the ozone contribution to the 2017 average design value at the Amherst monitor is attributed to New York State sources; meanwhile, a mere 2.0 percent of the contribution at Dunkirk comes from New York State. Each area has a history of ozone nonattainment, and may ultimately exceed the 2015 NAAQS depending on ozone concentrations in future years. Based on the above, it is clear that emissions from these significantly contributing upwind states' large sources could be the difference between attainment and nonattainment in these areas, particularly for the 2015 NAAQS.

Included as appendices are plots that display the modeled impacts on New York State monitors from each state's high-emitting sources: Appendix C features each state's highest impact on any New York State monitor on any day. New Jersey is excluded from this appendix since it did not significantly contribute to any nonattainment or maintenance monitors. Appendix D displays the maximum impacts on the Susan Wagner (Richmond County) monitor from each state whose collective 400 ton-per-year sources significantly contributed to it – i.e., Indiana, Kentucky (for the 2015 NAAQS), Maryland, Ohio, Pennsylvania, Virginia, and West Virginia.

Modeled Impacts in Connecticut and New Jersey Portions of Nonattainment Area

Because portions of Connecticut and New Jersey are part of the NYMA nonattainment area, upwind states' ozone impacts on those states' monitors are also of concern to DEC. Table 3 summarizes the modeled impacts from the 400 ton-per-year stationary sources from each upwind state on NYMA monitors in Connecticut and New Jersey.

Of greatest note are the impacts on the Connecticut monitors identified in EPA's 2016 transport modeling for the 2008 ozone NAAQS as nonattainment or maintenance monitors in 2017. Again, preliminary 2017 monitored data are provided here as a confirmation of the continuing ozone issues predicted by EPA's modeling – in some cases, preliminary monitored values are much higher than modeled predictions.

- Westport (ID 09-001-9003), Fairfield County:
    - projected 2017 design value of 76 ppb, indicating nonattainment;

    - preliminary monitored 2017 design value of 83 ppb.
- Madison Beach (ID 09-009-9002), New Haven County:
    - projected 2017 design value of 76 ppb, indicating nonattainment;
    - preliminary monitored 2017 design value of 82 ppb.
- Stratford (ID 09-001-3007), Fairfield County:
    - projected *maximum* design value of 79 ppb, indicating maintenance status;
    - preliminary monitored 2017 design value of 83 ppb.
- Greenwich (ID 09-001-0017), Fairfield County:
    - projected *maximum* design value of 76 ppb, indicating maintenance status;
    - preliminary monitored 2017 design value of 79 ppb.

These results further support the inclusion of sources from Maryland, Michigan, Ohio, Pennsylvania, and Virginia in this petition.

As with the Riverhead monitor in Suffolk County, New York, additional monitors in Connecticut have preliminarily monitored nonattainment in 2017 despite having been predicted to attain in 2017 by EPA's modeling:

- Danbury (ID 09-001-1123), Fairfield County:
    - projected design value of 71 ppb;
    - preliminary monitored 2017 design value of 77 ppb.
- Middletown (ID 09-007-0007), Middlesex County:
    - projected design value of 69 ppb,
    - preliminary monitored 2017 design value of 79 ppb.
- New Haven (ID 09-009-0027), New Haven County:
    - projected design value of 66 ppb,
    - preliminary monitored 2017 design value of 77 ppb.

Table 3. Connecticut and New Jersey Impacts from 400 Ton-per-Year Sources (Contributions in ppb)

State	Monitoring Site	County	AQS Code	Latitude	Longitude	IL	IN	KY	MD	MI	NJ	OH	PA	VA	WV
Connecticut	Greenwich	Fairfield	09-001-0017	41.00361	-73.58500	0.211	0.579	0.431	0.670	0.906	0.385	0.833	2.086	1.282	0.669
	Danbury	Fairfield	09-001-1123	41.39917	-73.44310	0.200	0.821	0.527	1.087	0.401	0.162	0.672	3.674	0.453	1.309
	Stratford	Fairfield	09-001-3007	41.15250	-73.10310	0.196	0.535	0.323	1.693	0.513	0.448	0.631	1.660	0.636	0.587
	Westport	Fairfield	09-001-9003	41.11833	-73.33670	0.147	0.567	0.354	1.715	0.506	0.464	0.663	1.641	0.689	0.568
	Middletown	Middlesex	09-007-0007	41.55222	-72.63000	0.148	0.365	0.251	0.976	0.392	0.253	0.349	1.860	0.393	0.092
	New Haven	New Haven	09-009-0027	41.30140	-72.90290	0.183	0.455	0.226	1.732	0.551	0.340	0.649	1.643	0.575	0.594
	Madison Beach	New Haven	09-009-9002	41.26083	-72.55000	0.330	0.635	0.215	2.362	0.680	0.287	0.549	1.570	0.776	0.511
New Jersey	Leonia	Bergen	34-003-0006	40.87044	-73.99200	0.118	0.979	0.674	0.654	0.383	0.148	0.779	3.907	0.419	1.722
	Newark Firehouse	Essex	34-013-0003	40.72099	-74.19290	0.207	1.002	0.719	0.544	0.730	0.085	1.469	5.722	0.691	2.238
	Bayonne	Hudson	34-017-0006	40.67025	-74.12610	0.197	0.982	0.695	0.750	0.751	0.262	1.263	4.839	0.617	2.403
	Flemington	Hunterdon	34-019-0001	40.51526	-74.80670	0.195	0.529	0.453	0.631	0.916	0.286	1.559	5.195	0.304	2.539
	Rutgers Univ.	Middlesex	34-023-0011	40.46218	-74.42940	0.248	0.477	0.766	1.416	0.812	0.494	1.106	3.593	0.584	2.724
	Monmouth Univ.	Monmouth	34-025-0005	40.27765	-74.00510	0.247	0.622	0.700	0.732	1.006	0.340	1.594	4.439	0.248	1.596
	Chester	Morris	34-027-3001	40.78763	-74.67630	0.189	1.425	0.805	0.332	0.691	0.002	1.324	5.839	0.272	1.965
	Ramapo	Passaic	34-031-5001	41.05862	-74.25550	0.039	0.081	0.057	0.399	0.430	1.253	0.724	5.286	0.378	1.560
	Columbia WMA	Warren	34-041-0007	40.92458	-75.06780	0.183	0.330	0.003	0.156	0.746	0.650	0.954	4.777	0.197	2.433

Significant contribution under 2008 NAAQS (> 0.75 ppb)

Significant contribution under 2015 NAAQS (> 0.70 ppb)

Request of EPA

Pursuant to CAA section 126(b), DEC requests that Administrator Pruitt take the following action on the major NOx sources named in this petition to assist New York State with attaining and maintaining the 2008 and 2015 ozone NAAQS: First, EPA should make a finding within the statutorily-mandated 60 days that the groups of identified sources in each of the nine named states significantly contribute to nonattainment or interfere with maintenance of the 2008 and 2015 ozone NAAQS in violation of CAA section 110(a)(2)(D)(i). Second, EPA should establish enforceable emission limitations for the major NOx sources listed in Appendix B at levels designed to prevent them from significantly contributing to air pollution in New York State, and establish a compliance schedule, including increments of progress, to ensure that the named major NOx sources comply with the emission limitations as expeditiously as practicable, but no later than three years provided by section 126(c).

DEC notes that some stationary sources named in this petition (e.g., sources that were controlled as a compliance strategy for CSAPR or a previous trading program) may already operate with a NOx emission rate equivalent to RACT as defined by New York State, which bases its presumptive limits and facility-specific control analyses on a standard of $5,000 per ton of NOx reduced. In these instances, DEC requests that EPA establish enforceable daily emission limit during the ozone season to require the sources to operate as they are currently operating, to prevent emission controls from being turned off, like in the case of a CSAPR budget surplus.

Appendix B includes average emission rates by EGU facility for the 2014 to 2016 period (these data are unavailable for non-EGUs); highlighted in green are three-year average emission rates less than or equal to 0.15 lb/mmBtu, which DEC considers to be in line with RACT. For the remainder of the facilities with emission rates highlighted in red, DEC requests that EPA establishes permanent and enforceable NOx emission limits based on its determination of available cost-effective controls.

Appendix A

Additional Details of Dunkirk Contribution Study

Dunkirk Contribution Study Methodology:

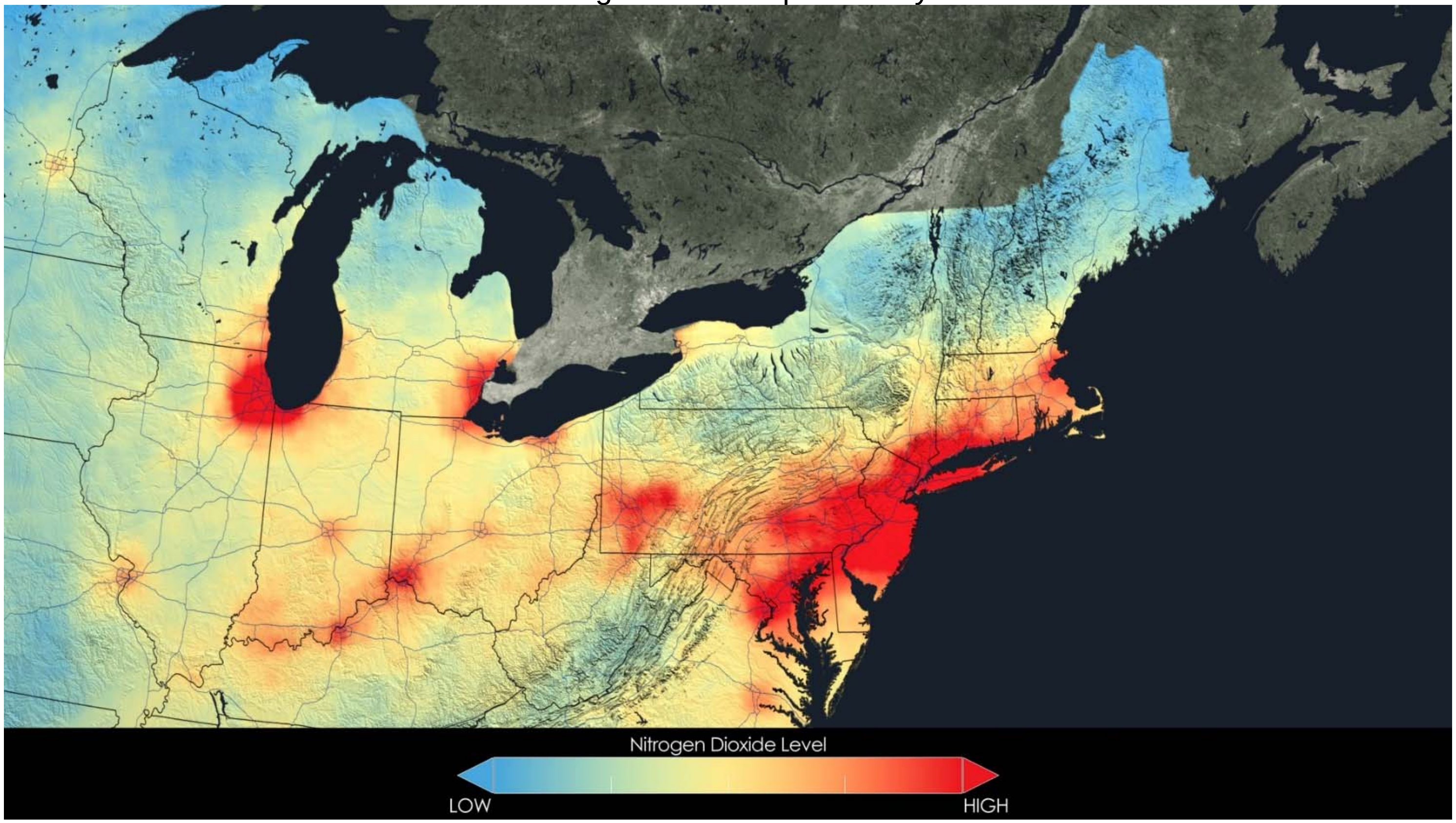
- Design days (days considered in the calculation of the design value, or the four days with the largest daily maximum 8-hour ozone concentrations) were identified for the Dunkirk monitor each year from 2013 to 2017.
- Long-range (120 hour) HYSPLIT back-trajectories were used to single out the design days that had direct inflow of air across the New York State border (fewer than three hours in New York State, and in the previous five days had not crossed the state or streamed along the boundaries);
    - 13 of 20 design days met these criteria. (Even in the remaining seven cases there is some inflow, though it is combined with an unknown amount of local pollution.)
- These long-range trajectories were cross-referenced with a NASA map of tropospheric column NOx concentrations to identify the probable source areas of pollution arriving at the Dunkirk monitor.
- Short-range (24 hour) HYSPLIT back-trajectories were then utilized to ensure incoming air flows were steady on the design days, and to assess the nearby Erie, Pennsylvania monitor as an upwind site.
    - The proximity of the Erie site makes it representative of the air quality entering western New York State on these stable, direct inflow days.
- The table below provides a detailed summary of the study results; figures on the following pages support the above details.

Date	Air flow type	Upwind sources	Erie daily max 8-hr ozone (ppb)	Dunkirk daily max 8-hr ozone (ppb)
5/15/2013	Inflow	Chicago, Detroit	69	66
5/29/2013	Inflow	Ohio Valley, Cleveland	62	69
6/22/2013	Inflow	Ohio Valley, Cleveland	64	70
09/10/2013	Inflow	Chicago, Detroit, Cleveland	70	76
4/21/2014	Recirculation	Chicago, Detroit, Ohio Valley, Pittsburgh, New York State	69	70
05/26/2014	Inflow	Detroit, Cleveland	71	74
06/16/2014	Inflow	Chicago, Detroit, Cleveland	61	71
6/28/2014	Recirculation	Ohio Valley, Cleveland, Pittsburgh, New York State	67	66
05/03/2015	Inflow	Chicago, Detroit, Cleveland	65	74
05/08/2015	Stagnation	Ohio Valley, Pittsburgh	75	78
05/24/2015	Inflow	Chicago, Detroit, Cleveland, Ohio Valley	65	71
09/16/2015	Stagnation	Chicago, Detroit, Cleveland, Ohio Valley	74	74
5/24/2016	Inflow	Detroit	70	69
05/25/2016	Inflow	Chicago, Detroit, Cleveland, Ohio Valley, Pittsburgh	79	82
06/11/2016	Inflow	Chicago, Detroit, Cleveland, Ohio Valley	73	80
06/19/2016	Recirculation	Cleveland, New York State	65	73
6/9/2017	Recirculation	Detroit, Cleveland, New York State	56	66
6/10/2017	Recirculation	Chicago, Cleveland, Ohio Valley, New York State	65	77
7/19/2017	Inflow	Chicago, Detroit	78	79
8/1/2017	Inflow	Detroit, Cleveland	63	67
		Average of Direct Inflow Events:	**68**	**73**

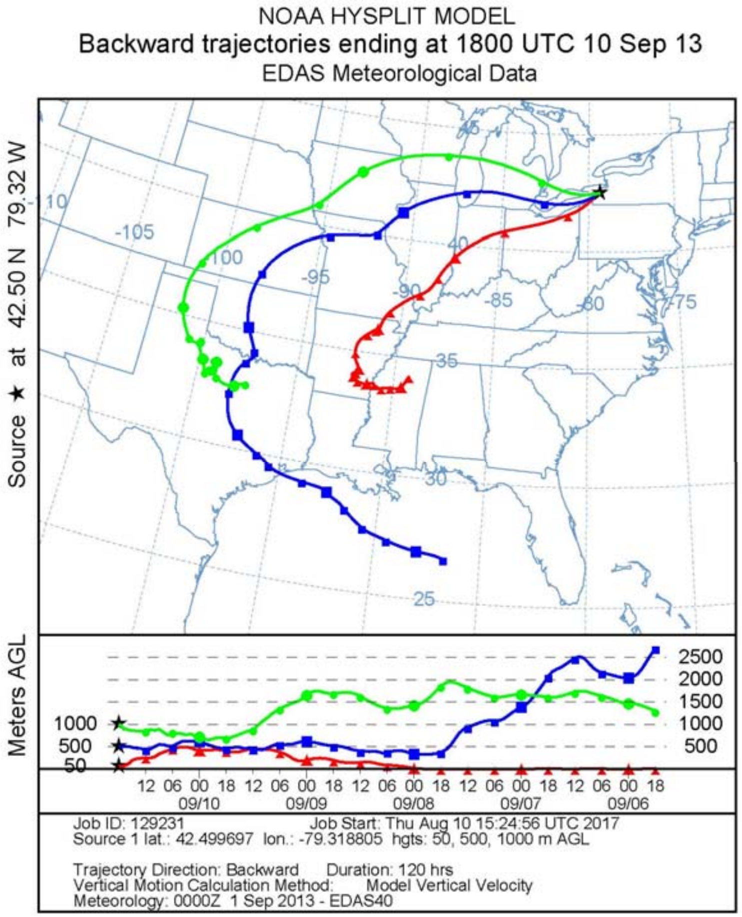
Average tropospheric column concentrations of nitrogen dioxide for 2011
Source: NASA Aura satellite

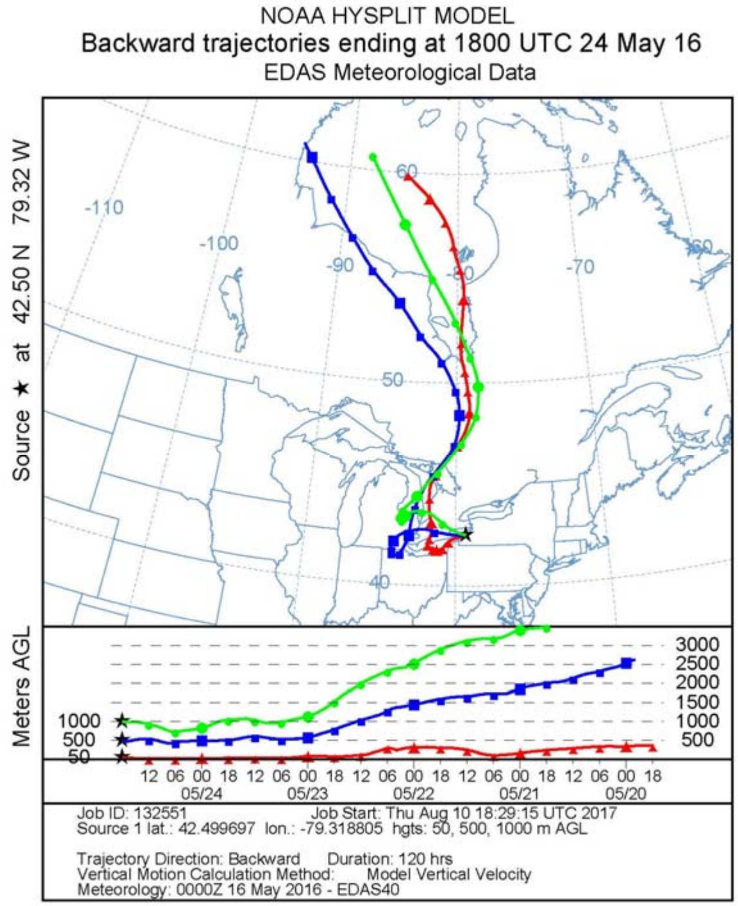
Major pollution source areas:

- Metropolitan Chicago
- Metropolitan Detroit / Windsor
- Metropolitan Cleveland
- Ohio Valley, along Indiana and Kentucky
- Metropolitan Pittsburgh
- Northeast Coastal Corridor extending from Chesapeake Bay to Greater Boston



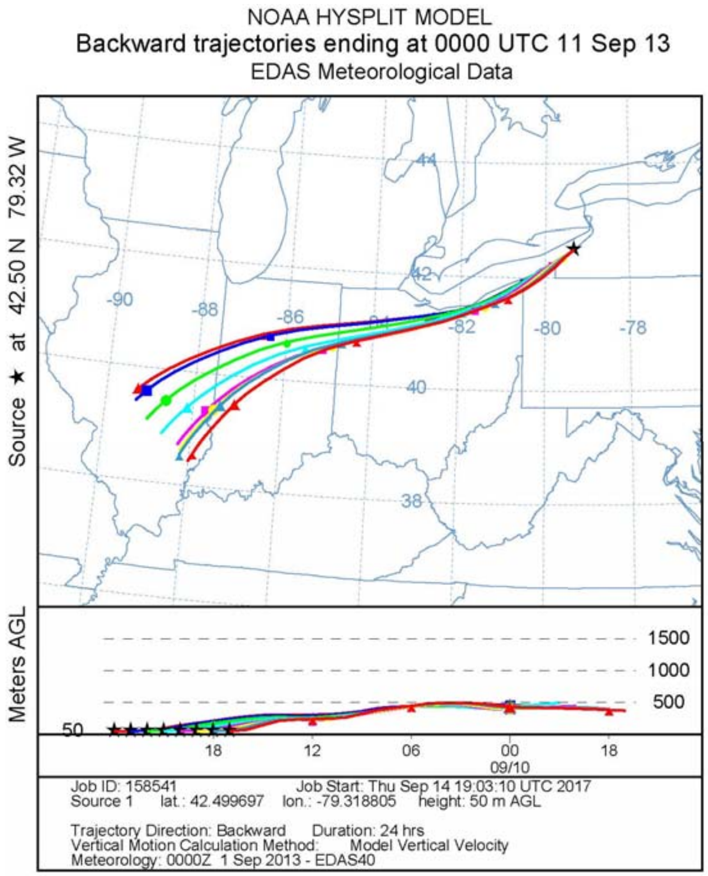
<u>Examples of WSW (September 10, 2013) and WNW (May 24, 2016) flow into Dunkirk</u>
(120-hour back-trajectories starting over Dunkirk at 2 p.m. local time)



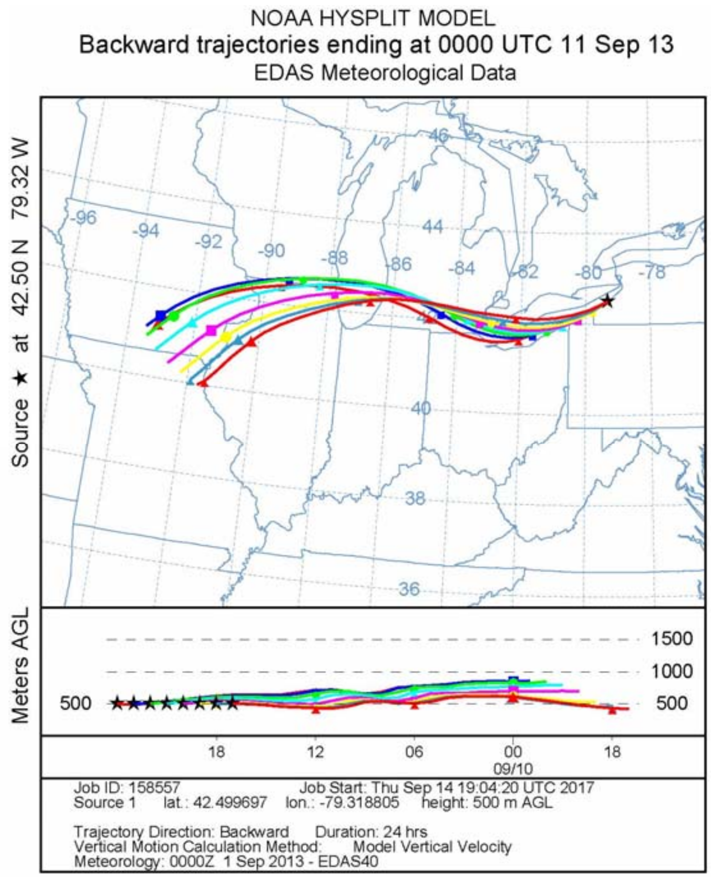


Red = starting at 50m; **Blue** = starting at 500m; **Green** = starting at 1000m

24-Hour Dunkirk Trajectories for each hour of 8-hour period defining daily max 8-hour ozone on September 10, 2013 (WSW inflow)

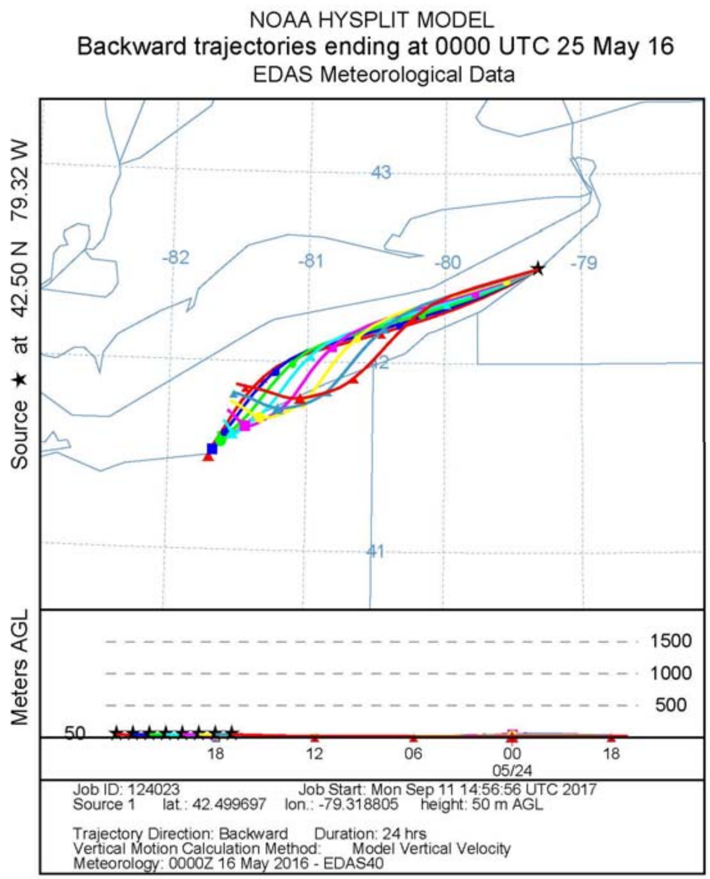


50m starting level

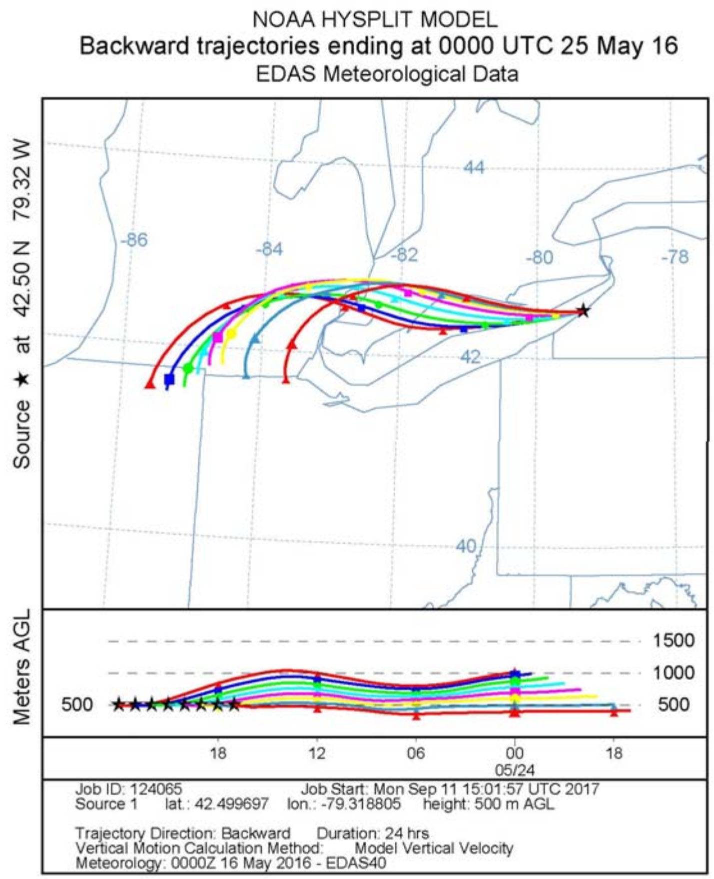


500m starting level

24-Hour Dunkirk Trajectories for each hour of 8-hour period defining daily max 8-hour ozone on May 24, 2016 (WNW inflow)

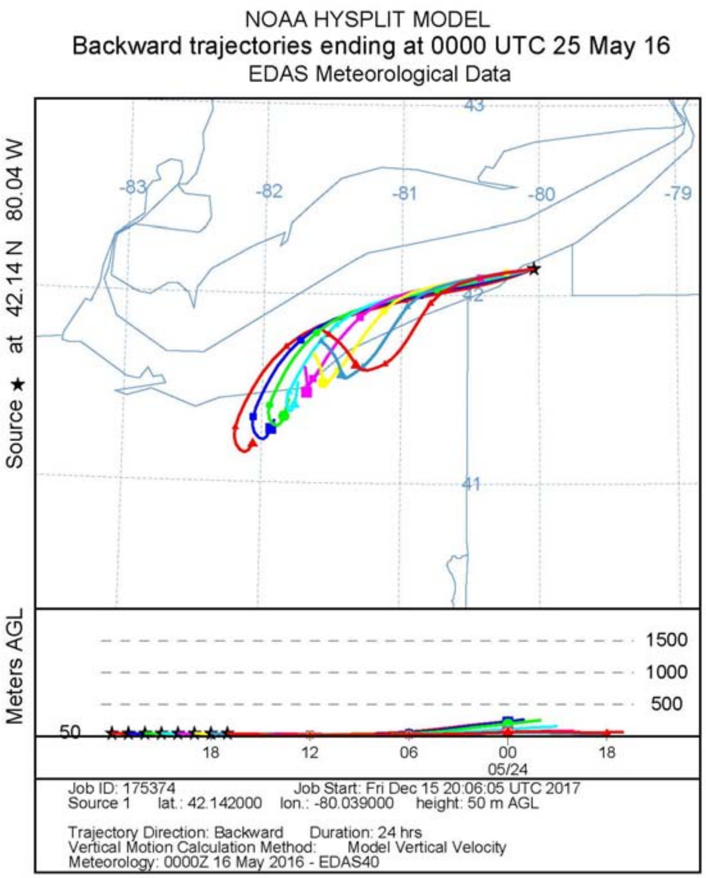


50m starting level

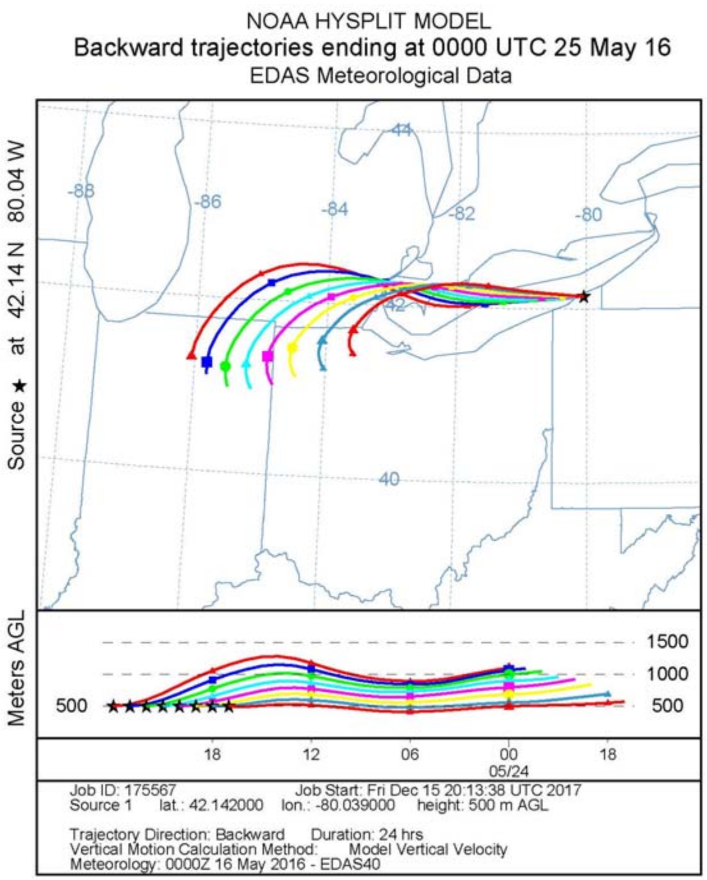


500m starting level

24-Hour Erie Trajectories for each hour of 8-hour period defining daily max 8-hour ozone on May 24, 2016 (WNW inflow)



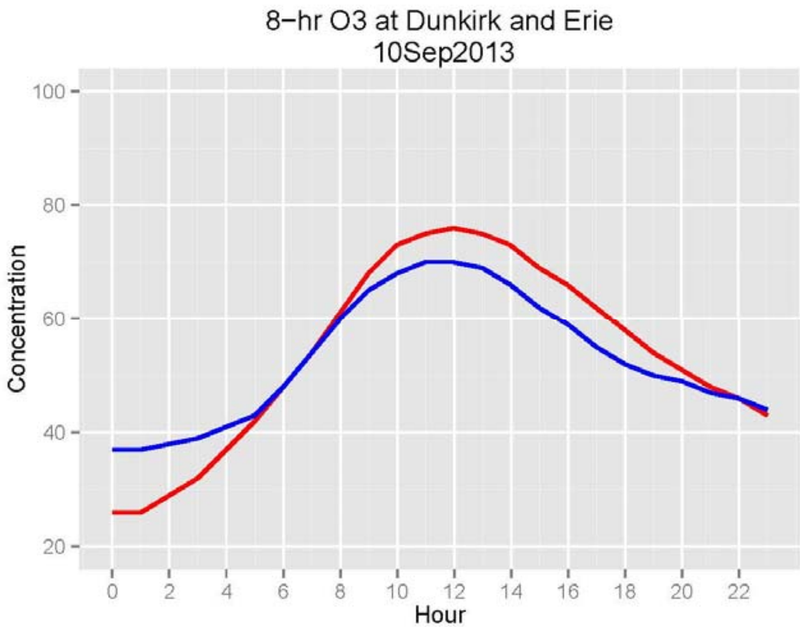
50m starting level

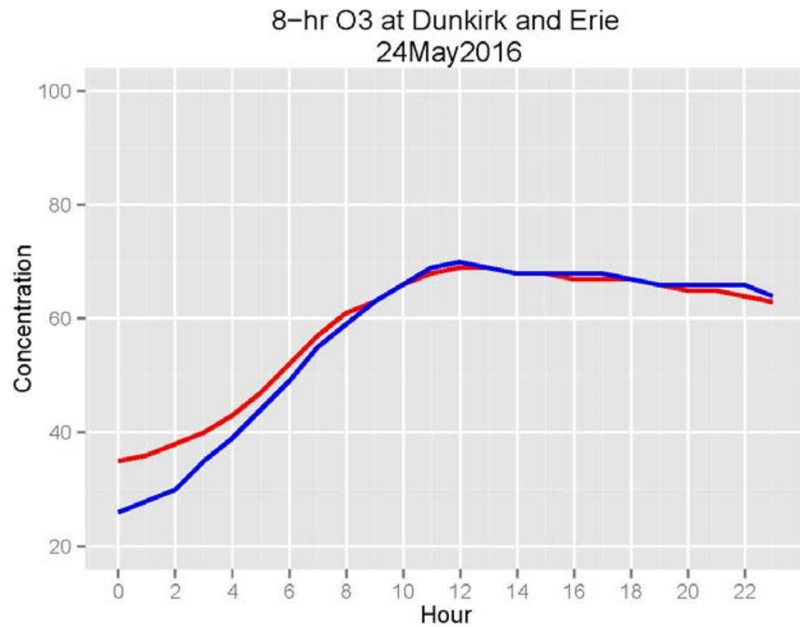


500m starting level

Time Series of 8-hour ozone averages for Dunkirk (**red**) and Erie (**blue**)
September 10, 2013 (WSW flow) and May 24, 2016 (WNW flow)

- The purpose of these plots was to confirm the short-term trajectory conclusion that the Dunkirk and Erie monitors experience the same air mass
- The daily cycle and maximum values look similar, and we conclude the monitors track each other





Appendix B

List of 400 Ton-per-Year Stationary Sources Significantly Contributing to Nonattainment and Interfering with Maintenance in New York State

Electric Generating Units Facility List

State	Plant ID	Plant Name	Projected 2017 NOx (Tons)	2014 NOx (Tons)	2014 Heat Input (mmBtu)	2014 NOx Rate (lb/mmBtu)	2015 NOx (Tons)	2015 Heat Input (mmBtu)	2015 NOx Rate (lb/mmBtu)	2016 NOx (Tons)	2016 Heat Input (mmBtu)	2016 NOx Rate (lb/mmBtu)	2014-2016 Avg NOx (Tons)	2014-2016 Avg NOx Rate (lb/mmBtu)
IL	8199411	Powerton	**5,754.9**	5,794.6	99,939,300	0.116	3276.9	65,593,748	0.100	2956.1	54,532,488	0.108	4,009.2	0.108
IL	7808911	Joppa Steam	**4,755.3**	4,024.2	75,405,102	0.107	2965.3	53,765,200	0.110	1895.1	35,325,584	0.107	2,961.5	0.108
IL	5422711	E D Edwards	**3,592.3**	2,432.8	39,374,995	0.124	2,140.8	30,446,795	0.141	1,762.6	28,192,302	0.125	2,112.1	0.130
IL	7792311	Waukegan	**2,423.4**	1,611.2	30,076,648	0.107	1130.9	19,724,689	0.115	1031.1	18,926,608	0.109	1,257.7	0.110
IL	10857911	Prairie State Generating Company	**2,277.8**	2,806.3	95,524,110	0.059	3625.4	112,745,247	0.064	3547.3	111,772,257	0.063	3,326.3	0.062
IL	1929211	Kincaid Station	**2,029.5**	1,968.2	65,281,618	0.060	1701.5	54,898,947	0.062	1478.3	47,771,596	0.062	1,716.0	0.061
IL	2587011	Newton	**1,952.3**	2,898.0	65,754,869	0.088	2195.1	50,394,878	0.087	1618.5	36,018,005	0.090	2,237.2	0.088
IL	7954611	Baldwin Energy Complex	**1,830.4**	4,703.5	119,159,388	0.079	4247.6	108,232,067	0.078	4039.3	102,132,534	0.079	4,330.1	0.079
IL	8164511	Marion	**1,649.6**	3,510.7	23,665,636	0.297	1179.3	24,284,063	0.097	915.7	21,839,993	0.084	1,868.5	0.159
IL	4685311	Hennepin Power Station	**1,561.6**	1,366.2	18,729,022	0.146	1210.1	17,390,110	0.139	1202.6	16,513,451	0.146	1,259.6	0.144
IL	7340311	Coffeen	**1,422.1**	1,878.6	56,129,000	0.067	1614.6	49,522,655	0.065	1697.1	48,562,151	0.070	1,730.1	0.067
IL	7337411	Havana	**1,132.8**	1,180.9	31,583,549	0.075	892.1	23,344,525	0.076	1188.4	30,279,146	0.078	1,087.1	0.077
IL	3206511	Duck Creek	**1,106.8**	1,065.1	22,385,698	0.095	1012.3	22,722,935	0.089	1070.5	23,470,382	0.091	1,049.3	0.092
IL	7377311	Dallman	**1,027.9**	1,104.8	27,685,809	0.080	822.1	23,348,484	0.070	773.0	20,954,721	0.074	900.0	0.075
IL	8018111	Will County	**921.9**	2,131.0	46,874,588	0.091	1371.8	30,636,969	0.090	1052.2	22,944,134	0.092	1,518.4	0.091
IL	7973011	Midwest Generations-Joliet Station 29 and 9*	**75.7**	3,329.8	66,415,064	0.100	3507.1	72,615,108	0.097	960.8	20,298,812	0.095	2,599.2	0.097
		*Listed separately in EPA's CAMD; emissions combined here												
IN	8017211	Rockport	**20,637.9**	19,727.5	164,635,674	0.240	13,921.8	127,626,833	0.218	12,888.1	118,678,065	0.217	15,512.4	0.225
IN	7363111	Gibson	**14,623.7**	14,292.2	173,662,612	0.165	10,834.0	143,438,239	0.151	13,190.1	164,635,699	0.160	12,772.1	0.159
IN	7744211	Clifty Creek	**11,252.3**	9,132.0	62,198,852	0.294	6,755.6	55,565,640	0.243	9,355.4	54,692,411	0.342	8,414.3	0.293
IN	7362411	Petersburg	**9,945.9**	13,047.8	118,170,716	0.221	12,426.8	99,369,897	0.250	10,813.2	104,265,688	0.207	12,095.9	0.226
IN	7957011	R M Schahfer Generating Station	**7,405.7**	7,115.9	93,459,227	0.152	5,172.3	67,544,523	0.153	4,396.6	55,982,713	0.157	5,561.6	0.154
IN	7248511	Cayuga	**7,118.9**	8,692.1	49,786,770	0.349	10,508.1	54,248,930	0.387	12,369.6	63,915,408	0.387	10,523.3	0.375
IN	4147311	Wabash River	**4,187.1**	3,351.8	27,604,598	0.243	3,541.1	27,558,797	0.257	941.9	8,723,105	0.216	2,611.6	0.239
IN	8396211	Merom	**3,447.2**	2,043.7	66,859,729	0.061	1,619.8	54,494,321	0.059	1,942.7	64,678,583	0.060	1,868.7	0.060
IN	7376611	Bailly Generating Station	**1,862.2**	1,726.3	27,374,470	0.126	1,072.3	18,063,606	0.119	1,345.2	23,532,548	0.114	1,381.3	0.120
IN	8166111	A B Brown Generating Station	**1,843.7**	2,866.5	33,596,427	0.171	2,138.6	28,556,215	0.150	1,694.0	24,810,718	0.137	2,233.1	0.152
IN	8183111	Alcoa Allowance Management Inc	**1,673.9**	10,780.1	64,676,328	0.333	10,440.1	64,401,854	0.324	6,837.3	43,417,012	0.315	9,352.5	0.324
IN	8011511	Michigan City Generating Station	**1,504.0**	1,241.1	26,633,260	0.093	793.9	16,191,050	0.098	815.4	18,745,645	0.087	950.1	0.093
IN	4478911	Edwardsport	**1,405.3**	698.8	22,534,424	0.062	841.2	25,943,302	0.065	761.5	25,038,478	0.061	767.2	0.063
IN	8183011	F B Culley Generating Station	**1,061.9**	1,344.0	19,437,698	0.138	870.3	17,553,073	0.099	1,108.4	14,796,643	0.150	1,107.6	0.129
IN	7742411	R Gallagher	**678.3**	1,656.7	9,229,760	0.359	940.4	5,575,423	0.337	648.5	3,783,511	0.343	1,081.9	0.346
IN	7255211	IP&L Harding Street Station	**55.4**	4,428.7	42,199,009	0.210	2,480.6	36,427,503	0.136	1,036.2	23,205,770	0.089	2,648.5	0.145
IN	8225111	IP&L Eagle Valley Station	**44.7**	1,264.8	7,773,806	0.325	427.3	2,577,054	0.332	182.9	1,199,471	0.305	625.0	0.321
KY	6037011	Shawnee	**15,026.4**	12,331.2	78,513,005	0.314	9,152.6	74,888,248	0.244	11,002.1	79,272,414	0.278	10,828.7	0.279
KY	7353711	Mill Creek	**8,122.2**	11,213.1	89,685,506	0.250	8,504.3	81,668,897	0.208	6,885.6	81,500,384	0.169	8,867.6	0.209
KY	5198511	Ghent	**7,485.5**	10,721.3	130,792,867	0.164	7,779.0	117,810,231	0.132	8,431.2	118,378,402	0.142	8,977.2	0.146
KY	5343711	Coleman	**6,496.0**	2,151.7	12,069,402	0.357	N/A	N/A	N/A	N/A	N/A	N/A	2,151.7	0.357
KY	5196711	Paradise	**4,252.6**	9,465.4	145,665,511	0.130	7,493.4	128,545,281	0.117	7,583.5	110,873,424	0.137	8,180.8	0.128
KY	6098611	R D Green	**3,943.4**	4,499.0	38,254,957	0.235	3,425.0	29,142,734	0.235	3,715.4	31,753,310	0.234	3,879.8	0.235
KY	5891711	Elmer Smith	**3,880.9**	7,347.6	24,545,102	0.599	4,358.3	23,435,083	0.372	3,053.7	21,265,846	0.287	4,919.9	0.419
KY	7335511	H L Spurlock	**3,581.3**	3,352.2	86,044,311	0.078	2,777.5	71,519,246	0.078	3,398.7	87,409,219	0.078	3,176.2	0.078
KY	6040811	East Bend	**2,767.1**	4,166.2	32,985,031	0.253	5,982.3	45,601,205	0.262	3,511.7	41,537,357	0.169	4,553.4	0.228
KY	5933111	E W Brown	**2,196.8**	3,375.4	38,187,089	0.177	2,812.1	33,843,902	0.166	2,258.8	28,303,431	0.160	2,815.4	0.168
KY	5742811	Trimble County	**2,066.6**	3,364.9	81,220,604	0.083	2,934.7	89,495,195	0.066	2,905.5	84,158,609	0.069	3,068.4	0.072
KY	5787711	John S. Cooper	**1,508.9**	863.1	9,668,046	0.179	628.6	7,796,544	0.161	559.8	7,032,680	0.159	683.9	0.166
KY	5523111	William C. Dale	**1,359.8**	41.6	204,330	0.408	102.1	510,292	0.400	N/A	N/A	N/A	71.9	0.404

KY	5561611	D B Wilson	**1,067.6**	1,034.3	33,064,392	0.063	1,305.9	39,941,780	0.065	1,152.0	36,240,652	0.064	1,164.0	0.064
KY	6067211	HMP&L Station 2	**836.2**	1,093.2	24,899,181	0.088	976.7	16,279,955	0.120	1,960.8	20,082,196	0.195	1,343.6	0.134
KY	5702411	Louisville Gas & Electric Co., Cane Run Stn	**89.4**	4,448.2	26,387,888	0.337	1,639.7	25,725,464	0.127	427.5	31,986,742	0.027	2,171.8	0.164
KY	6019011	Kentucky Power Co-Big Sandy Plant	**2.0**	4,130.5	41,313,164	0.200	3,821.6	28,779,909	0.266	438.5	5,347,156	0.164	2,796.9	0.210
MD	6084311	Brandon Shores	**4,366.7**	2,532.0	54,554,289	0.093	2,071.0	56,261,021	0.074	2,003.5	54,261,920	0.074	2,202.1	0.080
MD	6011911	Mirant Chalk Point	**4,194.5**	3,861.0	34,883,066	0.221	2,109.2	24,825,362	0.170	2,303.7	31,570,209	0.146	2,757.9	0.179
MD	5155011	C P Crane	**1,806.3**	1,223.4	6,218,452	0.393	1,070.4	5,344,520	0.401	654.2	3,821,337	0.342	982.7	0.379
MD	5998011	Mirant Dickerson	**1,697.9**	1,681.8	13,557,376	0.248	1,009.3	10,260,897	0.197	981.8	10,540,781	0.186	1,224.3	0.210
MD	6084311	Herbert A Wagner	**1,341.6**	1,086.8	14,587,555	0.149	1,025.4	15,922,221	0.129	561.5	13,122,257	0.086	891.2	0.121
MD	6011511	Mirant Morgantown	**1,252.0**	1,279.9	60,472,176	0.042	872.2	41,255,581	0.042	920.3	46,811,309	0.039	1,024.1	0.041
MD	7717711	AES Warrior Run	**914.4**	549.6	14,615,569	0.075	443.9	14,119,606	0.063	356.7	11,630,593	0.061	450.1	0.066
MI	7239111	Belle River	**8,449.1**	9,113.8	83,039,399	0.220	8,276.5	78,583,186	0.211	7,052.7	73,044,097	0.193	8,147.7	0.208
MI	7239111	St. Clair	**8,160.0**	7,902.5	57,344,551	0.276	7,192.5	58,129,806	0.247	5,463.1	40,317,805	0.271	6,852.7	0.265
MI	7888311	Monroe	**6,178.3**	8,295.5	157,824,072	0.105	4,996.9	161,341,773	0.062	4,110.7	146,356,344	0.056	5,801.1	0.074
MI	7778411	Presque Isle	**4,929.9**	3,763.6	23,642,632	0.318	3,868.5	21,977,002	0.352	3,757.6	22,966,610	0.327	3,796.6	0.333
MI	8125511	J H Campbell	**4,344.1**	4,732.3	88,969,922	0.106	2,881.1	93,051,269	0.062	2,247.1	67,566,729	0.067	3,286.8	0.078
MI	6473711	Midland Cogeneration Venture	**2,470.2**	1,625.5	33,298,329	0.098	3,005.9	52,011,885	0.116	3,883.1	68,004,748	0.114	2,838.2	0.109
MI	7422511	Trenton Channel	**2,394.2**	3,106.8	28,095,246	0.221	2,639.9	24,868,667	0.212	1,946.2	20,897,219	0.186	2,564.3	0.207
MI	8229311	River Rouge	**1,877.3**	3,668.9	22,814,228	0.322	2,595.7	18,618,102	0.279	1,859.4	12,757,617	0.292	2,708.0	0.297
MI	5985211	Eckert Station	**1,719.7**	834.8	7,838,044	0.213	727.3	6,740,672	0.216	785.4	7,346,586	0.214	782.5	0.214
MI	4174811	Erickson	**1,222.0**	1,228.3	12,595,815	0.195	1,178.3	11,782,100	0.200	1,058.3	10,724,985	0.197	1,155.0	0.197
MI	4856911	TES Filer City Station	**1,155.3**	1,569.7	6,852,659	0.458	1,615.3	7,084,008	0.456	1,373.6	7,130,408	0.385	1,519.5	0.433
MI	8172811	Dan E Karn	**1,129.2**	678.1	22,048,359	0.062	509.8	22,168,192	0.046	717.4	27,031,106	0.053	635.1	0.054
MI	7778711	Dearborn Industrial Generation	**406.7**	323.2	25,502,467	0.025	385.9	30,613,339	0.025	497.9	40,520,422	0.025	402.3	0.025
MI	7779711	Marquette Board of Light and Power	**266.8**	379.8	3,839,810	0.198	365.1	3,848,862	0.190	373.5	3,798,325	0.197	372.8	0.195
NJ	7989011	Carneys Point	**690.0**	903.6	12,788,495	0.141	756.3	12,067,027	0.125	692.3	11,753,378	0.118	784.1	0.128
NJ	7392311	Bergen	**520.9**	486.9	48,262,837	0.020	475.0	45,946,265	0.021	299.7	37,682,415	0.016	420.5	0.019
NJ	6719711	North Jersey Energy Associates	**450.9**	433.5	11,605,790	0.075	349.0	10,625,281	0.066	291.2	7,843,892	0.074	357.9	0.072
NJ	6719611	Sewaren Generating Station	**435.7**	35.7	682,739	0.105	25.2	183,873	0.274	223.6	1,078,143	0.415	94.8	0.265
NJ	7591411	Hudson Generating Station	**416.2**	524.9	13,100,969	0.080	168.1	4,975,703	0.068	175.3	4,152,233	0.084	289.4	0.077
NJ	8093811	Logan Generating Plant	**379.7**	625.4	10,313,398	0.121	421.3	7,574,870	0.111	410.2	7,482,619	0.110	485.6	0.114
NJ	5133011	B. L. England Generating Station	**372.5**	533.7	2,718,284	0.393	319.1	1,664,979	0.383	202.1	1,020,073	0.396	351.7	0.391
OH	7983011	Kyger Creek	**9,205.0**	5,587.6	57,065,139	0.196	4,172.0	40,048,480	0.208	5,821.6	54,665,716	0.213	5,193.7	0.206
OH	8010811	Conesville	**8,726.7**	11,581.5	85,630,349	0.271	6,564.7	55,563,714	0.236	5,981.9	51,022,283	0.234	8,042.7	0.247
OH	8294311	W H Zimmer Generating Station	**8,663.6**	11,300.2	69,741,897	0.324	7,037.0	56,917,095	0.247	5,460.0	51,295,304	0.213	7,932.4	0.261
OH	8101311	J M Stuart	**7,984.7**	7,117.1	111,225,511	0.128	5,475.8	104,565,774	0.105	5,465.4	115,734,720	0.094	6,019.4	0.109
OH	8190811	W H Sammis	**7,902.7**	8,421.3	117,365,843	0.144	6,250.2	89,003,911	0.140	4,993.6	81,638,155	0.122	6,555.0	0.135
OH	8148511	Gen J M Gavin	**7,213.6**	10,028.0	162,988,977	0.123	10,655.1	147,206,149	0.145	7,331.6	141,652,922	0.104	9,338.2	0.124
OH	8130811	Avon Lake Power Plant	**4,811.6**	3,657.5	20,955,582	0.349	5,561.7	27,244,224	0.408	2,057.4	11,213,995	0.367	3,758.9	0.375
OH	7738711	Miami Fort Generating Station	**4,526.4**	6,398.1	73,468,288	0.174	5,828.0	62,806,124	0.186	5,052.1	65,479,043	0.154	5,759.4	0.171
OH	8101411	Killen Station	**3,739.5**	7,110.9	41,445,800	0.343	5,655.5	36,398,878	0.311	6,058.2	35,988,025	0.337	6,274.8	0.330
OH	8115711	Cardinal	**2,264.6**	4,050.9	102,812,173	0.079	3,334.5	88,034,680	0.076	3,761.2	90,152,524	0.083	3,715.5	0.079
OH	8302011	Bay Shore	**837.6**	567.1	12,929,142	0.088	639.2	14,699,038	0.087	363.8	12,828,837	0.057	523.4	0.077
PA	3853711	Bruce Mansfield	**11,124.3**	18,563.1	163,438,740	0.227	11,699.9	132,998,643	0.176	9,128.5	113,158,979	0.161	13,130.5	0.188
PA	3866111	Keystone	**7,642.7**	17,009.2	112,359,466	0.303	14,312.6	97,146,022	0.295	13,380.5	105,560,720	0.254	14,900.8	0.284
PA	2905911	Conemaugh	**6,696.1**	17,090.9	105,411,569	0.324	14,840.1	110,303,312	0.269	11,162.9	94,580,462	0.236	14,364.6	0.276
PA	3005211	Homer City	**5,657.0**	22,116.4	115,786,811	0.382	18,371.0	94,094,696	0.390	11,287.9	69,817,048	0.323	17,258.5	0.365
PA	3881111	Montour	**5,297.9**	12,388.8	65,140,628	0.380	11,267.6	63,633,299	0.354	8,078.9	42,428,005	0.381	10,578.4	0.372

PA	8404811	Cheswick	**3,372.2**	6,101.1	30,639,565	0.398	3,494.0	22,111,341	0.316	4,220.7	21,475,813	0.393	4,605.3	0.369
PA	3193911	Brunner Island	**3,126.7**	11,053.1	59,705,203	0.370	8,303.7	48,942,274	0.339	6,280.9	35,443,761	0.354	8,545.9	0.355
PA	55524	Calpine Mid Merit, LLC - York Energy	**2,837.4**	65.8	20,177,292	0.007	58.3	15,687,354	0.007	40.9	12,504,354	0.007	55.0	0.007
PA	3005111	Seward	**2,102.8**	1,411.8	28,465,465	0.099	959.9	18,947,057	0.101	1,745.7	30,537,546	0.114	1,372.5	0.105
PA	2985011	Shawville	**915.0**	5,442.6	25,164,048	0.433	2,066.1	9,957,784	0.415	101.2	2,430,630	0.083	2,536.6	0.310
PA	4760211	Scrubgrass Generating Plant	**740.9**	594.5	7,518,927	0.158	312.0	4,243,679	0.147	547.2	7,354,190	0.149	484.6	0.151
PA	6594511	Cambria Cogen	**734.0**	1,066.7	9,869,910	0.216	769.6	8,108,813	0.190	1,121.7	9,340,347	0.240	986.0	0.215
PA	6594411	Colver Power Project	**710.5**	888.3	10,898,712	0.163	802.5	10,413,109	0.154	737.5	9,312,141	0.158	809.4	0.159
PA	7889011	Panther Creek Energy Facility	**567.3**	499.7	8,221,153	0.122	378.7	6,420,726	0.118	102.8	1,693,403	0.121	327.1	0.120
PA	3881711	Martins Creek	**557.0**	1,872.9	18,869,390	0.199	3,994.3	45,796,100	0.174	4,030.8	47,607,844	0.169	3,299.3	0.181
PA	6558911	Northampton Generating Plant	**449.4**	326.1	7,816,525	0.083	230.8	5,330,167	0.087	142.1	3,192,664	0.089	233.0	0.086
PA	8331411	Wheelabrator - Frackville	**441.2**	391.1	5,479,743	0.143	320.0	3,967,677	0.161	299.3	4,853,372	0.123	336.8	0.142
PA	3776611	NRG Power Midwest New Castle Plant	**362.5**	712.4	3,403,889	0.419	672.0	3,612,622	0.372	779.6	9,392,164	0.166	721.3	0.319
PA	3881811	NRG REMA LLC Portland Gen Station	**4.3**	428.8	2,673,776	0.321	1.0	21,255	0.091	4.8	34,931	0.275	144.8	0.229
VA	6160611	Clover Power Station	**6,984.2**	8,458.3	60,379,818	0.280	8,412.4	57,977,019	0.290	8,307.3	58,547,473	0.284	8,392.7	0.285
VA	4181011	Chesterfield Power Station	**2,967.6**	2,890.5	85,547,400	0.068	3,197.7	91,033,598	0.070	2,724.4	82,969,014	0.066	2,937.5	0.068
VA	4039911	Spruance Genco, LLC	**2,649.3**	1,682.9	11,379,210	0.296	1,536.5	10,581,478	0.290	1,319.1	9,162,455	0.288	1,512.8	0.291
VA	4565211	Yorktown Power Station	**1,230.5**	1,889.8	10,690,683	0.354	1,045.2	6,824,139	0.306	1,052.9	5,062,103	0.416	1,329.3	0.359
VA	6633911	Cogentrix-Hopewell	**1,002.5**	732.6	9,377,745	0.156	736.9	13,498,275	0.109	544.4	10,790,977	0.101	671.3	0.122
VA	16530111	Virginia City Hybrid Energy Center	**906.9**	1,208.9	35,625,835	0.068	974.8	30,240,824	0.064	1,053.9	35,572,585	0.059	1,079.2	0.064
VA	5883511	Hopewell Cogeneration Facility	**542.0**	732.6	9,377,745	0.156	736.9	13,498,275	0.109	544.4	10,790,977	0.101	671.3	0.122
VA	6631811	Doswell Limited Partnership	**427.0**	534.9	32,446,850	0.033	722.1	42,410,343	0.034	729.9	40,620,943	0.036	662.3	0.034
VA	5748311	Dominion-Mecklenburg Power Station	**380.5**	907.0	6,395,845	0.284	668.0	4,706,670	0.284	593.7	4,096,478	0.290	722.9	0.286
VA	7520511	Dominion - Possum Point Power Station	**321.7**	413.0	28,166,029	0.029	472.5	27,337,777	0.035	297.8	26,507,858	0.022	394.4	0.029
VA	5763511	American Electric Power-Clinch River Plant	**27.6**	998.7	7,521,342	0.266	801.1	4,785,885	0.335	211.4	3,511,568	0.120	670.4	0.240
WV	6271711	Harrison Power Station	**13,505.5**	21,764.2	122,823,706	0.354	17,876.6	113,882,126	0.314	11,981.6	130,232,313	0.184	17,207.4	0.284
WV	6773611	Fort Martin Power Station	**11,554.1**	9,489.6	63,574,613	0.299	9,650.4	67,686,117	0.285	9,788.6	63,282,525	0.309	9,642.9	0.298
WV	4782811	Pleasants Power Station	**5,638.0**	12,948.0	81,568,069	0.317	11,298.1	69,591,235	0.325	7,404.4	65,971,959	0.224	10,550.2	0.289
WV	6789111	John E Amos	**4,037.8**	4,736.5	129,010,365	0.073	6,084.7	138,109,257	0.088	6,284.9	146,312,186	0.086	5,702.0	0.082
WV	6257011	Mount Storm Power Station	**3,271.5**	3,657.9	100,584,284	0.073	3,903.2	100,624,677	0.078	3,468.9	94,287,175	0.074	3,676.7	0.075
WV	6760811	Mountaineer (1301)	**2,371.1**	3,019.2	82,991,220	0.073	3,793.7	78,323,403	0.097	3,941.0	80,127,096	0.098	3,584.6	0.089
WV	6902311	Mitchell (WV)	**2,339.4**	3,391.0	82,504,596	0.082	2,359.1	53,875,167	0.088	3,383.9	78,210,530	0.087	3,044.7	0.085
WV	4864511	Grant Town Power Plant	**1,520.8**	1,561.3	8,936,674	0.349	1,336.2	7,999,086	0.334	1,456.7	9,857,787	0.296	1,451.4	0.326
WV	16320111	Longview Power	**1,004.6**	1,146.6	36,003,082	0.064	889.8	28,855,296	0.062	1,562.5	50,075,229	0.062	1,199.6	0.063

Non-Electric Generating Units Facility List

State	Plant ID	Plant Name	Projected 2017 NOx (Tons)
IL	7940411	ConocoPhillips Co	**2,551.0**
IL	8139911	Archer Daniels Midland Co	**2,247.2**
IL	7808811	Lafarge Midwest Inc	**1,827.7**
IL	8208511	Illinois Cement Co	**1,815.2**
IL	7360711	Exxon Mobil Oil Corp	**1,671.6**
IL	7793411	Ppg Industries	**1,669.1**
IL	8222511	Marathon Petroleum Co LLC	**1,356.7**
IL	8191211	US Steel Granite City	**1,182.6**
IL	2599311	SUEZ DEGS of Tuscola LLC	**1,046.9**
IL	8065311	Aventine Renewable Energy Inc	**867.5**
IL	8191811	CITGO Petroleum Corp	**674.0**
IL	7361511	Archer Daniels Midland Co	**667.5**
IL	4635211	Pilkington North America Inc	**625.4**
IL	2444211	Rentech Energy Midwest Corp	**590.1**
IL	8209311	Equistar Chemicals LP	**516.4**
IL	7298911	ElectroMotive Diesel Inc	**480.7**
IL	10923611	Gateway Energy & Coke Co LLC	**406.7**
IL	14423711	GALESBURG	**398.3**
IL	8139511	Ardagh Glass Inc	**391.9**
IL	7793311	Tate & Lyle Ingredients Americas LLC	**366.5**
IL	946411	Ingredion Incorporated Argo Plant	**0**
IN	8183111	ALCOA WARRICK POWER PLT AGC DIV OF AL	**9,636.5**
IN	7376511	ArcelorMittal Burns Harbor Inc.	**8,206.5**
IN	3986511	Indiana Harbor East	**4,714.2**
IN	8192011	US STEEL GARY WORKS	**4,343.1**
IN	8225311	LEHIGH CEMENT COMPANY LLC	**3,700.1**
IN	7431611	LONE STAR INDUSTRIES, INC	**3,194.5**
IN	7247711	BP PRODUCTS NORTH AMERICA INC, WHITING R	**2,471.5**
IN	8198511	Essroc Cement Corp	**2,331.5**
IN	8224411	Essroc Cement Corp	**2,025.0**
IN	7364611	SABIC INNOVATIVE PLASTICS MT. VERNON LLC	**1,690.3**
IN	8202711	Carmeuse Lime Inc	**1,687.6**
IN	3986611	ARCELORMITTAL INDIANA HARBOR LLC	**1,606.0**
IN	4885311	Citizens Thermal	**1,481.2**
IN	7744611	COVANTA INDIANAPOLIS, INC.	**1,077.4**
IN	8182811	INDIANA HARBOR COKE COMPANY	**859.4**
IN	5453011	Ardagh Glass Inc	**684.8**
IN	8074511	TATE & LYLE SAGAMORE OPERATION	**577.0**
IN	8223611	ELI LILLY & COMPANY CLINTON LABS	**556.6**
IN	7376411	TATE & LYLE, LAFAYETTE SOUTH (33)	**489.0**
IN	7376911	SDI Steel Dynamics Incorporated	**479.8**

IN	4912511	PURDUE UNIVERSITY -WADE UTILITY PLANT	**453.6**
IN	5552011	UNIVERSITY OF NOTRE DAME DU LAC	**435.3**
IN	12766611	Wabash River Combined Cycle Plant	**61.1**
KY	7349811	Carmeuse Lime & Stone Inc	**1,913.6**
KY	5060111	Ak Steel Corp	**1,380.3**
KY	9619211	Domtar Paper Co LLC - Hawesville Operati	**1,303.3**
KY	7353311	Kosmos Cement Company	**1,097.0**
KY	7331911	Marathon Petroleum Co LLC - Catlettsburg	**957.3**
KY	7351711	Carmeuse Lime Inc	**820.9**
KY	5926411	AGC Flat Glass N America Inc	**634.0**
KY	7331511	Newpage Corp	**619.4**
KY	5198911	North American Stainless	**536.0**
KY	5929411	Westlake Vinyls Inc	**460.4**
KY	7365211	CC Metals and Alloys LLC	**457.5**
KY	13417311	Mississippi Lime Co - Verona Plant	**363.9**
MD	7763811	Luke Paper Company	**3,607.1**
MD	8200011	Lehigh Cement Company - Union Bridge	**2,623.2**
MD	7931411	Holcim (US), Inc.	**1,522.1**
MD	8239711	Sparrows Point, LLC	**1,165.6**
MD	5857411	Wheelabrator Baltimore, LP	**0**
MD	7719011	Montgomery County RRF	**0**
MI	8062611	TILDEN MINING COMPANY LC	**5,561.2**
MI	8127411	LAFARGE MIDWEST INC.	**3,461.8**
MI	9535411	Detroit Metropolitan Wayne County	**2,993.7**
MI	7780811	EMPIRE IRON MINING PARTNERSHIP	**2,799.0**
MI	8126511	ESCANABA PAPER COMPANY	**2,556.7**
MI	8483611	U S STEEL GREAT LAKES WORKS	**2,129.9**
MI	7888111	GUARDIAN INDUSTRIES	**2,042.1**
MI	8160611	St. Marys Cement, Inc. (U.S.)	**2,019.5**
MI	8171811	DETROIT RENEWABLE POWER, LLC	**1,618.3**
MI	7286011	VERSO PAPER - QUINNESEC	**1,226.4**
MI	8129311	Holland BPW, Generating Station & WWTP	**876.2**
MI	8483711	SEVERSTAL DEARBORN, LLC	**610.8**
MI	7778911	CARMEUSE LIME Inc, RIVER ROUGE OPERATIO	**547.0**
MI	8157711	Michigan State University	**523.5**
MI	8229011	Packaging Corporation of America - Filer	**521.5**
MI	8126211	Decorative Panels International, Inc	**464.8**
MI	8245611	MARATHON PETROLEUM COMPANY LP	**348.2**
MI	16662611	EES COKE BATTERY LLC	**0**
MI	16879411	WESTPORT LD, INC.	**0**
NJ	7903711	Phillips 66 Bayway Refinery	**918.9**
NJ	8177011	Covanta Essex Company	**779.5**

NJ	7201311	Paulsboro Refining Company LLC	**648.4**
NJ	7906111	Union County Resource Recovery Facility	**621.8**
OH	8463811	Carmeuse Lime, Inc. - Maple Grove Operat	**2,968.0**
OH	8008811	AK Steel Corporation (1409010006)	**2,152.4**
OH	8133211	MARTIN MARIETTA MAGNESIA SPECIALTIES INC	**2,029.4**
OH	3950711	Department of Public Utilities, City of	**1,901.9**
OH	8131111	P. H. Glatfelter Company - Chillicothe F	**1,759.1**
OH	8102411	PCS Nitrogen Ohio, L.P. (0302020370)	**1,298.4**
OH	8150111	CEMEX Construction Materials Atlantic, L	**1,175.0**
OH	7937411	ArcelorMittal Cleveland Inc. (1318001613	**1,161.2**
OH	9253511	Pilkington North America Inc (0487010012	**1,087.9**
OH	8418011	BP-Husky Refining LLC (0448020007)	**862.5**
OH	7319811	Toledo Refining Company, LLC. (044801024	**829.0**
OH	8007011	Lima Refining Company (0302020012)	**813.9**
OH	8259911	Anchor Hocking, LLC (0123010078)	**768.0**
OH	8130411	Globe Metallurgical Inc. (0684000105)	**765.9**
OH	9301711	DTE St. Bernard, LLC (1431394148)	**763.1**
OH	8014411	General Electric Aircraft Engines: Peebl	**755.4**
OH	9236811	Haverhill Coke Company LLC (0773000182)	**700.9**
OH	13571611	INEOS USA LLC (0302020371)	**670.6**
OH	8115611	ArcelorMittal Warren (0278000648)	**661.3**
OH	7401911	Alliance Casting Co. LLC (1576010014)	**613.5**
OH	7996411	Lafarge North America - Paulding Plant (	**536.0**
OH	8130511	Kraton Polymers U.S. LLC (0684010011)	**533.6**
OH	8010911	RockTenn CP,LLC (0616010001)	**530.0**
OH	8149211	Carmeuse Lime, Inc - Grand River Operati	**520.1**
OH	8149311	PAINESVILLE MUNICIPAL ELECTRIC PLANT (02	**509.0**
OH	8301711	Libbey Glass Inc. (0448010066)	**464.2**
OH	8115911	Owens Brockway Glass Containers - Plant	**451.9**
OH	7922111	General Electric Aviation, Evendale Plan	**420.8**
OH	8130211	Graymont Dolime (OH), Inc. (0362000079)	**420.2**
OH	7996011	Cargill, Inc. - Dayton (0857041124)	**400.1**
OH	8130611	Orion Engineered Carbons LLC (0684010049)	**391.8**
OH	8011211	Wausau Paper Towel & Tissue, LLC (1409010043)	**340.5**
PA	8204511	USS/CLAIRTON WORKS	**3,287.3**
PA	4952111	MAGNESITA REFRACTORIES/YORK	**2,807.1**
PA	4966111	PH GLATFELTER CO/SPRING GROVE	**1,720.3**
PA	6463511	PPG IND INC/WORKS NO 6	**1,501.7**
PA	7873611	SUNOCO INC (R&M)/MARCUS HOOK REFINERY	**1,447.2**
PA	8219711	COVANTA DELAWARE VALLEY LP/DELAWARE VALL	**1,433.7**
PA	6651211	ESSROC/NAZARETH LOWER CEMENT PLT I II I	**1,346.2**
PA	6597611	LEHIGH CEMENT CO LLC/EVANSVILLE CEMENT P	**1,163.2**
PA	6652211	PHILA ENERGY SOL REF/ PES	**1,122.5**
PA	2989611	GUARDIAN IND CORP/JEFFERSON HILLS	**987.4**

PA	6559611	DOMTAR PAPER CO/JOHNSONBURG MILL	**977.8**
PA	6603511	PITTSBURGH GLASS WORKS/MEADVILLE WORKS 8	**949.0**
PA	7889111	GRAYMONT PA INC/PLEASANT GAP & BELLEFONT	**946.9**
PA	7991511	HORSEHEAD CORP/MONACA SMELTER	**913.7**
PA	4843611	COVANTA PLYMOUTH RENEWABLE ENERGY/ PLYMO	**835.8**
PA	8220011	WHEELABRATOR FALLS INC/FALLS TWP	**831.5**
PA	3881611	HERCULES CEMENT CO LP/STOCKERTOWN	**801.5**
PA	7409411	US STEEL CORP/IRVIN PLT	**793.3**
PA	4952011	PROCTER & GAMBLE PAPER PROD CO/MEHOOPANY	**719.3**
PA	6581211	LANCASTER CNTY RRF/ LANCASTER	**656.8**
PA	7874511	MONROE ENERGY LLC/TRAINER	**617.5**
PA	14454711	CONWAY	**609.9**
PA	6582211	KEYSTONE PORTLAND CEMENT/EAST ALLEN	**579.4**
PA	4120011	YORK CNTY SOLID WASTE/YORK CNTY RESOURCE	**567.0**
PA	7407611	SHENANGO INC/SHENANGO COKE PLT	**449.6**
PA	3884311	CARMEUSE LIME INC/MILLARD LIME PLT	**444.3**
PA	6582111	INTL WAXES INC/FARMERS VALLEY	**424.7**
VA	10698711	Duke Energy Generation Services of Narro	**3,549.9**
VA	5798711	Meadwestvaco Packaging Resource Group	**3,041.5**
VA	5769011	Honeywell International Inc - Hopewell	**3,018.0**
VA	4182011	Smurfit Stone Container Corporation - We	**1,869.5**
VA	5039811	Roanoke Cement Company	**1,866.1**
VA	8517811	Old Virginia Brick Co	**1,330.7**
VA	5748611	Radford Army Ammunition Plant	**1,273.0**
VA	5768811	Smurfit Stone Container Enterprises Inc-	**1,242.8**
VA	5795711	Greif Packaging LLC	**620.1**
VA	4184511	Chemical Lime Company	**581.5**
VA	4034811	Jewell Coke Company LLP	**520.2**
VA	4195111	Covanta Alexandria/Arlington Inc	**471.5**
VA	6148011	Owens-Brockway Glass Container Division	**412.9**
VA	4183311	GP Big Island LLC	**239.8**
VA	4004311	Celanese Acetate LLC	**43.2**
VA	4183011	Wheelabrator Portsmouth Inc, RDF Facility	**0.5**
VA	6743611	Covanta Fairfax Inc	**0**
VA	5747111	International Paper Company	**0**
WV	4878711	PPG INDUSTRIES, INC., NATRIUM PLANT	**1,946.2**
WV	5782411	BAYER CROPSCIENCE	**1,749.2**
WV	4987611	CAPITOL CEMENT - ESSROC MARTINSBURG	**1,495.5**
WV	4878911	DUPONT WASHINGTON WORKS	**1,043.8**
WV	4864311	MOUNTAIN STATE CARBON, LLC	**964.9**
WV	4985711	WEST VIRGINIA ALLOYS, INC.	**891.8**
WV	6773811	MORGANTOWN ENERGY ASSOCIATES	**818.7**
WV	4985611	Rain CII Carbon LLC - Moundsville Calcin	**408.5**

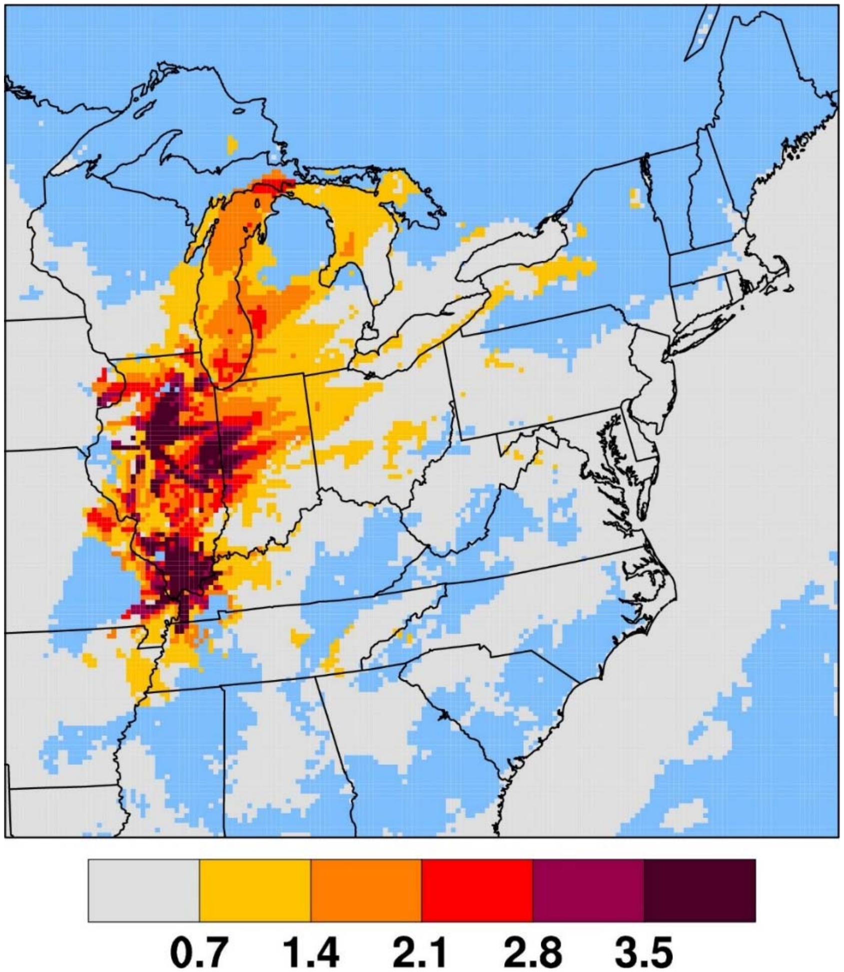
Oil & Gas Sector Facility List

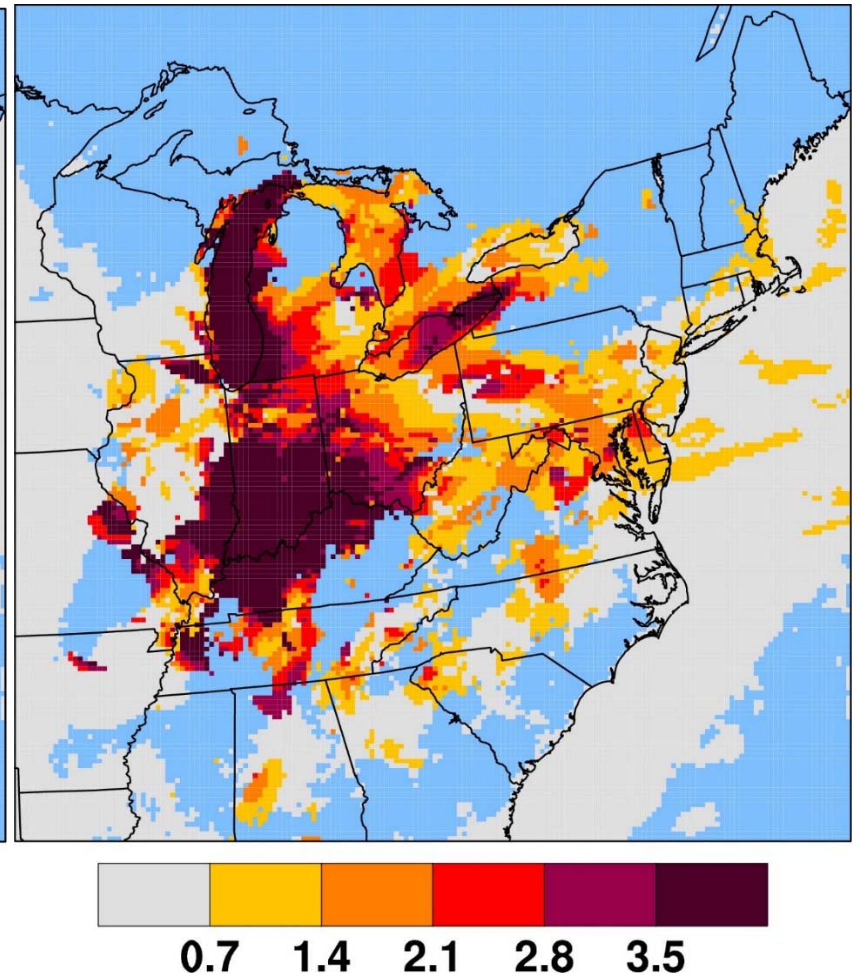
State	Plant ID	Plant Name	Projected 2017 NOx (Tons)
IL	5550111	Natural Gas Pipeline of America	**2,611.6**
IL	1816411	Natural Gas Pipeline Co of America	**1,948.9**
IL	5535511	Trunkline Gas Co	**1,448.7**
IL	2749511	Trunkline Gas Co	**1,168.1**
IL	2600611	Panhandle Eastern Pipe Line Co	**1,167.4**
IL	5574811	Trunkline Gas Co	**1,081.8**
IL	5529311	ANR Pipeline Co	**641.1**
IL	558811	Peoples Gas Light & Coke Co	**474.3**
IL	4484711	Panhandle Eastern Pipe Line Co	**418.5**
IL	5401911	Midwestern Gas Transmission	**144.8**
IN	4544011	PEPL - EDGERTON COMPRESSOR STATION	**1,556.8**
IN	8238711	PEPL - ZIONSVILLE COMPRESSOR STATION	**1,282.3**
IN	7957111	ANR PIPELINE CO PORTLAND STATION	**1,165.9**
IN	4887211	ANR PIPELINE CELESTINE STATION	**876.0**
IN	4911611	T G C - NORTH JUDSON STATION	**620.8**
IN	8201211	ANR PIPELINE CO - SHELBYVILLE STATION	**617.9**
IN	4671411	PANHANDLE EASTERN PIPE LINE COMPANY M	**342.4**
IN	4728511	T G C - AMBIA STATION	**332.9**
IN	7250811	Midwestern Gas Transmission Company Sta	**100.2**
KY	6127911	Texas Eastern Transmission LP - Danville	**1,076.8**
KY	5830611	ANR Pipeline Co (Madisonville Compressor	**790.6**
KY	5201011	Columbia Gulf Trans Co	**619.4**
KY	6096911	TN Gas Pipeline Co LLC - Station 200	**185.4**
MD	5997311	Transcontinental Gas Pipeline	**1,206.0**
MI	8246111	ANR Pipeline Company Lincoln Compressor	**639.7**
MI	4190611	ANR Pipeline Co - Woolfolk Compressor S	**562.0**
MI	4007011	Great Lakes Gas - Farwell Compressor Sta	**545.1**
MI	4201211	ROMEO GAS PROCESSING PLANT	**542.5**
MI	6358811	CONSUMERS ENERGY COMPANY- WHITE PIGEON C	**486.8**
MI	8195311	ANR Pipeline Company - Bridgman Compressor Station	**386.5**
MI	4006811	Consumers Energy - Muskegon River Compressor Stat	**372.6**
MI	7011311	DTE Gas Company BELLE RIVER COMPRESSOR STATION	**361.1**
MI	5888811	Howell Compressor Station	**359.3**
MI	5215311	DTE Gas Company-Taggart Compressor Station	**282.0**
OH	7938111	ANR Pipeline Company (0320010169)	**1,472.4**
OH	8259811	CRAWFORD COMPRESSOR STATION (0123000137)	**681.7**
OH	8425111	East Ohio Gas - Chippewa Station (028500	**522.1**
OH	8050011	LUCAS COMPRESSOR STATION (0370000164)	**469.6**

OH	8050111	PAVONIA COMPRESSOR STATION (0370000226)	**453.5**
OH	8132011	Tennessee Gas Pipline- Station 214 (0210	**431.5**
OH	13573011	Marathon Petroleum Company LP - Canton Refinery (1576002006)	**274.3**
OH	8008011	Tennessee Gas Pipeline Station 209 (0630000001)	**263.3**
OH	7984611	Tennessee Gas Pipeline Station 204 (0605000020)	**66.3**
PA	2980811	TRANSCONTINENTAL GAS/FRAZER STA 200	**731.3**
PA	3194611	TRANSCONTINENTAL GAS PIPE LINE CO LLC/ST	**442.1**
VA	4005411	Transco Gas Pipe Line Corp Station 165	**2,304.3**
VA	6217611	Transco Station 170	**756.5**
WV	6790711	FILES CREEK 6C4340	**1,298.8**
WV	6214811	DOMINION - OSCAR NELSON COMPRESSOR STN	**1,097.9**
WV	6341411	CEREDO 4C3360	**1,025.7**
WV	6341511	KENOVA 4C3350	**693.6**
WV	6340611	CLEVELAND 6C4330	**543.0**
WV	6900411	DOMINION - CAMDEN COMPRESSOR STATION	**530.6**
WV	6900311	EQUITRANS - COPLEY RUN CS 70	**505.6**
WV	6885411	DOMINION - CORNWELL COMPRESSOR STATION	**403.3**
WV	6790511	Columbia Gas - GLADY 6C4350	**370.9**
WV	6885111	Columbia Gas - CLENDENIN 4C1200	**288.1**
WV	6760611	Columbia Gas - ADALINE 7C6600	**287.3**
WV	6256711	Columbia Gas - GLENVILLE 4C1170	**46.8**

Appendix C

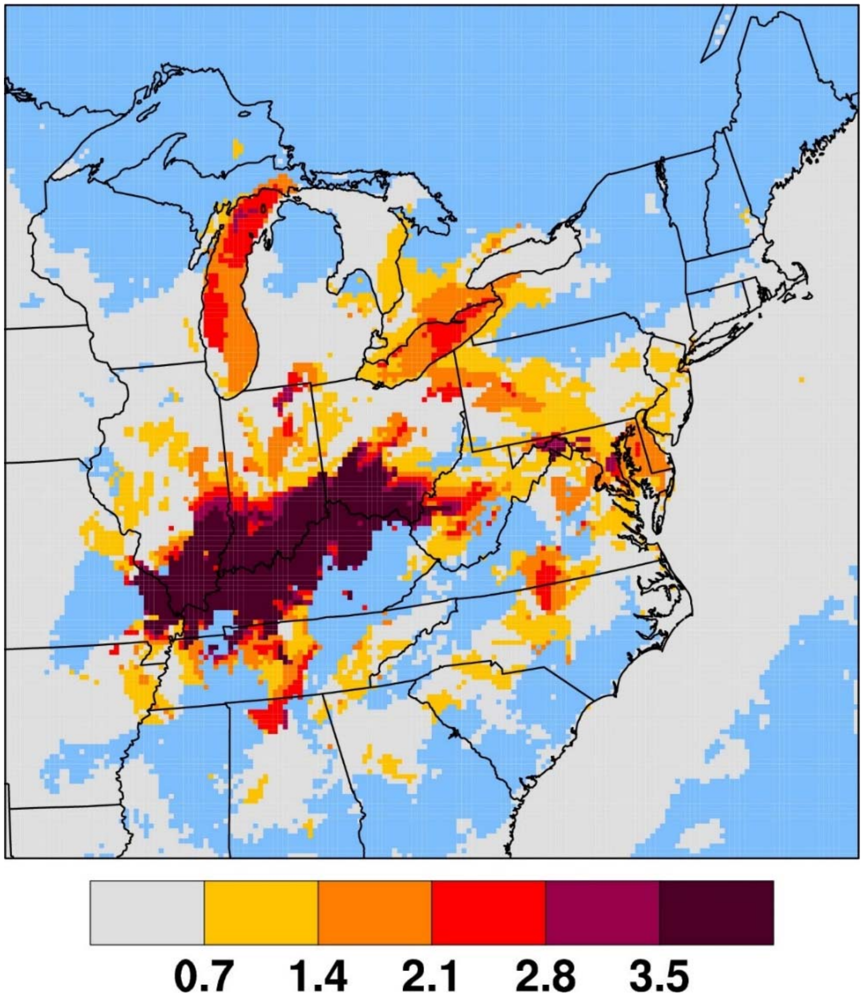
Maximum Impacts on New York State Monitors from 400 Ton-per-Year Sources in Significantly Contributing States



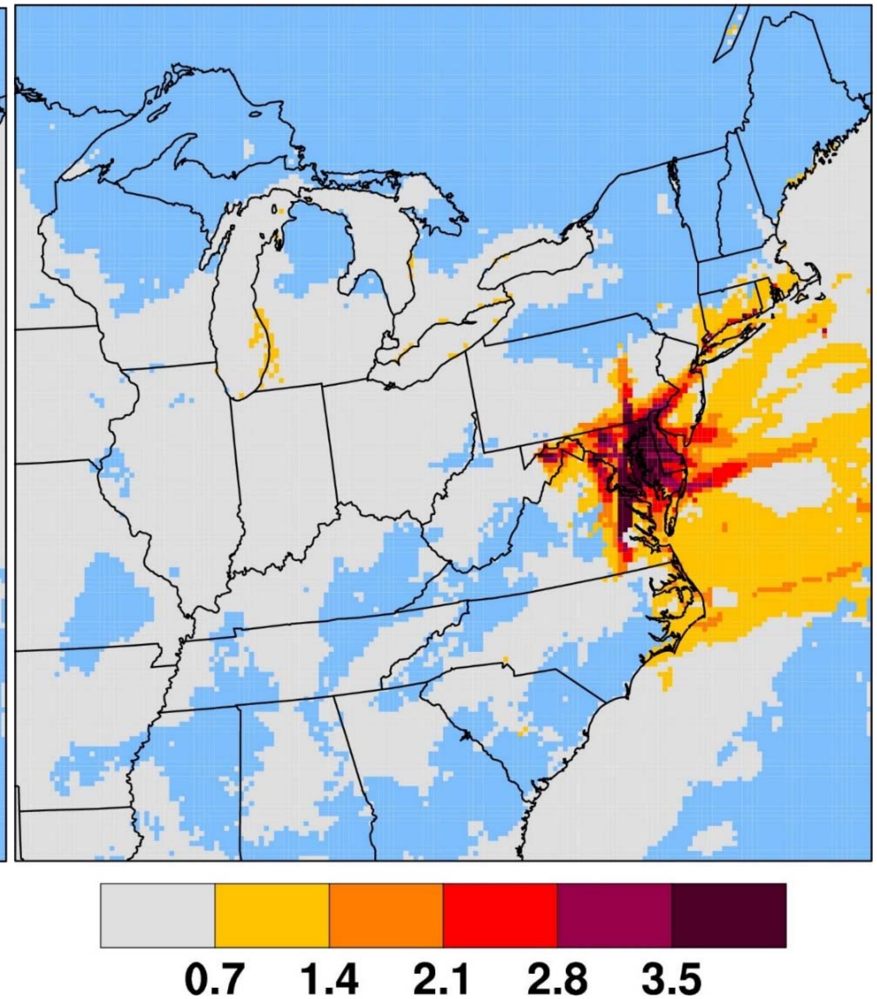


Maximum impact from Illinois:
0.986 ppb at East Syracuse (Onondaga Co.) monitor

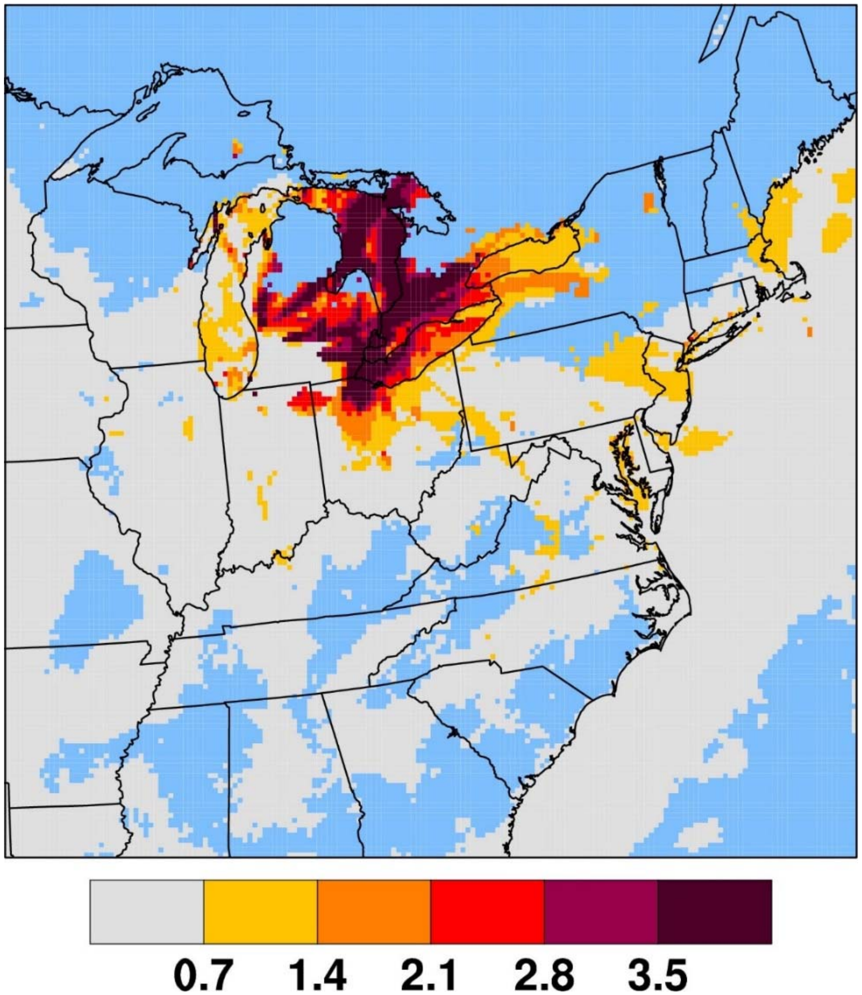
Maximum impact from Indiana:
4.207 ppb at Amherst (Erie Co.) monitor



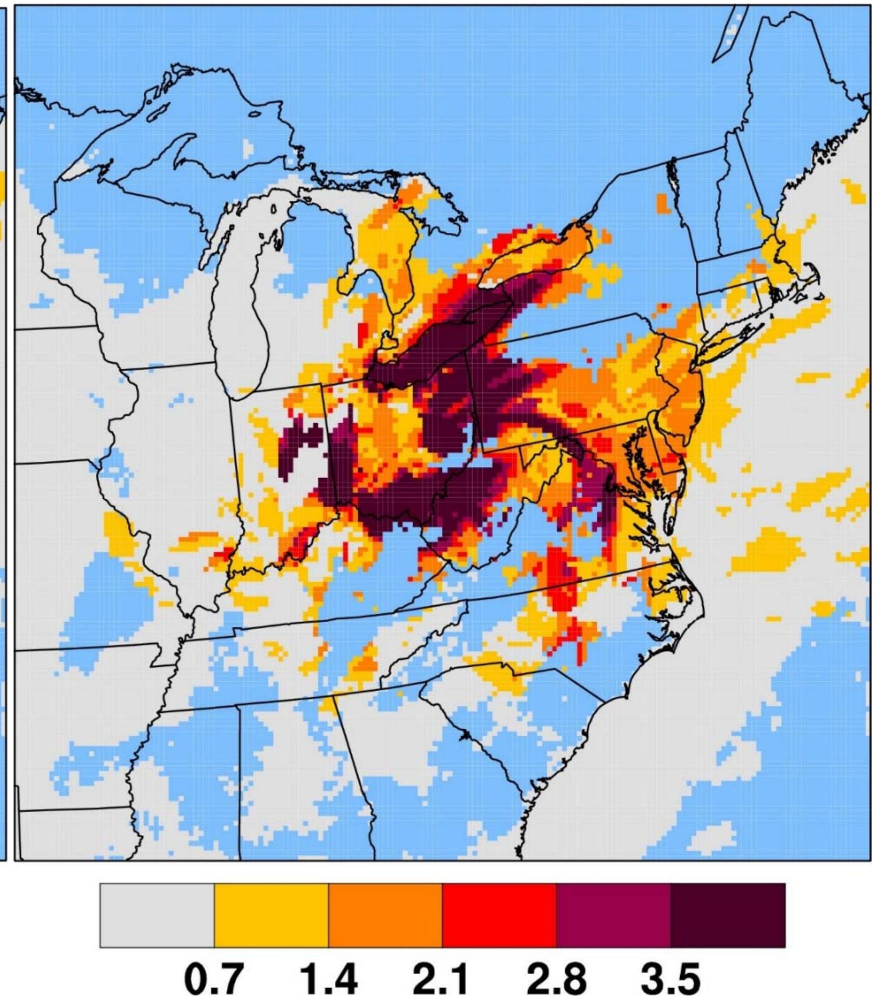
Maximum impact from Kentucky:
1.550 ppb at Middleport (Niagara Co.) monitor



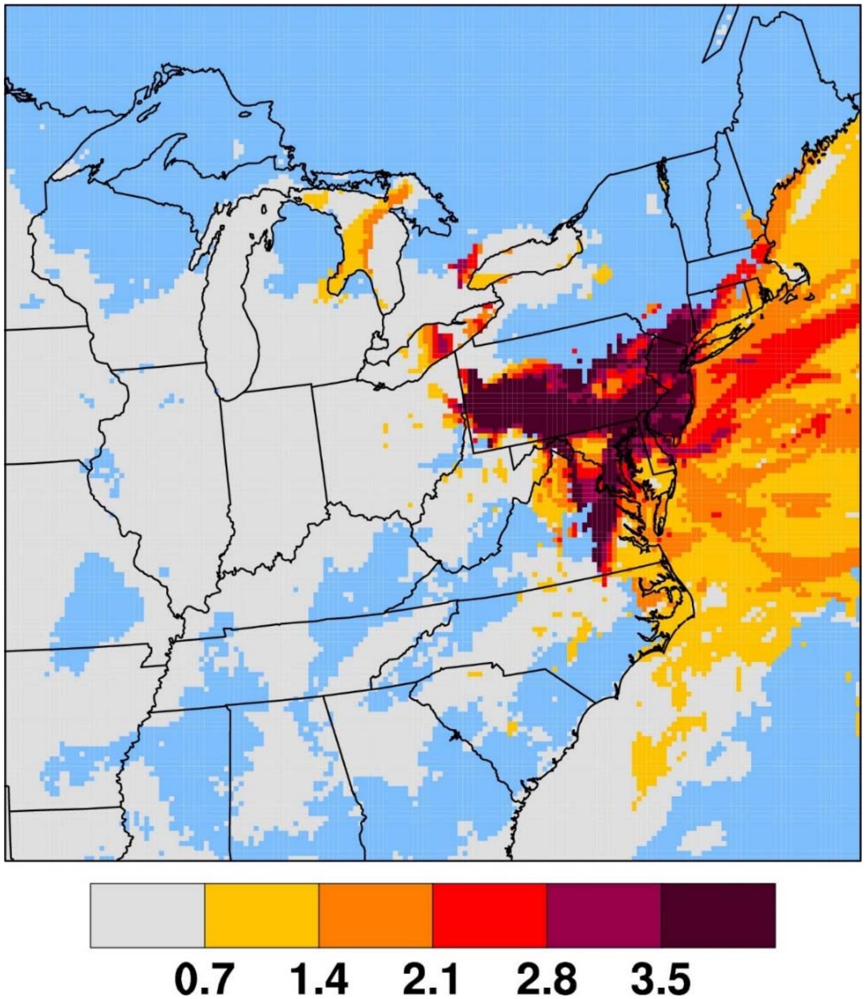
Maximum impact from Maryland:
1.509 ppb at Susan Wagner (Richmond Co.) monitor



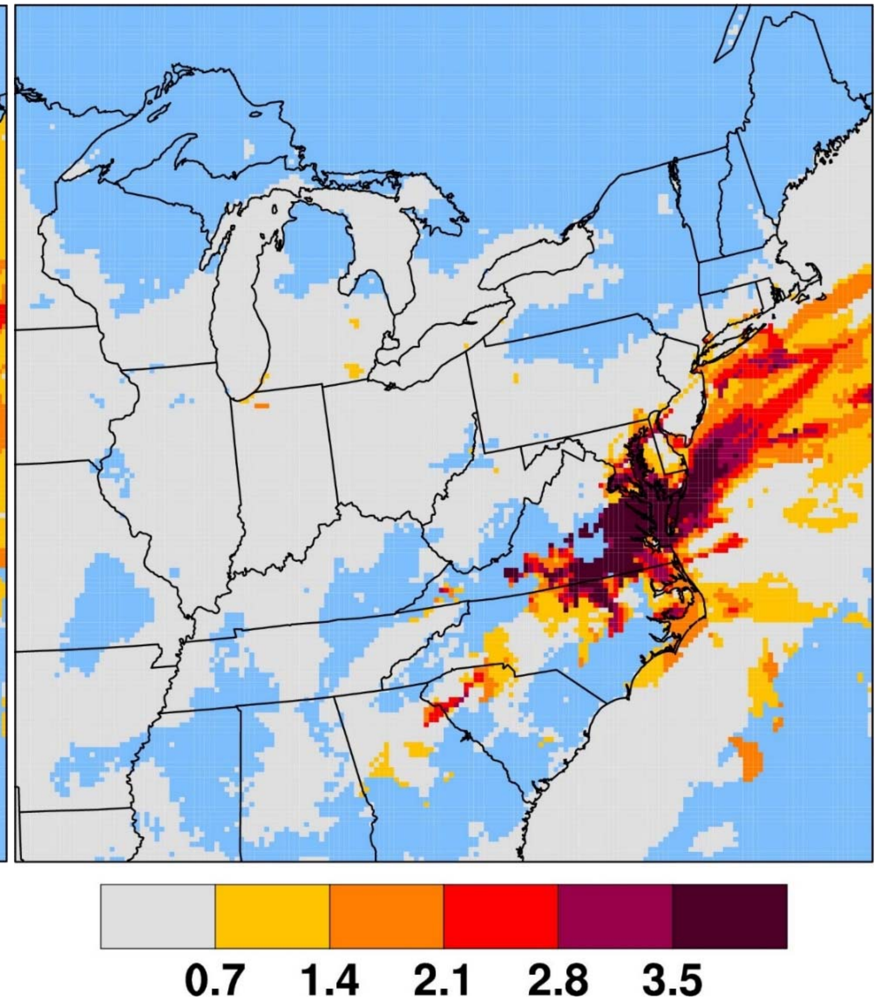
Maximum impact from Michigan:
1.770 ppb at Rochester (Monroe Co.) monitor



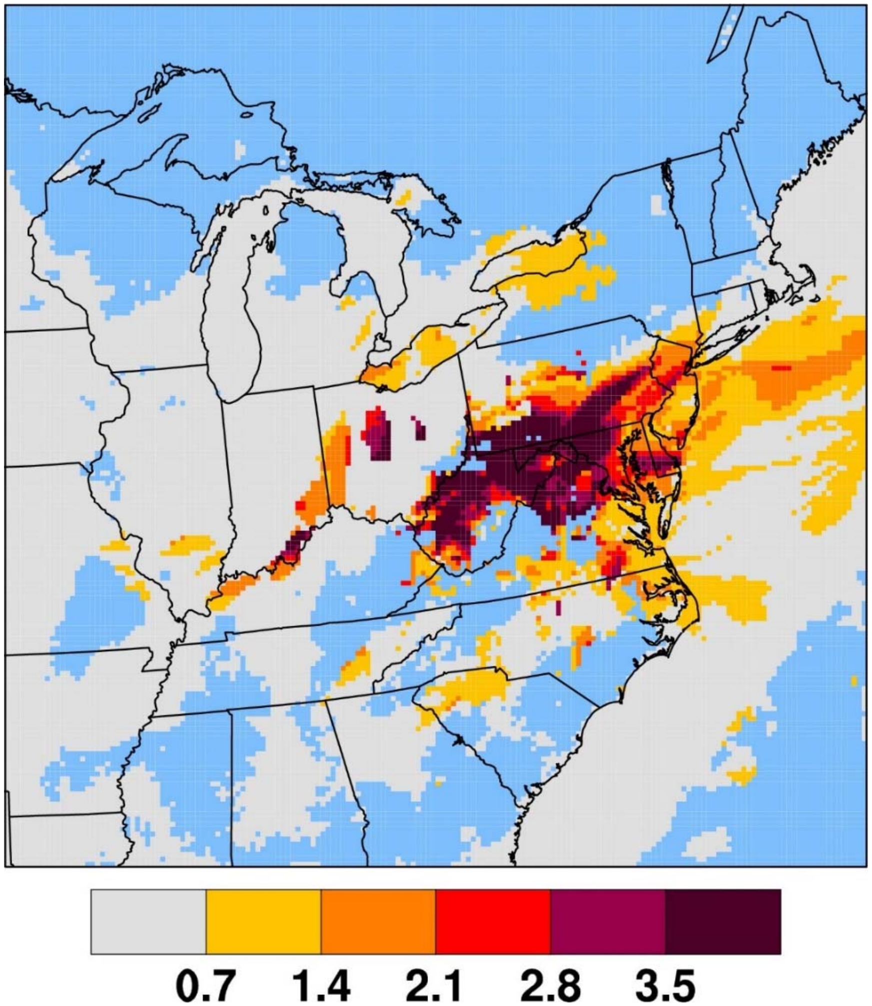
Maximum impact from Ohio:
6.343 ppb at Dunkirk (Chautauqua Co.) monitor



Maximum impact from Pennsylvania:
4.968 ppb at Rockland (Rockland Co.) monitor



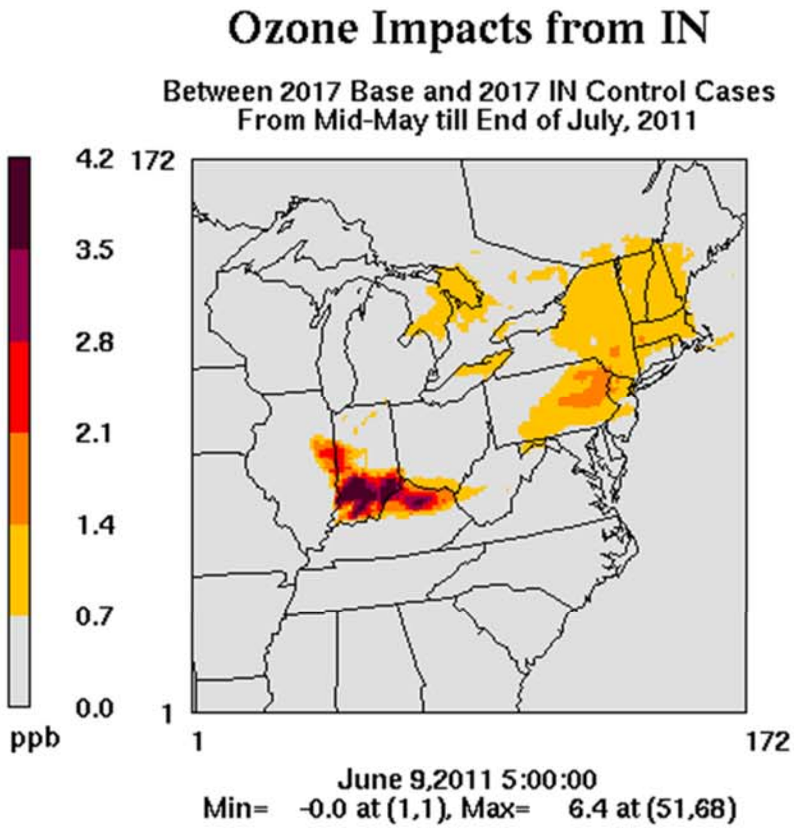
Maximum impact from Virginia:
0.929 ppb at Riverhead (Suffolk Co.) monitor



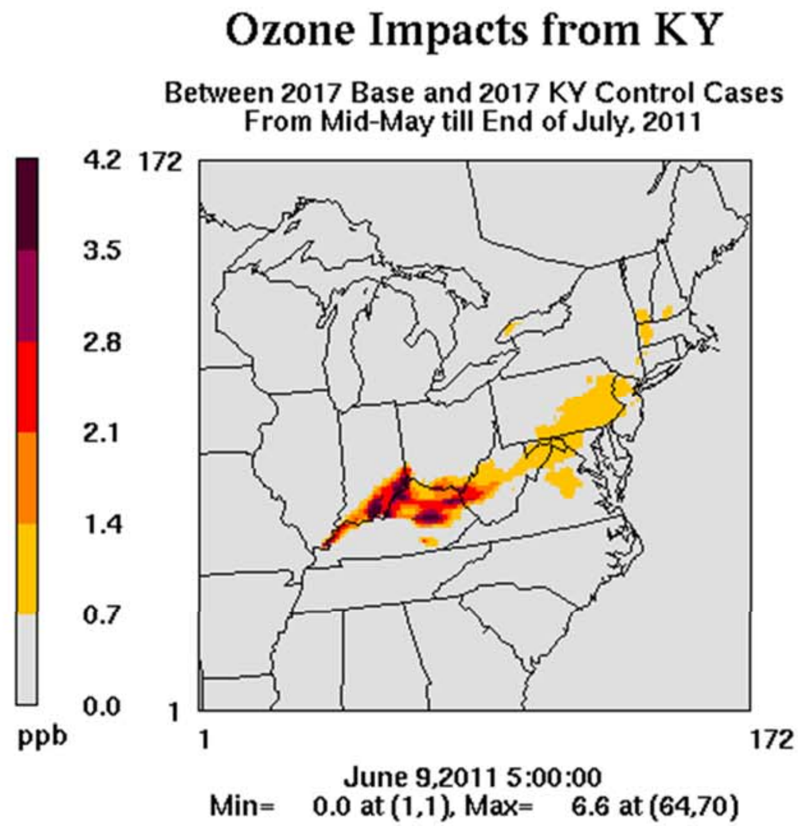
Maximum impact from West Virginia:
2.273 ppb at Susan Wagner (Richmond Co.) monitor

Appendix D

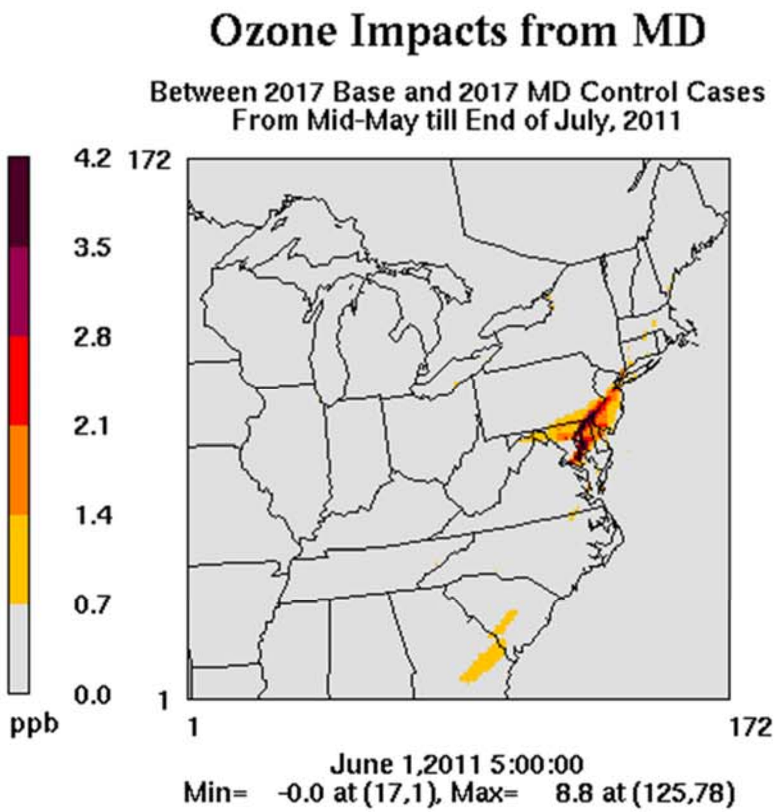
Maximum Impacts on Susan Wagner Monitor (Richmond County) from 400 Ton-per-Year Sources in Significantly Contributing States



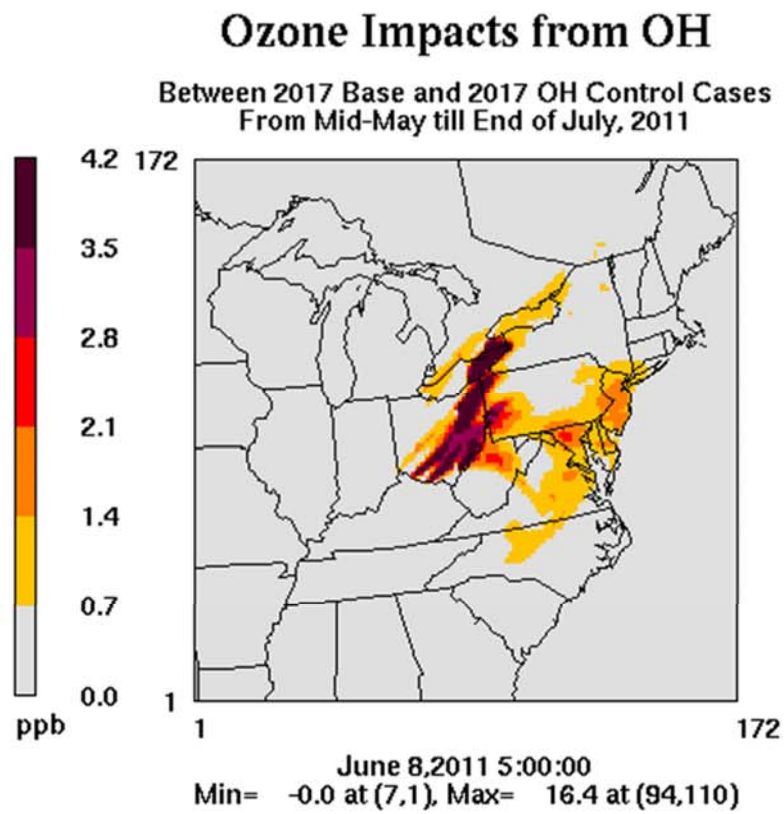
Maximum Indiana impact on Susan Wagner monitor = 1.012 ppb



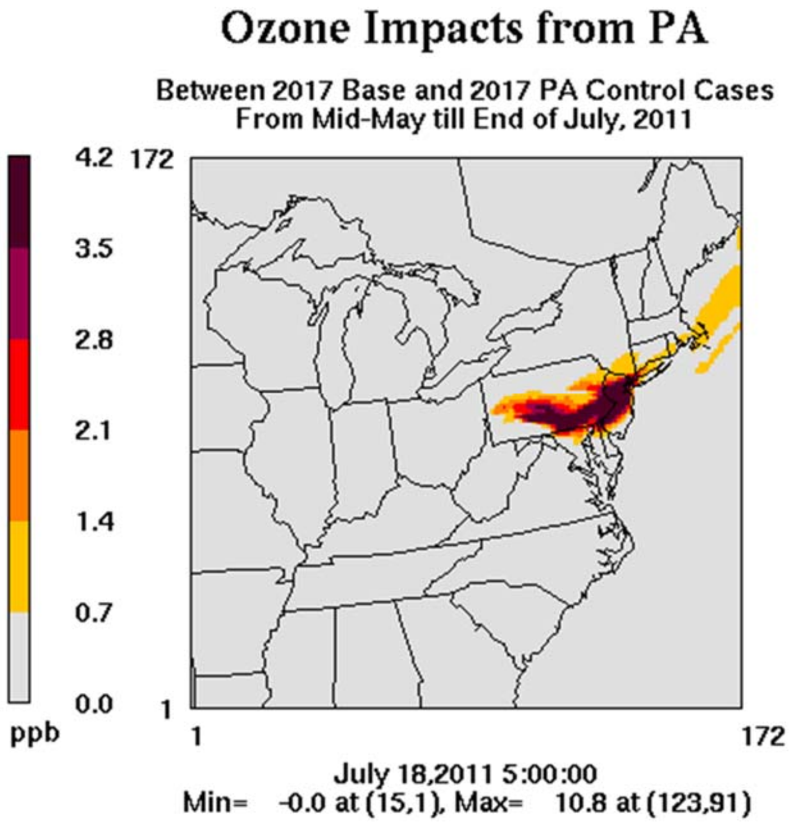
Maximum Kentucky impact on Susan Wagner monitor = 0.727 ppb

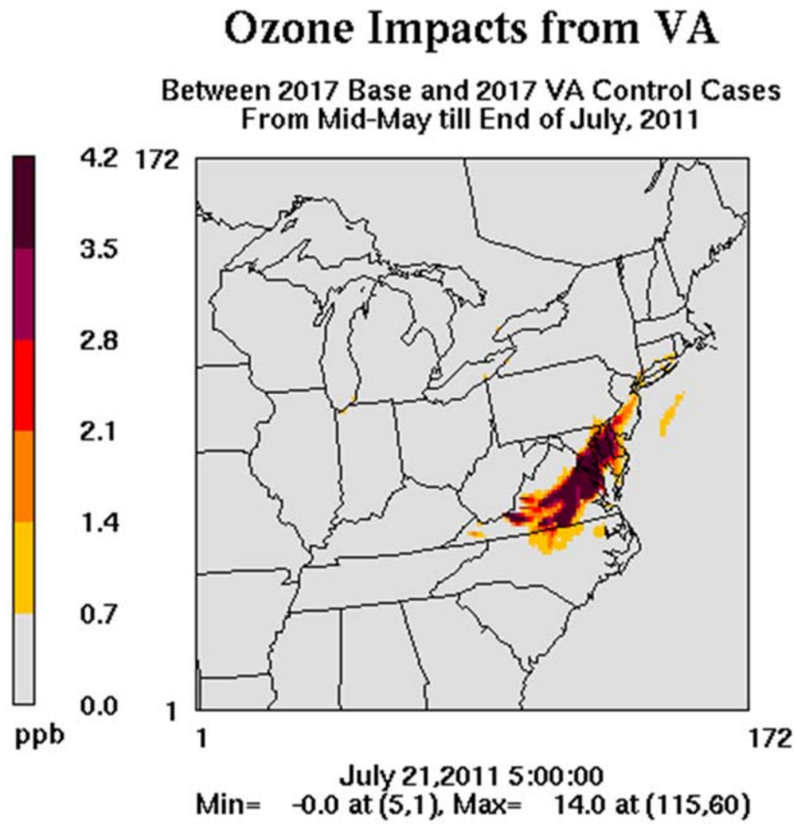


Maximum Maryland impact on Susan Wagner monitor = 1.509 ppb



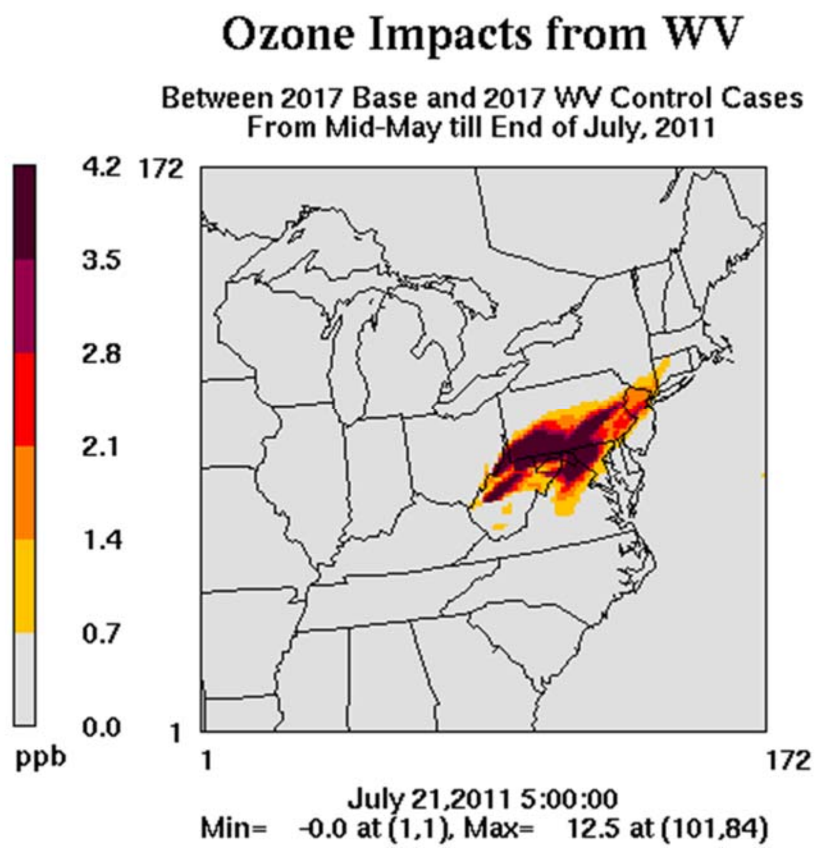
Maximum Ohio impact on Susan Wagner monitor = 1.350 ppb





Maximum Pennsylvania impact on Susan Wagner monitor = 4.660 ppb

Maximum Virginia impact on Susan Wagner monitor = 0.807 ppb



Maximum West Virginia impact on Susan Wagner monitor = 2.273 ppb