STATE OF MICHIGAN
DEPARTMENT OF ENVIRONMENTAL QUALITY
LANSING

JENNIFER M. GRANHOLM
GOVERNOR

STEVEN E. CHESTER
DIRECTOR

July 15, 2003

Mr. Thomas V. Skinner, Regional Administrator
United States Environmental Protection Agency
Region 5
77 West Jackson Boulevard (R-19J)
Chicago, Illinois 60604-3507

Dear Mr. Skinner:

In response to the United States Environmental Protection Agency's (EPA's) request for new designation recommendations for the 8-hour ozone national ambient air quality standard, the Michigan Department of Environmental Quality (MDEQ) hereby submits a list of each area of the state of Michigan with an indication of appropriate designation of attainment or nonattainment and boundaries. These recommendations are supported with an analysis of relevant information in the enclosed document.

Consistent with the EPA guidance provided, the MDEQ recommendations are based on air quality design values in excess of 0.085 parts per million for the years 2000-2002.

The MDEQ has considered factors relevant to regional planning agencies in Michigan in the analyses. The Southeast Michigan Council of Governments (SEMCOG) has provided a great deal of input and data for the analysis of their region. Consistent with our ongoing efforts to partner with agencies representing local government, the MDEQ has given careful consideration to regional planning programs (and other applicable federal statutes, such as the Intermodal Surface Transportation Efficiency Act) in developing these recommendations whenever doing so would not have negative impacts on air quality improvement. The MDEQ urges the EPA to also give consideration to the concerns of regional planners. We believe that separating Combined Statistical Areas into two or more nonattainment areas will help make the conformity process function better and provide more flexibility in the strategy development phase of air pollution planning without jeopardizing reaching attainment.

Our evaluation and recommendation has been complicated by the following factors:

1. The EPA intends to use a different air quality data set to designate areas than the state has used for recommendations.

2. Further complicating the above, the legal and policy implications for areas designated nonattainment for the 8-hour ozone standard are unknown. The EPA has yet to clarify implementation and classification positions. The June 2, 2003, proposed implementation rule provides many possible directional options but lacks specific statutory language to guide decision making in this evaluation.

3. The criteria for definitions for Metropolitan Statistical Areas (MSAs) are different than the criteria the states are required to use in rebutting the presumptive boundaries. Further, the U.S. Office of Management and Budget revised the MSA definitions in June 2003. This action resulted in changed boundaries for many MSAs in Michigan.

4. In the nitrogen oxides (NOx) State Implementation Plan (SIP) Call docket, the EPA claimed that the regional NOx reductions would result in dramatic ozone improvement with fewer nonattainment areas. It is necessary and appropriate for EPA to account for the benefits associated with the phase-in of these reductions in making designations. The NOx controls will all be operational in the next ozone season and many monitors are recording ozone levels marginally over the standard. The impact of the NOx reductions is not reflected in the data used for the recommendations.

5. Overwhelming (not regional) ozone transport is the sole reason for nonattainment levels of ozone at many monitors in Michigan. Community support for nonattainment designations and positive actions within some of these areas is hindered because such a designation results in regulatory mandates based on the erroneous premise that a local area should be held responsible for their air quality. Some of the "ozone receptor" counties in West Michigan have minimal industry and are very sparsely populated. Local emission reductions do not reduce ozone concentrations at shoreline monitors even in counties with urbanized areas.

Michigan's track record in achieving all national ambient air quality standards, including ozone, should weigh heavily in EPA's decision making. The state has a proven record of applying controls when necessary beyond nonattainment areas. Ultimately, the need for the degree and expense of controls will be decided upon after a thorough technical analysis undertaken in the SIP development process.

We look forward to working with EPA as you develop the final designations. If you have questions regarding our recommendations, please contact Mr. G. Vinson Hellwig, Chief, Air Quality Division (AQD), at 517-373-7069; Ms. Mary Maupin, AQD, at 517-373-7039; or you may contact me.

Sincerely,

Steven E. Chester
Director
517-373-7917

Enclosure
cc/enc: Governor Jennifer M. Granholm
Ms. Cheryl L. Newton, EPA
Mr. Chuck Hersey, SEMCOG
Ms. Dana Debel, Governor's Office
Mr. Jim Sygo, Deputy Director, MDEQ
Mr. G. Vinson Hellwig, MDEQ
Ms. Mary Maupin, MDEQ

Michigan Department of Environmental Quality

Recommended Attainment/Nonattainment Boundaries in Michigan for the 8-Hour Ozone National Ambient Air Quality Standard

Steven E. Chester
Director
July 15, 2003

Recommended Attainment/Nonattainment Boundaries in Michigan for the 8-Hour Ozone National Ambient Air Quality Standard

Designated Area	Designation	2000-2002 Design Value Parts per million (ppm)
Southeast Michigan		.088
Wayne County	Nonattainment	
Oakland County	Nonattainment	
Macomb County	Nonattainment	
St. Clair County	Nonattainment	
Livingston County	Nonattainment	
Washtenaw County	Nonattainment	
Monroe County	Nonattainment	
Genesee/Lapeer		.084
Genesee County	Attainment	
Lapeer County	Attainment	
Lenawee		.085
Lenawee County	Nonattainment	
Cass		.090
Cass County	Nonattainment	
Berrien		.087
Berrien County	Nonattainment	
Muskegon		.089
Muskegon County	Nonattainment	
Ottawa		.085
Ottawa County	Nonattainment	
Allegan		.092
Allegan County	Nonattainment	
Grand Rapids		.082
Kent County	Attainment	
Mason		.087
Mason County	Nonattainment	
Benzie		.086
Benzie County	Nonattainment	
All other counties	Attainment	

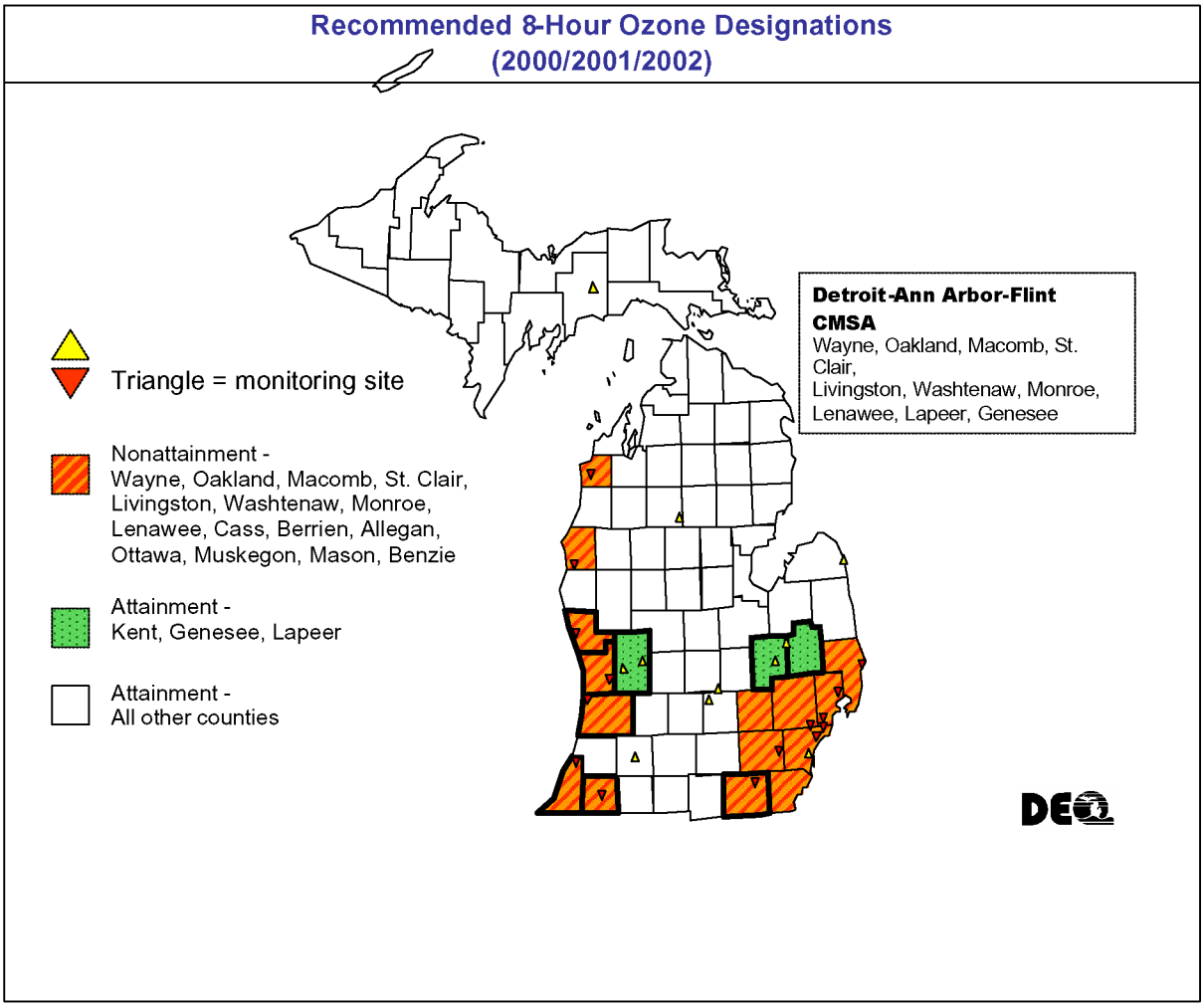


Figure 1
Recommended 8-hour
Ozone Designations

NOTE: A Michigan map with all county names listed is provided on Page 40.

Recommended Attainment/Nonattainment Boundaries
In Michigan for the 8-Hour Ozone
National Ambient Air Quality Standard

Introduction

In July 1997, the U.S. Environmental Protection Agency (EPA) promulgated a new National Ambient Air Quality Standard (NAAQS) for ozone, referred to as the 8-hour ozone standard. The federal Clean Air Act requires the EPA to seek recommendations from the states' governors for initial designations of the attainment status for all areas of the states when a new or revised standard is promulgated.

The states are also asked to provide recommendations for the appropriate boundaries of all nonattainment areas. The EPA guidance on boundary selection identifies the boundaries of the metropolitan statistical area (MSA) or consolidated metropolitan statistical area (CMSA), as defined by the U.S. Office of Management and Budget (OMB), Census Bureau, as the presumptive nonattainment area. Generally, an MSA is a core area with a substantial population, plus nearby communities maintaining a large economic and social integration with the core community. State recommendations that deviate from an MSA or CMSA boundary must provide an analysis of local factors, such as location relative to the urban core, amount of emissions, population, and prevailing meteorology.

The EPA will review and either affirm the states' recommendations or make modifications as determined to be necessary. Final promulgation of designations is to occur by April 15, 2004, in accordance with a consent agreement between the U.S. Department of Justice and several environmental advocacy groups.

This report provides the basis for recommendations of attainment/nonattainment designations and boundaries for the 8-hour ozone standard for all areas in the state of Michigan. The Michigan Department of Environmental Quality (MDEQ) has considered the input of local communities and organizations. The Southeast Michigan Council of Governments (SEMCOG) and the Genesee County Metropolitan Planning Commission (GCMPC) have provided much of the analysis for the Southeast Michigan area.

Analysis

The 8-hour ozone designations are to be based on the design values (the average of the fourth highest values from each three consecutive years of data at each monitor) calculated from observations from the most recent three-year period of record. The ozone design value for an entire region is derived by the measurements of whichever monitor in the region has the highest ozone values. State recommendations are to be based on the period 2000-2002, whereas the EPA indicates that a different data set, 2001-2003, will be the basis of the EPA's final nonattainment determinations.

Design values in violation of the 8-hour ozone standard have been recorded in Southeast Michigan, Cass County, and the West Michigan counties bordering Lake Michigan with monitors.

As mentioned previously, the EPA presumes that nonattainment area designations for the 8-hour ozone standard reflect the MSA or CMSA to incorporate not only the areas of measured violations, but also the contributing nearby emission source areas. Recommendations that vary from the presumption must be supported with an analysis considering the following eleven factors:

- Emissions and air quality in adjacent areas (including adjacent C/MSAs).
- Population density and degree of urbanization, including commercial development (significant difference from surrounding areas).
- Monitoring data representing ozone concentrations in local areas and larger areas (urban or regional).
- Location of emission sources (emission sources and nearby receptors should generally be included in the same nonattainment area).
- Traffic and commuting patterns.
- Expected growth (including extent, pattern, and rate of growth).
- Meteorology (weather/transport patterns).
- Geography-topography (mountain ranges or other air basin boundaries).
- Jurisdictional boundaries (e.g., counties, air districts, existing 1-hour nonattainment areas, Reservations, etc.).
- Level of control of emission sources.
- Regional emission reductions (e.g., nitrogen oxides (NOx) State Implementation Plan (SIP) call or other enforceable regional strategies).

New Metropolitan and Micropolitan Statistical Area Definitions

On June 6, 2003, the OMB established revised definitions of MSAs, new definitions for Micropolitan Statistical Areas (MiSAs) and Combined Statistical Areas (CSAs), and provided guidance on uses of the statistical definitions of these areas.

The new OMB definitions resulted in the listing of two large CSAs in Michigan, one in Southeast Michigan and one in West Michigan. These CSAs are comprised of new MSAs and MiSAs with counties grouped differently than in the last 2000 Census update. Four counties have been newly identified for inclusion in MSAs: Barry, Ionia, Newaygo, and Cass.

The former four-county Grand Rapids MSA consisting of Kent, Ottawa, Allegan, and Muskegon counties is changed dramatically, with four separate MSAs and one MiSA. The Grand Rapids-Wyoming MSA now consists of Kent, Barry, Ionia, and Newaygo counties. The Muskegon-Norton Shores MSA includes only Muskegon County, the Holland-Grand Haven MSA includes only Ottawa County, and the Allegan MiSA is comprised of Allegan County.

The former ten-county Detroit-Ann Arbor-Flint CMSA is now four MSAs and one MiSA. The Detroit-Warren-Livonia MSA is subdivided into two Metropolitan Divisions. The Warren-Farmington Hills-Troy Metropolitan Subdivision consists of the counties of

St. Clair, Oakland, Macomb, Livingston, and Lapeer. The Detroit-Livonia-Dearborn Metropolitan Division includes only Wayne County. The Flint MSA includes only Genesee County, the Ann Arbor MSA includes only Washtenaw County, the Monroe MSA includes only Monroe County, and the Adrian MiSA is Lenawee County.

The MDEQ has considered the new grouping in the recommendations of nonattainment areas for Michigan. The new MSA delineations are especially appropriate for application in West Michigan ozone transport impacted counties.

Ozone Transport

Although the EPA has long recognized that air quality in West Michigan is impacted by overwhelming ozone transport and local emission reductions cannot bring about attainment with the ozone standard, the EPA maintains that nonattainment designations for these counties are appropriate. See Figures 4 through 11 beginning on page 11. The rationale provided by the EPA for this position is that designations provide the public with important information on the air quality in their area.

Designations, however, are legal distinctions that drive emission reduction requirements, not public information tools. Designations very frequently do not reflect actual air quality status. A single violating monitor in a MSA or CMSA results in a nonattainment designation for the entire area even if all other monitors in the area measure attainment levels of ozone. Additionally, designating an area as nonattainment is a simple process, whereas changing that designation to attainment is not. Redesignation to attainment is a huge undertaking demanding many resources and a lengthy process that can take years. An area maintains an erroneous designation throughout those years, thus providing misleading information to the public on actual exposure to excessive levels of ozone. There are many better informed mechanisms in place for providing accurate and timely air quality status to the public, such as the MDEQ web site with near real time ozone levels reported hourly, OzoneAction! Day programs, and the Air Quality Index.

Although nonattainment designations for the West Michigan ozone transport receptor region are inappropriate, the MDEQ recommendations are consistent with the EPA's interpretation of required designations of nonattainment for counties with monitors recording violations of the NAAQS. However, it would be appropriate for the EPA to limit the regulatory mandates required for this transport receptor region through options for flexibility in its upcoming ozone implementation rule.

West Michigan

Monitors sited in the Lake Michigan coastal counties of Berrien, Allegan, Ottawa, Muskegon, Mason, and Benzie are all measuring levels of ozone that violate the 8-hour ozone standard. In addition, ozone levels in Cass County, an inland county, violate the standard. The MDEQ is recommending that the Muskegon-Norton Shores MSA, consisting of Muskegon County, be designated nonattainment. See Figure 2, page 9. The MDEQ is also recommending the Holland-Grand Haven MSA, consisting of Ottawa County, be designated as nonattainment; and that the Allegan Micropolitan Statistical Area, consisting of Allegan County, be designated as nonattainment. These three counties, Muskegon, Ottawa, and Allegan, should be independent nonattainment areas, which will allow for greater flexibility in control program mandates due to highly disparate design values. The counties of Cass, Berrien, Mason, and Benzie should be independent nonattainment areas, as well. See Figure 2, page 9.

Recommendation of Attainment for the Grand Rapids MSA

Kent County should be designated attainment. The two monitors in Kent County are measuring attainment levels of ozone. Although Grand Rapids is the principle city with the highest emission levels, population, and vehicle miles traveled in the entire West Michigan region, violations of the standard are not occurring at the downtown and downwind monitors. Kent County is further inland from Lake Michigan; therefore, ozone levels are lower despite higher emissions of ozone precursors. Kent County is also not causing nonattainment conditions in downwind communities. The monitor in Houghton Lake, which may be considered downwind under prevailing wind conditions, is attaining the NAAQS. The MDEQ believes that the overwhelming ozone transport phenomenon occurring in the Lake Michigan region should be differentiated from the regional ozone transport that is experienced elsewhere in the country. The degree of ozone transport impact on coastal monitors a few miles from the water's edge is truly overwhelming. West Michigan's transport occurs as distinct plume that grows in intensity, despite the lack of added emissions, as the air mass travels across the lake. The widespread, diffuse regional transport that is considered to be background ozone experienced throughout the eastern United States adds to the huge local loading of pollution in large cities, as seen in the Northeast where population densities are extremely high. Local emission reductions occurring downwind from the violating monitors in West Michigan have been shown to be ineffective in reducing the design values. The MDEQ recommends a designation of attainment for Kent County, and the three new counties in the newly defined Grand Rapids MSA. See Figure 3, page 10. The outlying counties barely qualified for inclusion in the MSA with commuting levels slightly above the 25% threshold. Barry County is at 25.8%, Ionia County is at 26.6%, and Newaygo County is at 26.7%. These three new counties do not have ozone monitors, and emissions and population numbers are low.

Justification for the Exclusion of Cass from the South-Bend-Mishawaka MSA

The county of Cass is part of the South Bend-Mishawaka MSA; however, it is the downwind county that will experience air quality improvements as reductions are made in the more urbanized upwind region. Only 5,002 Cass County residents—less than 10% of the county's population—live in the South Bend urbanized area. Fewer than

15% of Cass County's workers commute to Saint Joseph County, Indiana. However, Cass County qualifies as a central county of the South Bend MSA because it meets the criterion of having at least 5,000 residents in a single urban area of at least 10,000 population. The South Bend urbanized area surpasses the 50,000 population threshold, so its associated counties are metropolitan rather than micropolitan. Because of the low population density, low commuting patterns within the MSA, separate state governments and SIPs, and the prevailing winds from the southwest, Cass County should be excluded from the South Bend Mishawaka MSA, and be designated as an independent nonattainment area.

Recommendation of Separate Nonattainment Areas for Benzie and Mason Counties

Benzie and Mason counties are located on the western shore of Lake Michigan. These counties are subjected to overwhelming transport of ozone over Lake Michigan from the southwest. As shown in Table 1 below, these counties have a very low population, and very few sources of VOC and NOx emissions. For these reasons, Michigan is recommending these counties be designated as separate nonattainment areas.

Table 1
West Michigan Population

County	1990 Census	Estimated 2000
Allegan	90,509	102,600
Kent	500,631	553,500
Muskegon	158,983	166,400
Ottawa	187,768	229,800
Barry	50,057	54,600
Ionia	57,024	61,300
Newaygo	38,206	46,600
Berrien	161,378	162,300
Cass	49,477	49,800
Mason	25,537	27,300
Benzie	12,200	14,500

Office of State Demographer: Michigan Information Center, January 1996

Table 2
NOx Emissions (Tons/Yr)

County	Point	Area	Non-road	On-road	Total	% of Total
Allegan	934.82	573.40	1348.10	4680.73	7537.05	7 %
Kent	1133.67	3124.08	4514.99	15982.09	24754.83	24 %
Muskegon	6781.08	859.80	1665.98	4701.03	14007.89	14 %
Ottawa	36680.13	132.03	2304.79	7795.32	47912.26	47 %
Barry	21.42	219.10	434.03	1368.40	2042.94	2 %
Ionia	38.22	215.53	580.41	2652.03	3486.19	3 %
Newaygo	46.01	279.42	288.87	1127.59	1741.88	2 %
TOTAL	45635.35	6403.35	11137.17	38307.18	101483.05	100 %

Table 3
VOC Emissions (Tons/Yr)

County	Point	Area	Non-road	On-road	Total	% of Total
Allegan	1729.63	3780.12	1882.94	2551.83	9944.51	12 %
Kent	4506.39	15318.71	3862.95	12259.31	35947.36	44 %
Muskegon	656.18	4307.07	1739.97	3322.44	10025.67	12 %
Ottawa	1640.27	5882.60	2484.41	5085.62	15092.89	19 %
Barry	89.53	1774.19	710.30	771.85	3345.87	4 %
Ionia	109.51	1970.81	476.33	1371.10	3927.75	5 %
Newaygo	124.11	1656.61	498.68	612.042	2891.82	4 %
TOTAL	8855.62	34690.10	11655.58	25974.56	81175.87	100 %

*Non-road and On-road emissions totals taken from EPA Final 1999 NEI, Ver. 2. Posted November 2002.
Area emission totals taken from EPA Draft 1999 NEI, Ver. 3. Posted March 2003.
Point emissions totals taken from MDEQ MAERS 1999 Point Source Inventory.

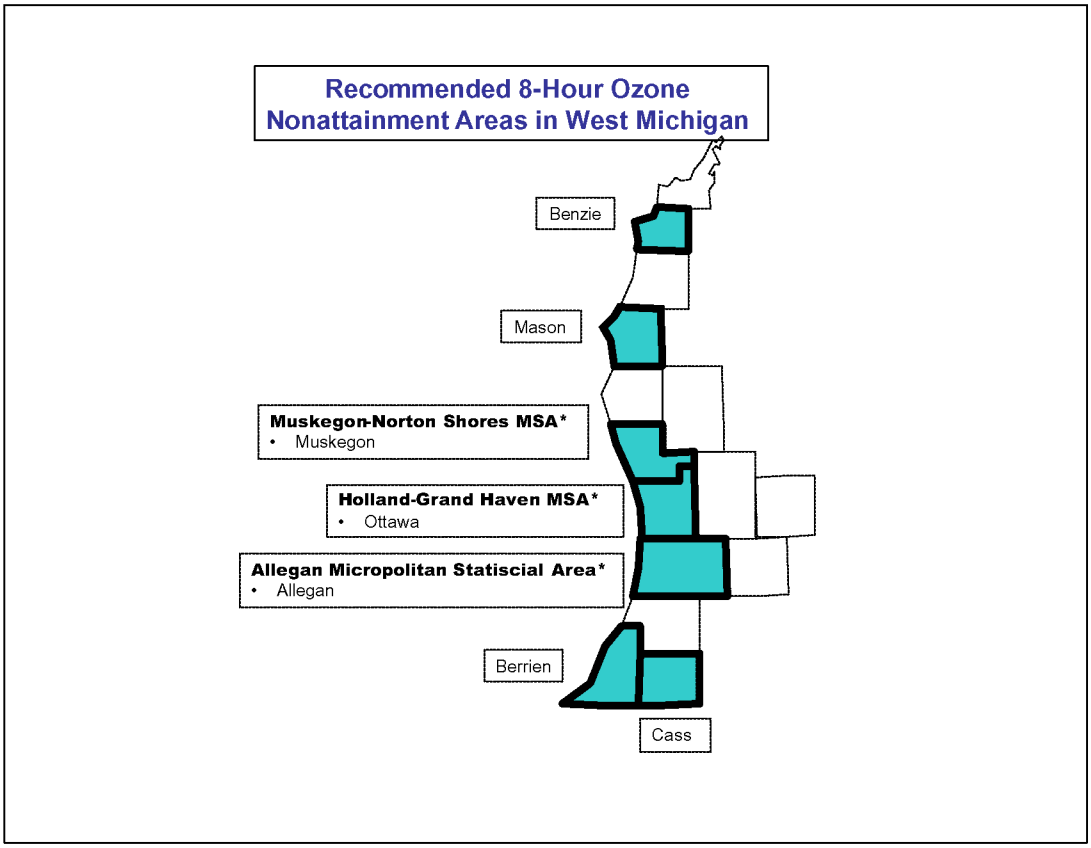


Figure 2
Recommended 8-hour Ozone
Nonattainment Areas in West Michigan

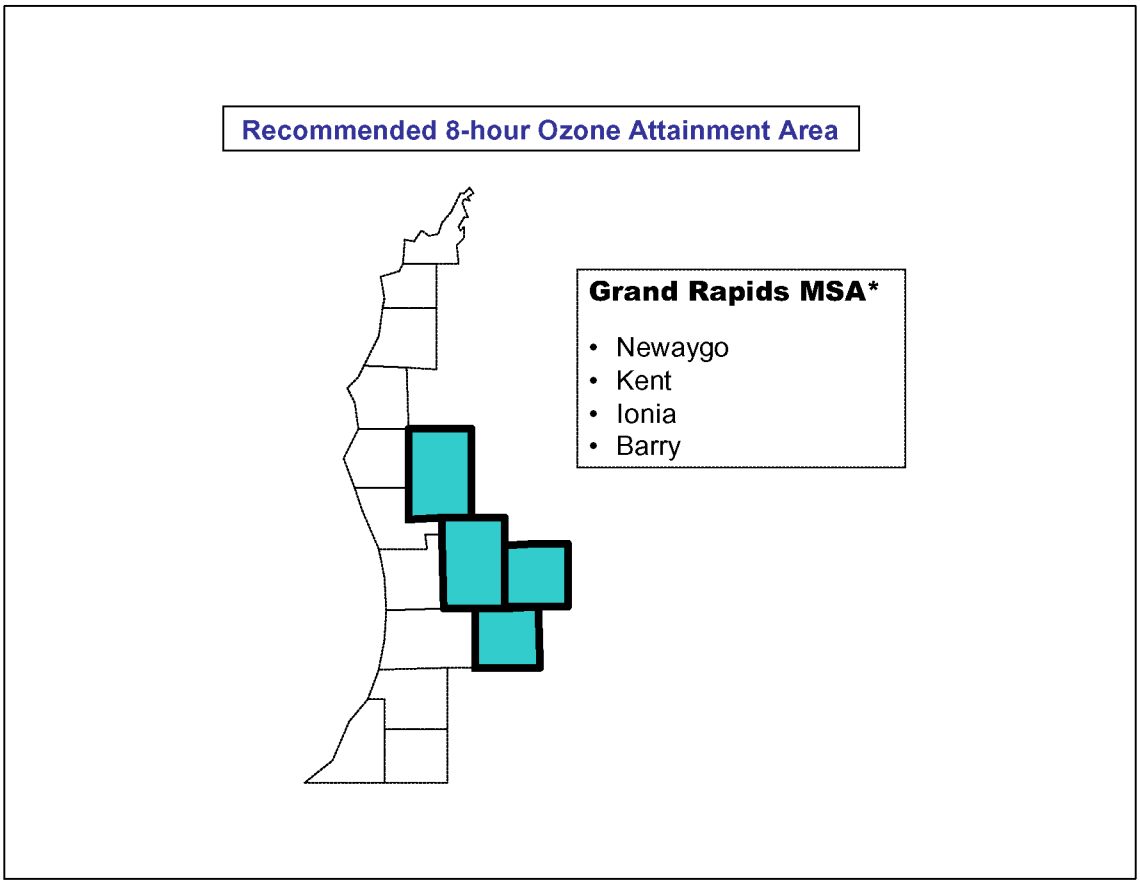


Figure 3
Recommended 8-hour Ozone Attainment Area

Prevailing Winds Demonstrating Transport into West Michigan

Ozone roses depict the correlation between wind direction and elevated ozone concentrations (above 70 parts per billion [pbb]) at several West Michigan monitoring sites. The roses show that these sites observe the highest ozone concentrations when the wind is out of the southwest.

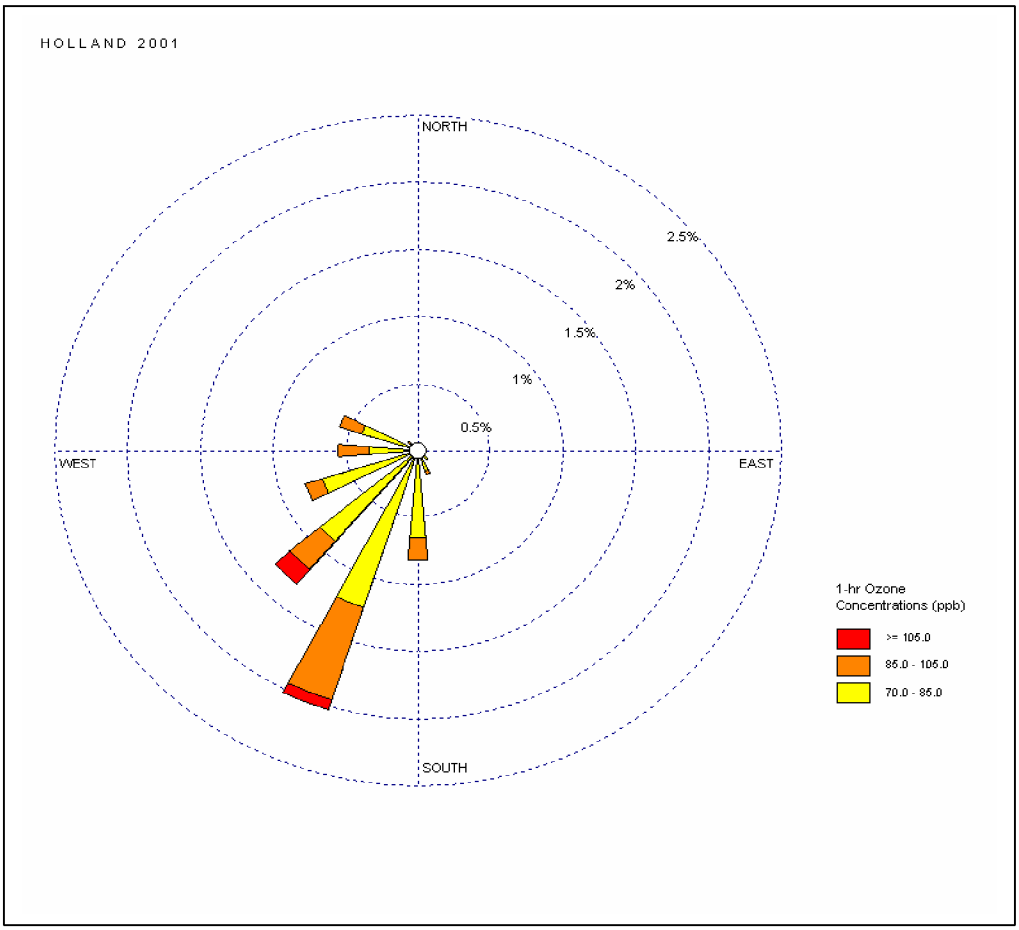


Figure 4
Holland 2001

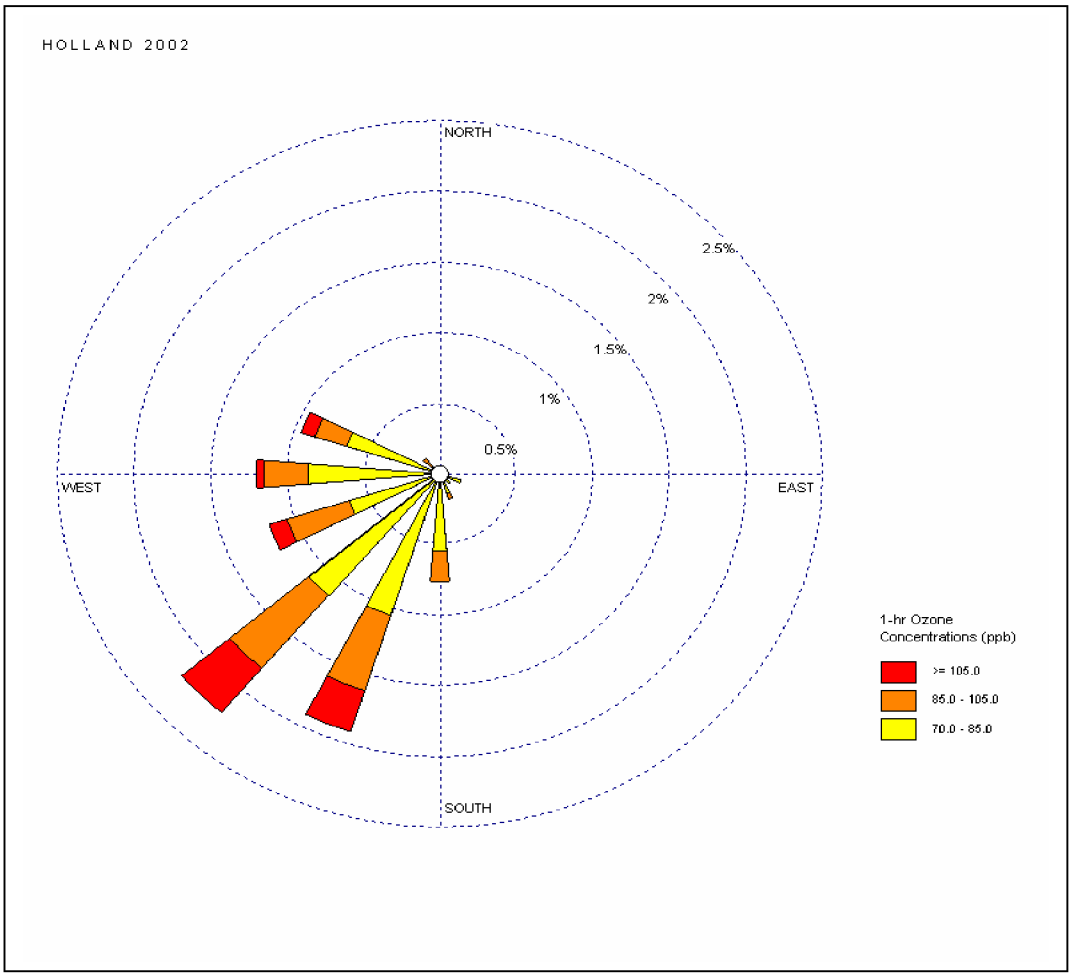


Figure 5
Holland 2002

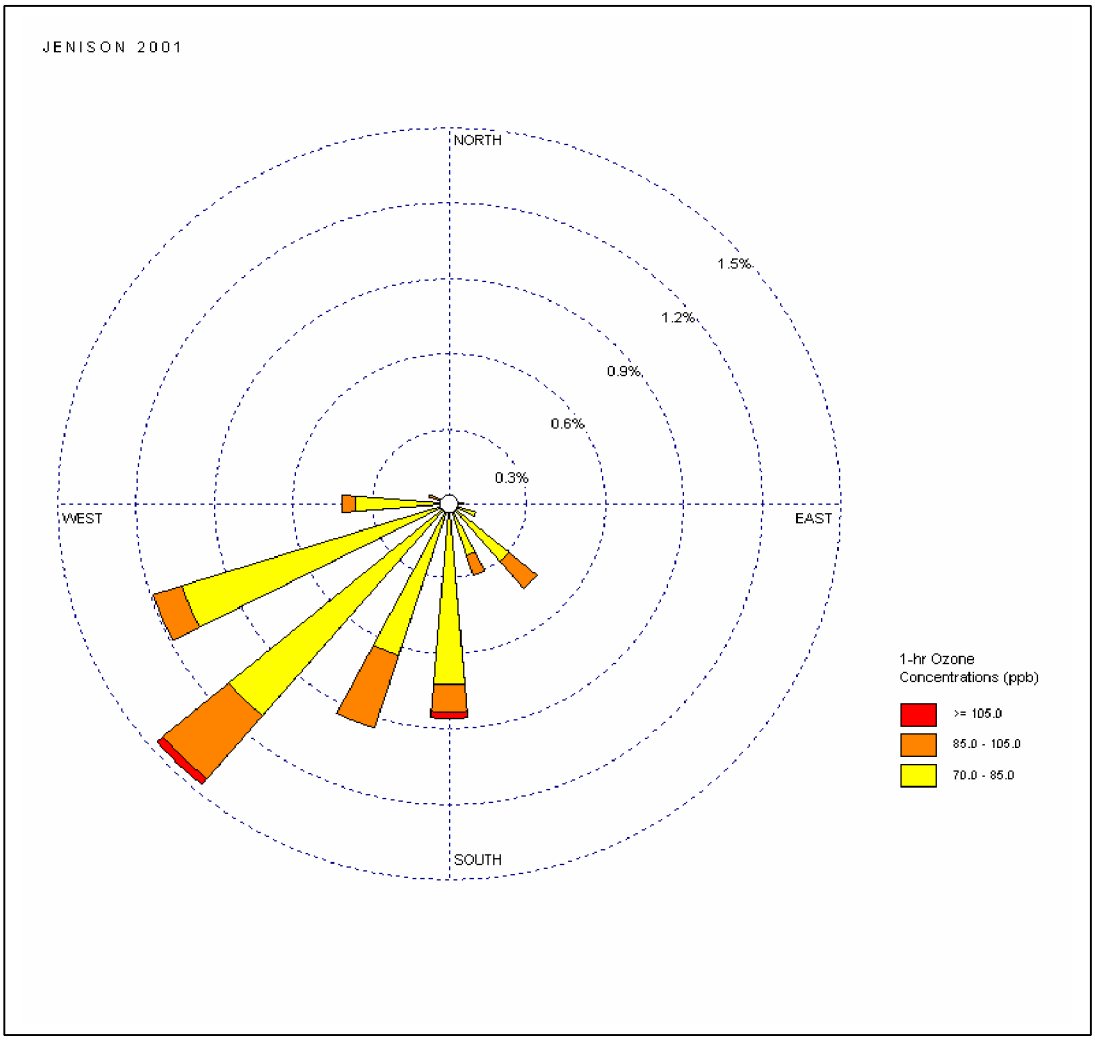


Figure 6
Jenison 2001

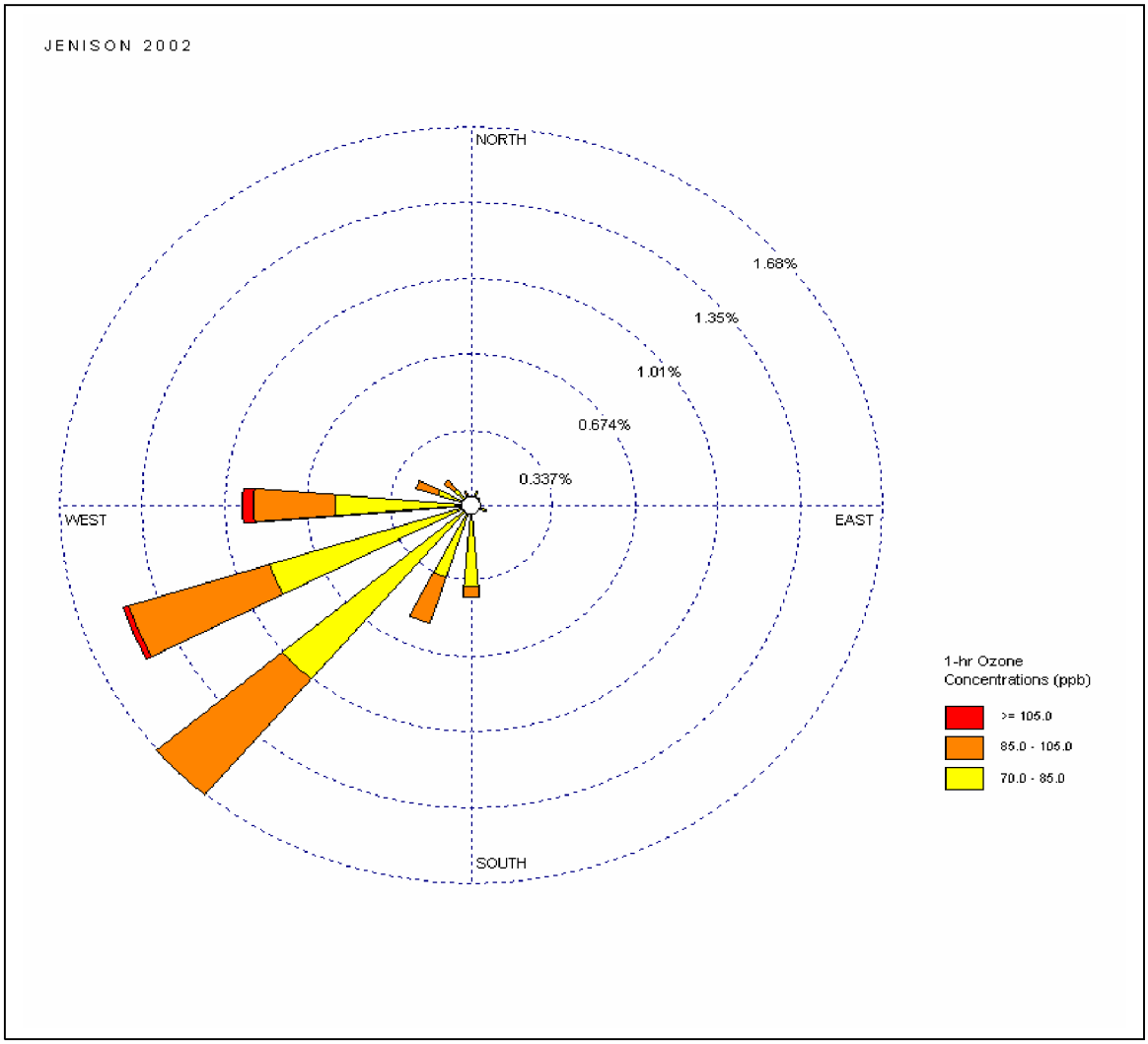


Figure 7
Jenison 2002

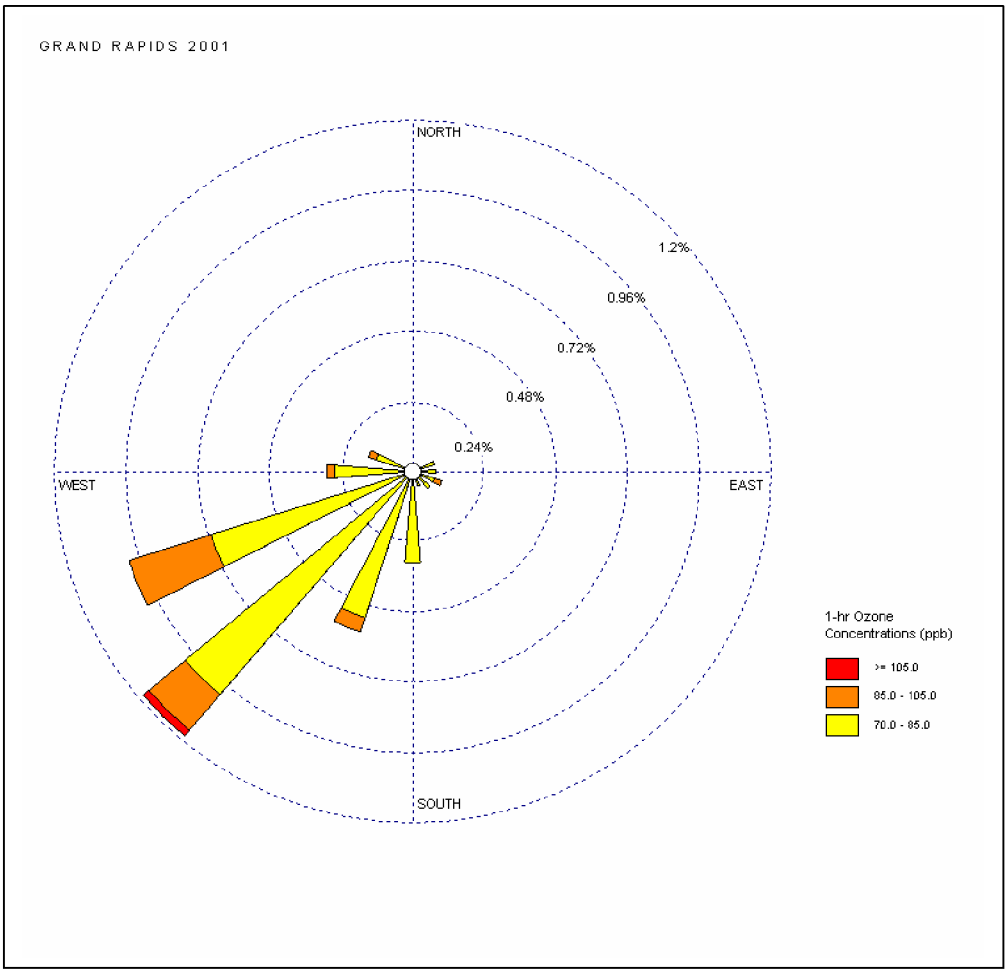


Figure 8
Grand Rapids 2001

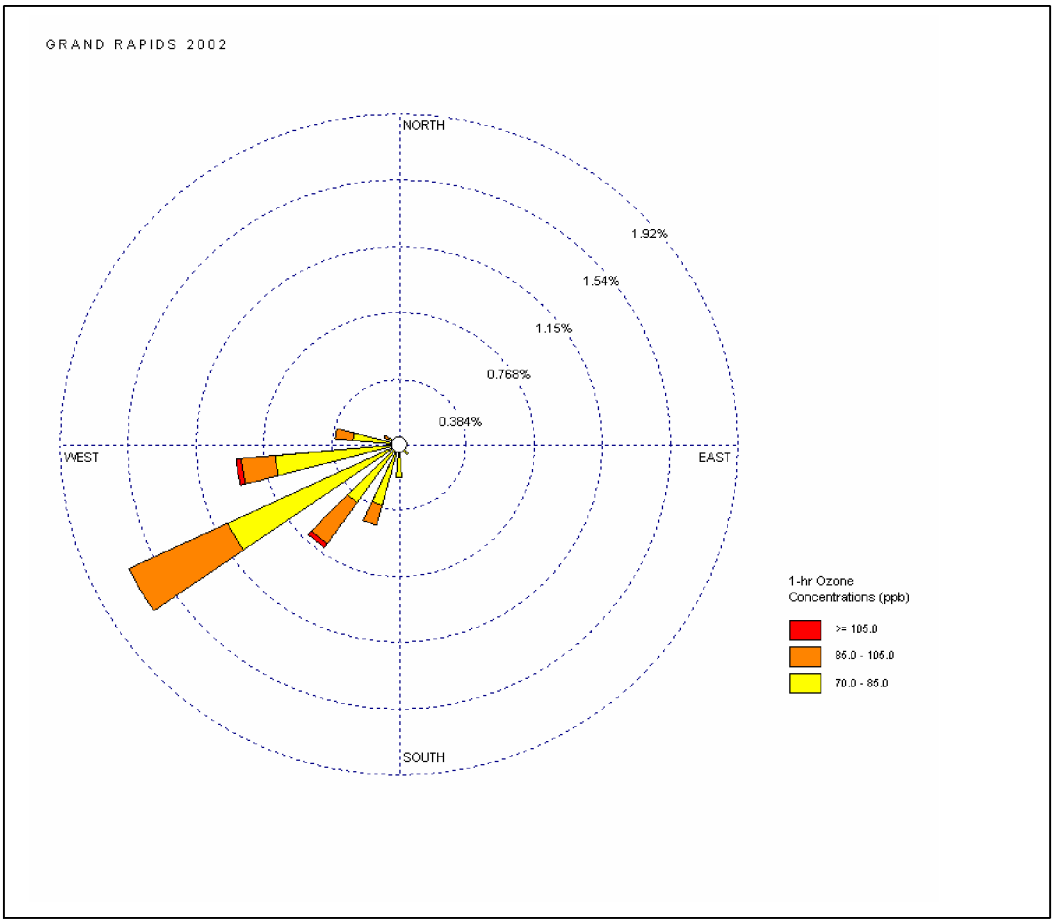


Figure 9
Grand Rapids 2002

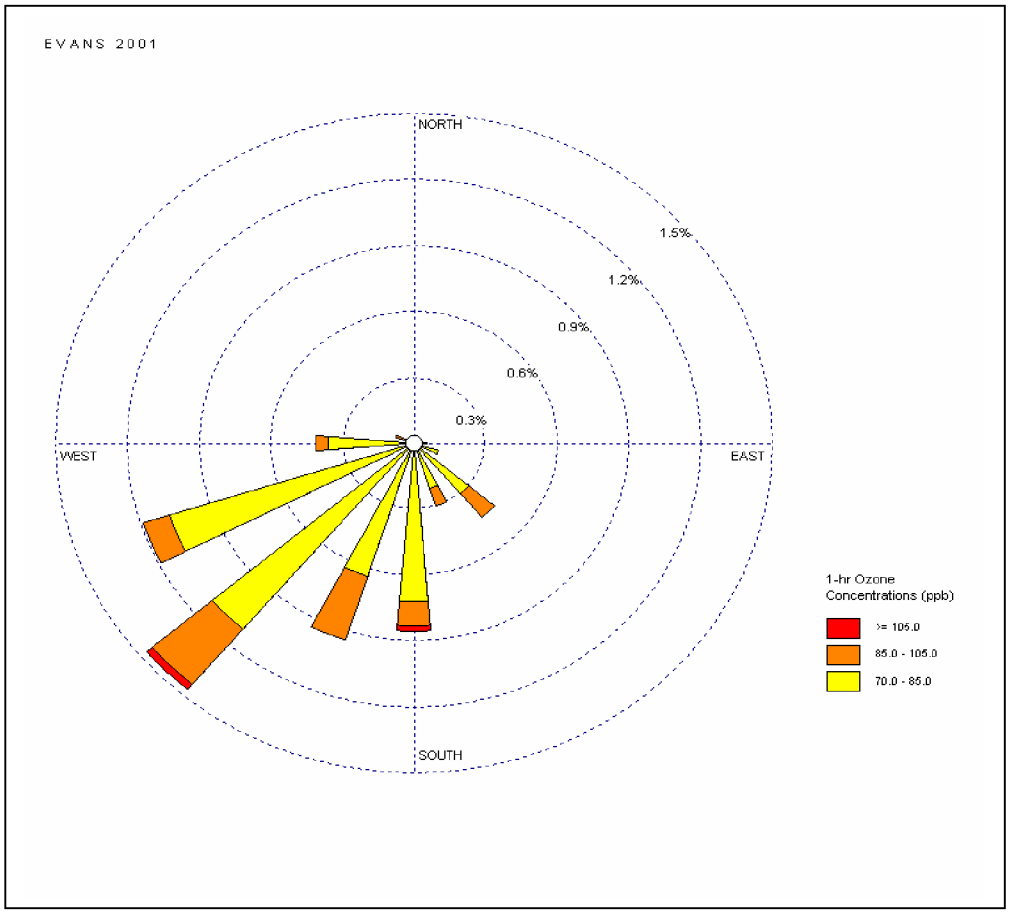


Figure 10
Evans 2001

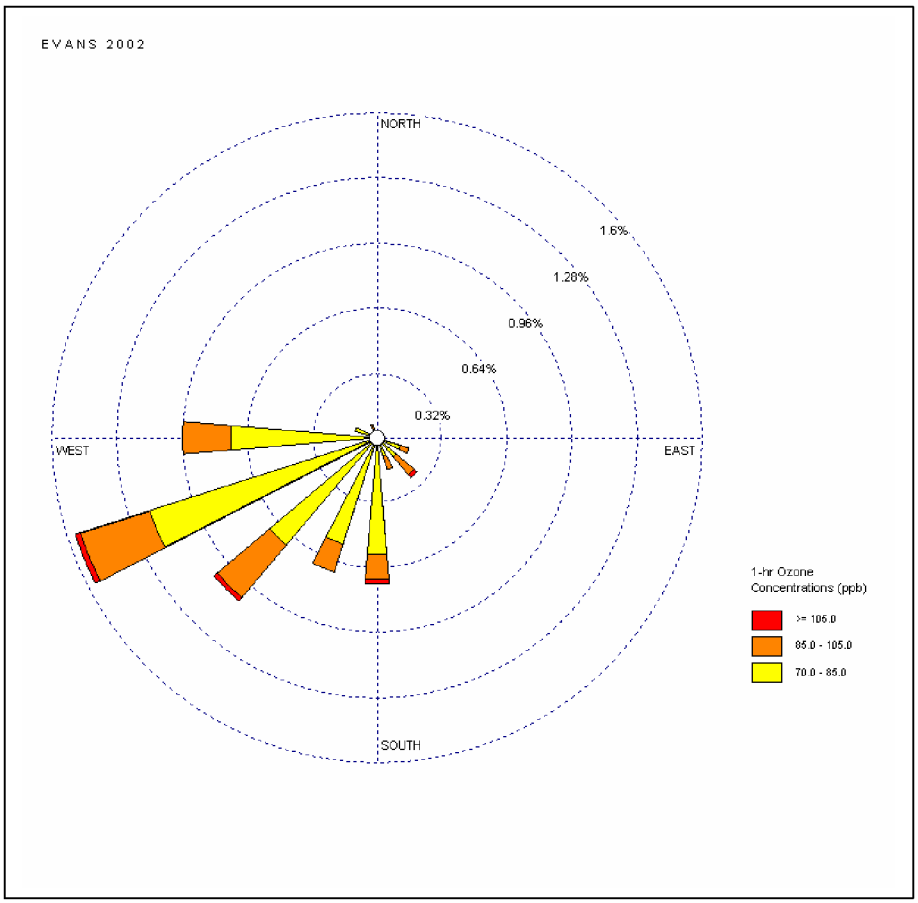


Figure 11
Evans 2002

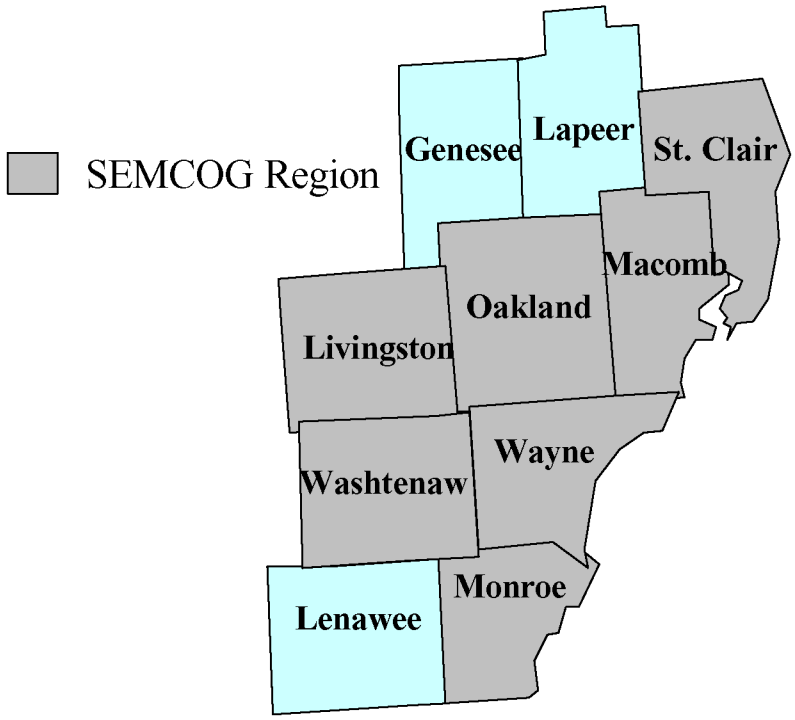
Southeast Michigan

A nonattainment designation for Southeast Michigan area is warranted. The MDEQ recommends that the nonattainment area boundaries for the for the 8-hour ozone standard remain the same seven counties of Wayne, Oakland, Macomb, St. Clair, Livingston, Washtenaw, and Monroe that comprise the current 1-hour ozone attainment area. These counties also coincide with the Metropolitan Planning Organization (MPO) boundaries for the region. The existing jurisdictional boundaries for the MPO, SEMCOG, for air quality and transportation planning should not be altered at this time. Past air quality planning has been effective in this region with the existing boundary. The Southeast Michigan area was one of the first major metropolitan areas to reach attainment of the 1-hour ozone standard. A new ambient air quality standard already requires extensive work for states and local areas. There is no compelling reason to further burden the MPOs with the added complications inherent in expanding boundaries. The State of Michigan can require ozone precursor controls on sources outside of nonattainment areas, if needed, except in cases where there is a federal prohibition.

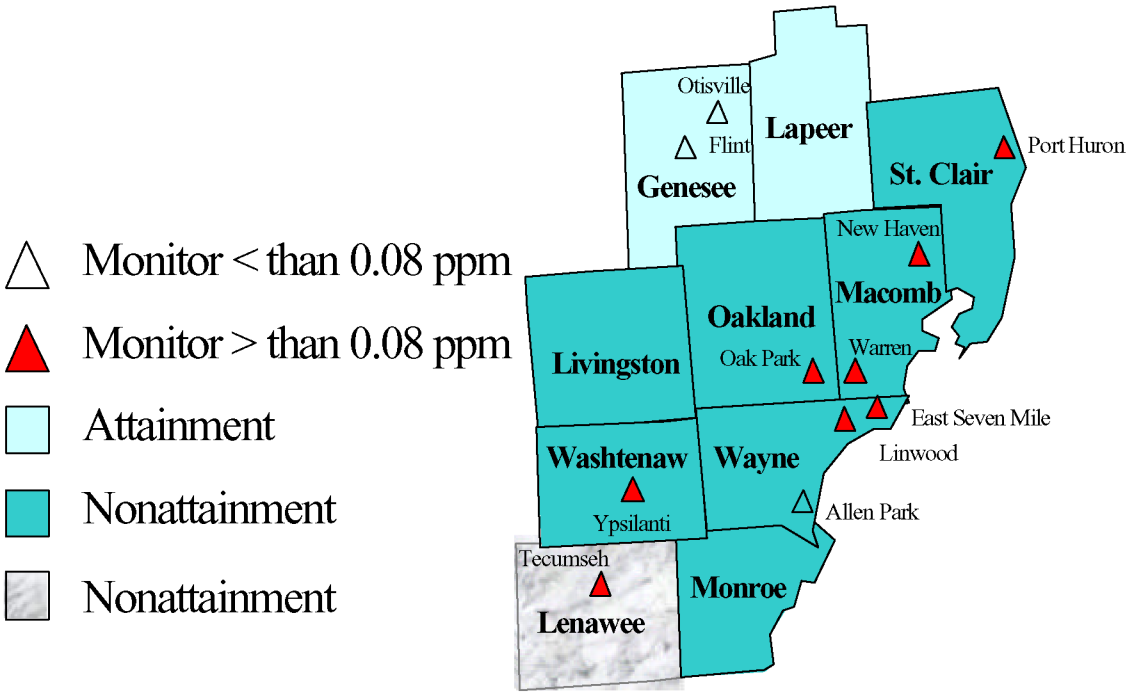
The other three counties in the Detroit-Ann Arbor-Flint CMSA, Genesee, Lapeer, and Lenawee, should be designated separately.

8-Hour Ozone Designation Recommendations for the Southeast Michigan Consolidated Metropolitan Statistical Area (CMSA)

Map 1
1999 Consolidated Metropolitan Statistical Area for Southeast Michigan



Map 2
Recommended 8-Hour Ozone
Designations for the
Southeast Michigan CMSA



Note: Based on monitoring data for 2000, 2001, and 2002.

Counties Outside the 1999 CMSA

The EPA should not include any counties outside of the Southeast Michigan CMSA in its 8-hour ozone designation. Because the surrounding counties either have differing meteorological conditions or a much smaller population and urban area than Detroit, these surrounding counties have very few connections to Southeast Michigan, both in terms of air quality management or transportation planning.

Justification for the Exclusion of Lenawee County

Lenawee County, located upwind of the Detroit area, is mostly rural in character and contributes little to the emissions of the Detroit region. The Tecumseh monitor in Lenawee County, has a 2000-2002 design value of .085, so a nonattainment designation is recommended. However, the MDEQ strongly urges EPA to designate Lenawee County as a separate nonattainment area from the seven-county recommended nonattainment boundary for Southeast Michigan (see Map 2, page 21). Lenawee County is likely to reach attainment levels of ozone long before the Detroit region and it should not be burdened with a nonattainment designation long after the county meets the standard, as it would be if included in the Southeast Michigan nonattainment area. Furthermore, Lenawee County is no longer even considered part of the 2000 Combined Statistical Area for Southeast Michigan, according to the U.S. Census. Existing MPO boundaries in Southeast Michigan also need to be considered, since Lenawee County is not part of the existing SEMCOG MPO boundary.

Emissions and air quality
Lenawee County comprises only 1.2% and 2.1% of the total NOx and volatile organic compound (VOC) emissions, respectively, in the Southeast Michigan 1999 CMSA (Tables 4 and 5, page 28). There is no evidence that reducing Lenawee County's small emissions contribution will reduce 8-hour ozone violations in the Detroit area. Violations of 8-hour ozone in Lenawee County, which is located upwind of the Detroit area, are likely due to ozone transport.

Population density and degree of urbanization including commercial development
The 2000 population density of Lenawee County is low at 131.8 persons per square mile (Table 6, page 29). This is significantly different than Monroe County, which is adjacent to Lenawee, and has a population density of 264.8 persons per square mile. In addition, the 2000 population of Lenawee County represents only 1.8% of the total Southeast Michigan 1999 CMSA population (Table 7, page 29). The largest metropolitan area in Lenawee County is the city of Adrian, which has 21,574 people according to the 2000 U.S. Census.

Lenawee County is not very urbanized. More than half of the population resides in the rural area (Table 8a, page 30). In addition, forest and farmland account for 81% of the land use according to the Natural Resource Conservation Service.

Monitoring data
There is one ozone monitor in Lenawee County in the city of Tecumseh, which has a 2000-2002 design value of .085 (Table 9, page 30). This monitor was placed there for the sole purpose of measuring upwind ozone concentrations for the Detroit area. Since 1990, the Tecumseh monitor has recorded only two violations of the 8-hour ozone standard, one in the 1994-1996 period, and the other in the 2000-2002 period. Because this monitor is upwind of the Detroit area in a county that is mostly rural in character, ozone transport is likely the reason for high ozone levels at the Tecumseh site. Therefore, Lenawee County's control strategy will likely be much different than that of the Detroit area.

Location of emission sources
There are only two major stationary sources of NOx emissions in Lenawee County (Map 3, page 37). Surrounding counties in the CMSA have at least double that amount. (A map of VOC emissions is not available because VOC emissions are not specified into particular grid cells in the DEQ's photochemical modeling process.)

Traffic and commuting patterns
Lenawee County contributes only 2% and 1.6% of NOx and VOC on-road mobile emissions in the total CMSA (Tables 4 and 5, page 28). The vehicle miles traveled (VMT) in Lenawee County is projected to increase by 28.5% from 2000 to 2025, a rate of 1.1% per year. By 2025, only 1.8% of the CMSA's total VMT will be attributed to Lenawee County (Table 10, page 31).

According to the county-to-county worker flow data from the 2000 U.S. Census, a small percentage of Lenawee County's workers, 21.8%, commute to the seven-county SEMCOG region. These workers comprise only 0.5% of the work force in the seven-county SEMCOG region (Table 11a, page 32).

Expected growth
Little growth occurred from 1990 – 2000 in Lenawee County and little growth is expected in future years, both in terms of population and employment. From 1990-2000, the rate of population growth was 0.74% per year (Table 7, page 29). From 2000 to 2020, the population of Lenawee County will increase by 6.9%, a reduction in the rate of growth to 0.33% per year (Table 12a, page 33). Like the population projections, employment projections show an increase of only 7.2% from 2000 to 2020, a rate of 0.34% per year (See Table 13, page 34).

Meteorology
As shown in the wind rose for Detroit on page 35, Lenawee County's dominant summer winds are from the south and southwest. Detroit is not contributing to Lenawee County's nonattainment problem, and given the information listed in these factors, Lenawee County is not a significant contributor to Detroit's nonattainment problem. Therefore, including them in the same designation boundary is not recommended.

High ozone concentrations in the Detroit area occur downwind of Lenawee County when winds are from the southwest. These winds transport ozone precursors over

Lakes Erie, Huron, and St. Clair, where ozone forms in the sunlight. It is a common occurrence for the winds to turn southeasterly, creating a lake effect, and pushing high ozone concentrations onshore. This lake effect ozone is typically measured at the Detroit urban monitors, and the downwind monitors in New Haven and Port Huron.

Geography/topography
There are no mountain ranges, air basins, or significant lake effects that need to be considered in Lenawee County.

Jurisdictional boundaries
Lenawee County is not a part of SEMCOG's planning boundary or the 1-hour ozone attainment boundary. Including Lenawee County in the seven-county recommended nonattainment area, that is, the SEMCOG region, would unnecessarily complicate transportation planning and conformity analyses and provide little air quality benefit for the Detroit area and Lenawee County. The coordination of work between SEMCOG and the Jackson MPO, of which Lenawee County is a member, would be an enormous undertaking with minimal air quality benefit because Lenawee County is neither a major contributor to Detroit's emissions nor a major receptor of Detroit's emissions.

Another item to note is that neither Lenawee County nor any of the other surrounding counties in the Detroit region will be ignored when planning for the new air quality standards. When evaluating ozone levels in the Detroit region, the Tecumseh monitor in Lenawee County is always involved in order to gain a better understanding of upwind ozone concentrations. Furthermore, as stated earlier, the State of Michigan can require emission reductions outside the nonattainment area if needed.

Level of control of emission sources
The State of Michigan has historically applied many air quality rules statewide. The State of Michigan can require ozone precursor controls on sources outside of nonattainment areas, if needed, except in cases where there is a federal prohibition. State rules for Reasonably Available Control Technology are applicable statewide.

Regional emission reductions
All major NOx sources in the 1999 Southeast Michigan CMSA are subject to NOx SIP call requirements.

Justification for the Exclusion of Genesee and Lapeer Counties

Both Genesee and Lapeer counties are located northwest of Detroit. Genesee County's current 1-hour ozone designation boundary should be expanded to include Lapeer County, which is experiencing relatively high growth in both population and VMT. However, Genesee and Lapeer counties should be designated separately from the seven-county Detroit region (Map 2, page 21) for the following reasons:

- Genesee and Lapeer counties neither receive significant emissions from the Detroit region, nor contribute significant emissions to the Detroit region, and
- Existing MPO and 1-hour ozone designation boundaries already in existence for Genesee County and the Detroit region should not be altered.

Emissions and air quality
Together Genesee and Lapeer counties contribute 7.2% and 11.5% of the total NOx and VOC emissions, respectively, in the 1999 CMSA (Tables 4 and 5, page 28). Because prevailing winds in this area are from the southwest, the seven-county Detroit region is not a major contributor of emissions to the Genesee/Lapeer area and vice versa.

Population density and degree of urbanization including commercial development
The population density of Genesee County is moderately high at 681.9 persons per square mile, but the population of Genesee County comprises only 8% of the total 1999 CMSA population (Table 6 and Table 7, page 29). Forty-five point eight percent (45.8%) of Genesee County's population resides in the urban area (Table 8c, page 30).

According to the 2000 U.S. Census, Genesee County is the 2000 Flint MSA, and a majority of the county is urbanized area as shown in Map 3, page 37. The urbanized area for the seven-county Detroit region is shown in Map 4, page 38. The Detroit urbanized area does have outlying areas that are close to Genesee County, but the urbanized area is centered around Detroit.

Lapeer County is a rural area. It has a low population density of 134.4 persons per square mile and comprises only 1.6% of the total 1999 CMSA population (Tables 6 and 7, page 29). Only 23.9% of the population lives in the urban area (Table 8b, page 30). Lapeer County is expected to grow in future years, however, as discussed later in this analysis.

Monitoring data
Genesee County has two ozone monitors; one is in Flint and the other is in Otisville. The Flint and Otisville monitors are measuring attainment of the 8-hour ozone standard with a design value of .084 for 2000-2002 (Table 9, page 30). If the design value of the 2001-2003 ozone data is above the standard, then a nonattainment designation is recommended. The issue is not whether an attainment or nonattainment designation is given for Genesee and Lapeer counties, but that they should be given separate designations from the seven-county Detroit region.

There are no ozone monitors in Lapeer County.

Location of emission sources
Thirteen major stationary sources of NOx emissions are located in Genesee County. Most of these facilities are located in the central and northern portion of the county and are thus fairly removed from the seven-county area.

There are only four major stationary sources of NOx emissions in Lapeer County.

Traffic and commuting patterns
Genesee County contributes 9.4% and 9.3% of the NOx and VOC on-road mobile emissions, respectively, in the 1999 CMSA (Tables 4 and 5, page 28). The VMT is

projected to increase by 29.1% from 2000 to 2025, a stable rate of 1.1% per year. By 2025, Genesee County is expected to account for 9.5% of the total VMT in the 1999 CMSA (Table 10, page 31). The county-to-county worker flow data shows that only 16.3% of Genesee County's workers commute to the seven-county recommended nonattainment area. This represents a mere 1.4% of the workers in the seven-county area (Table 11a, page 32).

Lapeer County contributes 2.7% and 1.9% of the on-road mobile NOx and VOC emissions, respectively, in the 1999 CMSA (Tables 4 and 5, page 28). The 2000-2025 projection of VMT growth for Lapeer County, however, is the largest in the region at 43%, a rate of 1.7% per year even though Lapeer County is projected to contribute only 2% of the VMT in the 1999 CMSA by 2025 (Table 10, page 31). According to worker flow data from the U.S. Census, 40.7% of Lapeer County's workers commute to the seven-county region; however, these workers comprise only 0.7% of the work force in the seven-county region (Table 11a, page 32).

Expected growth

Genesee County has a rather high population density and a large urban area. The expected population and employment growth, however, is quite low. From 1990-2000, Genesee County's growth rate was 0.12% per year (Table 7, page 29). From 2000-2020, Genesee County's population is projected to increase by 5.3%, a rate of just 0.25% per year (Table 12a, page 33). Employment projections for Genesee County are higher than the population projections, but this growth rate is still relatively low. From 2000-2020, total employment will increase by 13.4%, a rate of 0.64% per year (Table 13, page 34).

In direct contrast to Genesee County, Lapeer County has a rather high population growth rate of 1.6% per year from 1990-2000, second only to Livingston County (Table 7). From 2000-2020, the population growth rate is expected to increase 21.2%, a rate of 1% per year and the fourth highest in the 1999 CMSA (Table 12a, page 33). The 2000-2020 total employment projection for Lapeer County is comparable with the employment projection for Genesee County. An increase of 12.6% is expected during this time frame, a rate of 0.6% per year (Table 13, page 34).

Meteorology

A wind rose for Flint, the major city in Genesee County, for April through September 2002 shows that the winds are mainly from the South and Southwest (Wind Rose 2, page 36). This southwesterly wind flow is similar to Detroit's wind patterns. In other words, Genesee and Lapeer counties, located northwest of Detroit, are neither major contributors nor major receptors of emissions from the Detroit region.

On occasion, however, the two Genesee County monitors measure elevated ozone levels when winds are from the southeast Detroit region. Emission reductions will occur in the seven-county Detroit region and can be expected to slightly benefit air quality in these two counties as well.

Geography/topography
There are no mountain ranges, air basins, or significant lake effects that need to be considered in either Genesee or Lapeer counties.

Jurisdictional boundaries
Existing one-hour ozone designation boundaries coincide with the Flint and Detroit MPO boundaries in the region (Map 5, page 39). Genesee County is the jurisdictional MPO boundary for the Genesee County Metropolitan Planning Commission (GCMPC). The MPO for the Detroit region, SEMCOG, consists of the seven-county recommended nonattainment area for Detroit: Livingston, Macomb, Monroe, Oakland, St. Clair, Washtenaw, and Wayne counties. These existing MPO jurisdictional boundaries are another reason to have separate designation boundaries for Genesee and Lapeer Counties and the seven-county Detroit region. The GCMPC and SEMCOG have distinct procedures in place for conformity analyses and transportation planning that would become unnecessarily complicated if the two areas were included in the same designation boundary.

While the jurisdictional boundary for the GCMPC does not include Lapeer County, the 8-hour designation boundary should include both counties because of the high amount of growth that is occurring in Lapeer County. In addition, Genesee and Lapeer counties already coordinate work on several transportation and non-transportation related items, primarily due to their membership on the Genesee, Lapeer, and Shiawassee Region V Planning and Development Commission (GLS Region V PDC). The transportation work that is coordinated through GLS Region V PDC includes:

- Traffic counts;
- Highway Performance Monitoring System (HPMS) work;
- The Asset Management program;
- MDOT (Michigan Department of Transportation) Enhancement, Bridge, and Safety Applications;
- The regional Rideshare program; and
- The Regional Transit Study, which addressed interregional public transportation needs.

The non-transportation related work performed by the GLS Region V PDC includes reviewing applications that are eventually submitted to agencies such as the Michigan Department of Natural Resources (MDNR), the Michigan State Housing Development Authority (MSHDA), and the U.S. Department of Housing and Urban Development (HUD). An air quality designation that links these two counties and builds on their existing relationships is more reasonable than including Lapeer County with the Detroit region's designation.

It should be noted that having separate designation boundaries in Southeast Michigan does not mean that there will be no coordination on air quality planning with the various groups located in the 1999 CMSA. The MDEQ, SEMCOG, and the GCMPC are well aware that effective air quality planning must consider surrounding counties, and efforts are currently underway to better understand the nature of 8-hour ozone violations in the entire area.

Level of control of emission sources
The State of Michigan has historically applied many air quality rules statewide. The State of Michigan can require ozone precursor controls on sources outside of nonattainment areas, if needed, except in cases where there is a federal prohibition. State rules for Reasonably Available Control Technology are applicable statewide.

Regional controls
All major NOx sources in the 1999 Southeast Michigan CMSA are subject to NOx SIP call requirements.

Table 4

NOx Emissions in Southeast Michigan CMSA (Tons/Yr)						
COUNTY	NOx - Point	NOX - Area	NOx - Non-road	NOx - On-road	NOx Total	% of Total
Genesee	2,184.17	1,545.10	2,515.95	14,512.77	20,757.99	5.7
Lapeer	22.86	151.75	1,156.44	4,241.33	5,572.38	1.5
Lenawee	118.16	217.12	1,079.36	3,089.57	4,504.21	1.2
Livingston	437.00	361.92	962.45	6,493.80	8,255.17	2.3
Macomb	5,126.40	2,279.34	6,180.68	19,053.01	32,639.43	9.0
Monroe	59,586.38	239.12	2,488.37	5,647.02	67,960.89	18.7
Oakland	1,117.08	3,865.95	7,767.84	30,315.55	43,066.42	11.9
St. Clair	40,577.46	305.38	3,911.48	6,880.01	51,674.33	14.2
Washtenaw	1,170.42	986.83	2,353.54	10,278.74	14,789.53	4.1
Wayne	38,500.28	4,230.14	17,116.01	54,125.94	113,972.37	31.4
TOTAL	148,840.21	14,182.65	45,532.12	154,637.74	363,192.72	100

Table 5

VOC Emissions in Southeast Michigan CMSA (Tons/Yr)						
COUNTY	VOC - Point	VOC - Area	VOC - Non-road	VOC - On-road	VOC Total	% of Total
Genesee	2,600.21	9,180.23	1,830.99	10,834.21	24,445.64	8.8
Lapeer	1,976.72	2,632.82	806.54	2,170.14	7,586.22	2.7
Lenawee	389.92	2,908.34	648.97	1,892.93	5,840.16	2.1
Livingston	315.74	3,594.28	826.11	3,458.23	8,194.36	2.9
Macomb	3,028.18	14,261.43	4,223.56	15,330.55	36,843.72	13.3
Monroe	6,327.63	2,928.51	1,089.69	3,285.19	13,631.02	4.9
Oakland	5,002.95	20,881.09	8,173.13	23,394.86	57,452.03	20.7
St. Clair	1,209.83	3,794.91	1,009.63	4,155.79	10,170.16	3.7
Washtenaw	633.36	6,357.58	3,043.21	7,200.19	17,234.34	6.2
Wayne	8,707.12	35,437.55	7,783.49	44,716.79	96,644.95	34.8
TOTAL	30,191.66	101,976.74	29,435.32	116,438.88	278,042.60	100

Source for Tables 1 and 2: EPA's Final 1999 NEI version 2, posted November 2002

Table 6

Population Density	
County	2000 Pop./sq. mi.
Livingston	276.1
Macomb	1,640.5
Monroe	264.8
Oakland	1,368.6
St. Clair	226.7
Washtenaw	454.8
Wayne	3,356.1
Genesee	681.9
Lapeer	134.4
Lenawee	131.8

Source: U.S. Census

Table 7

Population of the Southeast Michigan CMSA, 1990-2000					
County	1990 Population	2000 Population	Population Change	Growth Rate (%/yr)	Percent of 2000 Total Pop.
Livingston	115,645	156,951	41,306	3.25	2.9
Macomb	717,400	788,149	70,749	0.90	14.4
Monroe	133,600	145,945	12,345	0.84	2.7
Oakland	1,083,592	1,194,156	110,564	0.93	21.9
St. Clair	145,607	164,235	18,628	1.16	3.0
Washtenaw	282,937	322,895	39,958	1.28	5.9
Wayne	2,111,687	2,061,162	-50,525	-0.22	37.8
Genesee	430,459	436,141	5,682	0.12	8.0
Lapeer	74,768	87,904	13,136	1.60	1.6
Lenawee	91,476	98,890	7,414	0.74	1.8
Total	5,187,171	5,456,428	269,257	0.47	100

Source: U.S. Census

Table 8a

Lenawee County-2000 Urban/Rural Split		Percentage
# of persons in urban area	45,355	45.9
# of persons in rural area	53,535	54.1
TOTAL	98,890	100.0

Table 8b

Lapeer county-2000 Urban/Rural Split		Percentage
# of persons in urban area	21,038	23.9
# of persons in rural area	66,866	76.1
TOTAL	87,904	100.0

Table 8c

Genesee County-2000 Urban/Rural Split		Percentage
# of persons in urban area	45,250	45.8
# of persons in rural area	53,640	54.2
TOTAL	98,890	100.0

Table 9

2000-2002 8-Hour Ozone Monitoring Data for the Detroit-Ann Arbor-Flint CMSA

Monitoring Site	Purpose	2000 4th High (ppm)	2001 4th High (ppm)	2002 4th High (ppm)	Design Value (ppm)	Rounded Design Value (ppm)
Allen Park	Pop exp.	0.067	0.080	0.088	0.078	0.08
Detroit E. 7 Mile	Max. conc.	0.080	0.092	0.083	0.085	**0.09**
Detroit Linwood	Pop. exp.	0.077	0.087	0.092	0.085	**0.09**
Flint	Pop. exp.	0.072	0.091	0.088	0.083	0.08
New Haven	Max. conc.	0.075	0.095	0.095	0.088	**0.09**
Oak Park	Pop. exp.	0.075	0.090	0.093	0.086	**0.09**
Otisville	Max. conc.	0.074	0.091	0.089	0.084	0.08
Port Huron	Pop. exp.	0.080	0.084	0.100	0.088	**0.09**
Tecumseh	Backgrd.	0.082	0.086	0.089	0.085	**0.09**
Warren	Max. conc.	0.077	0.094	0.092	0.087	**0.09**
Ypsilanti	Pop. exp.	0.078	0.092	0.091	0.087	**0.09**

Note: The monitoring sites in bold type are violating the 8-hour ozone standard.

Table 10

Summer Daily VMT				
Year	County			
	Genesee	Lapeer	Lenawee	7-county area
2000	12,492,958	2,344,471	2,362,255	131,999,400
2005	13,361,936	2,578,147	2,506,136	137,029,200
2010	14,335,023	2,831,985	2,684,798	141,041,600
2015	14,880,237	2,999,375	2,800,613	143,051,700
2020	15,578,700	3,188,047	2,901,403	144,612,400
2025	16,125,918	3,351,425	3,036,161	147,777,100
% Change	29.1	43.0	28.5	12.0
% of Total 2025 VMT	9.5	2.0	1.8	86.8

Source: 7-county area numbers are from SEMCOG's spring 2003 conformity analysis (Transportation:/Air_Quality/Win03).
Numbers for Genesee, Lapeer, and Lenawee Counties provided by MDOT.

Table 11a

Journey to Work Data from the 2000 U.S. Census				
County	# of workers in county	# of workers who drive to 7-county area	% workers who drive to 7-county area	% of workers in 7-county area from county*
Genesee	187,588	30,541	16.3	1.4
Lapeer	40,141	16,340	40.7	0.7
Lenawee	45,822	9,975	21.8	0.5

*The total number of workers in the 7-county SEMCOG area is 2,208,906.

Table 11b

Journey to Work Data from the 2000 U.S. Census				
County	# of workers in county	# of workers who drive to 3-county area	% workers who drive to 3-county area	% of workers in 3-county area from county*
Livingston	79,729	3,102	3.9	1.1
Macomb	383,664	1,170	0.3	0.4
Monroe	68,835	823	1.2	0.3
Oakland	603,761	7,248	1.2	2.6
St. Clair	76,437	1,234	1.6	0.5
Washtenaw	169,169	1,249	0.7	0.5
Wayne	827,311	1,008	0.1	0.4

*The total number of workers in the 3-county area is 273,551. The 3-county area refers to Genesee, Lapeer, and Lenawee Counties.

Table 12a

Population Projections for Lapeer, Lenawee, and Genesee Counties						
County	2000 Estimate	2005	2010	2015	2020	% Change
Lapeer	88,306	93,052	96,460	101,226	107,041	21.2
Lenawee	99,039	100,568	101,347	103,077	105,849	6.9
Genesee	436,829	446,585	451,042	466,356	459,851	5.3

Source: April 2003 REMI Model (Regional Economic Models, Inc.) results, provided by the University of Michigan and the Michigan Department of Transportation.

Table 12b

Population Projections for 7-county SEMCOG region						
County	2000 Census	2005	2010	2015	2020	% Change
Livingston	156,951	179,733	196,950	216,914	239,059	52.3
Macomb	788,149	811,251	830,143	851,415	876,371	11.2
Monroe	145,945	156,533	167,375	175,108	182,345	24.9
Oakland	1,194,156	1,229,625	1,258,206	1,288,922	1,309,461	9.7
St. Clair	164,235	171,312	176,795	185,608	192,626	17.3
Washtenaw	322,895	342,163	365,603	384,075	401,076	24.2
Wayne	2,061,162	2,046,588	2,038,012	2,027,915	2,015,793	-2.2
Detroit	951,270	928,582	908,883	892,263	878,817	-7.6
Balance Wayne	1,109,892	1,118,006	1,129,129	1,135,652	1,136,976	2.4

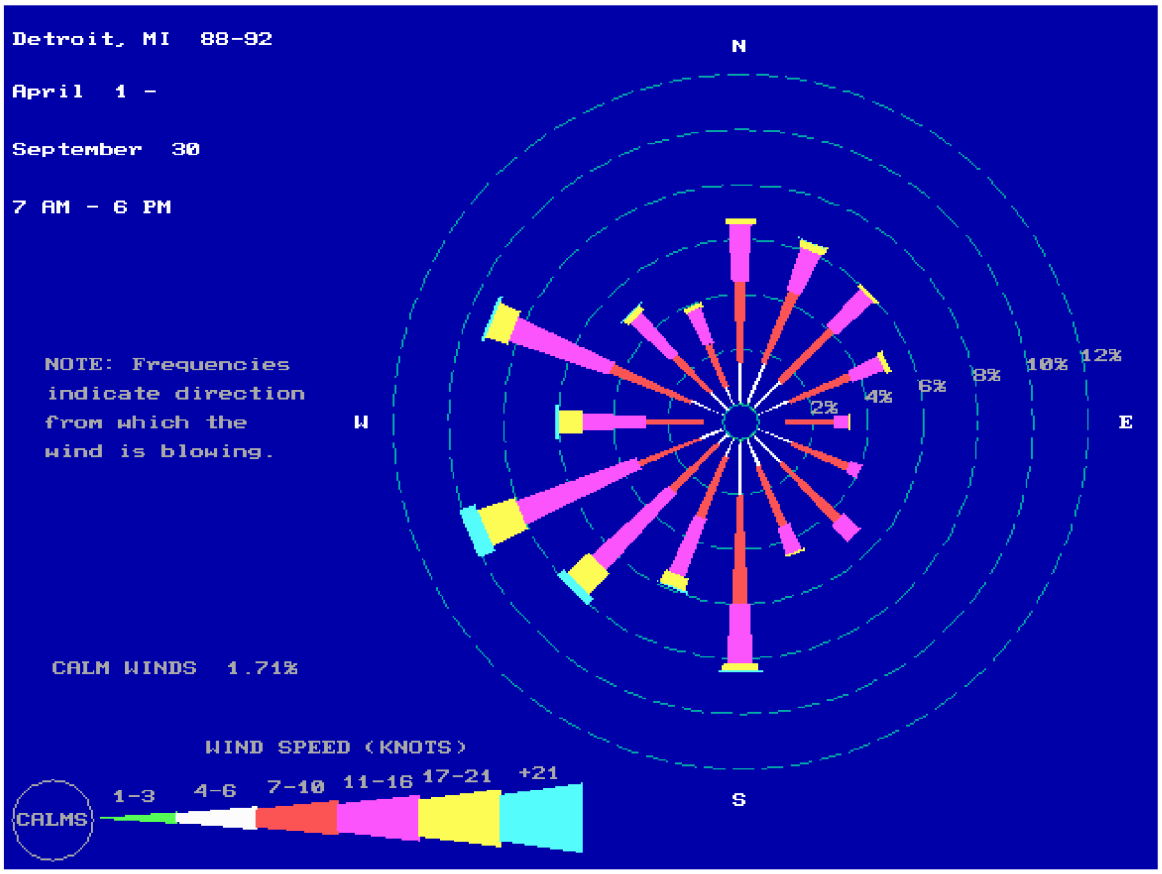
Source: 2030 Regional Development Forecast for Southeast Michigan, SEMCOG, October 2001

Table 13

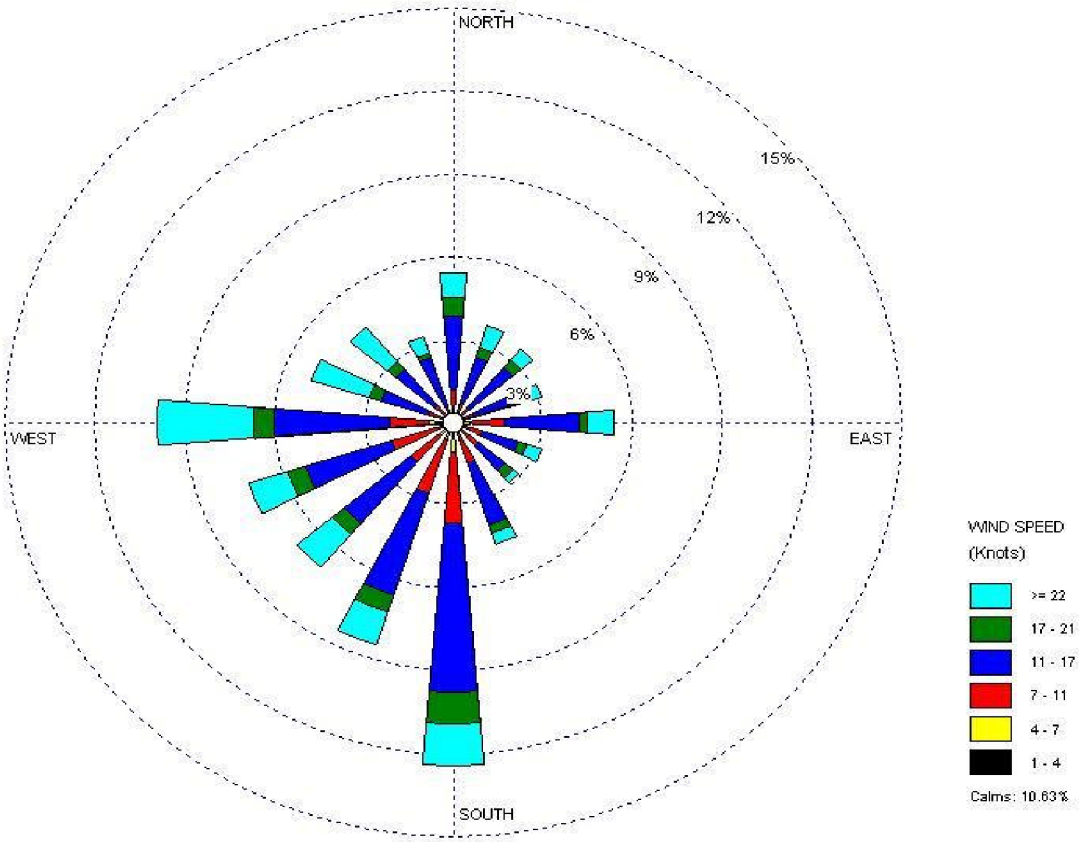
Projection of Total Employment for Southeast Michigan CMSA						
County	Year					% Change
	2000	2005	2010	2015	2020	
Livingston	59,186	70,241	78,188	86,068	91,653	54.9
Macomb	383,308	398,577	411,534	424,620	430,008	12.2
Monroe	54,375	57,942	61,454	65,109	68,313	25.6
Oakland	910,441	961,096	1,016,875	1,058,697	1,076,435	18.2
St. Clair	64,531	66,228	70,456	73,694	76,191	18.1
Washtenaw	230,212	238,518	257,970	268,740	275,285	19.6
Wayne	971,127	987,745	994,590	1,005,996	1,016,710	4.7
Detroit	345,465	330,329	320,391	313,942	309,547	-10.4
Balance Wayne	625,662	657,416	674,199	692,054	707,163	13.0
Genesee	177,477	178,758	184,623	190,766	201,247	13.4
Lapeer	49,937	53,573	55,147	55,495	56,226	12.6
Lenawee	50,880	53,405	54,325	54,428	54,568	7.2

Source: Numbers for SEMCOG region are taken from SEMCOG's 2030 Regional Development Forecast, October 2001. Genesee numbers are taken from the Genesee County 2025 Long Range Transportation Plan. Lapeer and Lenawee County's numbers are taken from the 2003 REMI model results, provided by the University of Michigan and MDOT.

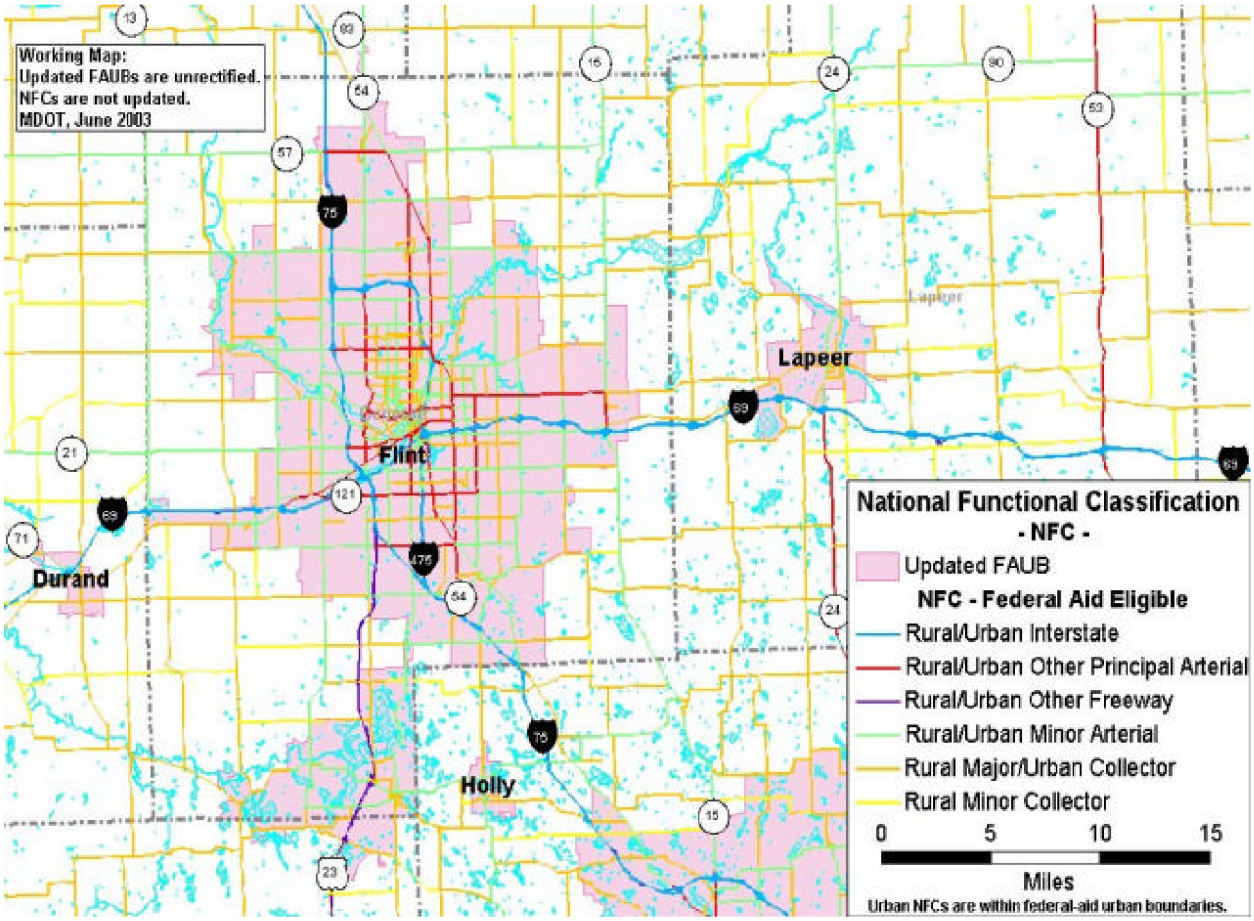
Wind Rose 1—Detroit



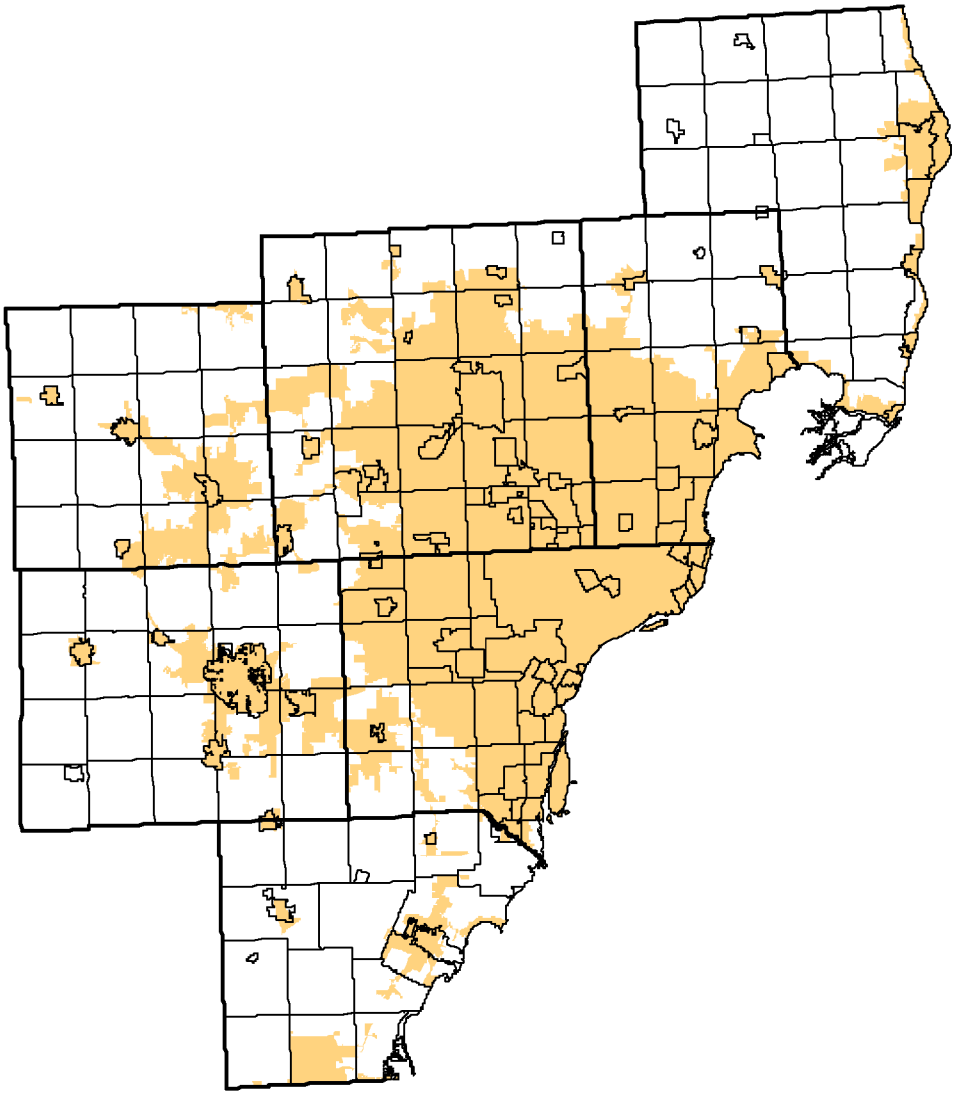
Wind Rose 2—Flint



Map 3
Federal Urban Air Boundary for Genesee and Lapeer Counties

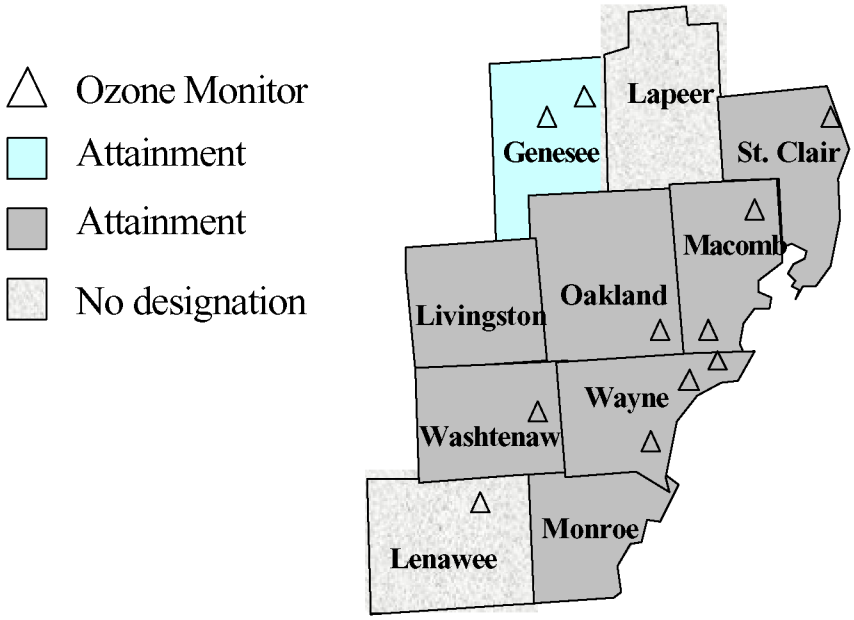


Map 4
Southeast Michigan Urbanized Area



Map 5

One-Hour Ozone Designation Boundaries
Southeast Michigan CMSA



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