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February 28, 2018

Mr. Scott Pruitt
Administrator
U.S. Environmental Protection Agency
1200 Pennsylvania Avenue, N.W.
Washington, DC 20460

Subject: U.S. EPA's Intended Area Designations for the 2015 Ozone National Ambient Air Quality Standard (NAAQS), Docket ID No. EPA-HQ-OAR-2017-0548

Dear Administrator Pruitt:

On December 20, 2017, EPA informed Governor Walker of its intention to designate several areas of Wisconsin as nonattainment of the 2015 ozone NAAQS. The Wisconsin Department of Natural Resources (DNR) is providing this submittal in response to EPA's intended designations, as provided for under the Clean Air Act.

DNR reiterates the governor's official recommendation that EPA should designate all areas of Wisconsin as attainment of the 2015 ozone NAAQS. This recommendation remains supported by science and data provided previously by DNR that shows that the state's elevated ozone concentrations are the result of factors beyond the state's control, such as out-of-state emissions, geography, and meteorology.

On April 20, 2017, DNR submitted a comprehensive technical support document (TSD) in support of the state's recommendation.[1] This TSD provided compelling, data-driven evidence that ozone concentrations above the level of the 2015 ozone NAAQS are limited to a narrow strip of land near the Lake Michigan lakeshore and are not meaningfully affected by in-state emissions. The TSD also estimated the maximum extent of 70 ppb ozone design values in the state based on the latest science, data, and analysis of Wisconsin-specific conditions.

EPA's intended nonattainment areas, however, do not fully reflect this information and are not technically supportable. While EPA's intended designations consider some of information provided by DNR, EPA relied far too heavily upon traditional applications of area designation factors, rather than the Wisconsin-specific technical information and analyses EPA had available. The enclosed TSD responds to EPA's technical evaluation, supplements the DNR's April 2017 submittal, and provides additional data and analyses in support of the state's recommendation. It is critical that EPA rely on this state-specific information when finalizing designations, as it is more refined than EPA's data and reflects much more accurately the unique ozone characteristics of Wisconsin's lakeshore region.

[1] Supplemental Information for 2015 Ozone National Ambient Air Quality Standard (NAAQS) Area Designations, available at http://dnr.wi.gov/topic/AirQuality/documents/OzoneTSD20170420.pdf.

To appropriately reflect what is known about ozone formation and transport in Wisconsin's lakeshore region, when finalizing designations EPA must consider the following alternatives, in this order:

1. Finalize the state's recommendation of attainment in all areas of the state. This would most appropriately recognize that the state has very little control over ozone concentrations in its lakeshore region due to out-of-state emissions, geography, and meteorology.

2. Finalize technically supported boundaries that reflect the maximum extent of the 70 ppb ozone design value gradient. This scientifically-sound approach is supported by air quality monitoring data and the science, which clearly identifies a narrow shoreline ozone gradient. The DNR first described the extent of this gradient in its April 2017 submittal and provides that information again here, with several specific modifications to individual counties.

To comply with the Clean Air Act, is important that EPA finalize its classification scheme for this NAAQS at the time of final area designations. Along with this, in order to help states understand their compliance obligations under this NAAQS, EPA should finalize its implementation rule in a timely matter.

Finally, EPA should revoke the 2008 ozone NAAQS at the earliest opportunity after finalizing designations for the 2015 ozone NAAQS. This revocation should be immediately effective in all areas, rather than on an area-by-area basis as individual areas attain the 2008 ozone NAAQS. It is unnecessary, from both a regulatory and health-based perspective, for states to be implementing two ozone standards concurrently, particularly when the more recent standard is more stringent.

Wisconsin's manufacturing-based economy is experiencing strong growth, which is improving the livelihoods and well-being of citizens throughout the state. EPA's intended designations threaten Wisconsin's economic engine and could result in severe and unnecessary economic consequences. It is important that EPA recognize and incorporate the appropriate data and science when making nonattainment designation decisions to ensure the economic consequences of such designations are minimized.

Cooperative federalism, when properly implemented, appropriately respects the roles state and federal governments have when implementing the Clean Air Act. In this case, the act gives the states clear authority to recommend designations and provide information to EPA for consideration in the designations process. Rather than rely on historical practice and outdated theories, EPA is obligated here to fully consider the state's submittals and ensure final designations reflect the science, data, and analysis provided by the state.

Please contact Gail Good, Air Management Program Director, at Gail.Good@wisconsin.gov or 608-264-8537 if there are any questions regarding this submittal.

Sincerely,

Daniel L. Meyer
Secretary

cc: Edward Chu, Deputy Regional Administrator, EPA Region 5
Bill Wehrum, Assistant Administrator, EPA Office of Air and Radiation
EPA docket center (via email)

Enclosure

Wisconsin's Response to EPA's Intended Nonattainment Area Designations for the 2015 Ozone NAAQS

Technical Support Document

February 2018

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1. Introduction

On December 22, 2017, the U.S. Environmental Protection Agency (EPA) informed Governor Walker in a letter dated December 20, 2017 of its intention to designate certain areas of Wisconsin as nonattainment of the 2015 ozone National Ambient Air Quality Standard (NAAQS). This letter was accompanied by technical support documents (TSDs) that described EPA's rationale for its intended designations.[1]

The Wisconsin Department of Natural Resources (DNR) is submitting this document in response to EPA's intended nonattainment area designations. Sections 2 and 3 discuss EPA's intended nonattainment area designations. Section 4 presents additional technical information supporting the state's recommendations, and Section 5 discusses the implications of this information for nonattainment area designations. Finally, Section 6 presents and discusses alternatives to EPA's intended nonattainment area designations.

DNR submitted supplemental information to EPA on April 20, 2017 in support of the state's recommendation of attainment for this NAAQS. [1] The TSD associated with that submittal is referenced throughout this document; as detailed below, this information was largely ignored by EPA in its designation decisions.

2. EPA's Intended Nonattainment Area Designations

Table 1 describes the areas of the state that EPA intends to finalize as nonattainment areas in the state, based on the information provided in its December 2017 "120-day" letter to Wisconsin. In addition, EPA proposed to identify the partial Door County nonattainment area as a rural transport area under Section 182(h) of the Clean Air Act (CAA). The partial Kenosha County nonattainment area is proposed to be part of the IL-IN-WI Chicago nonattainment area.

EPA's intended nonattainment designations for Wisconsin, as compared with the areas of the state identified in DNR's April 2017 TSD as experiencing ozone design values that exceed the 2015 ozone standard of 70 parts per billion (ppb), are shown in Figures 1 through 3.

[1] Available at https://www.epa.gov/ozone-designations/ozone-designations-2015-standards-wisconsin-state-recommendations-and-epa. Note that two EPA TSDs are associated with EPA's intended nonattainment areas in Wisconsin. One TSD covers the Milwaukee area, Sheboygan County, Manitowoc County, and Door County, while Kenosha County is included in the TSD for the Chicago, IL-IN-WI area.

Table 1. EPA's intended nonattainment areas for Wisconsin for the 2015 ozone NAAQS.

County	EPA's Intended Nonattainment Area
Door	The area north of the Sturgeon Bay canal.
Sheboygan	The portion of Sheboygan County inclusive and east of the following roadways with the boundary starting from north to south: Union Road which turns into County Road Y which turns into Highland Drive, to Lower Road which turns into Monroe Street, to Broadway/Main Street to Highway 32 which turns into Giddings Avenue to County Road W to County Road KW.
Manitowoc	The portion of Manitowoc County inclusive and east of the following roadways with the boundary starting from north to south: County Road B which turns into South State Street to County Road V which turns into Forest Home Drive to South Packer Drive to West Hillcrest Road to Highway 43 to West Custer Street to Dufek Drive which turns into Highway 42.
Milwaukee Washington Ozaukee Waukesha Racine	Entire counties
Kenosha	The area east of I-94.

Figure 1. Comparison of the area with design values over 70 ppb (pink) and EPA's intended nonattainment area boundaries (green) in Kenosha County and the 5-county Milwaukee area.

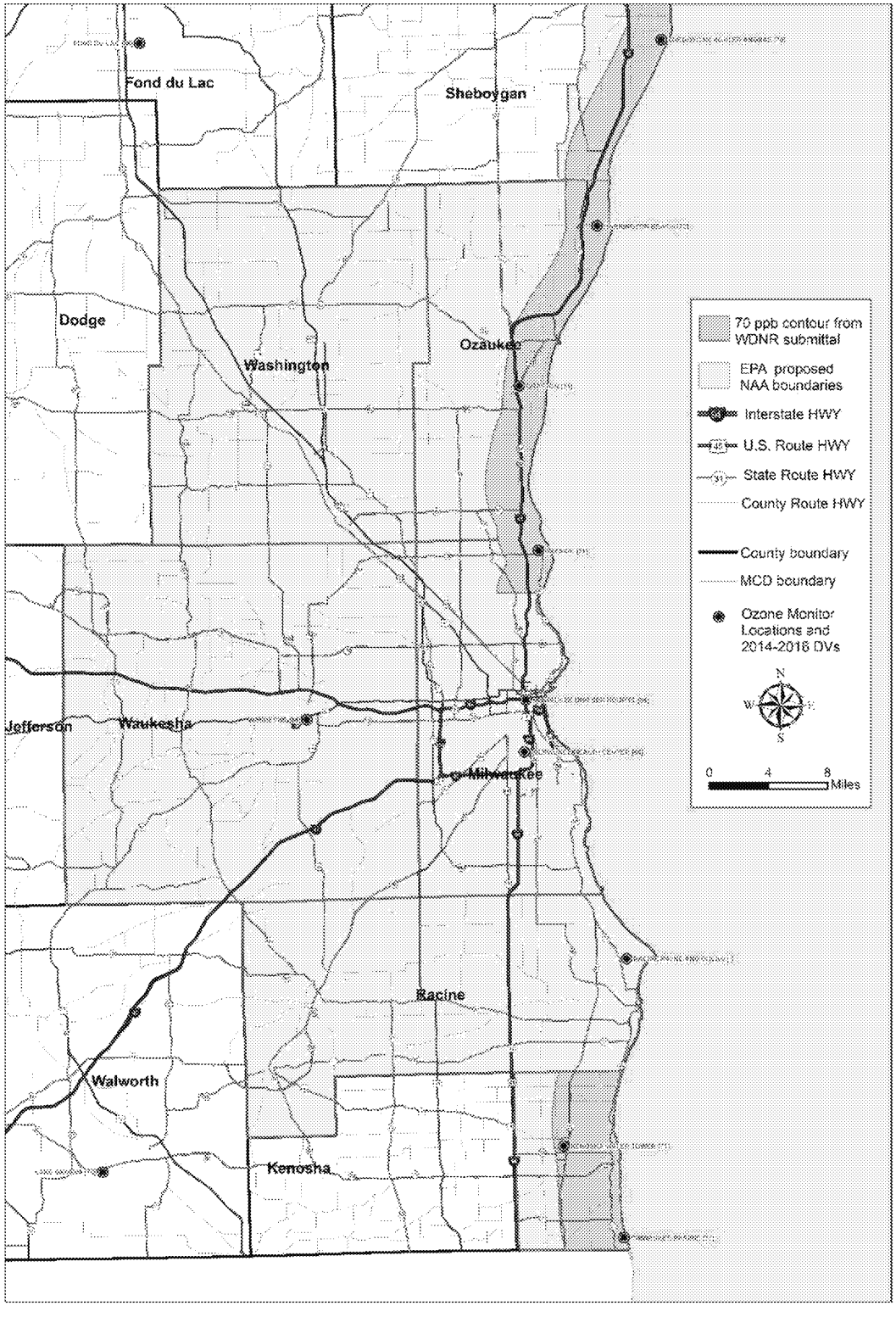


Figure 2. Comparison of the area with design values over 70 ppb (pink) and EPA's intended nonattainment area boundaries (green) in Sheboygan and Manitowoc counties.

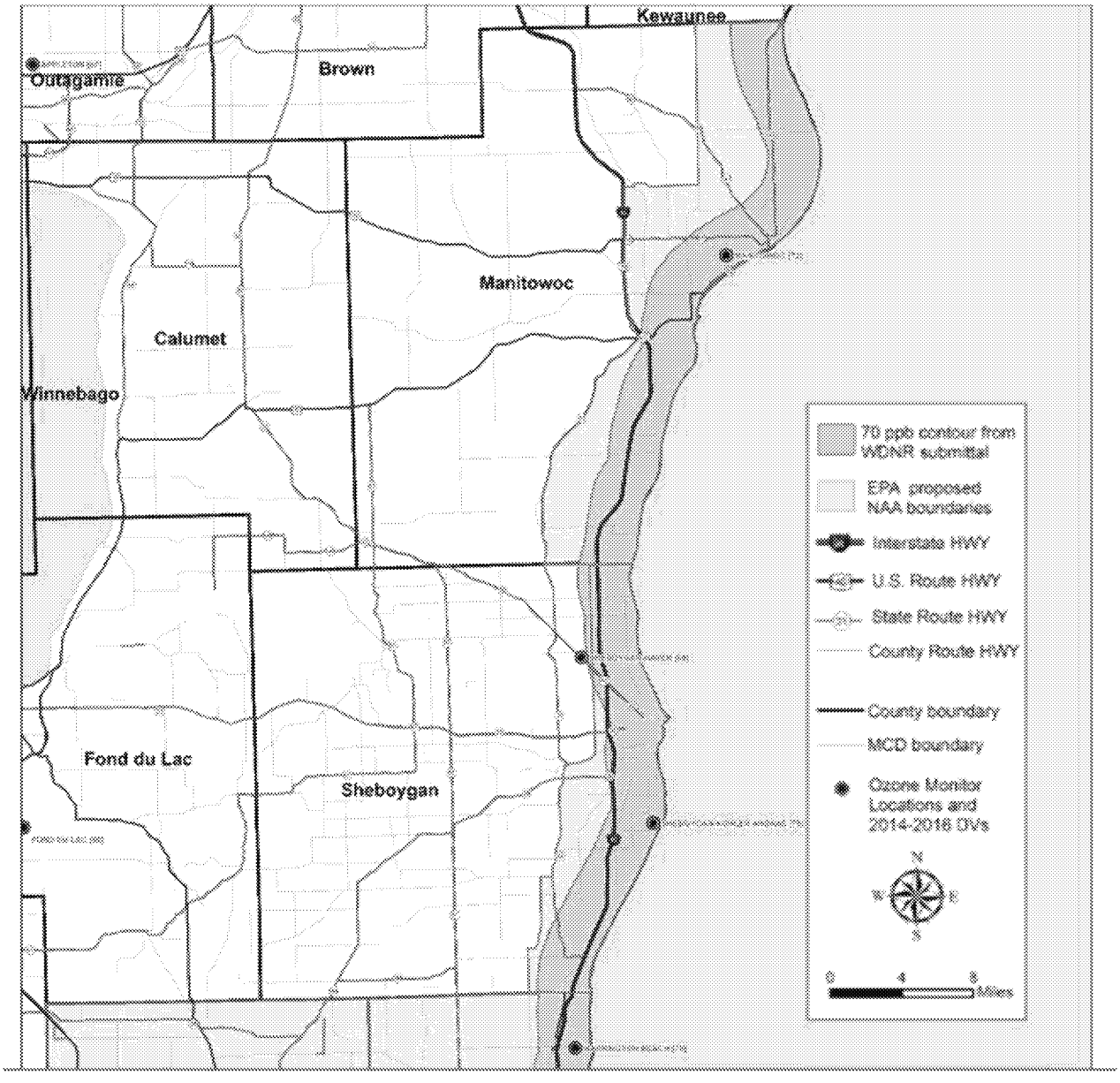
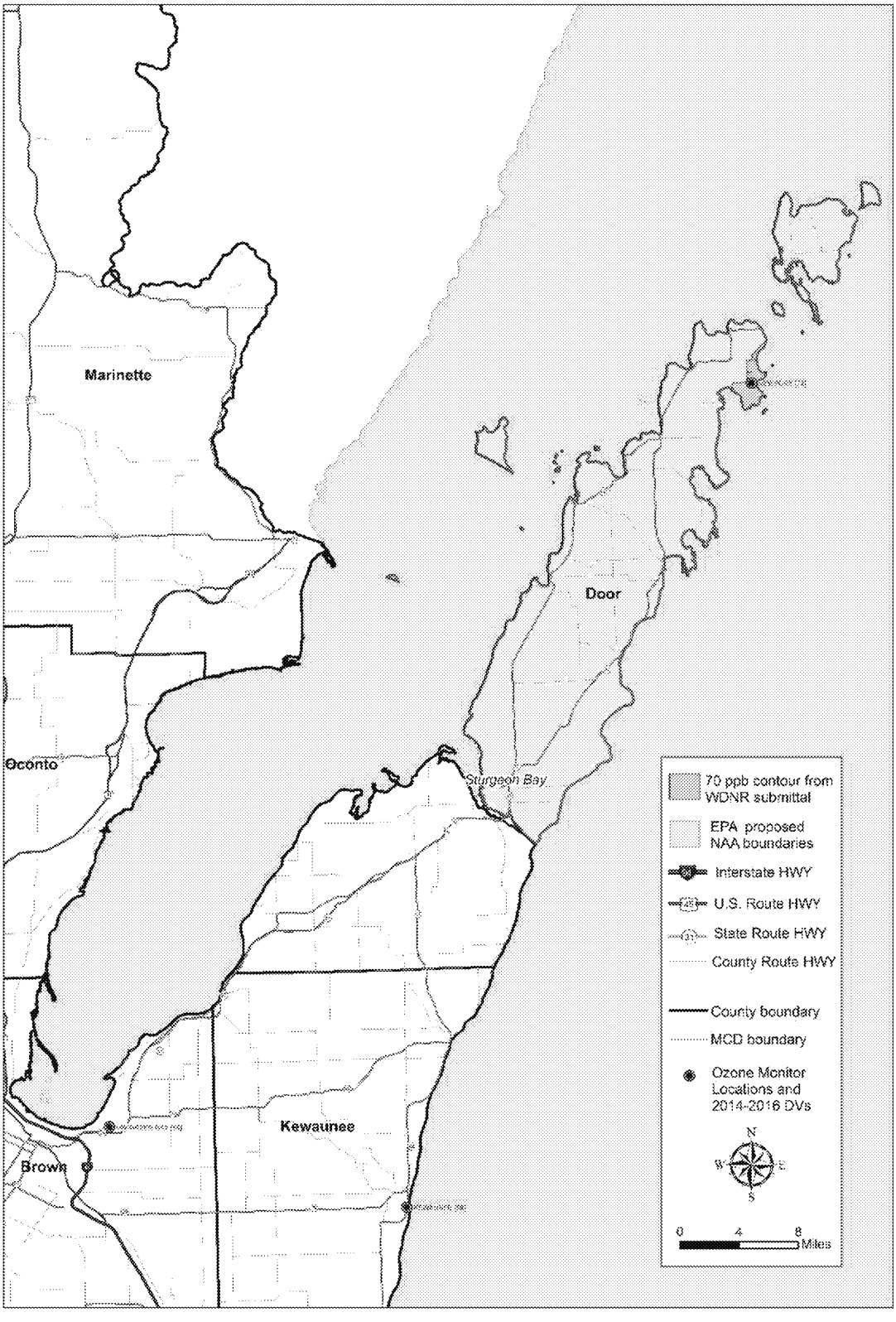


Figure 3. Comparison of the area with design values over 70 ppb (pink) and EPA's intended nonattainment area boundaries (green) in Door County.



3. Analysis of EPA's Intended Nonattainment Designations

In developing its intended designations for Wisconsin, with a few exceptions as noted below, EPA inappropriately relied upon a traditional and outdated application of the factors it considered for initial area designations for the 2015 ozone NAAQS.[2] These factors are:

- Air quality data
- Emissions and emissions-related data
- Meteorology
- Geography/topography
- Jurisdictional boundaries.

In its TSDs supporting its intended designations, EPA acknowledged some of the technical information provided by DNR in April 2017, particularly DNR's lake breeze analysis. EPA's consideration of this information is most apparent in its intended partial county designations for Door, Manitowoc, Sheboygan, and Kenosha counties. For these areas, EPA concurred with DNR's conclusion that only small portions of these counties may experience ozone concentrations above the level of the 2015 ozone NAAQS and that local emissions do not contribute significantly to ozone concentrations observed in these areas. The elevated ozone concentrations in these counties result entirely from their location along Lake Michigan and the unique meteorology of the region that transports ozone to downwind lakeshore areas from higher-emitting areas located upwind.

Further, EPA's intention to designate a partial Door County nonattainment area as a rural transport area under CAA Section 182(h) is both legally and scientifically supported. A rural transport area designation appropriately recognizes that Door County has no meaningful way to affect the ozone concentrations measured at the air quality monitor located at Newport State Park.

However, in developing its intended designations, EPA failed to consider – or even acknowledge – several critical pieces of technical information and analyses provided by DNR. Specifically:

1. EPA did not acknowledge the results of source apportionment modeling, which show that out-of-state emissions are responsible for the elevated ozone concentrations observed at Wisconsin's lakeshore monitors, including those in the 5-county Milwaukee area.

2. EPA failed to acknowledge that DNR had provided photochemical modeling demonstrating that eliminating all manmade emissions of the ozone precursors, volatile organic compounds (VOCs) and nitrogen oxides (NOx) in Sheboygan County would not reduce design values at the county's monitors, and that significant emission reductions in 10 lakeshore counties would not meaningfully impact ozone design values along the lake.

[2] https://www.epa.gov/ozone-designations/epa-guidance-area-designations-2015-ozone-naaqs

3. EPA applied a traditional, dated, and scientifically-unsupported approach to potential nonattainment area boundaries, using features such as roads and county boundaries instead of DNR's science- and data-based "distance from the lakeshore" method.

4. In determining intended nonattainment areas, EPA inappropriately included areas of the state with monitors that show attainment (e.g., Waukesha County).

5. EPA did not include or reference DNR's pollution rose analyses, which more accurately reflect the complex lakeshore environment than does the HYSPLIT back trajectory model relied upon by EPA, and which confirms that ozone concentrations exceeding 70 ppb occur when winds originate offshore.

6. EPA inappropriately considered local VOC and NOx emissions in its intended designations. Despite many lines of credible evidence provided by DNR showing that local emissions have little to no impact on areas of Wisconsin where ozone levels exceed 70 ppb, EPA's intended nonattainment areas appear designed to include as many local sources of these emissions as possible.

EPA erred most egregiously in its consideration of emissions and emissions-related data. When considering this factor, EPA only considered its own nationally generated emissions and emissions-related data, rather than completing (or considering) a more detailed assessment of the location, density, and intensity of emissions specific to Wisconsin.[3] EPA relies on this high-level, aggregate data to incorrectly conclude that local emissions need to be included in any potential nonattainment areas because these emissions contribute to nonattainment. DNR has shown this assumption is simply not supportable from either a technical or scientific perspective.

The relationship between emissions and ozone concentrations is complex. Extensive state and federal resources have been devoted to understanding this relationship in the Lake Michigan region. Complex photochemical grid models are widely used to determine and quantify this relationship; EPA itself routinely relies upon such models in regulatory applications. In support of this designations process, with the assistance of the Lake Michigan Air Directors Consortium (LADCO), DNR completed such modeling that showed that local emissions have little to no impact on lakeshore ozone concentrations. This was provided to EPA in DNR's April 2017 submittal; as noted above, EPA did not cite or otherwise reflect this information when making its intended designations.

EPA's errors here are particularly pronounced in the Milwaukee area, where EPA proposes to designate the entirety of five counties as nonattainment based almost solely on the size of their cumulative emissions inventory. In doing so, EPA fails to make <u>any</u> attempt to measure, quantify, or predict how emissions in these counties affect ozone levels at violating monitors; instead, EPA tenuously – and inappropriately – relies upon several individual HYSPLIT back trajectories, along with commuting patterns, to assume and imply a connection between these emissions and locally-

[3] EPA's Office of Air Quality Planning and Standards appears to have provided the same basic information, data, modeling results, and analyses to support all of EPA's intended designations, without completing any analytic work designed to address the unique situations of specific states, counties, regions, or areas.

monitored ozone levels. In doing so, EPA continues to apply the unsupported theory that ozone concentrations in Southeastern Wisconsin are meaningfully impacted by local emissions, while ignoring credible photochemical modeling results that provide strong evidence to the contrary. DNR has repeatedly demonstrated that local emissions are essentially decoupled from local ozone levels in this area. EPA's reliance on qualitative assessments instead of DNR's quantitative information when considering emissions and emissions-related data is perhaps the most serious and fundamental flaw of EPA's TSDs and the resulting intended designations.

In the following section, DNR reiterates the information that was not recognized or reflected by EPA in its TSDs and provides additional information regarding lakeshore ozone phenomena and emissions inventory data, particularly in southeast Wisconsin.

4. Additional Technical Information to Support the State's Recommendation

DNR is providing additional technical information for EPA's consideration as a supplement to the information provided in the April 2017 TSD. This document responds to the material provided by EPA in its TSDs or reiterates information that was previously provided to EPA but not reflected in EPA's proposed action. This information is particularly focused on providing additional evidence that local emissions are not responsible for the elevated ozone concentrations measured at monitors along the Wisconsin lakeshore. EPA should fully review and consider the information provided in this section when making final area designations for the 2015 ozone NAAQS.

4.1. Ozone-rich air masses arrive at lakeshore monitors from over Lake Michigan, not from over Wisconsin.

In its TSDs, EPA acknowledges that meteorology associated with Lake Michigan plays a key role in determining ozone concentrations in Wisconsin. However, EPA's heavy reliance on its HYSPLIT back trajectory analysis to infer the origins of ozone-rich air leads to overestimation of the role of emissions from inland regions and underestimates the role of the lake. While HYSPLIT is a useful tool for tracking the origin of air masses, it relies on coarse-resolution data sources that are incapable of resolving fine-scale meteorological processes (such as the lake breeze) that EPA acknowledges impact Wisconsin's lakeshore ozone levels. Accordingly, when used in the context of identifying regional pollutant nonattainment areas, HYSPLIT will underestimate the role of these critical lake-driven processes.[4]

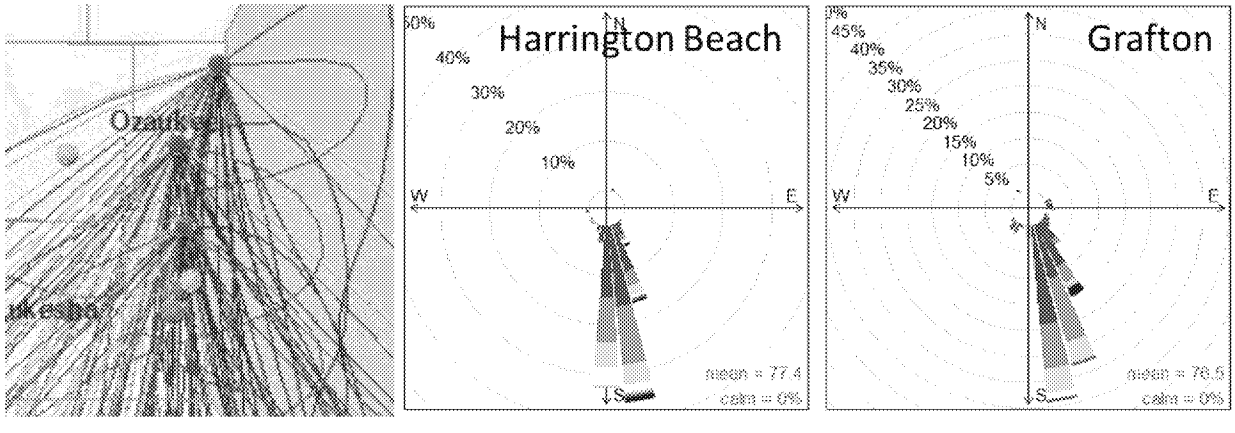
EPA's inclusion of HYSPLIT back trajectories for air parcels ending at high elevations (500 m and 1000 m) exacerbates this problem, because only the lowest elevation (100 m) back trajectories are relevant in determining the path taken by air reaching ground-level ozone monitors. An example of the differences between these high- and low-elevation back trajectories is shown in Figure 4. Almost all of the low-level (100 m) back trajectories came from the south (southwest to southeast), with most

[4] In addition, air masses that pass over an area will not necessarily pick up emissions from that area. Whether they do so depends in large part on the elevation of the air mass relative to the elevation of the emissions sources.

trajectories passing over the lake. In contrast, the highest-level (1000 m) trajectories had a much greater western component and passed over inland portions of the county. These high elevation tracks reflect synoptic flow, whereas the lower elevation tracks reflect the dominant influence of northerly transport over Lake Michigan. EPA distinguishes between these different types of trajectories at several points of their discussion but did not consider this important difference when determining its intended area designations. EPA's consideration of these high-elevation trajectories is inappropriate as it overemphasizes the influence of emissions within the counties being considered for nonattainment. Only 100 m HYSPLIT back trajectories are potentially relevant when considering associations with ground-level monitored ozone levels.

Figure 4 demonstrates the limitations of relying on the HYSPLIT analysis to determine the origins of high-ozone air, even for lower elevation air masses. This figure shows that HYSPLIT estimates that many of the 100 m back trajectories passed over land to reach the violating monitors in the Milwaukee area. In contrast, direct measurements at these monitors found that, for virtually every single hour with ozone concentrations above 70 ppb, the air masses came from over the lake: from 155-185 degrees for the Harrington Beach monitor and 135-175 degrees for the Grafton monitor. The pollution roses from the other lakeshore monitors showed similar results: ozone-rich air was delivered to the monitors almost exclusively from over Lake Michigan (see the appendix). This comparison conclusively shows that HYSPLIT underestimates the role of the lake in delivering ozone-rich air to this monitor and overestimates the impact of emissions from inland portions of the counties under discussion.

Figure 4. Comparison of EPA's HYSPLIT back trajectory analysis (left) and DNR's pollution rose analysis (right) for the Milwaukee area monitors. The red lines in the HYSPLIT plot correspond to air parcels ending at 100 m elevation, blue to air parcels at 500 m, and green to air parcels at 1000 m. Milwaukee County's Bayside monitor does not have a pollution rose because it does not monitor wind direction.



4.2. Local emissions do not meaningfully influence air quality in EPA's intended nonattainment areas.

In addition to overestimating the degree to which inland areas of lakeshore counties impact ozone levels measured at lakeshore monitors, EPA also gave undue weight to the quantity and location of local emission sources. EPA also failed to look at emissions and emissions-related data at a scale appropriate for the purpose of designations.

Emissions and emission-related data played a particularly significant role in determining EPA's intended nonattainment area boundaries for the 5-county Milwaukee area and in Manitowoc County. For these areas, EPA's TSD describes in detail the quantity and location of emissions sources in this area and uses that information to support its intended designation. Critically, however, EPA failed to provide <u>any</u> demonstration that local emissions have any impact on locally-measured ozone concentrations, particularly when those concentrations exceed 70 ppb. This section reinforces that emissions from Wisconsin's lakeshore counties are small compared with nearby, upwind emission sources. The impact of local emissions and of reductions in those emissions tends to be overwhelmed by the larger scale of transported emissions. Accordingly, EPA should not consider local emissions when making nonattainment area designations in Wisconsin unless it can demonstrate how those emissions impact locally-monitored ozone concentrations.

<u>Wisconsin emissions are very small relative to the rest of the southeast Lake Michigan region</u>

The emissions of the ozone precursors, NOx and VOCs, from Wisconsin's lakeshore counties are dwarfed by the large emissions from the Chicago area to the south (Table 2). The Chicago area emits 79 to 81 percent of the NOx and VOC emissions in the entire southwestern Lake Michigan region. In contrast, the 5-county Milwaukee area only accounts for 15 to 16 percent of the total emissions in the region. Seven of the nine Wisconsin counties that EPA intends to designate nonattainment each account for only 1 to 2 percent of the total emissions.[5] Combined with the finding that ozone-rich air was delivered almost exclusively from over Lake Michigan, this analysis suggests that the location of emission sources within these seven counties should be irrelevant to the determination of nonattainment area boundaries. It follows that EPA should consider nonattainment area boundaries based only on monitored air quality data for these counties or exclude these counties altogether from potential nonattainment areas.

<u>Transported emissions dominate ozone concentrations in the Milwaukee area as they do in the rest of the Wisconsin lakeshore</u>

In its TSDs, EPA acknowledged that transported emissions are heavily responsible for the ozone concentrations observed in rural portions of Wisconsin's Lake Michigan lakeshore. However, out-of-state and international sources of ozone dominate even in the urbanized Milwaukee area. Ozone

[5] These counties are Kenosha, Racine, Ozaukee, Washington, Sheboygan, Manitowoc and Door.

source apportionment modeling shows that only seven percent of the ozone at Milwaukee's Bayside monitor originated from Wisconsin; much larger portions came from out-of-state (e.g., 26 percent from Illinois) and from international sources (roughly 20 percent, identified as "BC"; see Figure 5).[6] This highly relevant information was presented to EPA in DNR's April 2017 submittal, but not included or cited in EPA's TSDs.

Table 2. Comparison of 2014 NOx and VOC emissions from sources in the southern and western Lake Michigan area. Emissions are shown for whole-county areas and are from the 2014 National Emissions Inventory (NEI) v1.

	Emissions (tons)		% of Total Emissions	
Area	**NOx**	**VOC**	**NOx**	**VOC**
Chicago NAA - Cook County, IL	95,864	86,253	33%	37%
Chicago NAA - Other IL	87,982	71,749	30%	31%
Chicago NAA – IN	45,572	21,399	16%	9%
Kenosha County	6,034	3,290	2%	1%
Total Chicago Area	**235,452**	**182,691**	**81%**	**79%**
Racine County	4,153	4,296	1%	2%
Milwaukee County	22,012	17,016	8%	7%
Waukesha County	9,685	10,526	3%	5%
Ozaukee County	3,107	2,003	1%	1%
Washington County	3,543	3,625	1%	2%
Total Milwaukee Area	**42,500**	**37,466**	**15%**	**16%**
Sheboygan County	4,585	3,421	2%	1%
Manitowoc County	3,253	2,812	1%	1%
Kewaunee County	1,141	1,291	0%	1%
Door County*	3,066	2,439	1%	1%
Total WI Lakeshore Area†	**60,579**	**50,719**	**21%**	**22%**
Total Lake Michigan area (without MI)	**289,997**	**230,120**	**100%**	**100%**

* Note that 53 percent of NOx emissions in Door County came from commercial marine vessels on Lake Michigan, and 61 percent of VOC emissions in this county came from recreational vehicles and pleasure craft. The state has no control over these emission sources.

† This area includes the inland Milwaukee area counties of Waukesha and Washington, as well as Kewaunee County, which EPA intends to designate as attainment of the 2015 ozone NAAQS.

Because of the overwhelming impact of transported emissions, there is no evidence that local emissions reductions meaningfully improve local air quality in the Milwaukee area. Emissions of NOx and VOCs from the 5-county Milwaukee area decreased by 25 and 33 percent, respectively, from 2008 to 2014 (Figure 6). However, ozone design values in the Milwaukee area remained relatively flat during this period. The disconnect between local ozone precursor emissions and measured ozone concentrations in the Milwaukee area results in part because emissions transported

[6] The appendix shows ozone source apportionment modeling for all of Wisconsin's lakeshore monitors. This information was also included in DNR's April 2017 TSD.

into this area are more important than local emissions as drivers of ozone formation; meteorological variability and the nonlinearity of ozone formation chemistry also play significant roles. These analyses are further evidence that emissions from the Milwaukee area do not significantly impact ozone concentrations within this area.

Figure 5. Ozone source apportionment modeling from LADCO for Milwaukee County's Bayside monitor.[7] Colors correspond to emission source categories.

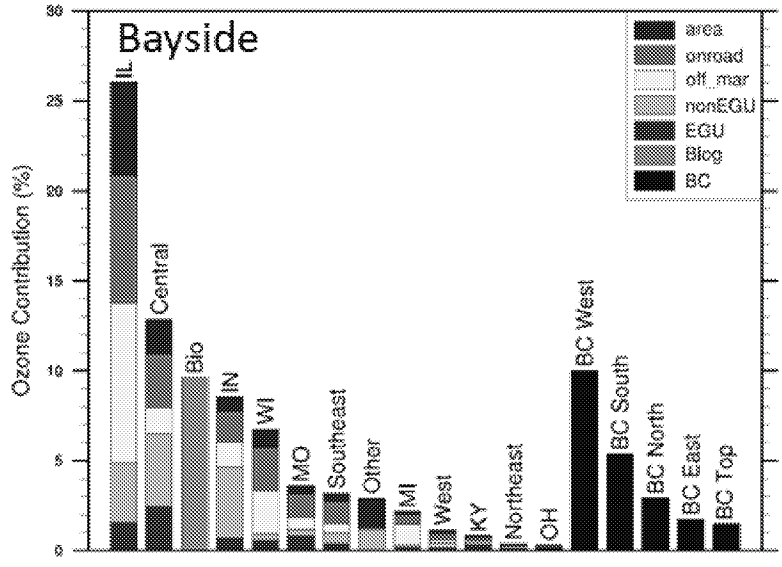
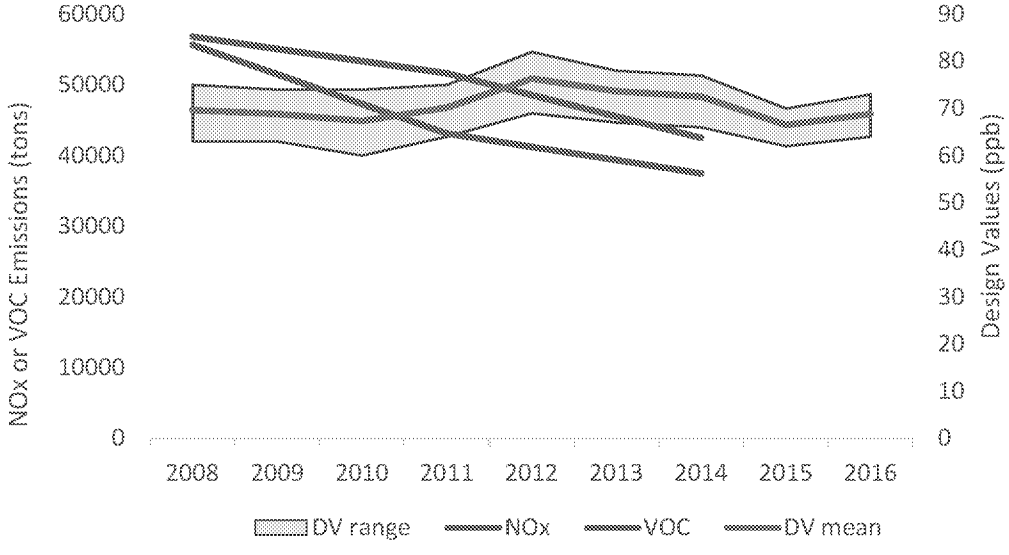


Figure 6. Trends in NOx and VOC emissions from the 5-county Milwaukee area and ozone design values at Milwaukee area monitors. Emissions are shown for the 2008, 2011 and 2014 NEI.



[7] The Central region includes MN, IA, NE, KS, OK, TX, AR and LA. The Southeast region includes MS, AL, GA, FL, TN, VA, NC and SC. The West region includes WA, OR, CA, NV, ID, MT, WY, UT, CO, AZ, NM, ND and SD. The Northeast region includes ME, NH, VT, MA, RI, CT, NY, NJ, PA, DE, MD, and WV. BC is boundary conditions, which are contributions from outside the U.S. "Bio" and "Biog" are biogenics.

Hypothetical additional emissions reductions in Wisconsin would have little to no impact in EPA's intended nonattainment areas

As discussed in greater detail in DNR's April 2017 submittal, photochemical modeling demonstrated that further reductions in nearby source emissions would have little, if any, impact on the monitored ozone concentrations in Wisconsin's lakeshore counties. This highly relevant information was presented to EPA in DNR's April 2017 submittal, but not included or cited by EPA.

In summary, this modeling examined the impact of two hypothetical emission reduction scenarios on the 13 monitors located in a 10-county area along Wisconsin's lakeshore; neither scenario considers realistic emissions reductions:

- Scenario 1: A 10 percent reduction in NO_x emissions and a 10 percent reduction in VOC emissions from all sectors (except from onroad and biogenics) from the 10-county area.
- Scenario 2: Completely eliminating ("zeroing out") all anthropogenic NOx and VOC emissions from Sheboygan County. This scenario eliminated emissions from all sectors except for biogenic emissions, which were held constant.

As shown in Table 3, under both scenarios most monitors show little to no change in their modeled 2017 design value (0.1 ppb or less) using either grid cell approach, indicating that local emissions are essentially decoupled from the ozone concentrations monitored in these counties.[8] These results demonstrate that local emissions in Sheboygan County, in particular, are completely irrelevant to the ozone concentrations measured at the Kohler Andrae monitor. The same relationship likely holds true for other low-emission counties heavily affected by lakeshore transport, such as Kenosha, Racine, Ozaukee, Manitowoc and Door counties. In addition, since significant additional emission reductions from Wisconsin's entire lakeshore region do not significantly decrease ozone design values in this region, the modeling suggests that even Wisconsin's highest-emitting counties (Milwaukee and Waukesha) do not have a meaningful impact on lakeshore ozone concentrations. This finding is further evidence that emissions from these two counties are overwhelmed by those from the upwind regions, including the Chicago area, which emits six to seven times more NOx and VOC (Table 2).

[8] The results of these two emission reduction scenarios are discussed in more detail in DNR's April 2017 TSD.

Table 3. Model projected 2017 design values (DVs, in ppb) and changes in design values (ppb) for the 2017 base case modeling run and for two hypothetical emission reduction scenarios. Design values are calculated considering modeled concentrations in either a 3x3 grid cell area or just the grid cell containing the monitor (1x1). Modeling was conducted by LADCO.

	Base Case DVs		10% Cut Run*				Zero-Out Sheboygan Run*			
			3x3 DVs		1x1 DVs		3x3 DVs		1x1 DVs	
Monitor	3x3	1x1	DV	change	DV	change	DV	change	DV	change
Chiwaukee Prairie	66.4	69.5	66.4	0	69.6	+0.1	66.3	-0.1	69.5	0
Racine	64.9	68.4	64.8	-0.1	68.5	+0.1	64.8	-0.1	68.4	0
Milwaukee Health Ctr	61	65.6	60.9	-0.1	65.6	0	60.9	-0.1	65.5	-0.1
Milwaukee SER	65.7	71.9	65.6	-0.1	72.2	+0.3	65.6	-0.1	71.7	-0.2
Bayside	70.9	75.5	70.8	-0.1	75.7	+0.2	70.7	-0.2	75.5	0
Grafton	69.7	71.4	69.7	0	71.4	0	69.7	0	71.4	0
Harrington Beach	66.8	68	66.7	-0.1	67.9	-0.1	66.8	0	67.9	-0.1
Kohler Andrae	76.1	77	76	-0.1	76.9	-0.1	76.1	0	77.6	+0.6
Manitowoc	70.9	71.6	70.8	-0.1	71.4	-0.2	70.8	-0.1	71.5	-0.1
Kewaunee	68.1	68.4	68	-0.1	68.3	-0.1	68	-0.1	68.1	-0.3
Newport	68.3	68	68.2	-0.1	67.9	-0.1	68.1	-0.2	67.8	-0.2
Lake Geneva	63.7	63.4	63.6	-0.1	63.3	-0.1	63.6	-0.1	63.3	-0.1
Waukesha	61.8	63	61.8	0	63.1	+0.1	61.8	0	63	0

*The "10% cut run" reduced VOC and NOx emissions by 10 percent from all sectors except onroad and biogenics in the eight lakeshore counties along with Waukesha and Washington counties. The "zero-out Sheboygan run" completely eliminated emissions from all sectors in Sheboygan County, except for biogenics.

5. Implications for EPA's Final Nonattainment Area Designations

Both the information provided above, and that provided in DNR's April 2017 submittal, support the governor's recommendation of attainment for all areas of Wisconsin for this NAAQS. As Wisconsin has argued in multiple rounds of litigation against EPA, EPA must rationally account for ozone that States "lack the authority to control" to ensure that it is not requiring the impossible. State Petrs. Opening Br. 19-44, *Murray Energy Corp. v. EPA*, No. 15-1385 (D.C. Cir. Apr. 22, 2016); State Petrs. Reply Br. 4-16, *Murray Energy Corp. v. EPA*, No. 15-1385 (D.C. Cir. Sept. 26, 2016) (quoting *EPA v. EME Homer City Generation, L.P.*, 134 S. Ct. 1584, 1592 (2014)). Accordingly, EPA must "make specific and comprehensive allowances for downwind States, such that they are held harmless for any uncontrolled interstate pollution." State Petrs. Opening Br. 44-47, *Wisconsin v. EPA*, No. 16-1406 (D.C. Cir. Sept. 18, 2017). Given that the proposed nonattainment areas are "overwhelming[ly] impact[ed] [by] transported emissions" and that "local emissions do not meaningfully influence air quality" in those areas, *supra* section 4, EPA cannot rationally impose nonattainment designations anywhere in Wisconsin.

However, if EPA elects to impose nonattainment areas on the state, it is important for EPA to apply the following principles:

5.1. EPA's final nonattainment areas must only include areas of the state containing air quality monitors with design values that currently exceed the 2015 ozone standard.

EPA's primary criteria for determining nonattainment areas is certified air quality monitor data. The air quality monitors in Washington and Waukesha counties have 2014-2016 design values that attain the 2015 ozone NAAQS. Therefore, there is no justification for including any part of these counties in a nonattainment area for this NAAQS. If EPA insists on imposing nonattainment in any part of these counties, it must consider and follow the information presented in elsewhere in this section and in section 6.

EPA appropriately recognized that full county designations for this NAAQS were inappropriate for Door, Manitowoc, Sheboygan and Kenosha counties because only certain areas of those counties experienced ozone design values that exceeded the NAAQS. In section 6, DNR demonstrates that even smaller nonattainment areas are justified in these counties. EPA must use appropriately-sized partial county designations where supported by the latest data and science.

5.2. There is no justification for designating all of the 5-county Milwaukee area as nonattainment.

EPA's intended designation of the entire Milwaukee-Racine-Waukesha combined statistical area (CSA) as nonattainment is neither technically nor scientifically supported. EPA's rationale behind its decision to designate the entire 5-county area as nonattainment is that emissions from the entire area contribute to the elevated ozone design values measured at area monitors. EPA, however, does not

provide any evidence that such a connection exists. In contrast, DNR has provided multiple lines of evidence showing that local emissions in the Milwaukee area do not meaningfully impact local ozone concentrations; this information was neither reflected nor acknowledged by EPA.

First, air quality monitoring data does not support designating the entire 5-county area as nonattainment. This data clearly supports designating Waukesha and Washington counties as attainment. Furthermore, the technical analyses included in DNR's April 2017 submittal supports its assertion that only small portions of Milwaukee and Ozaukee counties experience ozone concentrations above the level of the 2015 ozone NAAQS. Similarly, only a narrow portion of Racine County is likely to experience ozone concentrations above the level of the standard.

Emissions-related data also does not support designating the entire Milwaukee area as nonattainment. Three of the counties in the area each contribute miniscule emissions, as discussed in section 4.2. In addition, DNR's more detailed examination of sub-county level emissions and emissions-related data (i.e., population density) shows that many parts of Milwaukee and Waukesha counties do not contain significant emissions sources that could contribute to nonattainment (see section 5.3 and the appendix). Furthermore, most parts of the 5-county area do not have significant onroad emissions, indicating that commuters are not responsible for significant NOx or VOC emissions.

EPA's intended designation of the entire Milwaukee CSA as nonattainment is based on an inappropriate application of EPA's designation factors and is simply not justified. EPA must consider the information provided later in this document and evaluate the five factors in each county individually. Any potential nonattainment area boundaries must be based on that analysis.

5.3. If EPA considers local NOx and VOC emissions, it must consider these emissions at the sub-county level, particularly in the Milwaukee area.

EPA's documentation included only nationally generated emissions and emissions-related data, rather than a more detailed assessment of the location, density, and intensity of emissions specific to Wisconsin. EPA relies on this high-level, aggregate data to incorrectly conclude that local emissions meaningfully contribute to nonattainment-level air quality along Wisconsin's lakeshore.

This error is particularly egregious in the Milwaukee area. EPA's use of gross emissions data (e.g., county-wide population and emissions and 12-km gridded vehicle miles traveled) fails to accurately reflect the true spatial distribution and intensity of these emissions and is inappropriate to use for designation purposes, given what is known about ozone formation and transport along Wisconsin's lakeshore.

EPA's guidance says that it will consider emissions and emissions-related data, but the scale at which this data is considered matters. Figures 7 through 9 show, for example, the differences between considering emissions and emissions-related data at a high-level (as EPA did) relative to a more refined scale in Milwaukee and Waukesha counties. Consideration of the sub-county level emissions-

related data demonstrates that emissions are concentrated in specific parts of these counties and recognizes that other parts of these counties contain extremely low emissions. The same areas of the counties have the highest total and on-road emissions, as well as the greatest population density. These important distinctions are simply not possible to discern from the coarse, unresolved data provided in EPA's TSDs, and do not support designation of the entirety of these counties as nonattainment.

Such fine-resolution emissions data is, and always has been, readily available to EPA. Specific maps showing sub-county level emissions data (covering all sectors), along with population density information, for the five-county Milwaukee area are provided in the appendix in order to put these into the record for EPA's consideration. If EPA insists on considering local emissions to inform potential nonattainment areas, EPA must consider these emissions (and emissions-related data) in a more refined manner, particularly in the Milwaukee area. The refined data clearly demonstrates how the whole-county nonattainment designations proposed by EPA in the five-county area are inappropriate.

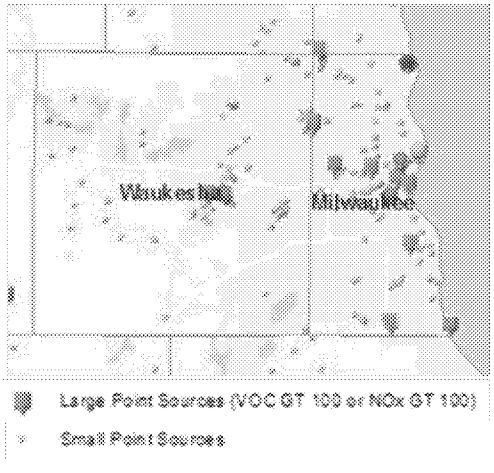
Figure 7. Comparison of <u>total emissions</u> as considered by EPA (left) and the same data at a more refined scale (right).

As Considered by EPA

County-Wide Emissions

County	Total NOx (tpy)	Total VOC (tpy)
Milwaukee	22,012	17,016
Waukesha	9,685	10,526

Location of point sources



Finer-Scale Analyses

Sub-county level emissions by minor civil division (MCD)

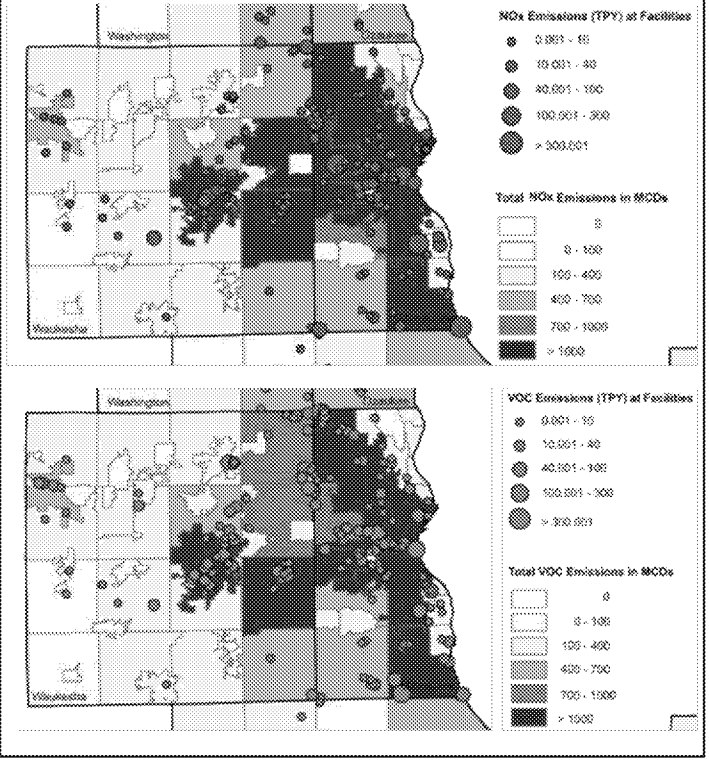


Figure 8. Comparison of <u>population-related data</u> as considered by EPA (left) and the same data at a more refined scale (right).

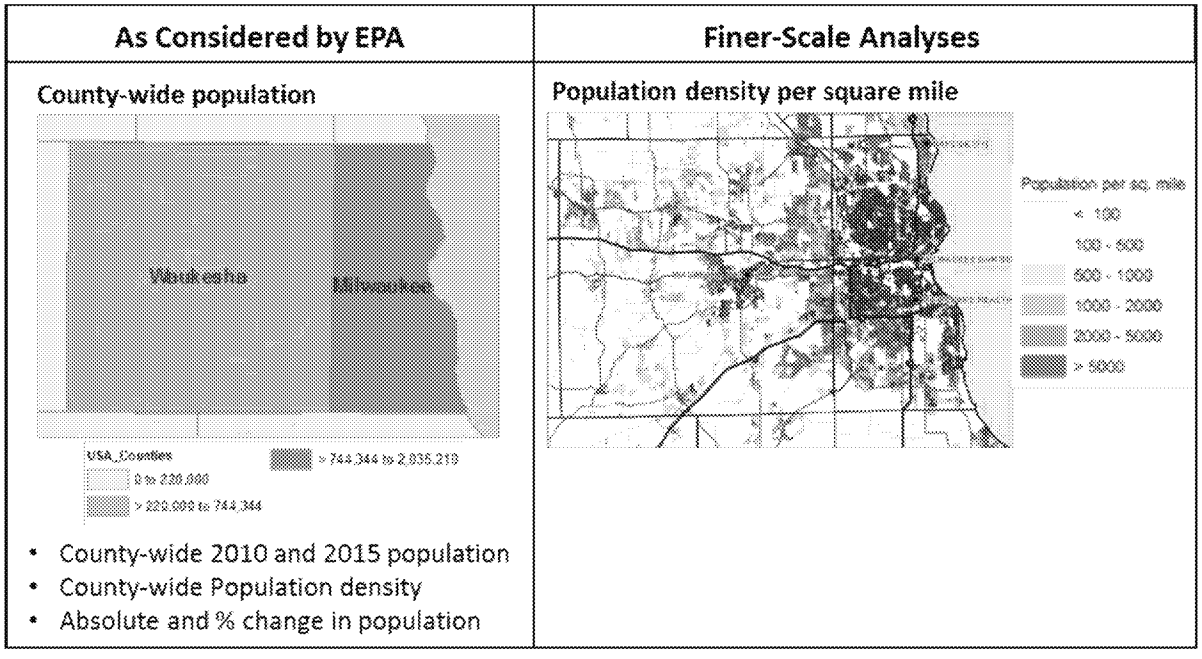
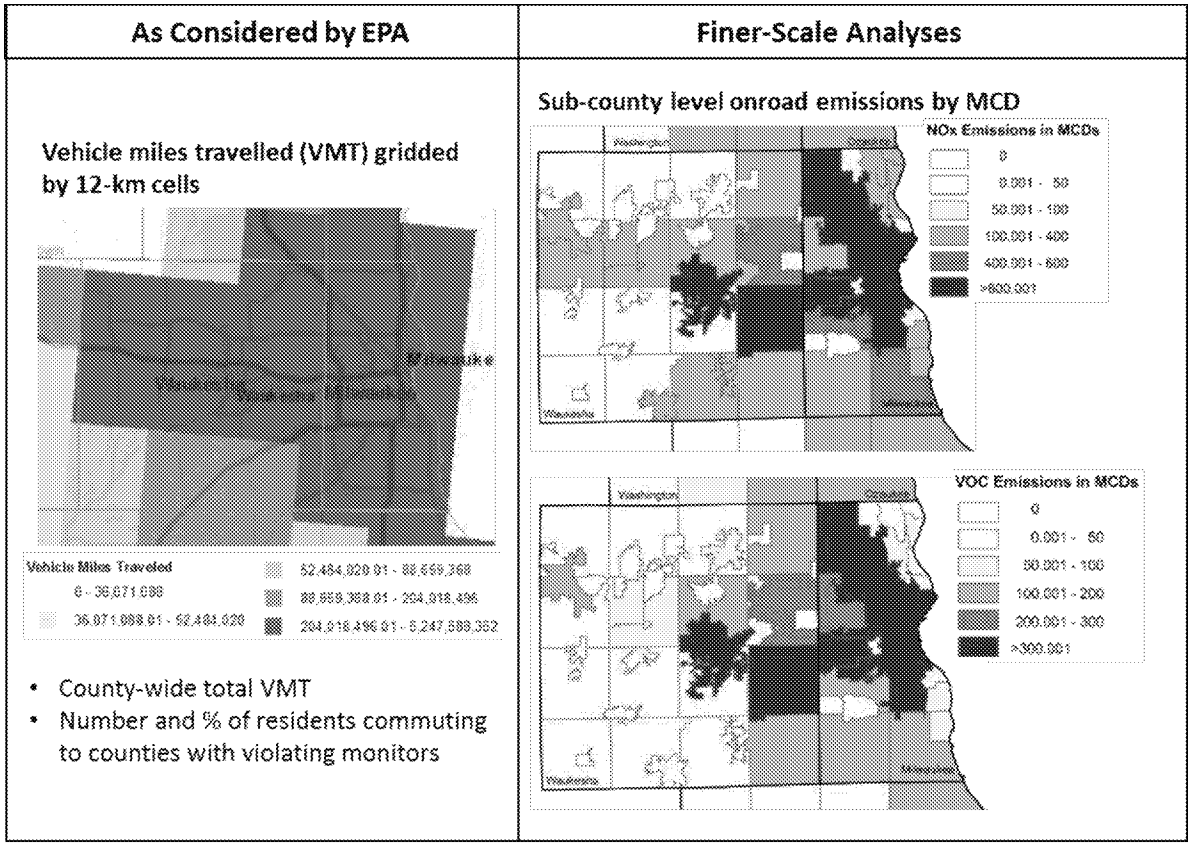


Figure 9. Comparison of <u>on-road emissions and emissions-related data</u> as considered by EPA (left) and the same data at a more refined scale (right).



5.4. EPA should use a "distance-from-the-shoreline" approach to determine nonattainment area boundaries.

EPA's use of roadways to determine the boundaries of partial county nonattainment areas pulls parts of counties with clean air into nonattainment areas because roadways do not correspond with the location of gradients in ozone concentrations. In some cases, the nearest roadways may be located a large distance away from the location of the 70 ppb contour. In addition, the use of roadways introduces a significant degree of subjectivity into the boundary determinations, given that any number of combinations of roads could be used to define a boundary. The use of a consistent "distance-from-the-shoreline" approach is fully supported by the technical analyses included in DNR's TSD and is a much less arbitrary way to define a partial county nonattainment area boundary.

DNR understands that such approach to defining nonattainment area boundaries has not historically been used in this region. However, EPA has in the past established nonattainment area boundaries based on watershed boundaries in El Dorado and Placer counties in California and using elevation in Tehama County, California.[9] Therefore, there is national precedent for EPA using similar, nontraditional approaches to make nonattainment area designations in cases when such approaches are scientifically supported.

DNR recognizes that nonattainment area boundaries must be well-defined, permanent and readily identifiable.[10] DNR therefore suggests that, to implement this "distance from the lakeshore" approach, EPA could do the following:

- Define the Lake Michigan shoreline as the Ordinary High Water Mark (OHWM) for Lake Michigan as defined by the U.S. Army Corps of Engineers (USACE). The USACE has determined the OHWM for Lake Michigan to be 581.5 feet.[11] The USACE OHWM is a recognized jurisdictional benchmark for administering its regulatory program in navigable waterways under Section 10 of the Rivers and Harbors Act and Section 404 of the Clean Water Act. The USACE OHWM is permanent (e.g., it does not change based on water level fluctuations), is legally-defined, can be easily identified, and is already widely-used used in federal regulatory applications.

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[9] For the 2008 ozone NAAQS, EPA designated "All portions of [El Dorado or Placer] county except that portion of [the] County within the drainage area naturally tributary to Lake Tahoe including said Lake", plus an additional, more traditionally defined area of Placer County. For Tehama County, EPA designated "Those portions of the immediate Tuscan Buttes area at or above 1,800 feet in elevation".

[10] EPA's Guidance on the Area Designations for the 2015 Ozone NAAQS: https://www.epa.gov/ozone-designations/epa-guidance-area-designations-2015-ozone-naaqs.

[11] The OHWM is the line on the shore coincident with the elevation contour that represents the approximate location of the line on the shore established by fluctuations of water and indicated by physical characteristics such as shelving, destruction of terrestrial vegetation, presence of litter or debris, or changes in the character of soil. http://www.lre.usace.army.mil/Missions/Great-Lakes-Information/Links/Ordinary-High-Water-Mark-and-Low-Water-Datum/

- EPA can then define the western terminus of the nonattainment areas as a specified distance inland (e.g., 2.9 statute miles) from the USACE Lake Michigan OHWM line.

Such an approach fully meets EPA's guidance for establishing boundaries under this NAAQS and would result in unambiguously defined nonattainment area boundaries. DNR encourages EPA to contact the USACE with any questions about the potential application of the Lake Michigan OHWM in this context. DNR can discuss with EPA further specific techniques by which the western boundary of such an area can be determined using the USACE OHWM as a defined starting point.

6. Technically Supported Alternatives to EPA's Intended Nonattainment Areas

When considering the science, data, modeling, and analyses provided by DNR as well as that considered by EPA, it is clear that EPA's intended nonattainment areas are not technically supportable. When finalizing designations, EPA must consider the following alternatives, in the order presented. These options are supported by data and science and represent appropriate methods for applying EPA's five designation factors in the context of the Wisconsin lakeshore.

1. Finalize the state's recommendation of attainment in all areas of the state. This would appropriately recognize that the state has very little control over ozone concentrations in its lakeshore region due to out-of-state emissions, geography, and meteorology.

2. Finalize technically supported boundaries that reflect the maximum extent of the 70 ppb ozone design value gradient. This scientifically-sound approach is supported by air quality monitoring data and the science, which clearly identifies a narrow shoreline ozone gradient. The DNR first described the extent of this gradient in its April 2017 submittal and provides that information again here, with several specific modifications to Racine and Sheboygan counties.

The technically-supported alternatives presented below are not state recommendations for nonattainment areas. They are included to describe the maximum extent of potential nonattainment areas for this NAAQS based on the data, scientific principles, and other factors included in DNR's submittals to EPA as well as EPA's own technical documentation. Maps showing these alternative boundaries are shown below for individual areas.

6.1. Kenosha County

Any nonattainment designation for Kenosha County should be based on a distance-from-the-shoreline approach. Any nonattainment area boundary should extend no greater than 4.2 miles inland from the lakeshore, which is the location of the 70 ppb ozone design value contour as determined in DNR's April 2017 TSD. This boundary is shown in Figure 10.

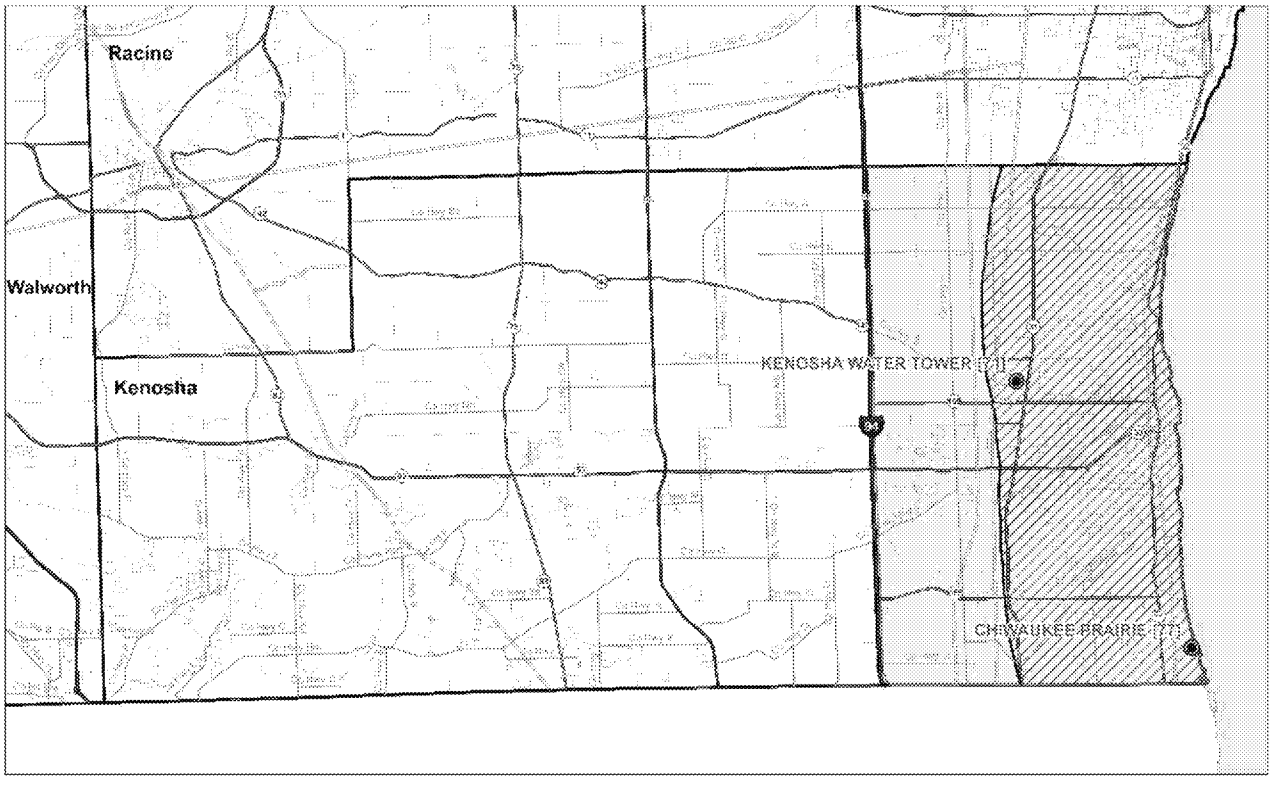
Both of Kenosha County's ozone monitors had design values over the 2015 ozone NAAQS. However, the design value for the lakeshore monitor (77 ppb) was 6 ppb higher than that for the monitor located just 3.6 miles inland, indicating a very strong gradient in ozone concentrations. As part of its April 2017 TSD, DNR submitted the same type of lake breeze analysis for Kenosha County as it did for Sheboygan County. This analysis strongly indicates that ozone design values exceeding 70 ppb are limited to a very narrow area along the lakeshore in *both* counties. EPA relied upon this analysis to support potentially designating only a very narrow portion of Sheboygan County as nonattainment. However, EPA did not mention this analysis in the context of Kenosha County, where it is equally relevant. EPA instead intends to designate a wider portion of Kenosha County as nonattainment of the 2015 ozone NAAQS than is technically justified (Figure 10).

High ozone reaches the county's violating monitors almost exclusively via southerly winds, which carry ozone from Illinois and other states to the south. This is evident from EPA's 100 m elevation HYSPLIT analysis and DNR's pollution roses (see the appendix). Since local emissions are decoupled from local ozone concentrations, they are irrelevant to the determination of the spatial extent of a potential nonattainment area and should not be considered by EPA when determining boundaries in this county.

In addition, as discussed above, levels of NOx and VOC emissions from all of Kenosha County are very low, accounting for just 1 to 2 percent of the total for the southern and western Lake Michigan region (see Table 2). When the largest point source in the county, the Pleasant Prairie power plant, closes in April 2018, Kenosha County emissions will account for just one percent of regional emissions for both pollutants.[12] These emissions levels are comparable to those of Door County (which EPA intends to designate as a rural transport area), and mobile sources will account for 83 percent of the remaining NOx emissions and 47 percent of the remaining VOC emissions. After this facility closes, there will be very little Kenosha County will be able to do to reduce emissions further.

[12] This power plant emitted 40 percent of the county's NOx emissions and 4 percent of the county's VOC emissions in 2014. This facility is located west of any technically supported alternative nonattainment area boundary.

Figure 10. Comparison of EPA's intended nonattainment area boundary (green) and a technically supported alternative (hatched) for Kenosha County.



6.2. The Milwaukee-Racine-Waukesha CSA

As discussed in section 5.2, EPA should consider the unique situation of each county in the 5-county Milwaukee-Racine-Waukesha area if finalizing any nonattainment area designations in these counties. If EPA will not designate this entire area as attainment, it should only designate as nonattainment those portions of the area with monitored air quality that exceeds the level of the standard. Figure 11 shows the technically supported alternative boundaries for the Milwaukee area, which are described and supported in greater detail below.

DNR notes that EPA is considering partial county designations of Grundy and Kendall counties in Illinois under circumstances that compare favorably to Milwaukee area. Despite being part of the Chicago IL-IN-WI CSA, only the parts of Grundy and Kendall counties most contiguous to the urban area of the CSA are proposed by EPA to be designated nonattainment of the 2015 ozone NAAQS; EPA explains that this is due to their low emissions relative to other areas.[13] Without explanation, EPA failed to consider this approach in the Milwaukee area.

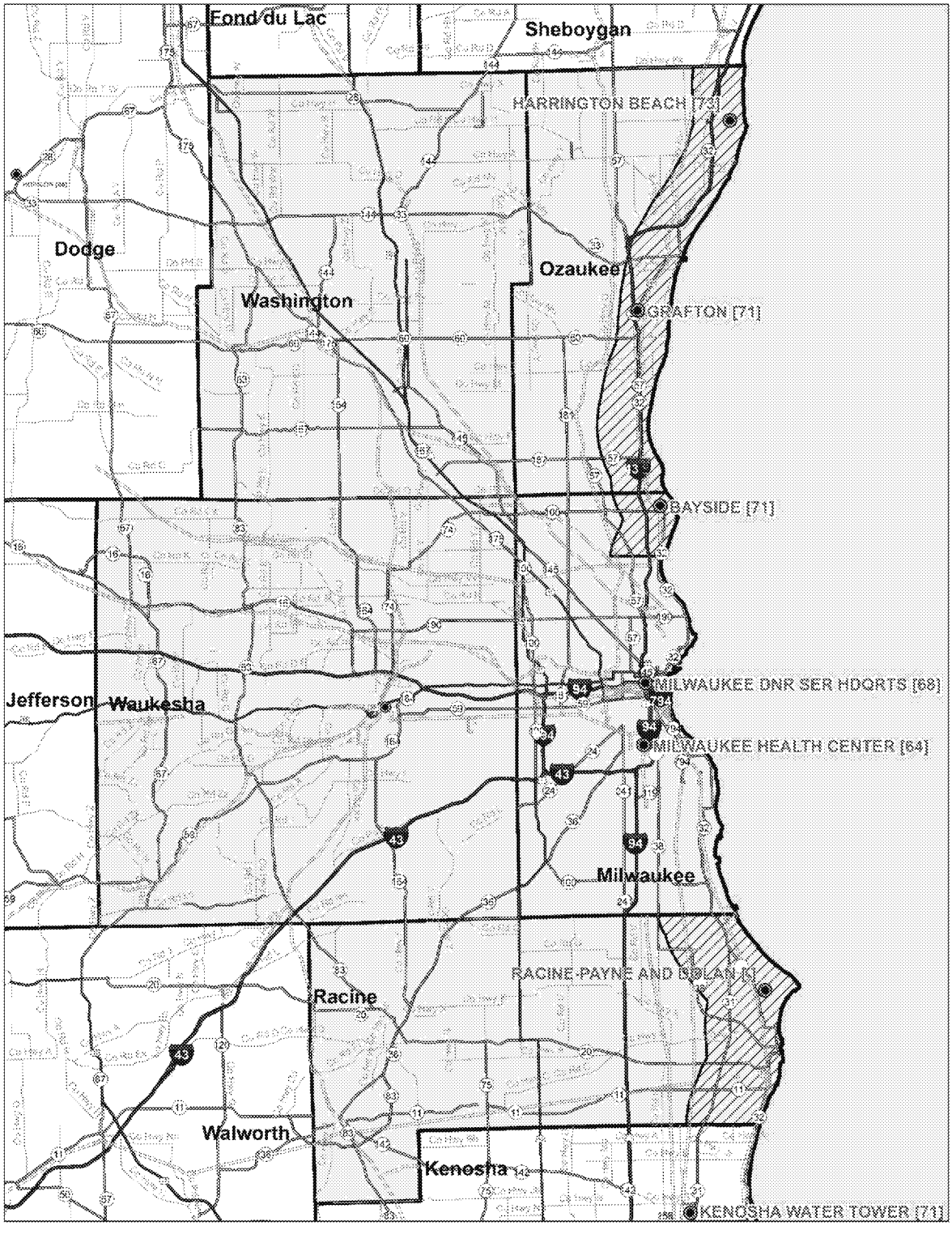
<u>Racine County</u>

Any nonattainment area in Racine County should be consistent with any nonattainment area in Kenosha County and follow the same contour-based approach. Any nonattainment area boundary should extend no greater than 4.2 miles inland from the lakeshore, which is consistent with the 70 ppb ozone design value contour as determined in DNR's April 2017 TSD for Kenosha County. This boundary is shown in Figure 11 and is supported by data and other evidence, as described below.

Racine County is located downwind of Chicago on the Lake Michigan lakeshore and thus is likely to have similar ozone concentration gradients to Kenosha County. Racine County's emission levels are similarly low, accounting for just 1 to 2 percent of the total region's emissions (Table 2). The county's location on the lakeshore and low levels of local emissions suggest that ozone concentrations in Racine County are dominated by the southerly transport of ozone over Lake Michigan.

[13] EPA's TSD for the Chicago, IL-IN-WI Nonattainment Area Intended Area Designations for the 2015 Ozone NAAQS, pages 23-24.

Figure 11. Comparison of EPA's intended nonattainment area boundary (green) and a technically supported alternative (hatched) for the 5-county Milwaukee area.



Milwaukee County

Any nonattainment designation in Milwaukee County should be based on a distance-from-the-shoreline approach and should only include the northeastern-most corner of the county. Any nonattainment area boundary should extend no more than 2.9 miles inland from the lakeshore and no more than 2.8 miles south of the Bayside monitor, which is the location of the 70 ppb ozone design value contour as determined in DNR's April 2017 TSD. This boundary is shown in Figure 11.

The Bayside monitor was the only monitor in Milwaukee County with a 2014-2016 design value above 70 ppb (Figure 11). The other two monitors, in central Milwaukee, had design values well below the level of the standard, despite being located within two miles of the shoreline. This indicates that likely only the northeastern portion of the county has air quality above the level of the standard, as discussed in greater detail in DNR's April 2017 TSD.

Milwaukee County's emissions are only a tenth as large as those from the Chicago area, accounting for just eight percent of NOx emissions and seven percent of VOC emissions in the southern and western Lake Michigan region (Table 2). More importantly, as described in Section 4.2, modeled emissions reductions from Milwaukee and other lakeshore counties had minimal, if any, impact on projected ozone concentrations along Wisconsin's Lake Michigan lakeshore. These analyses demonstrate that emissions from Milwaukee County do not have a significant impact on ozone concentrations in the area. EPA should therefore only consider air quality monitoring data when considering any potential nonattainment area boundaries for this county.

Waukesha County

EPA should finalize a designation of attainment for all portions of Waukesha County. Such a designation is supported by both air quality and emissions data.

Waukesha County's air quality monitor's 2014 to 2016 design value was 66 ppb, well below the level of the 2015 ozone NAAQS. As with Milwaukee County, emissions from Waukesha County accounted for a relatively small portion of the total emissions from the southern and western Lake Michigan region (three to five percent; Table 2). Modeled reductions in these and other emissions had an insignificant impact on design values in the region (Section 4.2). EPA should therefore base its designation for Waukesha County on air quality monitoring data alone, which supports a designation of attainment for the entire county.

Ozaukee County

Any nonattainment designation in Ozaukee County should be based on a distance-from-the-shoreline approach. Any nonattainment area boundary should extend no greater than 2.9 miles inland from the lakeshore, which is the location of the 70 ppb ozone design value contour as determined in DNR's April 2017 TSD. This boundary is shown in Figure 11.

Both of Ozaukee County's ozone monitors had 2014 to 2016 design values above the level of the 2015 ozone NAAQS (71 and 73 ppb), with the higher concentration at the monitor closer to the lakeshore. The relationship between both monitors' design values and their distance from the lakeshore was consistent with the relationship found for monitors in the other lakeshore counties, as demonstrated in DNR's TSD. This relationship indicates the presence of an ozone concentration gradient in this county.

EPA's 100 m HYSPLIT analysis and DNR's pollution rose analysis (Figure 4) both suggest a dominant role for over-lake transport to the Ozaukee County monitors. As with Racine and Kenosha counties, emissions from Ozaukee County sources are minimal, just 1 percent of the regional total.

Finally, the emissions from Ozaukee County are of a similar magnitude as those from Door County (Table 2), which EPA concluded "do not significantly contribute to ozone concentrations in the area itself or to other areas".[14] Taken together, these analyses demonstrate that local emissions from Ozaukee County are minimal and unlikely to contribute significantly to ozone formation in the region.

Ozaukee County is located just south of Sheboygan County and almost certainly is impacted by the same lake breeze effects described by both DNR and EPA for Sheboygan County. EPA should therefore consider this information similarly in Ozaukee County.

Washington County

EPA should finalize a designation of attainment for all portions of Washington County. Such a designation is supported by both air quality and emissions data.

Washington County does not have an ozone monitor. However, it is located directly north of Waukesha County, whose 2014 to 2016 design value of 66 ppb was well below the level of the 2015 ozone NAAQS. There is no evidence to suggests that ozone concentrations in Washington County would not be similar. In addition, Washington County is located directly inland from Ozaukee County, whose design values drop to 71 ppb just 1.9 miles inland from lakeshore at the Grafton monitor (as discussed in more detail in DNR's April 2017 TSD). The relationships shown in DNR's TSD indicate that ozone concentrations almost certainly continue to drop as one moves inland from the Ozaukee County monitors. The weight of evidence strongly suggests that Washington County attained the 2015 ozone NAAQS for the years 2014 to 2016.

In addition, emissions from Washington County are low, accounting for just 1 to 2 percent of the western and southern Lake Michigan regional total (Table 2). Taken together, this air quality and emissions data supports a designation of attainment for all of Washington County.

[14] See EPA's TSD for the Milwaukee Area, Sheboygan County, Manitowoc County, and Door County Intended Area Designations for the 2015 Ozone NAAQS, page 82.

6.3. Sheboygan County

Any nonattainment designation in Sheboygan County should be based on a distance-from-the-shoreline approach. Any nonattainment area boundary should extend no greater than 2.3 miles inland from the lakeshore, which is the location of the 70 ppb ozone design value contour suggested by Figure 6.2 in DNR's April 2017 TSD. The 2.3 mile line is consistent with the "best fit" line described in Section 6.3.1 of DNR's April 2017 submittal and takes into consideration that Sheboygan County ozone concentrations are heavily impacted by out-of-state transport and unfavorable meteorological and geographic factors and are not affected by local sources of emissions. Industrial emissions comprise less than 10 percent of county NOx and VOC emissions and are already well controlled.[15] The county's largest source of NOx emissions (Edgewater Generating Station) has significantly reduced emissions since 2011 and forecasts even more dramatic reductions in future years.[16]

If EPA imposes nonattainment but will not finalize a 2.3 mile boundary, it is important that EPA finalize a nonattainment area boundary extending no more than 2.9 miles inland, the location determined by comparison of design values at Sheboygan's two ozone monitors as described in DNR's April 2017 TSD. Both boundaries are shown in Figure 12.

EPA, in its intended designations for a partial county nonattainment area in Sheboygan, relied upon some of the technical analyses submitted by DNR as well as EPA's own information. However, EPA should draw any nonattainment area boundary based on the distance from the shoreline rather than using roads as a boundary. As discussed in Section 5.4, the choice of roads as boundaries is arbitrary whereas the use of a distance-from-the-shoreline approach is more objective and better reflects the available data and science.

In addition, there is no support for a boundary drawn at 3.2 miles inland, as EPA intends. The 3.2-mile distance is based on the location of the attaining Sheboygan Haven monitor. However, this monitor's design value for 2014 to 2016 was 69 ppb, one ppb below the NAAQS. This indicates that attainment level air quality would be found between this monitor and the lakeshore, indicating that any nonattainment area boundary should be to the east of this monitor.

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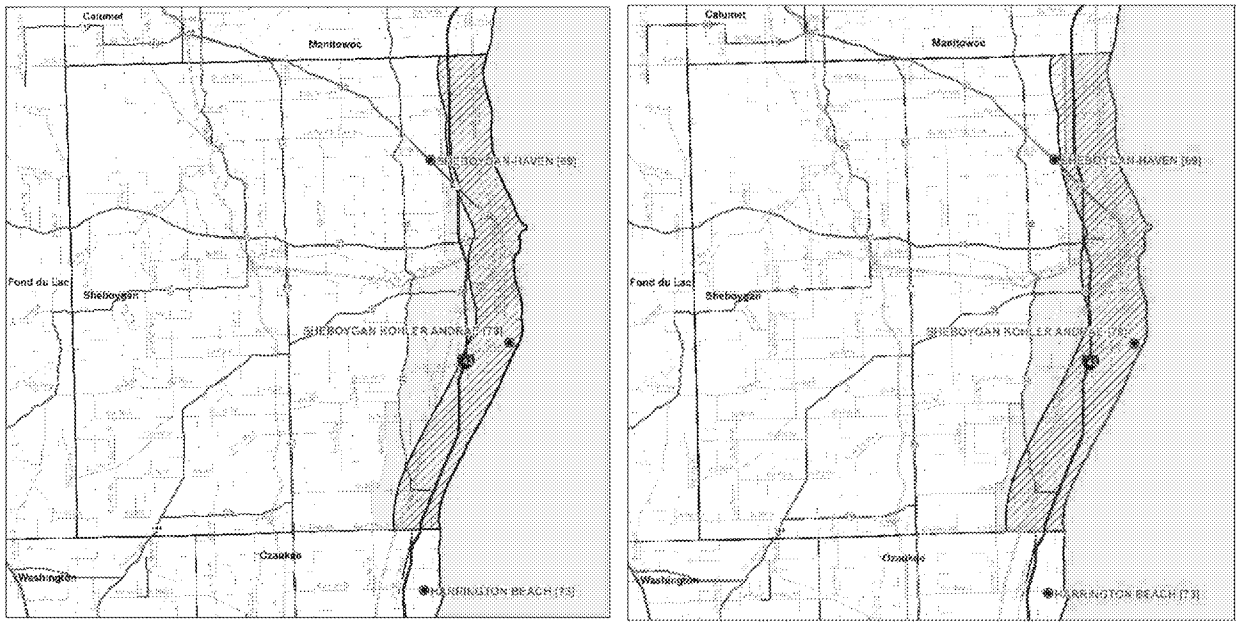
[15] See DNR's February 2018 Sheboygan County Redesignation Request and Maintenance Plan for the 2008 Ozone NAAQS, Table 4.1, "Point – Non-EGU" sector emissions (2014).
[16] Ibid.

Figure 12. Comparison of EPA's intended nonattainment area boundary (green) and technically supported alternatives (hatched) for Sheboygan County. The left figure shows the 2.3-mile boundary alternative; the right figure shows the 2.9-mile boundary alternative.



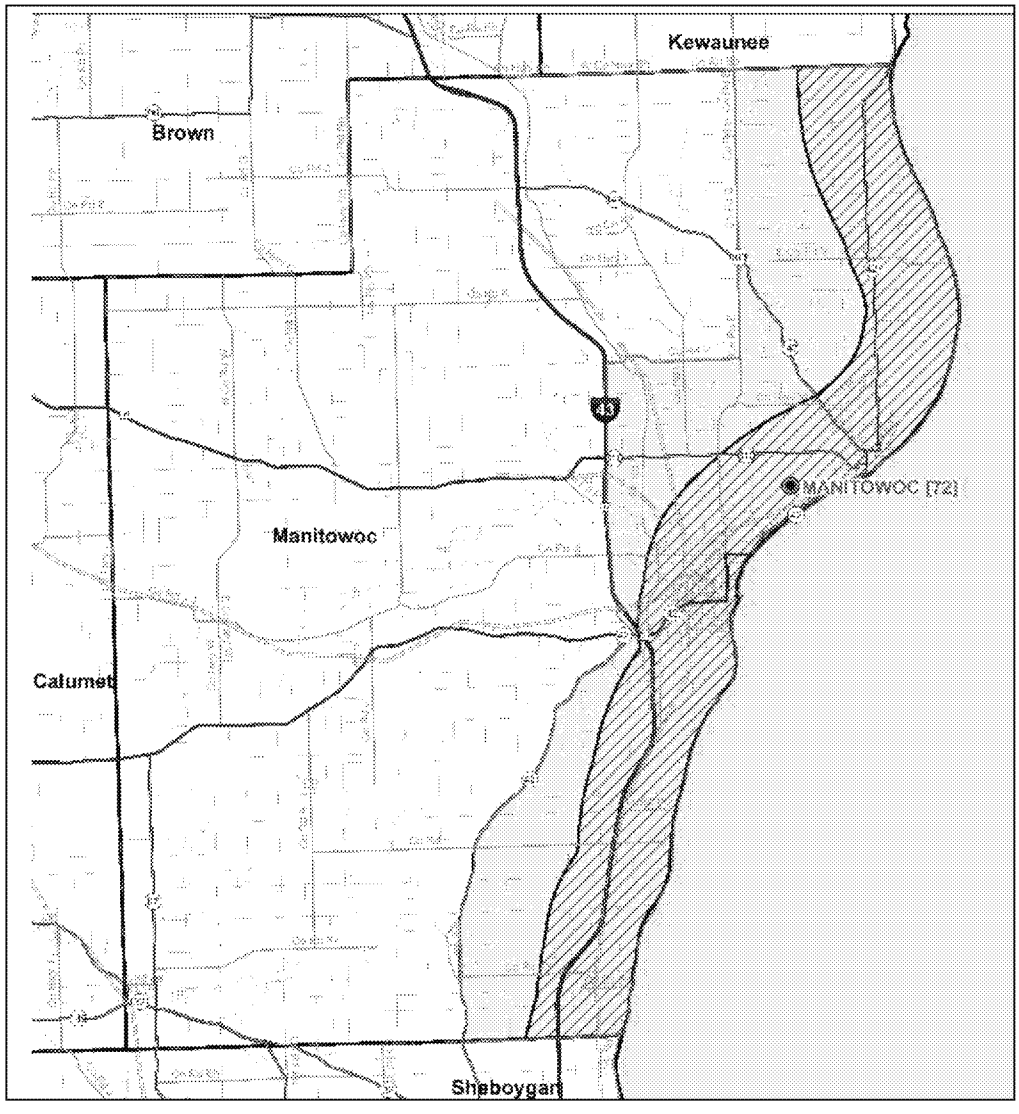
6.4. Manitowoc County

Any nonattainment designation in Manitowoc County should be based on a distance-from-the-shoreline approach. Any nonattainment area boundary should extend no greater than 2.9 miles inland from the lakeshore. This boundary is shown in Figure 13.

EPA's intends to designate only the eastern part of Manitowoc County as nonattainment for the 2015 ozone NAAQS. However, EPA's TSD describes how the intended nonattainment area was intentionally designed to include major emissions sources located in the county. It is inappropriate for EPA to do this. Table 2 shows that Manitowoc County emissions account for just 1 percent of the regional total emissions. As with Ozaukee County, the emissions from Manitowoc County are of a similar magnitude as those from Door County (Table 2), which EPA concluded "do not significantly contribute to ozone concentrations in the area itself or to other areas" (p. 82 of EPA's TSD). Ozone-rich air reaches the Manitowoc monitor exclusively from over Lake Michigan (see the appendix), meaning that this air has been transported from the south over the lake and not over the county itself. Accordingly, as is the case along much of Wisconsin's lakeshore, local emissions in Manitowoc County are decoupled from the ozone concentrations observed in this county.

The available evidence shows that ozone gradients in Manitowoc County are likely to be similar to those in Sheboygan County. EPA should therefore rely on the extensive technical analysis completed for Sheboygan County and, in the absence of any additional scientific or technical information or data, ensure this information is considered consistently.

Figure 13. Comparison of EPA's intended nonattainment area boundary (green) and a technically supported alternative (hatched) for Manitowoc County.



6.5. Door County

Because of Door County's unique circumstances, any nonattainment area in Door County should be no greater than the boundaries of Newport State Park. This boundary is shown in Figure 14.

EPA intends to designate only the northern portion of Door County as nonattainment. The Kewaunee County monitor has an attainment-level design value (69 ppb) for the years 2014 to 2016. As stated in DNR's April 2017 TSD, the area with design values attaining the standard likely extends north into Door County. It would therefore be inappropriate to designate the southern portion of the county as nonattainment.

If EPA were to designate a nonattainment area in Door County, the data at the Newport monitor supports a smaller area than proposed by EPA. DNR's April 2017 TSD showed that the design value for the Newport monitor (and that for the Kewaunee monitor) was lower than would be expected based on the relationship between design values and distance inland found for monitors in the other lakeshore counties. This suggests differences in the factors influencing ozone concentrations in this area, likely due to the remoteness of this monitor relative to the major out-of-state emission source regions to the south. The deviation of the Door County monitor from the trendline also suggests that the area with design values above the 2015 ozone NAAQS is likely to be even smaller in Door County than it is in Sheboygan and Manitowoc counties.

EPA should also exclude all the offshore islands in Door County from any nonattainment area, as there is no recognized benefit to designating them as nonattainment. EPA has similarly excluded islands from its nonattainment area designations for Ventura County, California.[17]

EPA's own HYSPLIT analysis provides additional evidence demonstrating the overwhelming role of transport of ozone from over Lake Michigan to the Newport monitor. Only two of EPA's 100 m back trajectories passed over Door County, with the remainder passing over the lake.[18] This further confirms that the elevated ozone levels measured at the ground level Newport monitor result from air being transported over the lake from the south. This is further justification that any nonattainment area should be limited to the boundaries of Newport State Park.

EPA also intends to designate Door County as a rural transport area (RTA). Independent of any boundary determination, such a designation is legally and scientifically supported. Door County emissions do not significantly contribute to its ozone levels. Door County contributed an insignificant proportion of the southern and western Lake Michigan region's emissions (Table 2). Furthermore, most of these emissions came from sources that the state cannot control: 53 percent of NOx from commercial marine vessels on Lake Michigan and 61 percent of VOC emissions from recreational vehicles and pleasure craft. Additionally, the Newport monitor only measures elevated levels of ozone when winds are coming from the south over Lake Michigan (see the appendix). A RTA designation is therefore appropriate due the county's remote location, lack of sizeable emissions sources within the county and location downwind of significant emission sources.

As demonstrated by numerous factors detailed in DNR's April 2017 TSD, as well as EPA's own technical analysis, Door County's ozone situation presents a very unique case warranting special consideration. EPA's treatment of Door County, therefore, should not be unnecessarily limited by precedential concerns.

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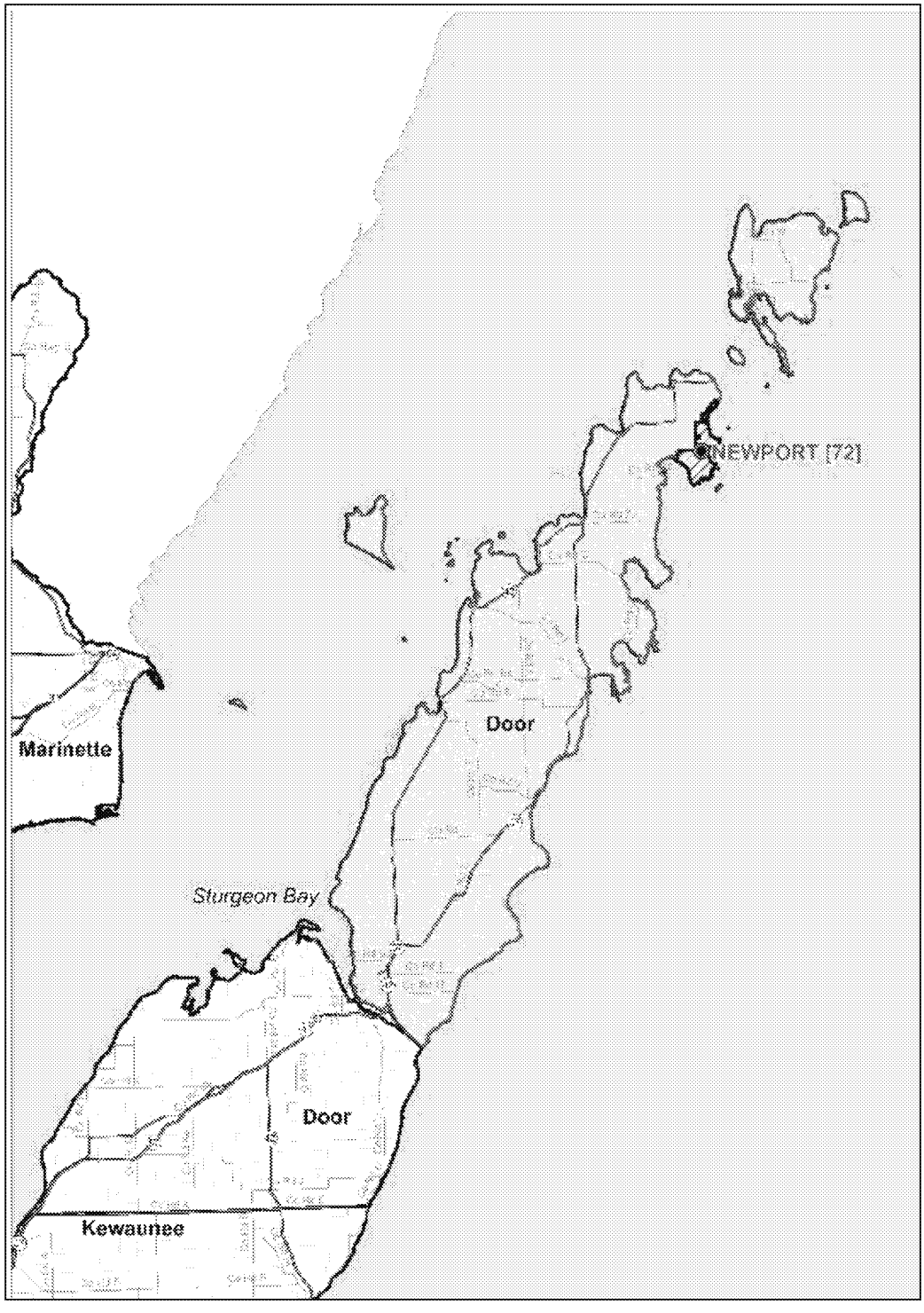
[17] EPA excluded the Channel Islands of Anacapa and San Nicholas Islands from its designation for Ventura County, CA, for the 2008 ozone NAAQS.

[18] See EPA's 2015 Ozone NAAQS Designations TSD for Wisconsin, Section 3.4 (Technical Analysis for Door County), Figures 6 and 7, pp. 75-76.

Figure 14. Comparison of EPA's intended nonattainment area boundary (green) with the technically supported alternatives (hatched) for Door County.



7. Conclusion

EPA's intended nonattainment areas are not technically supported. In developing these areas, EPA widely applied, without justification, a traditional and outdated approach to considering the factors it deems relevant to designations. EPA has considerable discretion as to how to consider and reflect the factors described in its designations guidance; it is critical that EPA use this flexibility to appropriately apply these factors in a way that accurately reflects state-specific conditions and situations.

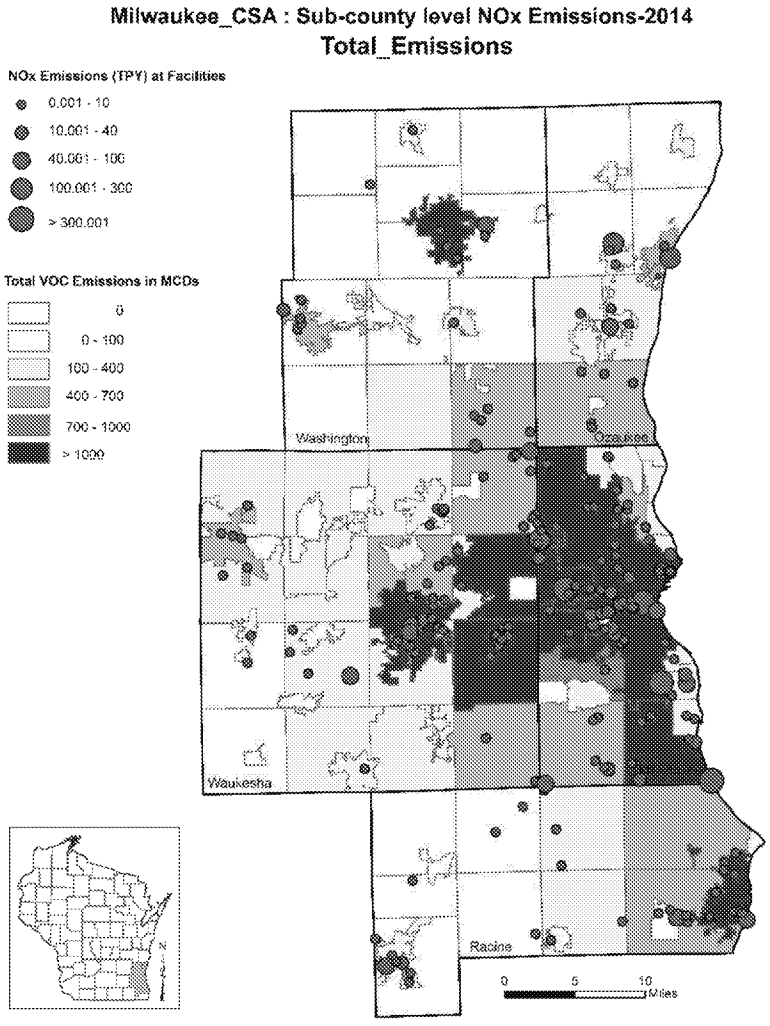
EPA also failed to consider – or even to acknowledge – critical information provided by DNR, including credible, quantitative, and scientifically supported evidence demonstrating that local emissions in EPA's intended nonattainment areas do not meaningfully impact ozone concentrations measured at violating monitors. This evidence strongly supports the recommendations of the state and indicates that any nonattainment areas for this standard imposed by EPA must be considerably smaller than EPA's intended boundaries. If EPA finalizes nonattainment despite this information, EPA must also describe how it expects the state to achieve attainment when the available evidence demonstrates that there is little to no additional actions the state could take to meet this standard.

EPA reliance on nationally generated analyses and traditional factors at the expense of state-specific information is not supported legally or technically. EPA is obligated to consider all the relevant information it has been provided; it cannot choose to ignore or reject information it finds contrary or inconvenient. DNR expects EPA to fully respond to all the information the state has provided and ensure this information is reflected in EPA's final area designation decisions.

Appendix

Additional Maps, Air Quality Analyses and Modeling Figures

Figure 1. Total NOx (left) and VOC (right) emissions by minor civil division (MCD) for the 5-county Milwaukee Area.



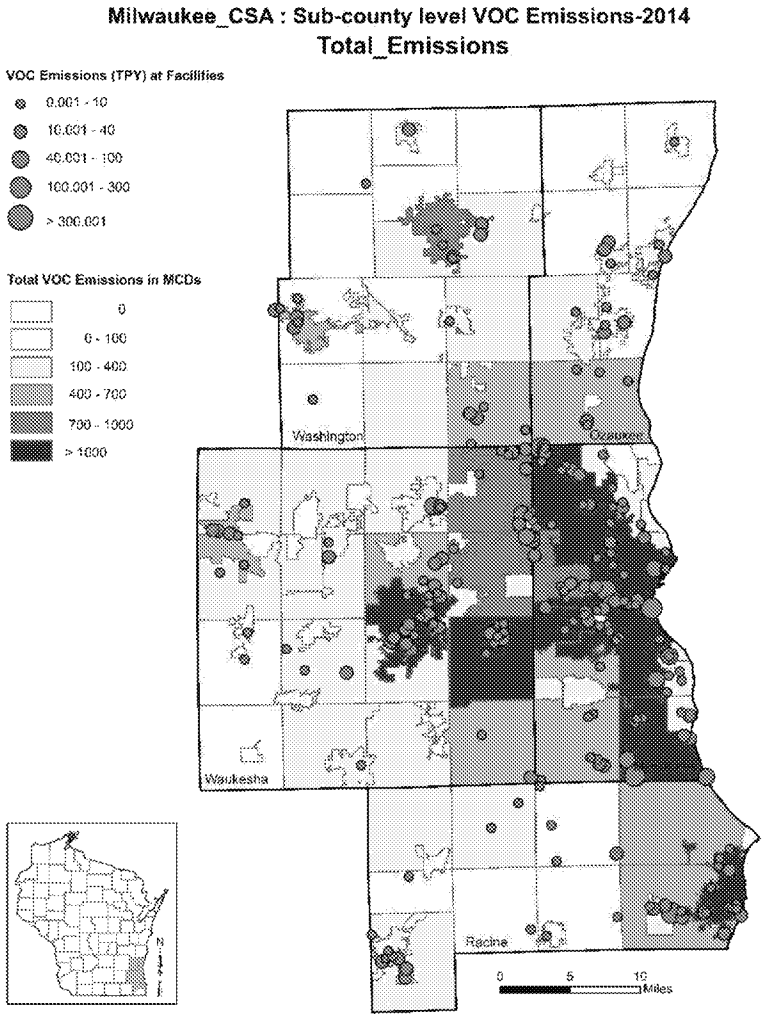
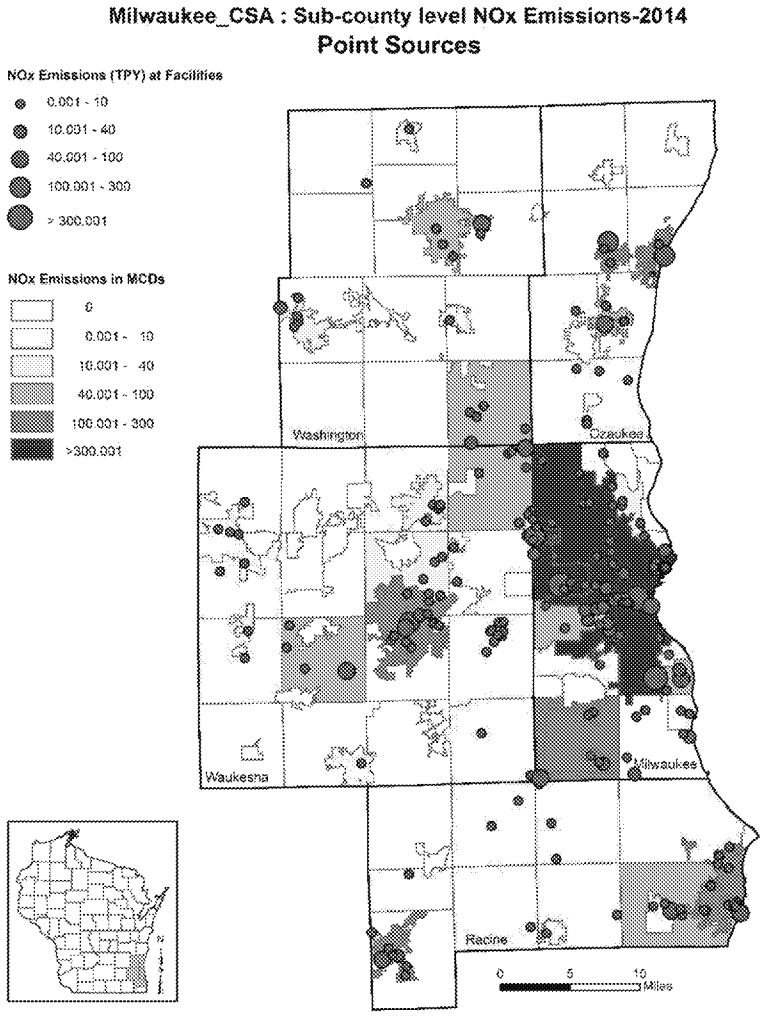


Figure 2. NOx (left) and VOC (right) emissions from point sources by minor civil division (MCD) for the 5-county Milwaukee Area.



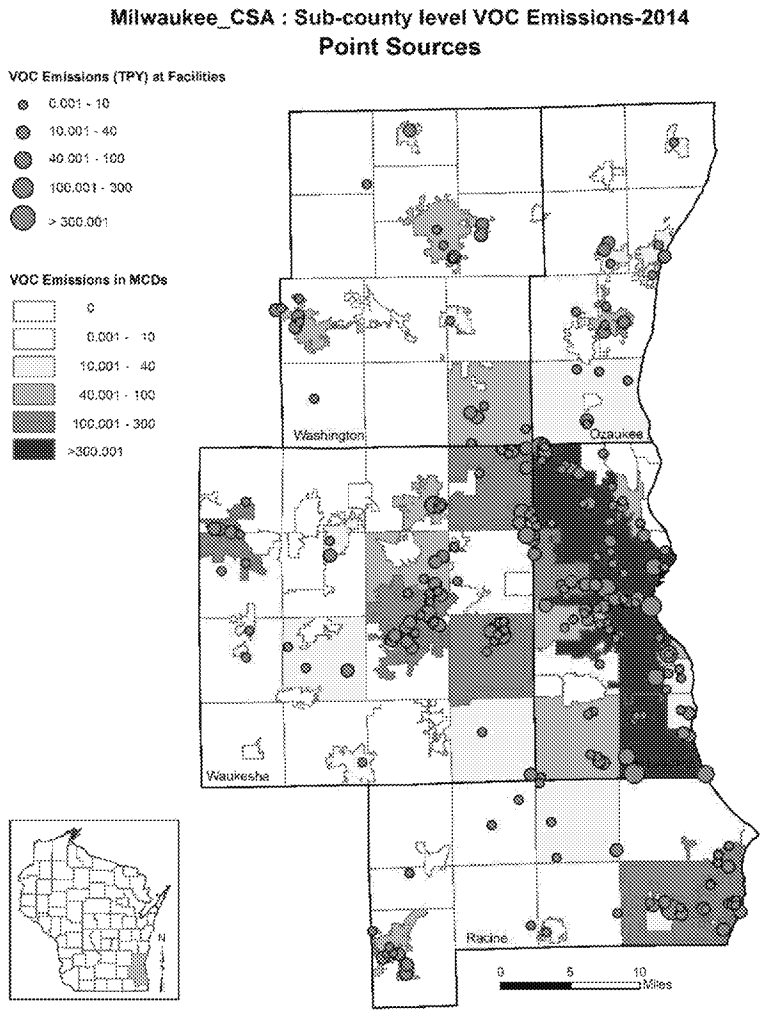
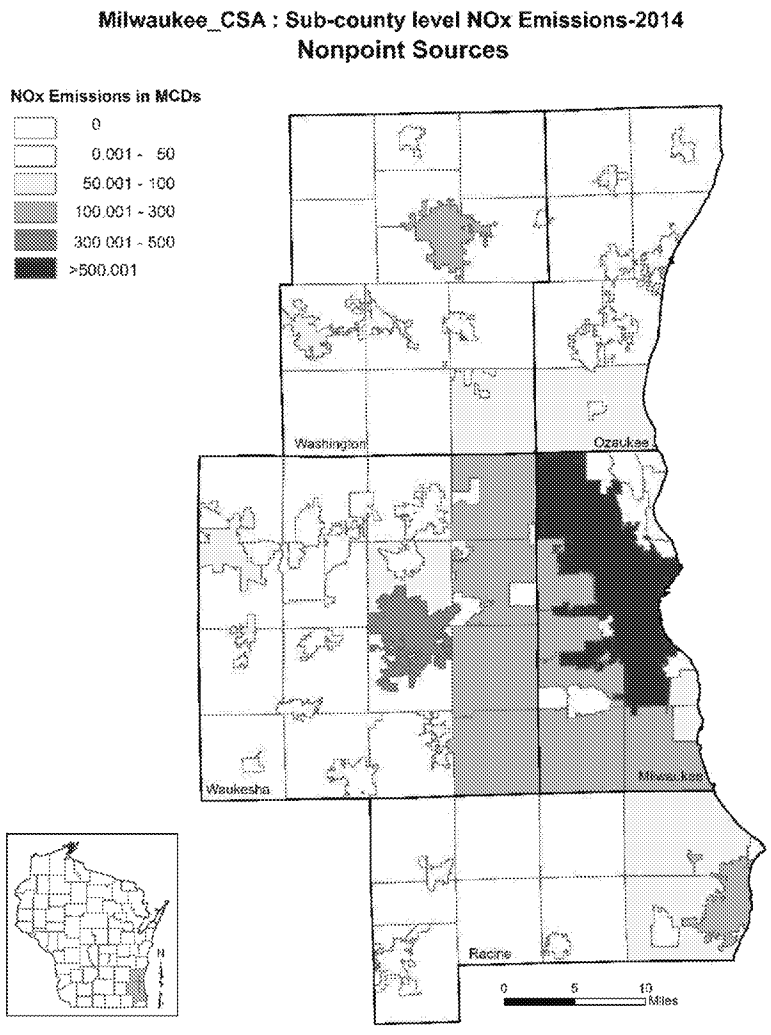


Figure 3. NOx (left) and VOC (right) emissions from nonpoint (area) sources by minor civil division (MCD) for the 5-county Milwaukee Area.



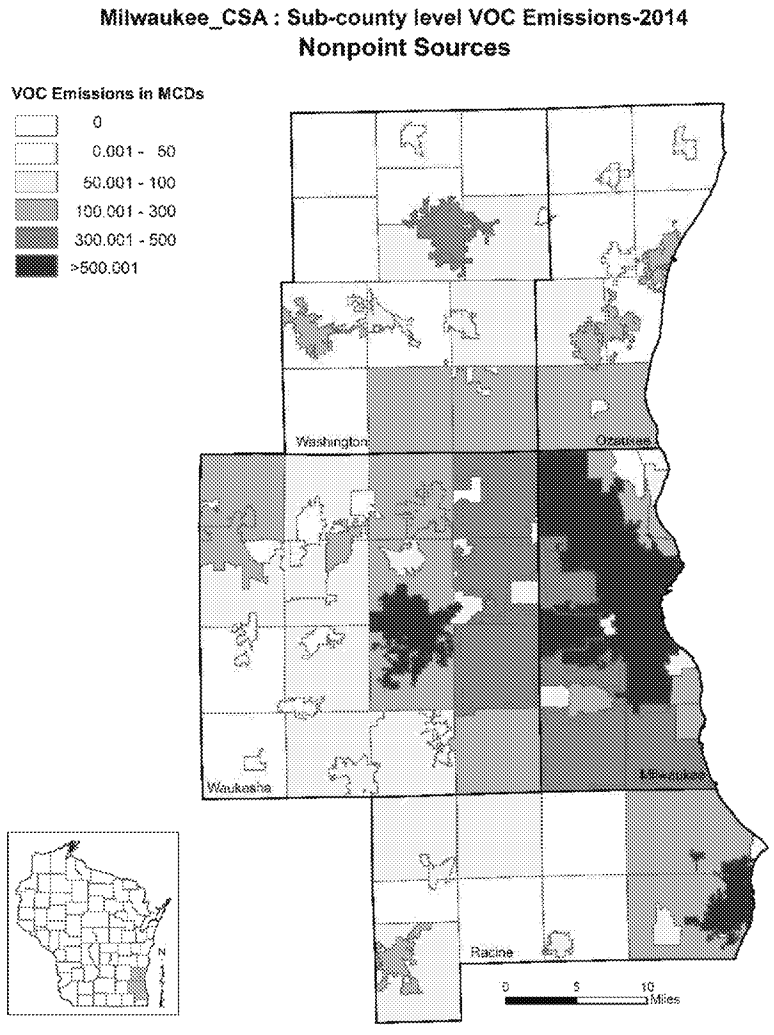


Figure 4. NOx (left) and VOC (right) emissions from on-road sources by minor civil division (MCD) for the 5-county Milwaukee Area.

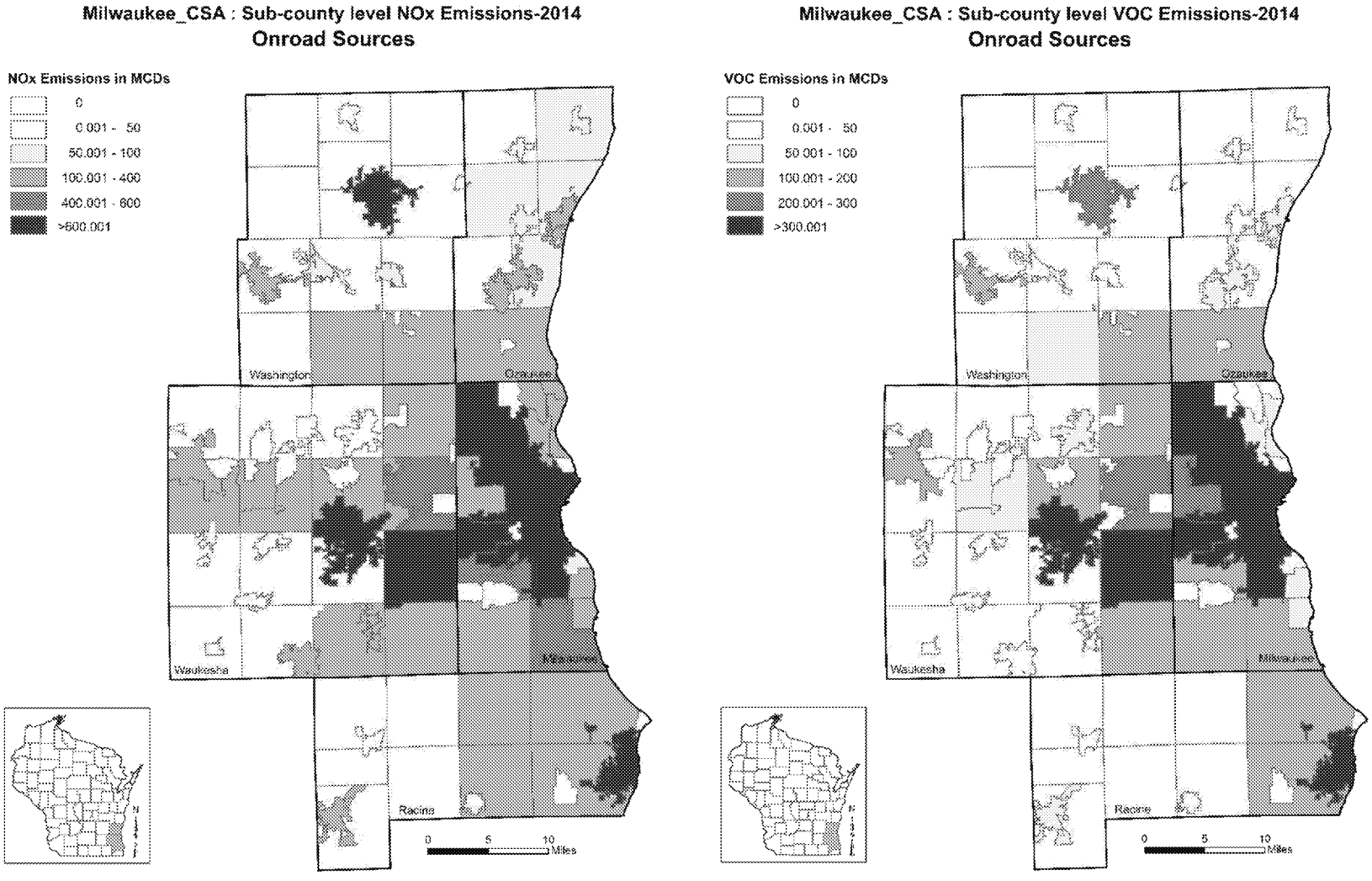


Figure 5. NOx (left) and VOC (right) emissions from nonroad sources by minor civil division (MCD) for the 5-county Milwaukee Area.

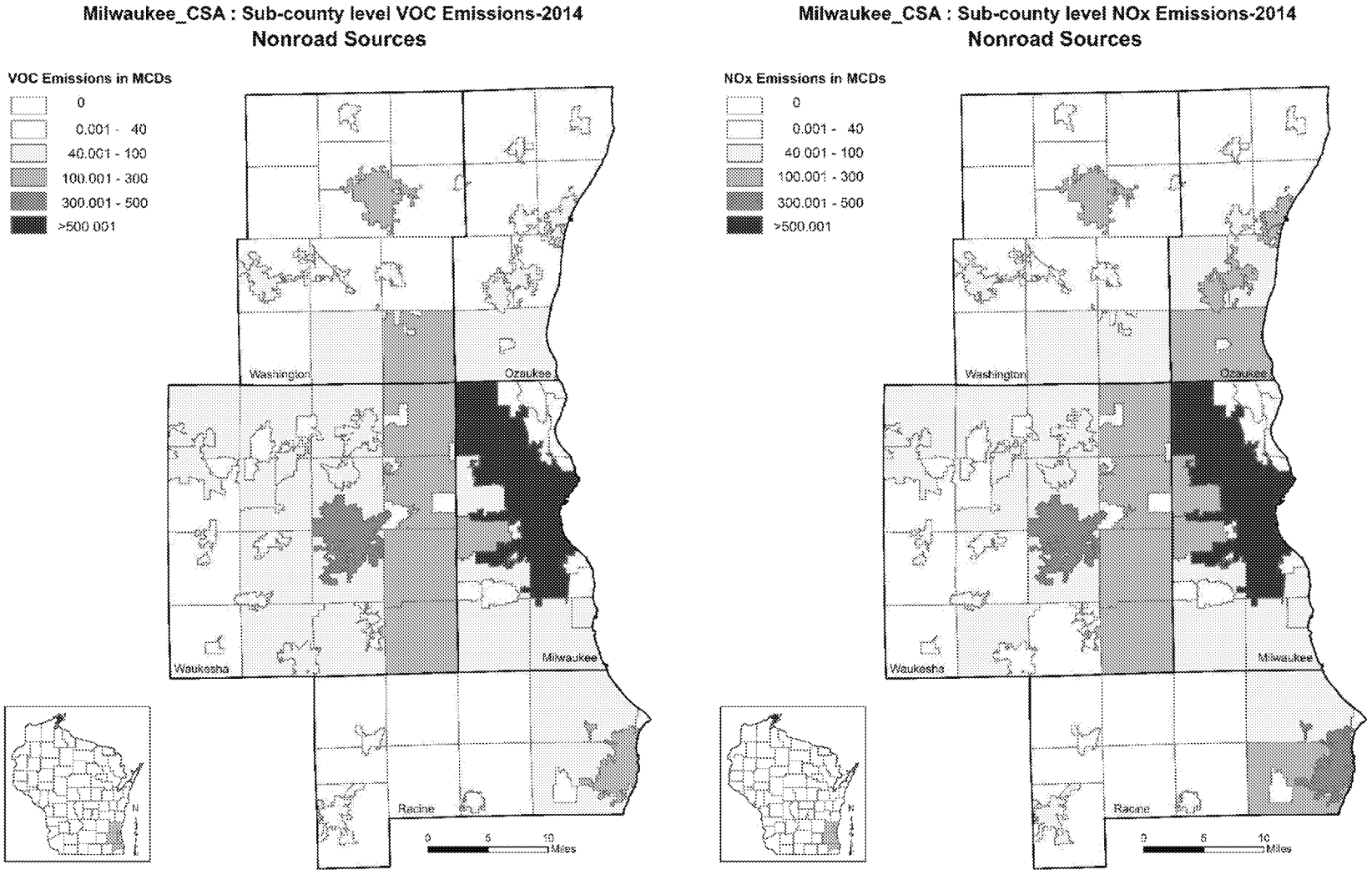


Figure 6. Population density map for the 5-county Milwaukee area.

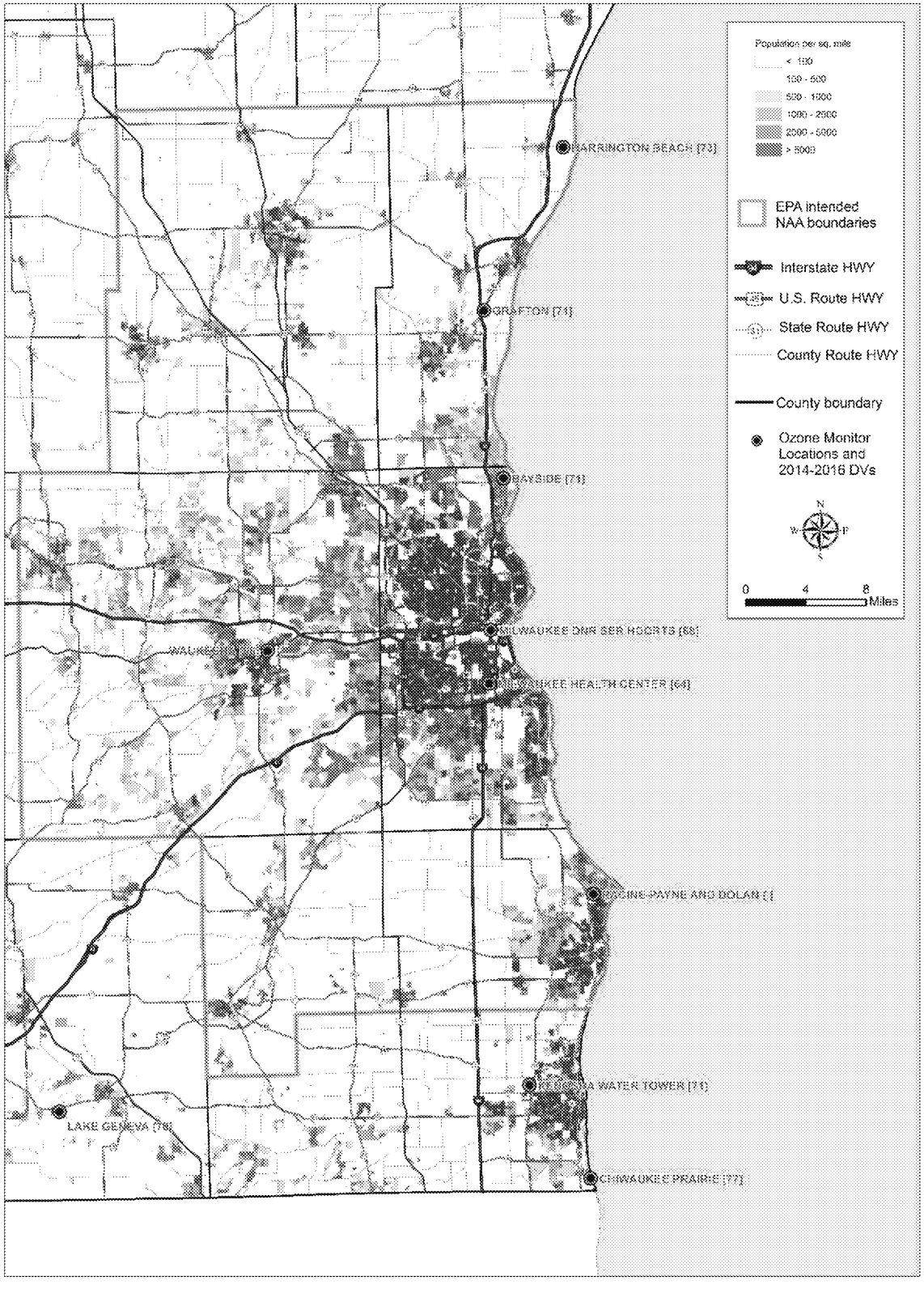


Figure 7. Comparison of EPA's HYSPLIT back trajectory analysis and DNR's pollution rose analysis for all monitors with wind direction data. No HYSPLIT data is shown for the Milwaukee monitors because EPA did not run the model for these attaining monitors. The red lines in the HYSPLIT plots correspond to air parcels ending at 100 m elevation, blue to air parcels at 500 m, and green to air parcels at 1000 m.

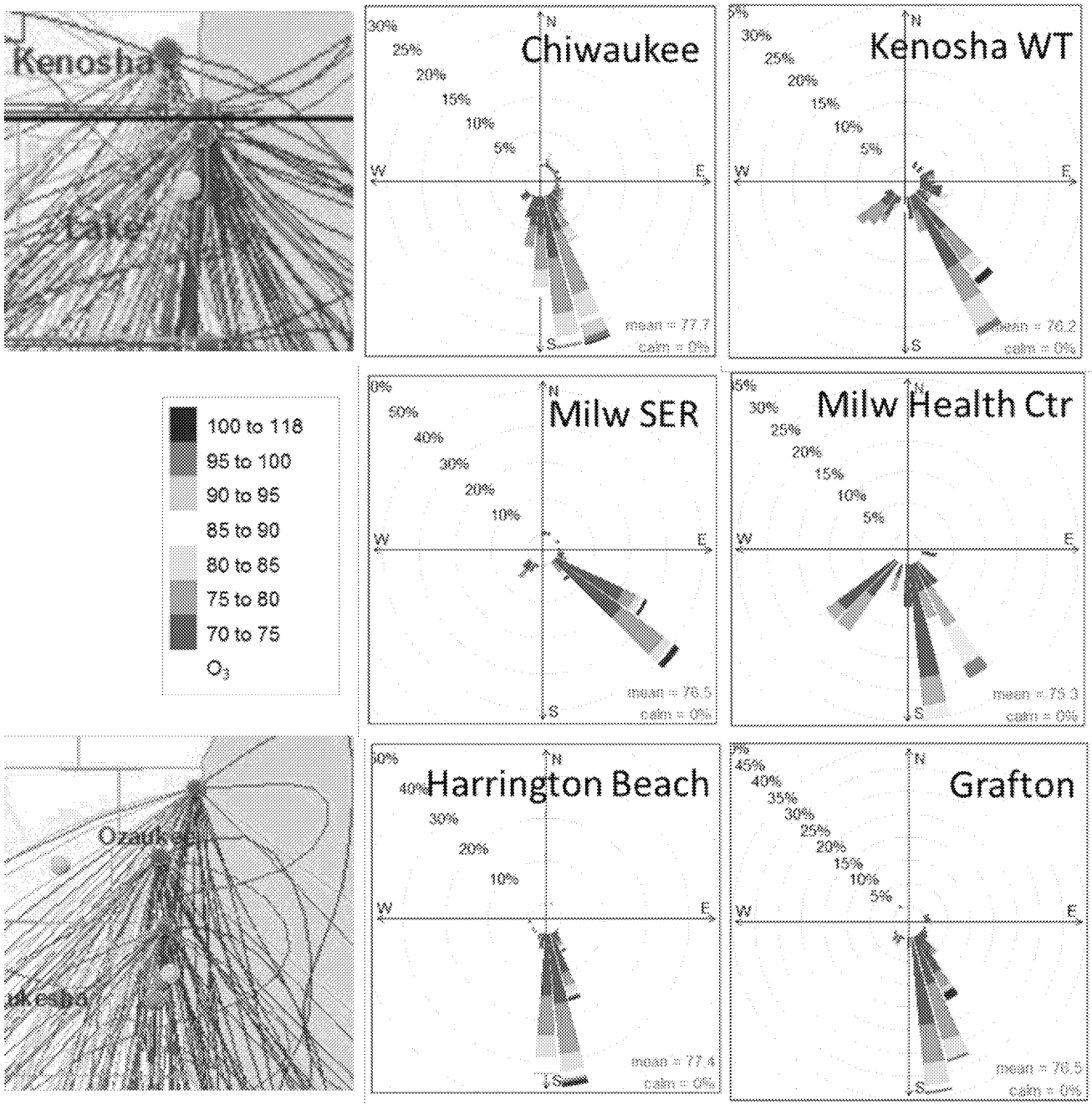


Figure 7 (continued).

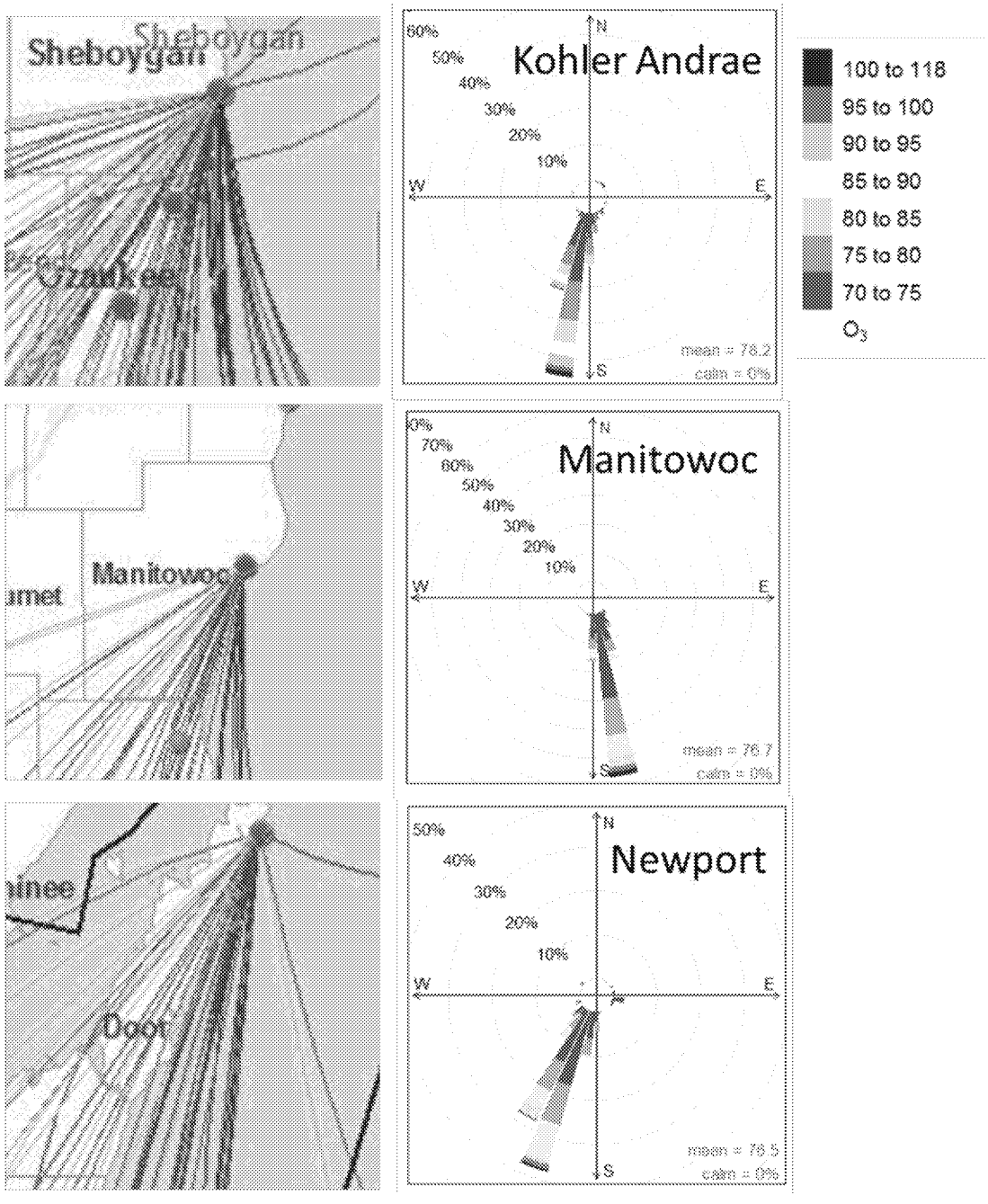
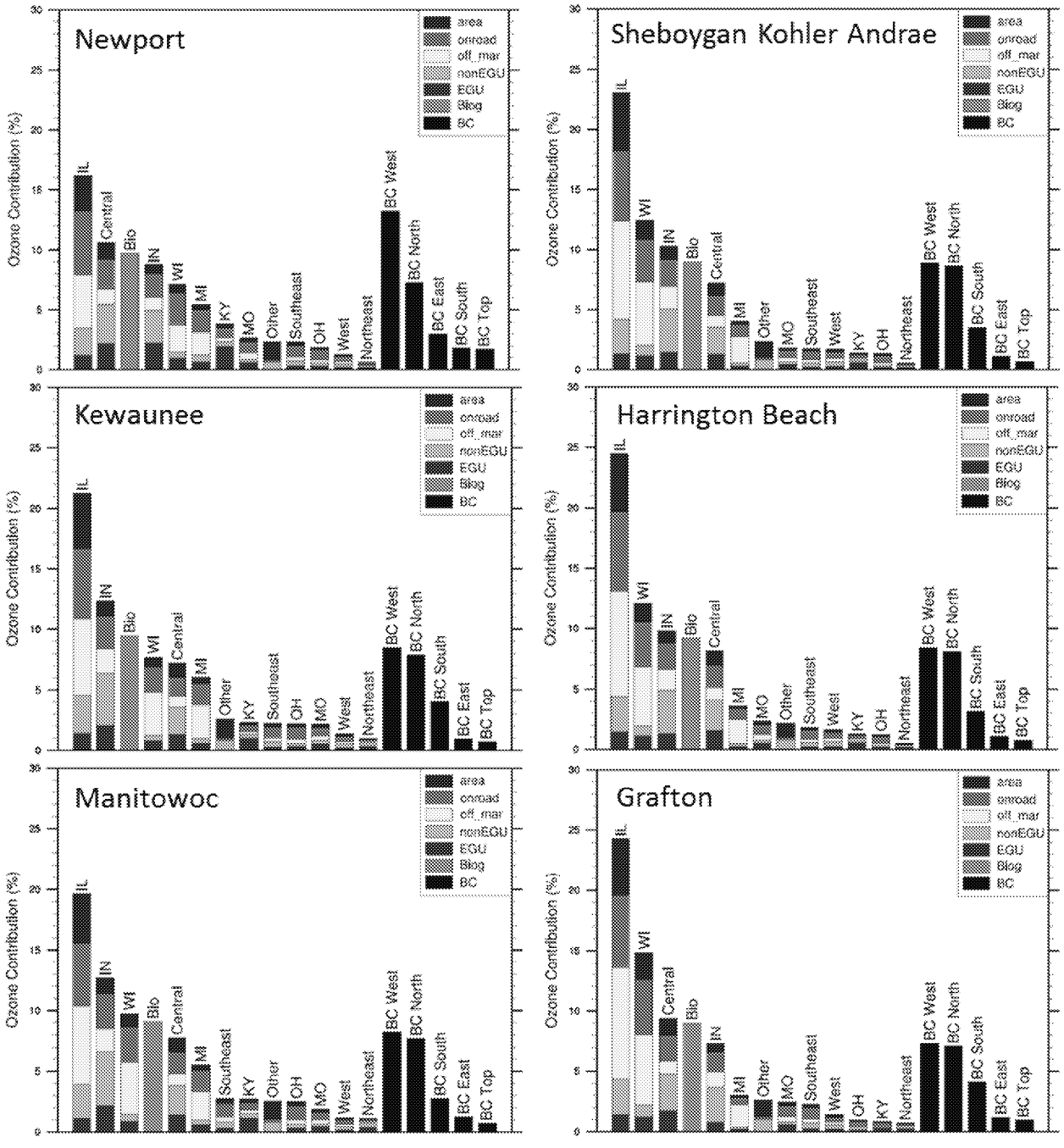


Figure 8. Ozone source apportionment modeling from LADCO for Wisconsin's lakeshore monitors.[1] Colors correspond to emission source categories. Monitors are arranged from north to south within each column.



[1] The Central region includes MN, IA, NE, KS, OK, TX, AR and LA. The Southeast region includes MS, AL, GA, FL, TN, VA, NC and SC. The West region includes WA, OR, CA, NV, ID, MT, WY, UT, CO, AZ, NM, ND and SD. The Northeast region includes ME, NH, VT, MA, RI, CT, NY, NJ, PA, DE, MD, and WV. BC is boundary conditions, which are contributions from outside the U.S. "Bio" and "Biog" are biogenics.

Figure 8 (continued).

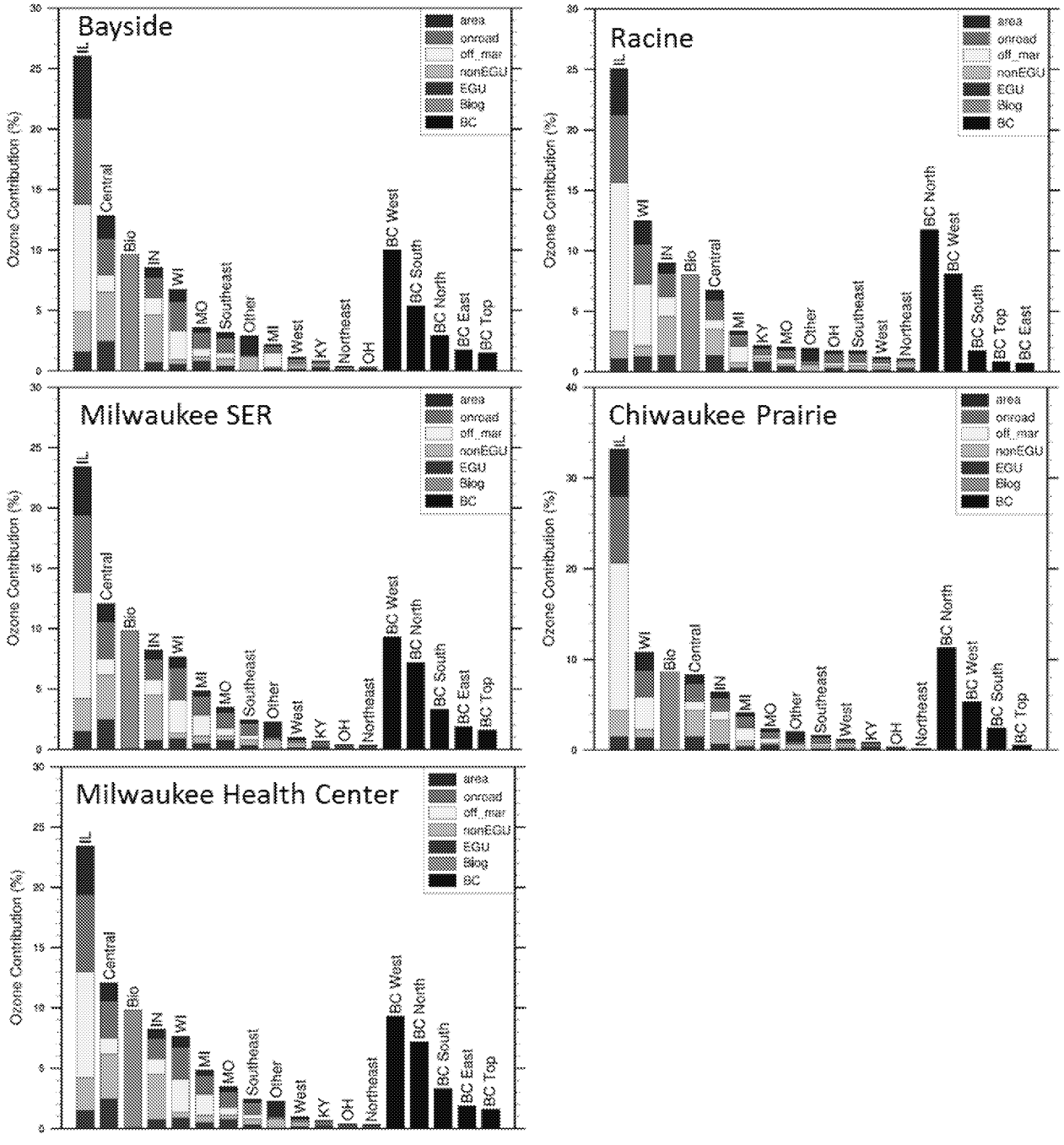
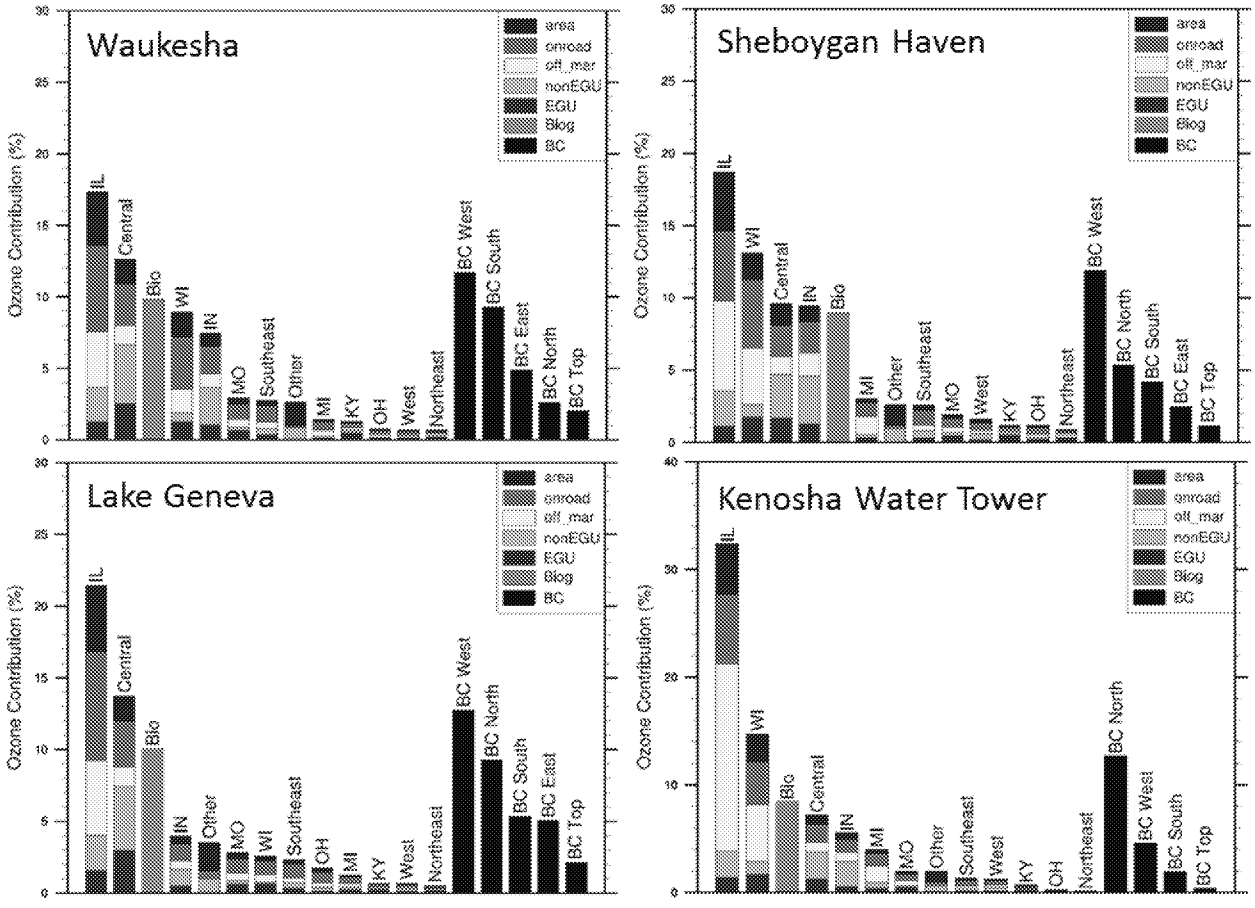



Figure 9. Ozone source apportionment modeling from LADCO for Wisconsin's inland monitors.[1] Colors correspond to emission source categories. Monitors on the left are located in inland counties and on the right are located in lakeshore counties. Monitors are arranged from north to south within each column.