STATE OF MICHIGAN
DEPARTMENT OF ENVIRONMENTAL QUALITY
LANSING

JENNIFER M. GRANHOLM
GOVERNOR

STEVEN E. CHESTER
DIRECTOR

October 14, 2008

Ms. Lynn Buhl, Regional Administrator
U.S. Environmental Protection Agency
Region 5
77 West Jackson Boulevard (R-19J)
Chicago, Illinois 60604-3590

Dear Ms. Buhl:

The Michigan Department of Environmental Quality (MDEQ) has reviewed your letter of August 18, 2008, to Governor Jennifer M. Granholm. Thank you for sending me a copy of this letter, which was also published in the *Federal Register* on September 2, 2008. Your letter identifies counties in Michigan that the U.S. Environmental Protection Agency (EPA) believes should be included in the nonattainment area for the 24-hour fine particulate matter less than 2.5 microns in diameter (PM2.5) national ambient air quality standard. The MDEQ has a different opinion and would like to take this opportunity to provide the attached additional support for our recommendations initially made in our letter dated December 18, 2007.

Thank you for your consideration of our revised recommendations. We look forward to a continued dialog with the EPA on these critical designations. If you have questions about our recommendations, please contact Mr. G. Vinson Hellwig, Chief, Air Quality Division, at 517-373-7069.

Sincerely,

Steven E. Chester
Director
517-373-7917

Attachments
cc: Governor Jennifer M. Granholm
Ms. Cheryl Newton, EPA Region 5
Mr. Jim Sygo, Deputy Director, MDEQ
Mr. G. Vinson Hellwig, MDEQ

Michigan's PM2.5 Nonattainment Areas
Response to EPA's Letter of August 18, 2008
to Governor Jennifer M. Granholm's Letter

Issues with Methodology

The U.S. Environmental Protection Agency (EPA) used a nine-factor analysis based on pollutant emissions, air quality data, population density and growth, traffic and commuting patterns, meteorology, geography, jurisdictional boundaries, and control of emissions sources to determine a Contributing Emissions Score (CES) for each county.

Michigan maintains that the CES calculation is a complicated and obscure analysis of air pollution concentrations across Michigan. Ambient values clearly are the best representation of actual environmental conditions in areas of concern. The CES calculation used to determine the daily PM2.5 nonattainment areas is much more complex than the version used previously for the annual PM2.5 designations. The Michigan Department of Environmental Quality (MDEQ) is concerned about the extensive use of assumptions and weighting factors, all of which culminate in propagation of error in the final result.

Grand Rapids Nonattainment Area

The EPA is proposing to designate Kent and Ottawa Counties as nonattainment for the 2006 daily PM2.5 standard. The MDEQ recommended that the boundary for nonattainment include only Kent County in our December 18, 2007 letter to the EPA because the only violating monitor in West Michigan is in Kent County, based on 2004-2006 data used to make states' boundary recommendations. The EPA considered three-year averages from both 2004-2006 and 2005-2007 to make the proposed designations, neither of which show any West Michigan monitors violating except for the one in Kent County. In fact, monitored values continue to decrease, and based on the most recent values, the MDEQ believes that the three-year average for 2006-2008 is likely to show Kent County to be attaining the daily PM2.5 standard. The Grand Rapids metropolitan area has had daily PM2.5 values below the standard every year since 2002 except for 2005 (see Table 1). Both 2002 and 2005 are considered to have extreme meteorological conditions (extended periods of air stagnation), with 2005 being particularly extreme, compared to other years. For these reasons, the MDEQ strongly urges the EPA to consider 2006-2008 data to make final designations for the daily PM2.5 standard. We will expeditiously process and submit our 2008 data to EPA and plan on requesting reconsideration of designations based on 2005-2007 data, as appropriate.

The EPA believes that Ottawa County should be included with Kent County, one primary reason being that the emissions from the J. H. Campbell plant electric generating units (EGUs) in Ottawa County are impacting the Kent County monitor. However, selective catalytic reduction controls have been installed on one of three EGUs at the Campbell facility, which will result in significant NOx emission decreases. Plans are also in place to install scrubbers to reduce sulfur dioxide emissions. Both of these controls significantly reduce PM2.5 and are likely to result in continued improvements in the PM2.5 levels in Kent County. Additionally, national rules are reducing emissions from both mobile and nonroad mobile sources throughout the region. The MDEQ believes that decreased emissions in the

area will ensure that the Grand Rapids metropolitan area will attain and continue to maintain the daily PM2.5 standard.

Southeast Michigan Nonattainment Area

The EPA proposed that seven counties in Southeast Michigan (Livingston, Macomb, Monroe, Oakland, St. Clair, Washtenaw, and Wayne Counties) should all be one nonattainment area for the daily PM2.5 standard (see Figure 1). In our December 18, 2007, letter to the EPA, we recommended that Southeast Michigan be divided into three separate nonattainment areas consisting of St. Clair County, which appears to be influenced by Canadian emissions; Wayne County, which has higher concentrations of PM2.5 than the other counties due to local emissions sources; and the remaining five counties as a third nonattainment area.

Our experience in addressing the 1997 PM2.5 annual standard has convinced us that the industrialized area of Wayne County is unique to the rest of the region and should be dealt with separately for the daily standard as well. For the annual standard, only monitors in Wayne County have been showing violations since 2003 even though the entire seven-county region is still considered nonattainment. The 2006-2008 three-year daily average shows only monitors in Wayne County and St. Clair County in violation of the standard. The MDEQ continues to believe that designating a huge nonattainment area in response to violating monitors in a small area is heavy-handed and unnecessary. It serves to economically penalize the entire region at a time when the state has been economically distressed for the past eight years and is struggling to revive.

Wayne County

Our understanding of the PM2.5 problem in Southeast Michigan has been driven by the high values in the industrialized portion of Wayne County. Current data indicates that only one monitor, Dearborn, is likely to be violating the annual PM2.5 standard for the period 2006-2008. Six counties in the seven-county region have been kept in nonattainment because of one monitor that is in the most industrialized area of Wayne County, directly downwind of a steel mill, auto manufacturing plant and oil refinery. This monitor is strongly influenced by local sources, as will be discussed further below. The history of PM10 and PM2.5 annual standard violations in Wayne County's industrial center supports focused attainment plans for separate nonattainment areas for the daily PM2.5 standard as well.

To expand our understanding of PM2.5 in Southeast Michigan, the Southeast Michigan Council of Governments (SEMCOG) hired a contractor who conducted a study (Turner, 2008) to analyze the monitoring data in the seven-county region. The full report is available at http://www.semcog.org/uploadedfiles/Programs_and_Projects/Air/SEMOS_HighPM_FinalReport_Version1.0.pdf.

The purpose of the study was to determine the drivers (i.e., local source, regional transport, or meteorology) for high PM2.5 days in Southeast Michigan. Drivers for network-wide high

PM, where the majority of monitors having high PM readings, are regional transport (background levels of pollution entering Southeast Michigan) and/or poor atmospheric ventilation across the network.

This report indicates that ambient air data is composed of emissions from regional-scale contributions, urban-scale contributions and neighborhood- and finer-scale contributions. Depending on the placement of a monitor, it may be influenced by one or all of these types of sources.

Figure 2 shows the placement of a transect of monitors from southwest to northeast: the Allen Park (AP), Dearborn (D), Linwood (LIN), and East 7 Mile (E7M) monitors are all in Wayne County, and the New Haven (NH) monitor is in Macomb County. This figure shows the unique position of the Dearborn monitor in the core of the industrial zone plume and the urban-scale plume, which results in much higher values due to local sources than the other monitors in the area. It also shows that New Haven, which is downwind of the Detroit area, is not impacted by the urban-scale contributions or the industrial zone plume. This lack of impact from the urban and industrial plumes from Detroit on the New Haven monitor is also evident in Table 1, which shows that New Haven has been in attainment since 2005-2007.

Table 2 (Table 4-2 from the Turner study) compares the number of days a monitor has an exceedance to high days throughout the network. For 13 of the 15 monitors, at least 85 percent of exceedances from 1999 to 2006 occurred on days when the entire network was exhibiting high PM. Two monitors in Wayne County, the Dearborn and Wyandotte monitors, frequently had exceedances on days when the entire network was not exhibiting high PM. On these days these sites are significantly influenced by nearby emission sources.

Figure 3 shows that the Dearborn monitor, and to a lesser extent SW High School and Wyandotte monitors, have a much higher percentage of high days than other monitors. Compared to the Allen Park monitor, Dearborn and to a lesser extent SW High School and Wyandotte have many more days above 30 ug/m^3 when Allen Park (which is about six miles southwest of the Dearborn monitor) exhibits less than 30 ug/m^3 (see Figure 4). Because Allen Park is so near to the Dearborn monitor but just upwind of the industrialized plume (see Figure 1), these high days indicate a strong influence from local sources.

The directional source of excess at Dearborn is indicated in Figure 5. This figure shows a one-dimensional nonparametric wind regression (1-D NWR) that estimates the expected value of concentration as a function of wind direction. It is similar to a pollution rose but with more robust mathematical support. The southwest quadrant at Dearborn has 4 to 10 ug/m^3 excess of PM2.5. This quadrant is the direction of a steel mill, an auto manufacturing plant, an oil refinery, and several other smaller industries. Wyandotte and SW High School data also exhibit excess PM2.5 in the range of 2 to 4 ug/m^3 (see Figures 6 and 7). Both of these monitors are in industrialized areas, but not as much in the core of industry as is the Dearborn monitor. All other monitors indicate a much smaller excess of less than 2 ug/m^3 (see Turner report, Figure E-1, p. 60).

Based on this information and everything that has been learned in addressing the annual PM2.5 standard, the MDEQ continues to recommend that Wayne County be made a separately designated area for the daily PM2.5 standard.

St. Clair County/Port Huron Monitor

The Port Huron monitor is located in the most northern and eastern county in the EPA proposed nonattainment area (see Figure 1). The Turner report indicated that the two monitors on the edges of the seven-county region, Port Huron in St. Clair County and Luna Pier in Monroe County, may experience different air masses than the other monitors. In addition, the two monitors may be in different urban core areas than the other monitors. The Luna Pier monitor trends tended to follow Ohio/Toledo monitors more closely than the Wayne County monitors for the annual PM2.5 standard. Likewise, the Port Huron monitor appears to be strongly influenced by the Canadian/ Sarnia industrial core. It is the Port Huron monitor that is the focus of this designation proposal.

The three-year annual PM2.5 average at Port Huron is one of the lowest in the seven-county region (see Table 3). However, the daily PM2.5 values are some of the highest in the seven-county region (see Table 1). In addition, the daily averages are distinctly different from the averages noted at other monitors in Southeast Michigan. Values measured at Port Huron appear to be unchanged or possibly increasing (see Figure 8) whereas other monitors' averages appear to be decreasing (not including 2005). This suggests that Port Huron is being influenced by different sources than other monitors in Southeast Michigan.

Figure 9 from the Turner report shows the conditional probability function (CPF) for excess mass at Port Huron. The CPF for Port Huron indicates that the excess mass is coming from the south, southeast, and east. One of the most industrialized areas of Canada (Sarnia) is to the south and east of the Port Huron monitor. Sarnia is a highly industrialized city containing several oil refineries, petrochemical plants and chemical companies. The largest petrochemical complex in Canada is located in Sarnia, and air quality problems around this complex are well documented.

The daily PM2.5 values at Port Huron are some of the highest in the state, and are likely influenced by Ontario sources on high PM2.5 days. Although air quality in other areas of Southeast Michigan is improving and may soon meet the annual average and daily standard, the same cannot be said about Port Huron. It does not make sense, therefore, to include St. Clair County with the other six Southeast Michigan counties as one nonattainment area. For these reasons, St. Clair County should be identified as a separate nonattainment area.

Attachments

Table 1

98th Percentile 24 Hour $PM_{2.5}$ Values Averaged over 3 Years

*** Muskegon & Holland changed sampling frequency Jan & Feb 1999. This reflects most recent sampling freq.

sampling frequency changed to 1:6 on April 1, 2006 due to budget cuts.

sampling frequency changed from 1:1 to 1:3 on April 1, 2006 due to budget cuts.

red'n in sampling frequency from 1:6 to 1:12

sampling frequeny increased to daily - +/- 5% NAAQS

AIRS ID	Site	POC	Current Sampling Freq	1999 98th % ile	2000 98th % ile	2001 98th % ile	2002 98th % ile	2003 98th % ile	2004 98th % ile	2005 98th % ile	2006 98th % ile	2007 98th % ile	2008 98th % ile	01-03 Avg	02-04 Avg	03-05 Avg	04-06 Avg	05-07 Avg	06-08 Avg
Monitors in Southwest Michigan Proposed (by EPA) Nonattainmenta Area																			
260810007	Wealthy	1	1 in 3			---	---	---	---	---	---	29.7	26.8						
260810020	Grand Rapids	1	1 in 1	36.5	35.1	39.0	35.1	35.0	31.8	44.7	33.2	29.7	25.8	36	34	37	37	38	30
260810020	Grand Rapids	2	1 in 12	39.3	28.1	39.4	32.4	29.6	30.5	45.6	31.5	31.7	16.6	34	31	35	36	36	27
261390005	Jenison	1	1 in 3	38.7	33.7	35.0	36.8	31.0	30.9	42.3	30.2	28.1	27.6	34	33	35	34	34	29
Monitors in Southeast Michigan Proposed (by EPA) Nonattainmenta Area																			
260910007	Tecumseh	1	1 in 3			---	---	---	---	---	---	---	23.3	---	---	---	---	---	---
260990009	New Haven	1	1 in 3	31.9	33.2	42.0	35.6	31.8	31.9	41.5	34.4	29.0	29.1	36	33	35	36	35	31
261150005	Luna Pier	1	1 in 3	18.1	37.2	39.2	42.7	34.7	35.0	49.3	32.6	32.2	26.4	39	37	40	39	38	30
261250001	Oak Park	1	1 in 3	42.8	40.7	39.4	38.4	36.6	32.5	52.2	33.0	35.3	31.9	38	38	40	39	40	33
261450018	Saginaw	1	---	31.0	27.5	34.6	26.0	26.8	27.4	37.8	---	---		29	27	31	---	---	---
261450018	Saginaw	2	---	34.3	28.4	10.3	---	---	---	---	---	---		---	---	---	---	---	---
261470005	Port Huron	1	1 in 3	44.5	33.1	40.5	38.3	37.2	32.2	47.6	37.9	36.3	37.2	38	35	39	39	41	37
261470005	Port Huron	2	---	---	---	35.9	37.7	38.0	---	---	---	---		37	---	---	---	---	---
261610005	Ann Arbor	1	---	38.2	33.1	38.5	31.3	33.3	28.4	39.1	---	---		34	31	34	34	39	#DIV/0!
261610008	Ypsilanti	1	1 in 3	40.6	30.3	38.7	30.9	38.8	31.5	52.1	31.3	34.5	29.4	36	34	41	38	39	32
261610008	Ypsilanti	2	1 in 12	---	---	36.0	32.6	32.5	31.2	54.6	33.0	30.6	31.3	35	32	39	40	38	32
261630001	Allen Park	1	1 in 1	43.7	38.6	44.2	39.6	40.5	36.9	43.0	34.1	35.5	31.3	41	39	40	38	38	34
261630001	Allen Park	2	1 in 12	44.1	34.6	46.1	30.9	39.2	33.8	58.0	34.2	36.2	32.3	37	35	44	42	43	34
261630015	SW High Sch.	1	1 in 3	50.2	44.5	42.6	38.2	33.6	36.0	49.7	36.2	34.0	35.1	38	38	40	41	40	35
261630016	Linwood	1	1 in 6	44.5	40.3	40.8	42.7	46.2	38.3	51.8	36.9	34.8	32.1	43	42	45	42	41	35
261630019	E 7 Mile	1	1 in 6	---	42.0	42.6	34.4	37.1	35.0	52.3	36.2	33.0	30.9	38	36	41	41	41	33
261630025	Livonia	1	1 in 6	38.4	35.9	44.7	32.7	38.1	32.2	40.2	30.4	32.8	28.3	39	34	37	34	34	31
261630033	Dearborn	1	1 in 3	45.1	45.1	43.2	45.7	42.6	39.4	50.2	43.1	36.6	35.0	44	43	44	44	43	38
261630036	Wyandotte	1	1 in 3	45.0	42.7	46.6	34.1	34.8	32.3	46.7	33.2	28.6	25.0	39	34	38	37	38	29
261630038	Newberry	1	1 in 3	---	---	---	---	---	36.8	57.5	28.6	33.4	32.4	---	---	---	41	40	31
261630039	FIA/Lafayette	1	1 in 3	---	---	---	---	---	---	43.9	32.4	34.8	32.2	---	---	---	38	37	33
Other Monitors in Michigan																			
260050003	Holland	1	1 in 3	35.0	31.9	37.0	36.7	35.6	30.3	36.1	34.1	31.7	24.5	36	34	34	34	34	30
260140014	Bay City	1	1 in 3	---	27.7	34.2	32.0	26.7	28.0	40.5	27.9	25.2	23.6	31	29	32	32	31	26
260210014	Coloma	1	1 in 3	35.4	29.7	32.3	30.6	34.1	29.0	33.8	27.7	33.0	27.2	32	31	32	30	32	29
260490021	Flint	1	1 in 3	32.8	32.2	38.0	30.8	32.2	27.9	35.9	26.7	25.1	25.1	34	30	32	30	29	26
260650012	Lansing	1	1 in 3	34.6	37.2	37.2	32.8	29.0	29.4	38.1	28.3	29.0	24.0	33	30	32	32	32	27
260770008	Kalamazoo	1	1 in 3	38.0	35.5	40.0	32.3	36.9	27.3	33.3	29.1	29.2	26.0	36	32	33	30	31	28
260770008	Kalamazoo	2	1 in 12	38.7	36.7	38.0	32.0	35.7	28.9	31.5	29.1	32.5	15.2	35	32	32	30	31	26
261010922	Manistee	1	1 in 3			---	---	---	---	---	25.9	26.5	28.6	---	---	---	---	---	---
261130001	Houghton Lake	1	1 in 3	---	---	---	---	23.6	21.0	30.8	21.6	23.3	22.3	---	---	25	24	25	22
261210040	Muskegon	1	1 in 3	38.1	35.0	34.9	29.8	36.3	32.7	41.0	29.8	28.1	26.7	34	33	37	35	33	28

A 3-year 24-hour average of 36 ug/m3 would violate the NAAQS according to the data handling conventions in 40 CFR part 50

Note: 2008 values are basedo n only the first two quarters of data.

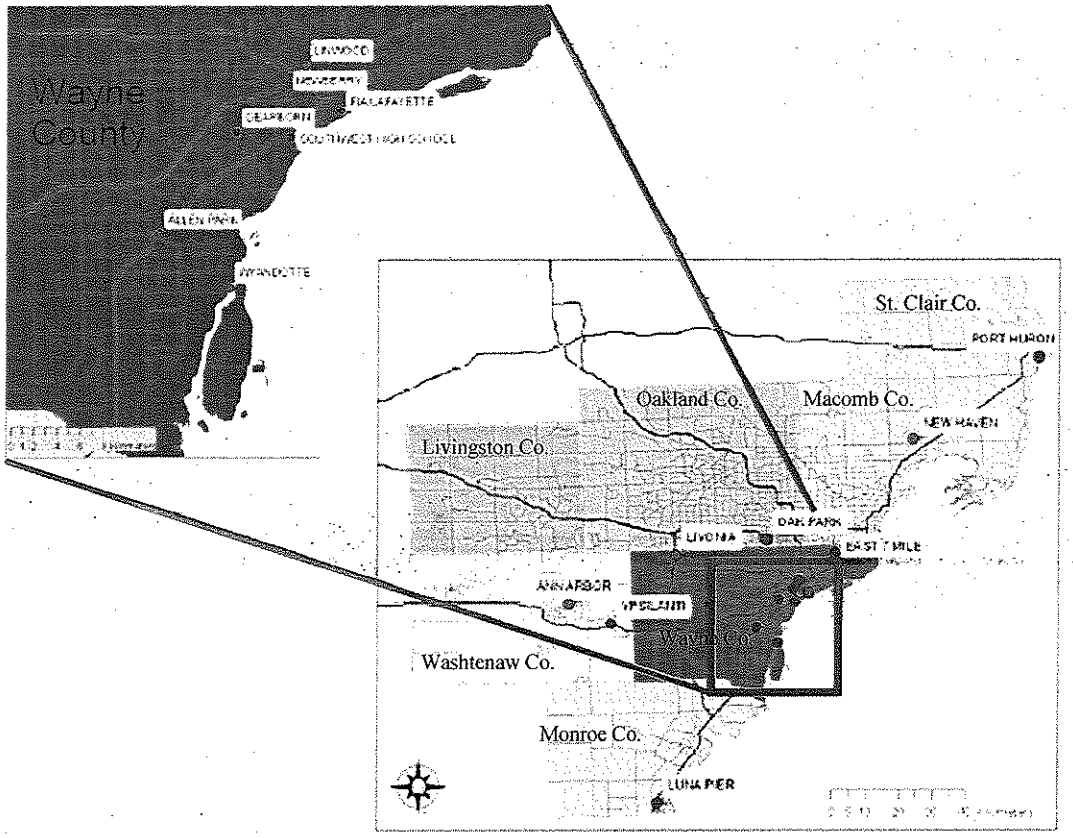


Figure 1. Map of Southeast Michigan Monitoring Sites.

Table 2. Site-specific exceedance trends on valid network days.

(A)	(B)	(C)	(D)	(E)	(F)
Site Name	Number of Sampling Days	Number of Exceedance Days	% Sampling Days on Valid Network Days	% Exceedances on Valid Network Days	% Network Day Exceedances on Network-Wide High PM Days
Allen Park	2497	92	27.2%	27.2%	96.0%
Ann Arbor	714	13	82.9%	92.3%	100.0%
Dearborn	879	67	77.1%	77.6%	61.5%
E 7 Mile	724	29	92.1%	89.7%	84.6%
FIA/Lafayette	155	1	68.4%	100.0%	100.0%
Linwood	2273	102	29.5%	29.4%	86.7%
Livonia	777	26	87.1%	69.3%	92.0%
Luna Pier	804	26	82.8%	85.7%	87.5%
New Haven	878	22	80.4%	86.4%	100.0%
Newberry	161	6	71.4%	100.0%	100.0%
Oak Park	793	32	82.0%	75.0%	91.7%
Port Huron	841	32	81.8%	81.3%	88.5%
SW High Sch.	881	41	78.4%	73.2%	93.3%
Wyandotte	838	35	80.2%	85.7%	73.3%
Ypsilanti	829	16	82.8%	88.9%	100.0%

Figure 2

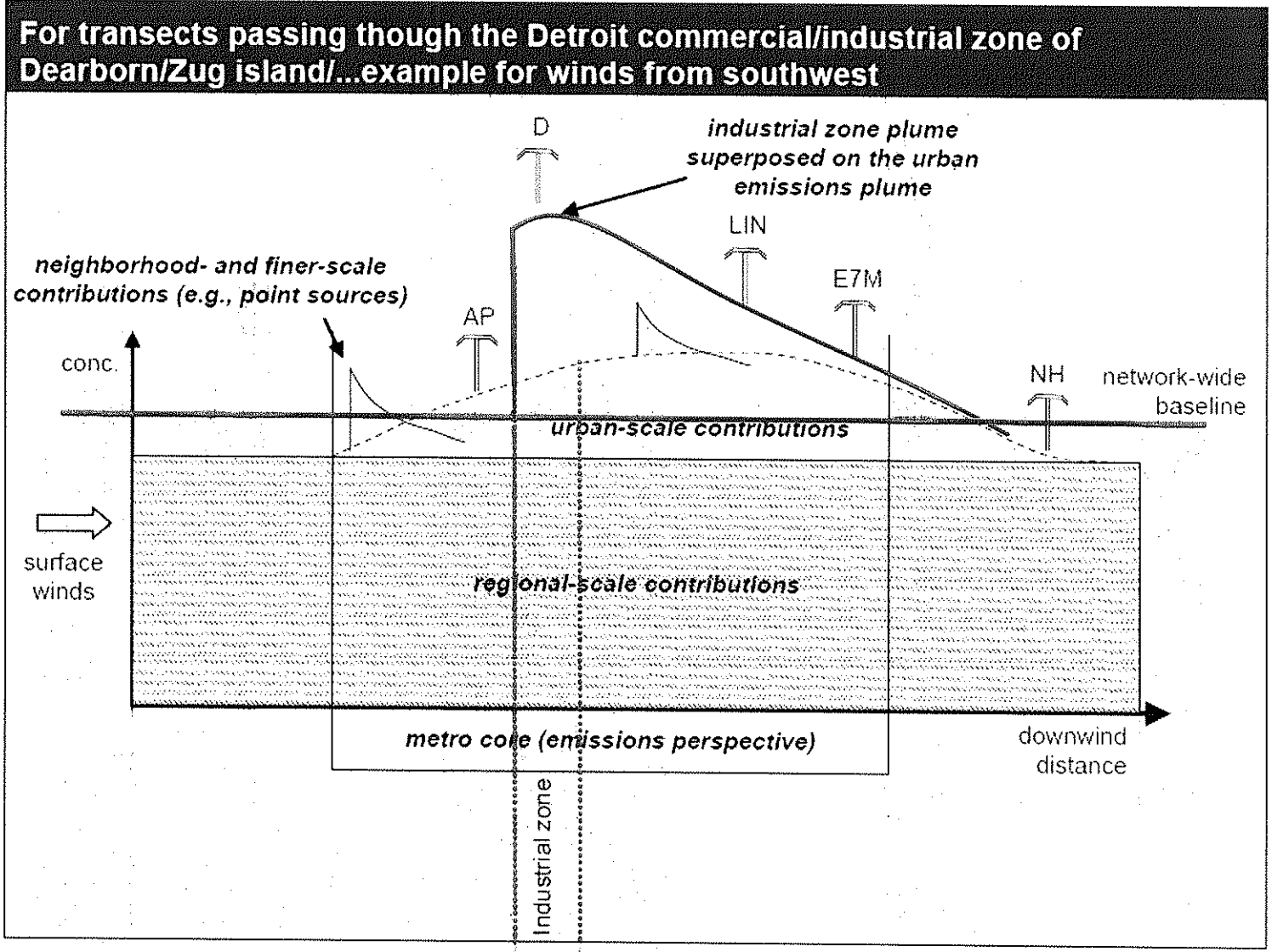

For transects passing though the Detroit commercial/industrial zone of Dearborn/Zug island/...example for winds from southwest
D
industrial zone plume superposed on the urban emissions plume
LIN
E7M
AP
NH
neighborhood- and finer-scale contributions (e.g., point sources)
conc.
network-wide baseline
urban-scale contributions
surface winds
regional-scale contributions
metro core (emissions perspective)
downwind distance
Industrial zone

Figure 3

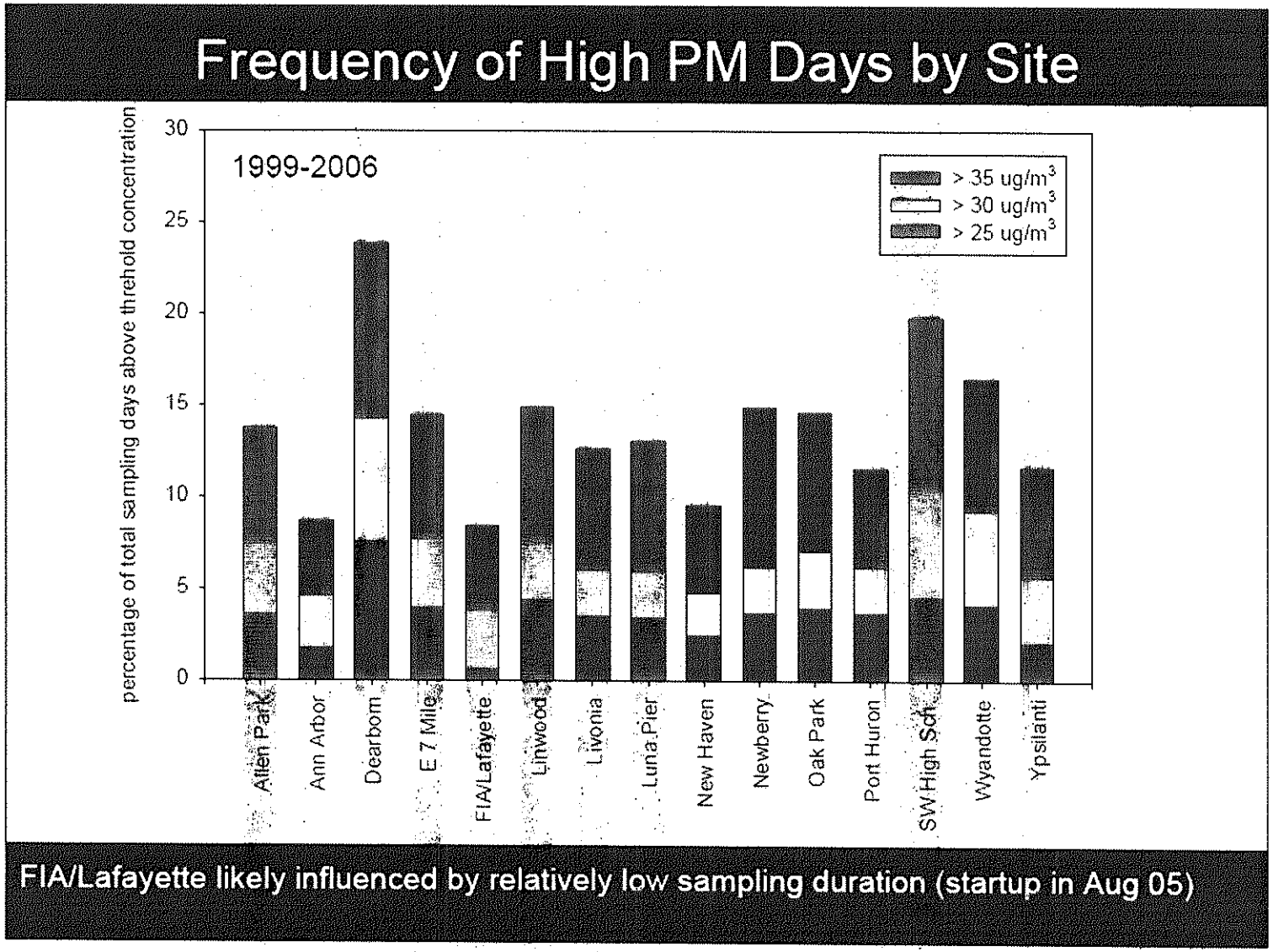
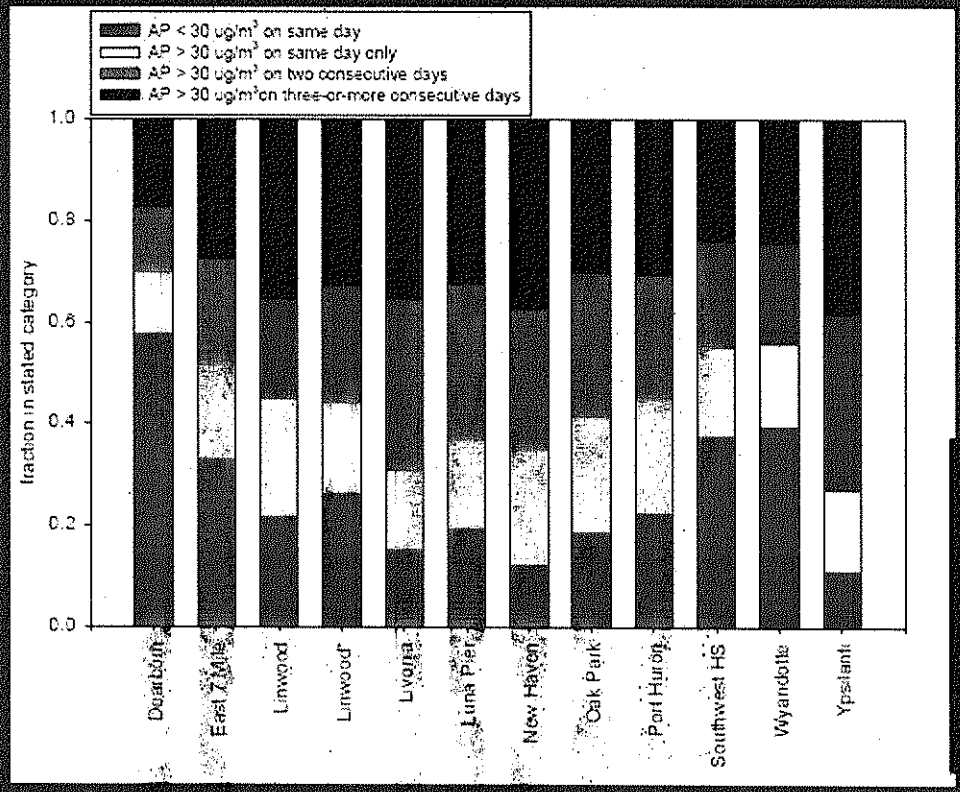

Frequency of High PM Days by Site
1999-2006
> 35 ug/m3
> 30 ug/m3
> 25 ug/m3
percentage of total sampling days above threhold concentration
30
25
20
15
10
5
0
Allen Park
Ann Arbor
Dearborn
E 7 Mile
FIA/Lafayette
Linwood
Livonia
Luna Pier
New Haven
Newberry
Oak Park
Port Huron
SW High Sch
Wyandotte
Ypsilanti
FIA/Lafayette likely influenced by relatively low sampling duration (startup in Aug 05)

Figure 4

Allen Park PM when Other Sites > 30 μg/m³



Relatively high frequencies of spatially- and temporally-isolated high PM days were observed at Dearborn, Wyandotte, SW High School, and East 7 Mile. At all other sites, high PM days most frequently correspond to multiday PM episodes (blue plus green bars) with a roughly equal split between two-day episodes and longer-persistence episodes

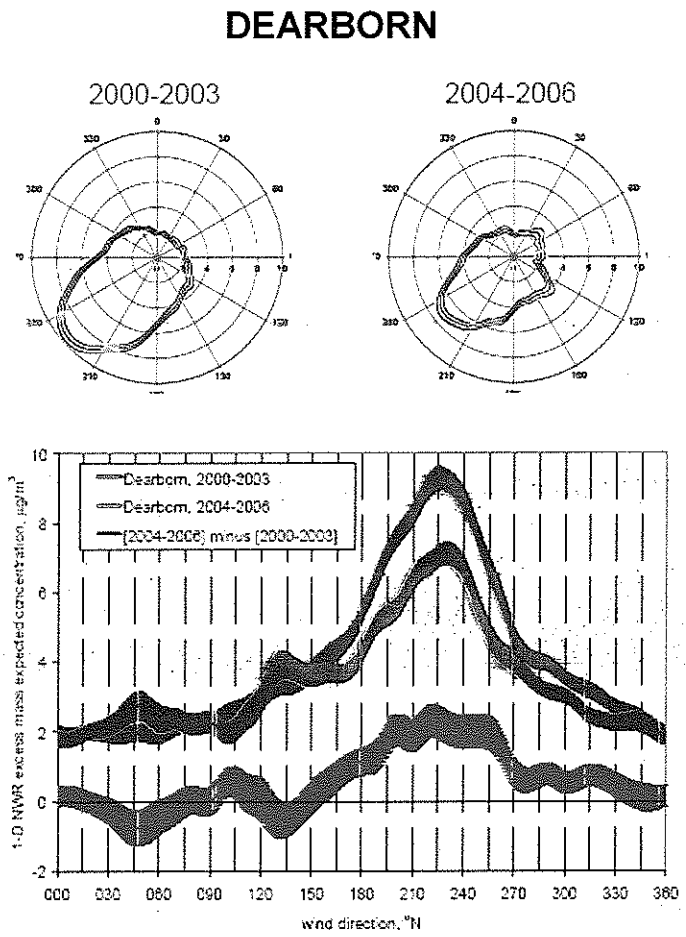


Figure 5. Excess PM2.5 mass compared to the network wide base concentration at Dearborn. **Top**: 1-D NWR for excess mass at each site relative to the network-wide baseline concentration for 2000-2003 (left) and 2004-2006 (right). Average concentrations and 95% confidence intervals are red and pink like respectively and radial units are ug/m3. **Bottom**: 1-D NWR expected excess mass concentrations after censoring the data to remove extreme values.

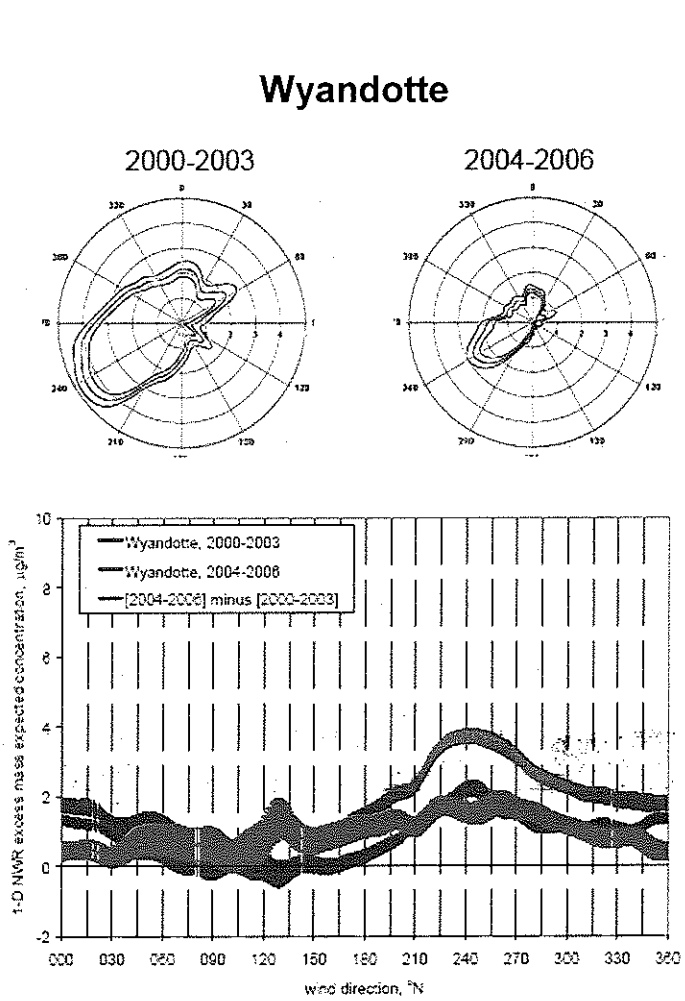


Figure 6. Excess PM2.5 mass compared to the network wide base concentration at Wyadotte. **Top**: 1-D NWR for excess mass at each site relative to the network-wide baseline concentration for 2000-2003 (left) and 2004-2006 (right). Average concentrations and 95% confidence intervals are red and pink like respectively and radial units are ug/m3. **Bottom**: 1-D NWR expected excess mass concentrations after censoring the data to remove extreme values.

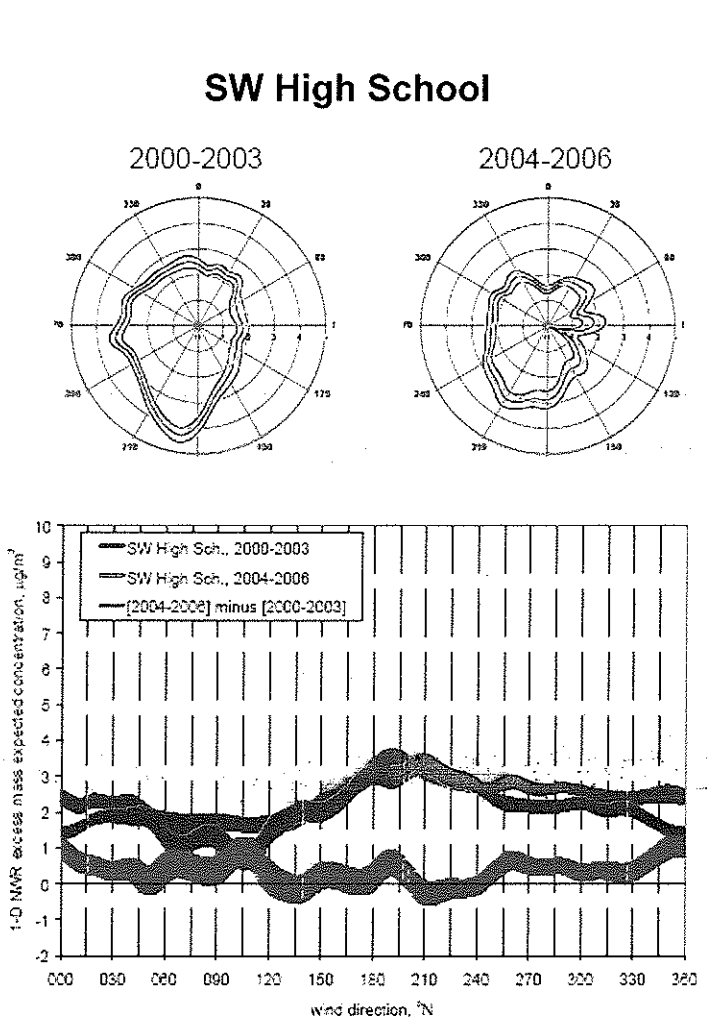


Figure 7. Excess PM2.5 mass compared to the network wide base concentration at SW High School. **Top**: 1-D NWR for excess mass at each site relative to the network-wide baseline concentration for 2000-2003 (left) and 2004-2006 (right). Average concentrations and 95% confidence intervals are red and pink like respectively and radial units are ug/m3. **Bottom**: 1-D NWR expected excess mass concentrations after censoring the data to remove extreme values.

Table 3

PM2.5 Monitoring Data Summary - Southeast Michigan

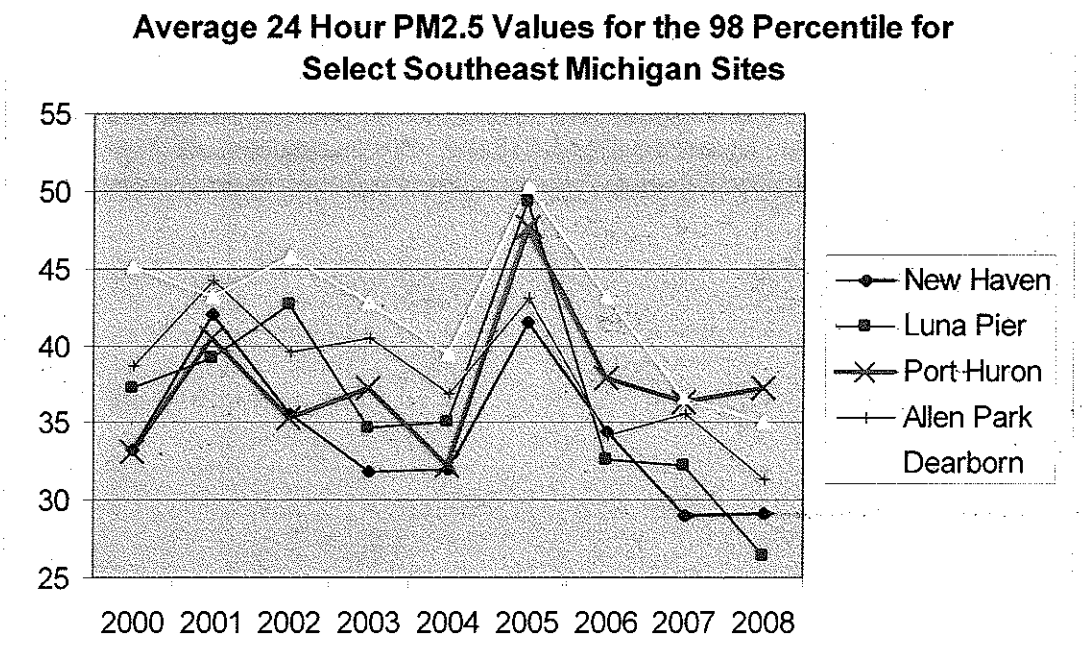
8/25/2008

Lowest Concentration at this site

incomplete annual average for 2008

Time Period	Year	Monitoring Location: Dearborn	SW HS	Wyandotte	Allen Park	Linwood	Luna Pier	E 7 Mile	Oak Park	Ypsilanti	Livonia	Port Huron	New Haven	Newberry	FIA
Annual Average	1999	**16.82**	**17.57**	**16.28**	**16.66**	**17.08**			14.16	14.19	13.07	13.16	12.66	---	---
	2000	**20.13**	**18.10**	**17.63**	**15.56**	**15.49**	**15.19**	14.51	**15.39**	14.26	14.59	14.35	13.42	---	---
	2001	**19.61**	**18.28**	**18.20**	**17.25**	**15.72**	**15.30**	14.50	14.70	14.49	14.60	13.96	13.60	---	---
	2002	**19.84**	**17.42**	**16.28**	**15.96**	**15.60**	**16.26**	**15.64**	**15.00**	14.86	14.37	13.84	13.35	---	---
	2003	**19.20**	**16.69**	**16.32**	**15.23**	**15.85**	13.79	14.71	14.58	14.73	14.20	14.25	12.85	---	---
	2004	**16.83**	**15.39**	13.66	14.24	13.69	12.98	13.23	12.76	12.87	12.57	12.11	11.96	---	---
	2005	**18.55**	**17.21**	**16.42**	**15.94**	**16.01**	**15.70**	**16.48**	**15.47**	**15.61**	14.93	**15.09**	14.38	---	---
	2006	**16.13**	14.68	12.92	13.19	13.04	12.72	12.71	12.11	12.55	11.80	12.04	11.28	---	13.13
	2007	**16.89**	**14.54**	13.59	12.76	13.86	13.08	13.01	13.33	12.98	12.75	12.44	11.94	14.02	13.83
	2008	*13.89*	*13.54*	*11.01*	*12.02*	*12.09*	*11.51*	*11.56*	*11.17*	*11.15*	*11.53*	*11.72*	*11.19*	*12.08*	*12.48*
3-Year Average	99-01	**18.9**	**18.0**	**17.4**	**16.5**	**16.1**	**15.2**		14.7	14.3	14.1	13.8	13.2	---	---
	'00-'02	**19.9**	**17.9**	**17.4**	**16.3**	**15.6**	**15.8**	14.9	**15.0**	14.5	14.5	14.0	13.5	---	---
	'01-'03	**19.5**	**17.5**	**16.9**	**16.1**	**15.7**	**15.1**	**15.0**	14.8	14.7	14.4	14.0	13.3	---	---
	'02-'04	**18.6**	**16.5**	**15.4**	**15.1**	**15.0**	14.3	14.5	14.1	14.2	13.7	13.4	12.7	---	---
	'03-'05	**18.2**	**16.4**	**15.5**	**15.1**	**15.2**	14.2	14.8	14.3	14.4	13.9	13.8	13.1	---	---
	'04-'06	17.2	**15.8**	14.3	14.5	14.2	13.8	14.1	13.4	13.7	13.1	13.1	12.5	---	---
	'05-'07	17.2	**15.5**	14.3	14.0	14.3	13.8	14.1	13.6	13.7	13.2	13.2	12.5	13.2	---
	'06-'08	*15.6*	*14.3*	*12.5*	*12.7*	*13.0*	*12.4*	*12.4*	*12.2*	*12.2*	*12.0*	*12.1*	*11.5*	*13.0*	*13.1*

Figure 8



Port Huron

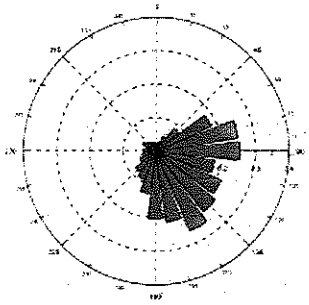


Figure 9. Conditional probability function plots for excess mass at Port Huron relative to Allen Park, 1999-2006. Probabilities are for the top decile of the excess mass distribution.