



**Petition and Revised Recommendations
to the Regional Administrator
United States Environmental Protection Agency - Region V
Concerning Designations for Ozone Air Pollution
in the Shoreline Counties of
the Northwest Lower Peninsula of Michigan
pursuant to the Clean Air Act, 42 U.S.C. §7407**

February 6, 2004

Little River Band of Ottawa Indians (LRBOI)

Lee A. Sprague, Ogema
(231)398-6823

William Brooks, Tribal Attorney
(231)398-6821

LRBOI Tribal Government Offices
375 River Street, Manistee, MI 49660

Prepared by:

Alexander J. Sagady
Environmental Consultant
PO Box 39, East Lansing, MI 48823
(517)332-6971; ajs@sagady.com
<http://www.sagady.com>

Contributor:

Jimmie Mitchell, Traditionalist & Chair,
Natural Resources Commission, LRBOI
375 River St., Manistee, MI 49660

Table of Contents

1	Introduction	1
2	The Tribe’s Revised Recommendation to EPA Concerning Michigan’s Manistee and Oceana Counties	3
2.1	Authority, Policy and Factual Context Underlying the Tribe’s Petition to EPA	3
2.1.2	Overwhelming Long Range Transport over Lake Michigan is the Primary Cause of Elevated Ozone Air Pollution in All Shoreline Counties of Michigan’s Northwestern Lower Peninsula	4
2.1.3	Discussion of the Qualitative Physical Nature of Long Range Transport of Ozone Air Pollution and Ozone Formation Precursors to Northwest Michigan Shoreline Counties	5
2.2	EPA’s Guidance Documents Concerning Boundary Designations for the 8 Hour Average Ozone National Ambient Air Quality as such Guidance Relates to Manistee and Oceana Counties	10
2.2.1	Factual Exposition Concerning Northwestern Michigan Shoreline County Ozone Air Quality Monitors	10
2.2.2	An Exposition of Year 2001-2003 Ozone Data for the Muskegon, Scottville and Benzonia Ozone Monitors Using EPA AIRNOW Peak 8-Hour Average Concentration Interpolation Imagery Predicts NAAQS Violations and the Resulting Need for Non-Attainment Designations for Manistee and Oceana Counties	11
3	Discussion of the Elevent Factors in the July 18, 2000 EPA Seitz Memo on Designation Guidance for Indian Country	15
3.1	Emissions and Air Quality in Adjacent Areas	15
3.2	Population Density and Degree of Urbanization	15
3.3	Monitoring Data Representing Ozone Concentrations in Local Areas and Large Areas	15
3.4	Location of Emission Sources	15
3.5	Traffic and Commuting Patterns	16
3.6	Expected Growth	16

3.7	Factors of Meteorology, Geography/Topography	17
3.8	Jurisdictional Boundaries	17
3.9	Level of Control of Emission Sources	17
3.10	Regional Emission Reduction Impacts	17
4	The Tribe Supports EPA's Ozone Nonattainment Designations for Michigan's Benzie, Mason and Muskegon Counties	17

List of Exhibits

- 1 Summary Table, Interpolations for Manistee County between Scottville and Benzonia Monitors
- 2 Summary Table, Interpolations for Oceana County between Muskegon and Scottville Monitors
- 3 Manistee County Nitrogen Oxide (NOX) and Volatile Organic Compound (VOC) Emission Sources, Year 2001 Emission Inventory
- 4 Little River Band of Ottawa Indians – 1836 Treaty Reservation
- 5 Little River Band of Ottawa Indians – 1855 Treaty Reservation
- 6 Selected U.S. EPA AIRNOW Ozone Episode Peak 8-Hour Image Products for Years 2001-2003
- 7 Lake Michigan Ozone Study UAM-V Model Output Imagery for July 18, 1991
- 8 Map showing Benzonia Monitor
- 9 Map showing Scottville Monitor
- 10 Map showing Muskegon Monitor

1 Introduction

The Tribal Government and Council of the Little River Band of Ottawa Indians (the “Tribe”) is pleased to provide these comments on EPA’s proposal to designate certain counties in Michigan as nonattainment areas for the new 8-hour ozone standard. These comments address EPA’s proposal not to list Manistee and Oceana Counties as designated nonattainment areas under the new standard. By using an alternate form of data analysis and other methods to address EPA’s boundary guidance criteria, these comments show that the weight of evidence supports designating Manistee and Oceana Counties as being in nonattainment. As a result, the Tribe respectfully requests that EPA reconsider its proposal, consider these comments, and include Manistee and Oceana Counties on the list of designated nonattainment areas for the new 8-hour ozone standard.

In a letter to the Tribe dated December 3, 2003, EPA proposed listing as designated non-attainment areas all of the Western lakeshore counties in Michigan’s Lower Peninsula (Benzie, Mason, Muskegon, Ottawa, Allegan, Van Buren, and Barrien) *except* Manistee and Oceana.¹ While Manistee and Oceana’s lack of monitoring sites may have led to EPA’s listing those counties as attainment/unclassifiable, these comments show that Manistee and Oceana Counties suffer from the same overwhelming ozone transport phenomenon as the other lakeshore counties. As a result, there is no reason they should not be designated as non-attainment areas as well.

The Tribe has strong governmental, stewardship, public health and spiritual interests in the protection of our Tribal members, our Lands and our air, water, natural features and wildlife. Our 1836 and 1855 Treaty Reservation lands are shown in the mapped areas circumscribed by the orange lines shown in Michigan’s Manistee County (1836 Treaty – Exhibit #4) and Mason County (1855 Treaty – Exhibit #5). Exhibits #4 and #5 also identify the specific location of trust and fee lands owned by the Tribe within these Treaty Reservation areas. The Tribe exercises jurisdiction over its lands and territory in accordance with Article I of the Tribe’s Constitution.

The Regional Administrator has previously acknowledged the Tribe’s eligibility for treatment as a State for EPA programmatic purposes. The Tribe’s Council is a governing body carrying out substantial governmental duties and functions. The Council has established a Tribal Natural Resources Commission to set policy and establish regulations concerning environment and resources within the Reservation lands subject to the Tribe’s jurisdiction.

¹ The Tribe originally intended only to address the nonattainment/attainment designation for Manistee County due the location of the Tribe’s Reservation lands within that County. However, for many of the reasons stated in this petition, we believe Oceana County could not logically be excluded from the rest of the Lake Michigan Shoreline proposed to be designated as nonattainment.

The Tribe recognizes that long range transport of ozone air pollution is a serious public health concern. This pollution threatens the health of Tribe members who live both on and off Treaty lands and our non-Indian neighbors in all of Michigan's Northwest Lower Peninsula shoreline counties, notably, Benzie, Manistee, Mason, Oceana and Muskegon Counties.

Ozone is a pulmonary irritant that exacerbates adverse respiratory health conditions in those with asthma, chronic pulmonary obstructive disease and hay fever. Children with asthma are particularly at risk of exposure from ozone as a result of spending more time outside and because of the large volumes of air they breath in proportion to their body size. For individuals with very serious asthma that is not well controlled, ozone air pollution can cause asthma attacks that are life-threatening and that result in frequent hospitalizations.

Health studies have shown that even healthy young adults and children who vigorously exercise can have severe coughing and chest tightness from exposure to ozone at concentrations known to occur in Michigan's Northwest Lower Peninsula shoreline counties. Long term exposure to ozone has been associated with permanent changes in lung tissue and potential development of chronic lung disease.

The special interest of our Tribe in the health of our children and members, the need to protect their access to clean air and the need to heal our earth's air of this pollution from far away sources runs deep among Tribe members. Jimmie Mitchell, Traditionalist and Chair of the Tribe's Natural Resources Commission put it best:

“Huddled within the pitch-black confines of a sweat lodge, as traditional Indian people we place our medicine upon the lava-hot rocks in anticipation of feeling the sacred breath of our ancient ones, speaking to us of the things we need to know to live good lives. The air we breathe is a sacred gift from the Gzhé mnidoó (the Creator). It provides oxygen for our blood, which is fed into our heart, the center of our being. It provides the medium that permits us to communicate with one another; to sing, praise, and seek the guidance of our Creator; and to advise our children of what they need to know to grow into good people. Whispering even the most basic phrase, "I Love you," would not be possible without air. The purity of this sacred element is crucial to every living thing on the planet, and is something that we must not stand by and allow to be spoiled in the name of progress. From the first breath we take into sound - our birth-cry - to the last breath that leaves us as we cross over to the other side, we rely on the "purity" of this gift the Creator bestowed upon us all.”

Miigwetch
Jimmie Mitchell
LRB Odawa.

2 The Tribe's Revised Recommendation to EPA Concerning Michigan's Manistee and Oceana Counties

On December 2, 2003, the Tribe informed EPA Region V by verbal conference of our intent to modify a recommendation previously provided to EPA concerning Manistee County. The December 3, 2003 letter from EPA Regional Administrator to Ogema Lee Sprague acknowledged this communication and invited the Tribe to submit additional information on a revised recommendation for consideration by EPA not later than February 6, 2004.

The principle purpose of this document is to provide a such a revised recommendation to the EPA Regional Administrator and to petition EPA to revise its preliminary determination not to designation Michigan's Manistee and Oceana Counties as nonattainment areas for the 8 hour ozone standard.²

The Tribe is not requesting nonattainment designation specific to its trust and fee lands or the Reservation areas described in Exhibits #4 and #5. The Tribe believes, consistent with the guidance provided by EPA with respect to nonattainment/attainment area designations, asserts that the weight of evidence shows that the most appropriate boundaries of the nonattainment areas requested should include the entire area of Manistee and Oceana Counties.

2.1 Authority, Policy and Factual Context Underlying the Tribe's Petition to EPA

2.1.1 Brief Review of Statutory and Regulatory Requirements and Legislative Intent on the Designation of Areas for Ozone Nonattainment and Applicable Federal Regulations

Congress enacted 42 U.S.C. §7407 to establish procedures for making final determinations based on both state and Tribal recommendations on whether specific state and Tribal reservation areas should be designated as nonattainment, attainment or unclassifiable with all of the common criteria pollutants.

Under the Act, states must, in part, submit proposed areas for nonattainment designation which include:

² The Tribe originally intended only to address the nonattainment/attainment designation for Manistee County due the location of the Tribe's Reservation lands within that County. However, for many of the reasons stated in this petition, we believe Oceana County could not logically be excluded from the rest of the Lake Michigan Shoreline proposed to be designated as nonattainment.

“...any area that does not meet (or that contributes to ambient air quality in a nearby area that does not meet) the national primary or secondary ambient air quality standard for the pollutant,” 42 U.S.C. §7407(d)(1)(A)(i)

After the states make their proposed designations, EPA must then promulgate the designations as “expeditiously as practical” and “...in no case later than 2 years from the date of promulgation of the new or revised national ambient air quality standard.” 42 U.S.C. §7407(d)(1)(B)(i)

However, in making its final decision on designation of areas pursuant to a new or revised National Ambient Air Quality Standard, EPA can make changes to what was proposed by the state:

“In making the promulgations required under clause (i), *the Administrator may make such modifications as the Administrator deems necessary to the designations of the areas (or portions thereof)* submitted under subparagraph (A) *(including to the boundaries of such areas or portions thereof)*. Whenever the Administrator intends to make a modification, the Administrator shall notify the State and provide such State with an opportunity to demonstrate why any proposed modification is inappropriate. The Administrator shall give such notification no later than 120 days before the date the Administrator promulgates the designation, including any modification thereto.” 42 U.S.C. §7407(d)(1)(B)(ii) (emphasis added)

In enacting these legislative provisions, Congress intended that nonattainment designations serve two important public purposes. First, a designation of nonattainment serves the important public health goal of informing the public that air quality in a particular locale is poor and that community air pollution is considered to pose health risks for those who are exposed. The second purpose of a designation of nonattainment is as a trigger to further regulatory requirements under the Act. 42 U.S.C. §7501, *et seq.* These include the requirement for deadlines to achieve attainment with standards, air pollution controls on existing sources, a requirement for reasonable further progress, nonattainment new source review provisions and other planning, control and remedial measures under the Act.

2.1.2 Overwhelming Long Range Transport over Lake Michigan is the Primary Cause of Elevated Ozone Air Pollution in All Shoreline Counties of Michigan’s Northwestern Lower Peninsula

Overwhelming long range transport of ozone and ozone precursors over Lake Michigan is the predominate and primary cause of elevated ozone air pollution in all Northwestern Lower Peninsula shoreline counties. This is a well established

phenomenon which has been documented by the State of Michigan³ and the findings of extensive research conducted or authorized by U.S. EPA⁴ and the Lake Michigan Air Director's Consortium (LADCO).

Attainment of the 8 hour ozone National Ambient Air Quality Standard can not be achieved solely through emission reductions in these downwind Northwest Lower Peninsula shoreline counties. Notwithstanding this position, the Tribe does not agree that local air pollution sources in these heavily impacted shoreline counties are not capable of contributing to increases in ozone concentrations in further downwind areas. For this reason, the Tribe remains seriously concerned about the matter of a pending large emission source in Manistee County that would be inappropriately regulated under EPA's proposed attainment/unclassifiable designation given adverse air quality in the area.

2.1.3 Discussion of the Qualitative Physical Nature of Long Range Transport of Ozone Air Pollution and Ozone Formation Precursors to Northwest Michigan Shoreline Counties

Ozone air pollution in the shoreline counties of the Northwestern area of Michigan's Lower Peninsula occurs because of a complex matrix of factors. The factors

³ See, for example, the July 15, 2003 letter from MDEQ Director Steve E. Chester to Thomas V. Skinner, Regional Administrator concerning nonattainment designations. As noted in this letter and attachments:

“Overwhelming (not regional) ozone transport is the sole reason for nonattainment levels of ozone at many monitors in Michigan.”

“Some ozone receptor counties in West Michigan have minimal industry and are very sparsely populated.”

“Although the EPA has long recognized that air quality in West Michigan is impacted by overwhelming ozone transport and local emission reductions cannot be about attainment with the ozone standard, the EPA maintains that nonattainment designations for these counties are appropriate.”

“Prevailing Winds Demonstrating Transport into West Michigan. Ozone roses depict the correlation between wind direction and elevated ozone concentrations (above 70 parts per billion [ppb] 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.”

⁴ See Technical Support for Modifications to State Air Quality Designation Recommendations, U.S. EPA, 2003 (Region V Michigan Technical Analysis at [ch5/region5/ch5MI.pdf](#)) (Stating that “[t]he ozone transport phenomenon that occurs in this area is well documented and recognized by EPA. Monitors on the Lake Michigan lakeshore typically experience the highest ozone levels in Michigan.”).

include elevated ozone season ambient temperatures occurring over the multi-state Lake Michigan area, available solar insolation, synoptic wind field conditions favorable to long range transport, shoreline-related mesoscale meteorological effects on pollutant transport, unique stability and photo-chemical transformation and transport phenomena occurring over Lake Michigan, point, area and mobile source emissions from the shoreline metropolitan areas of Indiana, Illinois and Wisconsin. To make matters worse, air masses that approach the Chicago metropolitan area can sometimes contain ozone at concentrations at or near the ozone NAAQS as a result of Eastern continental United States transport from other high emitting regions and from poorly controlled emission sources of nitrogen oxides in other locations.

Ozone formation occurs from ultraviolet light-driven photochemical reactions between nitrogen oxides and volatile organic compounds. Under conditions where an air mass containing ozone precursors has a long fetch of transport over Lake Michigan on a hot sunny day, ozone formation is significantly enhanced because of reduced turbulent mixing of the atmosphere under highly stable atmospheric conditions associated with lake-induced temperature inversions. Photochemical reactions are enhanced over the Lake because of increased water surface light reflectivity. Finally, scavenging (and thus destruction) of ozone from the presence of highly reactive NO compounds released immediately after combustion and subsequent emission is reduced because there are few combustion sources over the Lake other than from shipping and air transportation.

Elevated air pollution downwind of the Chicago metropolitan area is generally expected when ambient temperatures exceed about 85 degrees F, there is sufficient solar radiation and winds are light. When regional wind fields are more southerly, the highest ambient ozone air pollution typically occur along the shoreline counties of Wisconsin from the Wisconsin/Illinois border to the tip of Door County and beyond. Under the similar ambient conditions with wind fields having a more southwesterly component, elevated ozone air pollution will occur in Michigan's shoreline counties.

During conditions favorable to elevated ozone formation, the polluted air masses from southern Lake Michigan shoreline metropolitan areas will cause elevated concentrations of ozone in Michigan wherever these urban plumes reach the Michigan shoreline. These polluted air masses can travel hundreds of miles over Lake Michigan with little attenuation of ambient ozone gas concentrations. For example, on June 25, 2003 Chicago transport over the entire north-south length of Lake Michigan caused heavy ozone air pollution at the Seney National Wildlife Refuge in Michigan's eastern Upper Peninsula north of the northern shore of Lake Michigan. This was a distance of just under 300 miles from downtown Chicago. During this event, the Seney ozone monitor recorded an 8 hour average of 118 ppb, which was the third highest 8 hour ozone average ever measured in Michigan for the years 2000 - 2003. By comparison, Manistee and Oceana counties are only about 145-180 miles from the Chicago loop, and located

squarely in the path of these plumes during many commonly occurring synoptic wind field conditions.

In addition to the long distances that polluted air masses can travel over Lake Michigan, there is significant evidence that the width of these polluted air masses is also substantial.

Transverse plume aircraft sampling studies and ambient air quality monitoring indicate the absolute width of the transported Gary-Chicago-Milwaukee polluted urban plumes can be roughly comparable to the width of Lake Michigan at times. During the worst incidents the combined effect of these urban plumes transported over Lake Michigan together with the upwind eastern United States background can cause episodes of 8 hour ozone concentrations exceeding 85 ppb in both Wisconsin and Michigan shoreline counties.⁵ As such, the width of these polluted urban plumes downwind of the Chicago area is comparable in size to the width of Lake Michigan.

The large downwind spatial extent width of such Lake Michigan polluted air masses isn't surprising given the plethora of both major stationary point sources and shoreline based multi-county metropolitan areas ranging from large power plant and steel industry sources starting at Michigan City, Indiana, through Gary and the multi-county Chicago metropolitan area, through the large high emitting power plants located north of Chicago on the shoreline in Wisconsin and on into the large Milwaukee metropolitan area.

Reviews of air quality data show that excessive ozone air pollution can be observed at each of the widely spaced Michigan shoreline county ozone monitors from Coloma, MI in the South all the way to Benzonia, MI in the north during a single ozone air pollution episode. This widespread pattern of impact has been confirmed also with prior long range transport modeling activities conducted under the Lake Michigan Ozone Study.

The Tribe has not conducted any Urban Airshed Modeling of the Lake Michigan area and multi-state emission domain. The Tribe is unaware that any other institution has run UAM-V for the Lake Michigan area to determine expected modeled 8 hour concentrations for actual emission inventory years 2001-2003 that could be used for the purpose of interpolating expected 8 hour ambient ozone concentrations for Manistee and Oceana Counties.

Absent a specifically developed UAM-V modeling run that would shed light on year 2001-2003 expectations for the subject counties, the Tribe offers one UAM-V output run from a 1994 study for predicting 1 hr peak ozone concentrations during a SSW

⁵ See Exhibit #6 showing U.S. EPA AIRNOW maximum 8 hour averages on selected ozone episode days.

regional wind field condition that illustrates the transverse spatial aspects of how a polluted air mass from the Chicago region would affect Michigan's Northwest Lower Peninsula shoreline counties. See Exhibit #7.⁶ The characteristics of the overlay of constant isopleths of peak 1 hour ozone over the shoreline counties in question shows 1 hour ozone concentrations of between 120 and 150 ppb impacts for the entire area from Muskegon to Betsie Point in Benzie County caused under 1991 emission inventory conditions.

While the absolute 1 hour impacts reflect a larger emission inventory from back in 1991, the model output demonstrates the wide transverse spatial characteristic of typical polluted air masses as they affect northern Lake Michigan shoreline counties. The imagery shows continuous high impacts from Benzie County down to Muskegon County in all five shoreline counties.

Given the long range transport and wide transverse spatial characteristics of polluted air masses over Lake Michigan, EPA's preliminary conclusion considering that Manistee and Oceana Counties should be considered to have likely air quality better than the ozone NAAQS is not supportable. With the adjacent shoreline counties of Muskegon, Mason and Benzie Counties all showing monitored violations of the ozone NAAQS, EPA's preliminary determination on Manistee and Oceana Counties is physically unrealistic given the previously demonstrated spatial characteristics of polluted Lake Michigan air masses that impact Michigan shoreline.

A final simplified geographical approach for physical plausibility was checked for a straight, plume centerline from downtown Chicago towards the Northwestern Lower Peninsula shoreline areas. A straight line arc with origin at downtown Chicago will subtend Little Point Sable in Oceana County to Betsie Point in Benzie County within an angle of less than 10 degrees.

This simplified view means that transport of a polluted air mass in a straight line wind field at the correct direction from the Chicago area could be confined to a relatively narrow 10 degree angle representing direction persistent winds and still impact a significant portion of the entire 5 county shoreline area in the same ozone episode. This simplified analysis lends additional credibility to the notion that polluted air masses from the Chicago area can quite plausibly affect all five subject shoreline counties in a single ozone episode event with persistent winds from the same direction merely as a consequence of existing geography. As a result, exclusion of Manistee and Oceana

⁶ Michigan State Implementation Plan Submittal of Attainment Demonstration of the National Ambient Air Quality Standard for Ozone [the old 1 hr standard] for Grand Rapids MSA, and Muskegon MSA Moderate Nonattainment Areas, Michigan Department of Natural Resources Air Quality Division, November 1994; LMOS UAM-V Model Prediction of Maximum Hourly Ozone: XY Map -- July 19, 1991 -- Grids A & B & C

County from a nonattainment designation is a geographically implausible conclusion when Benzie, Mason and Muskegon Counties are so designated.

To summarize and illustrate the resulting spatial extent and physical features of the problem of long range transport of ozone polluted air masses associated with the Gary-Chicago-Milwaukee urban plume influences plus upwind ozone pollution background over Lake Michigan:

Polluted air masses can travel hundreds of miles over Lake Michigan in synoptic wind flows and will cause elevated ground-level ambient ozone air pollution impacts in Michigan's Northwest lower peninsula shoreline counties when such plumes come ashore after hundreds of miles of transport.

Available evidence in the form of aircraft studies, the Lake Michigan Ozone Study UAM-V modeling runs and the review of Michigan monitoring data on ozone episodes shows that the spatial extent of the transverse width of such polluted air masses in Lake Michigan transport can be comparable to the width of Lake Michigan itself and does not support non-continuous county nonattainment designations on the Lake Michigan shoreline.

The polluted air masses affecting the Northwest Lower Peninsula shoreline counties can have a lasting effect during a 24 hour period. Although the highest ambient 8 hour average ozone concentrations during episodes in Western Michigan generally occur in Muskegon and Ottawa Counties rather than Mason and Benzie Counties, these latter counties are distinguished by another phenomena. In Mason and particularly in Benzie Counties, episodes of elevated ozone with hours over the gas concentration level of the 8 hour standard will frequently occur for longer 10-12 hour periods, unlike the shorter episodes experienced farther south. This means that measured elevated ozone concentrations will frequently persist from early afternoon until late at night, particularly for Benzie County, as the ozone formed out over the expanse of miles of open Lake Michigan waters continuously moves over these northern shoreline areas. This phenomena on the time interval of monitored elevated ozone in the northern shoreline counties increases the human health risk by prolonging human population exposure periods for ozone.

2.2 EPA's Guidance Documents Concerning Boundary Designations for the 8 Hour Average Ozone National Ambient Air Quality as such Guidance Relates to Manistee and Oceana Counties

On March, 28, 2000 EPA published a memorandum on boundary guidance for air quality designations intended for use by EPA regional administrators and the States.⁷ On July 18, 2000, an additional and supplementary memo⁸ was published on similar guidance for Indian country.

The relevant decision guide contained in the latter memo is as follows:

“Indian country without a monitor, that is located nearby or adjacent to a C/MSA with a violating monitor, will generally be designated unclassifiable. However, it should be designated nonattainment when: (1) existing sources or expected growth contribute to air quality in the nonattainment area, or (2) **air quality modeling shows that the NAAQS is being violated in Indian country.**” (Emphasis added)

While Manistee and Oceana Counties currently lack air quality monitors,⁹ an empirical data modeling approach using interpolation shows that the NAAQS is being violated in both counties. Both counties are sandwiched between other lake Michigan shoreline counties have have been designated nonattainment areas on the basis of clean monitoring results for years 2001 through 2003.

2.2.1 Factual Exposition Concerning Northwestern Michigan Shoreline County Ozone Air Quality Monitors

At the present time there are a total of 4 ozone air quality monitors located in Northwestern Lower Peninsula of Michigan in Lake Michigan shoreline counties:

⁷ March 28, 2000 Memorandum from John S. Seitz, Director, Office Air Quality Planning and Standards (MD-10), U.S. Environmental Protection Agency; Boundary Guidance on Air Quality Designations for the 8 hour Ozone National Ambient Air Quality Standards (NAAQS or Standard)

⁸ July 18, 2000 Memorandum from John S. Seitz, Director, Director of Office of Air Quality Planning and Standards; Guidance on 8-Hour Ozone Designations for Indian Tribes

⁹ The Little River Band of Ottawa Indians has committed to initiating air quality monitoring, including ozone monitoring, on Reservation lands in Manistee County to help close this gap in the existing air quality monitoring network. However it is expected that this new monitoring site will not become operational until year 2005.

Monitor ID	Location, City	County
261210039	340 Green Creek Road, Muskegon	Muskegon
261050007	525 W US-10, Scottville	Mason
260190003	1060 West St., Benzonia Twp, .Benzonia	Benzie
260890001	3155 W. Peshawbestown Rd., Peshawbestown	Leelanau

The Muskegon, Mason and Benzie County monitors are longstanding sites and are owned/operated by the Michigan Department of Environmental Quality Air Quality Division. Each MDEQ site has shown monitoring results indicating violations of the 8 hour ozone NAAQS. Exhibits #8, #9 and #10 show maps of the locations of each of the MDEQ ozone air quality monitoring sites.

As can be seen in the chart below, these existing monitoring sites showing violations of the ozone NAAQS are all extremely closed to the boundaries of both Manistee and Oceana Counties:

Air Miles Distance Descriptions West Michigan Monitors and County Borders	Estimated Distance
From Benzonia Monitor to Nearest Northern Manistee County Border	7.3 miles
From Scottville Monitor to Nearest Southern Manistee County Border	16.3 miles
From Scottville Monitor to Nearest Northern Oceana County Border	9 miles
From Muskegon Monitor to Nearest Southern Oceana County Border	13 miles

2.2.2 An Exposition of Year 2001-2003 Ozone Data for the Muskegon, Scottville and Benzonia Ozone Monitors Using EPA AIRNOW Peak 8-Hour Average Concentration Interpolation Imagery Predicts NAAQS Violations and the Resulting Need for Non-Attainment Designations for Manistee and Oceana Counties

Predictive modeling of the nature of UAM-V efforts is not necessary to make a "modeling" case that Lake Michigan shoreline counties where no air quality monitor is located can be considered to be in violation of the Ozone NAAQS within the meaning of EPA's "boundary guidance."

Instead, an analysis of the existing monitor data using interpolation techniques can be conducted in such a way that constitutes a valid empiric data modeling approach to make a showing that such unmonitored counties can be considered as being in violation of the ozone NAAQS and thus justifying nonattainment status.

From the standpoint of interpolation of expected ambient air quality in Manistee County, the Benzonia and the Scottville ozone monitors would have the greatest influence on empiric prediction. Similarly, the Muskegon and the Scottville ozone monitors would have the greatest influence on empiric prediction for Oceana County.

Fortunately, the Tribe did not have to create new workproducts to illustrate this empirical data modeling and interpolation approach. EPA's AIRNOW spatial imagery of peak 8 hour average predictions are a ready-made view of the applicable data using recognized interpolation techniques. The Tribes methods of making this showing are provided below.

First, numeric ozone data was downloaded from the Michigan Department of Environmental Quality Air Quality Division website¹⁰ in order to determine the dates of all ozone episodes for years 2001-2003. The data output from the MDEQ website shows the following as stated on the MDEQ report:

"All 8 hour values that are equal to or greater than 85 ppb are included to illustrate frequency of occurrence. The four largest ozone values are also listed, even if values are not greater than 85 ppb."

The report gives validated data for the years 1992 through 2002. Year 2003 data is updated as of 8/17/03, and this data is yet to be finally validated.

Two tables were constructed; one for Manistee County and the other for Oceana County. The Manistee County table shows all dates when there were measured 8 hour average concentrations at either the Scottville or the Benzonia ozone monitors, or at both. For each monitor and date, the corresponding 8 hour average in parts per billion was shown for the two monitors. Similarly, the Oceana County table shows similar information related for the Muskegon and the Scottville ozone monitors, or both. The Manistee County table and the Oceana County table are attached as Exhibit #1 and #2.

The following air pollution episode dates were identified from these tables:

¹⁰ See http://www.deq.state.mi.us/aqi/content/8hr_high_con.shtml

Ozone Episode Days		
Year 2001	Year 2002	Year 2003
06/13/2001	06/09/2002	06/22/2003
06/27/2001	06/20/2002	06/23/2003
06/28/2001	06/09/2002	06/24/2003
06/29/2001	06/22/2002	06/25/2003
06/30/2001	06/23/2002	07/02/2003
07/18/2001	06/24/2002	07/03/2003
08/01/2001	06/25/2002	
08/05/2001	07/03/2002	
08/06/2001	07/17/2002	
08/08/2001	08/01/2002	
	08/10/2002	
	08/12/2002	
	09/08/2002	

Once the episode days were identified, peak 8-hour AIRNOW imagery was located and downloaded for the Lake Michigan basin domain display from EPA's AIRNOW archive website.¹¹ All of these imagery products are shown in Exhibit #7.

The imagery products represent outputs created on the date at the time of the episode from unvalidated air quality data. As a result, all of the outputs were examined to determine the physical plausibility of the indicated interpolated features given validated air quality monitoring results available for years 2001 and 2002 and the August, 2003 version of updated data for year 2003. One such imagery product was found to be implausible and invalid based on this review and was excluded from the subsequent analysis.

The color imagery from each episode date was evaluated to see whether all or a portion of both Manistee and Oceana Counties were covered by an interpolation showing an expected concentration of nominally 85 ppb or above (orange/brown on AIRNOW imagery) or, alternatively, nominally 105 ppb or above (red on AIRNOW imagery). On Exhibits #1 and #2 the results of this coverage analysis are described in the center column of each table for Manistee and Oceana Counties as either "85N" or "105N" and the coverage as being for either the entire county or a portion. See Exhibits #1 and #2. Where the value of the 8 hour average is blank for any of the tables, the detected 8 hour average was always less than 85 ppb, assured by reliance on the underlying MDEQ data report assumptions.

¹¹ See <http://www.epa.gov/airnow/mwmapselect.html>

The results of this empiric data interpolation analysis from the tables are very significant.

For Manistee County, the table results shows that at least the top 4 episodes for each year based on priority of interpolating from the southernmost Scottville monitor show that the entire County of Manistee would be considered in violation on the basis of the 4 high daily events. Consideration of the 4th highest event for each year is analogous to the test for legal compliance within the ozone NAAQS. The review also shows there were 7 times out of 24 episode days when the peak 8 hour average at the northernmost monitor in Benzie County exceeded the 8 hour average detected at the Scottville monitor on the same day. The Tribe views this as a *prima facie* basis that shoreline county emissions sources have the potential to increase ozone concentrations further downwind.

For Oceana County, for year 2001, the AIRNOW interpolations for the top four days at the Muskegon monitor showed the entire County of Oceana interpolated as being at 85 ppb or over. For year 2002, three of the top four interpolations based on the Muskegon monitor priority were for the entire county at or over 85 ppb and the fourth was for the southern one third of Oceana County over 85 ppb. For year 2003, three of the four top interpolations based on the Muskegon monitor priority showed interpolations with the entire county over 85 ppb and one interpolation showed only the southern half of the county at or over 85 ppb. This again is analogous to a conclusion that the interpolated results indicate a probability that Oceana county would not meet the 3 year average test for the fourth highest concentration, as per the ozone NAAQS. Further review shows that nine out of the 27 episode days show 8 hour concentrations at the northernmost monitor at Scottville exceeding the monitored results at the Southernmost monitor at Muskegon.

Apart from the top 4 events for each year in Manistee and Oceana Counties, the Exhibit #1 and #2 table analysis for both Manistee and Oceana Counties showed several other events of both total or partial coverage of both counties indicated for the ozone episodes shown. This results in a robust empirical data model that demonstrates that the 8 hour average ozone NAAQS is, in fact, being violated in Manistee and Oceana Counties for the years 2001 through 2003, notwithstanding the lack of available ambient air quality modeling data.

The approach of using an empirical model based on interpolation from existing ozone monitoring sites has been supported by work performed by air staff in EPA Region III. In an EPA Region III staff review of such an approach, interpolated data from existing ozone monitoring sites shows excellent correlation with the results of UAM-V predictive modeling. Additional information on this approach and EPA Region III air staff conclusions is available at an EPA Region III web site.¹²

¹² See <http://www.epa.gov/reg3artd/whatnew/sdaw.htm>

3 Discussion of the Elevent Factors in the July 18, 2000 EPA Seitz Memo on Designation Guidance for Indian Country

3.1 Emissions and Air Quality in Adjacent Areas

The immediately preceding section contained a consolidated air quality discussion that covered all available air quality monitor data and an empiric data interpolation approach. In this section we review year 2001 point source emission inventory data for Manistee County. This data is available at a Michigan Department of Environmental Quality Air Quality Division emission inventory query web site.¹³

Manistee County NOX emissions totalled 2803.87 and Manistee County VOC emissions totalled 1965.83 (See supporting data in Exhibit #3). Oceana County NOX and VOC point source emissions are minimal in this fundamentally rural county.

3.2 Population Density and Degree of Urbanization

Manistee County has a higher degree of urbanization than either Mason or Benzie County. Although Manistee is considered a rural community in terms of population density, Manistee County's industrial zone is comparable, for example, with a recognized Metropolitan Statistical Area such as Muskegon. In addition, Manistee County is part of regional tourist economy which draws over 1 million summer visitors. This increase in seasonal population and traffic occurs during the same summer months in which ozone levels in downwind counties are violated.

3.3 Monitoring Data Representing Ozone Concentrations in Local Areas and Large Areas

Please see the preceding discussion in Section 2 on this topic.

3.4 Location of Emission Sources

Present and future point source emission sources located in Manistee County have the potential to adversely affect the downwind nonattainment area in Benzie County. As noted previously, a new 425 megawatt coal-fired power plant is proposed in Manistee County which would significantly increase total emissions of NOx from Manistee County industrial sources. Information contained in applicant's air permit on file with the Michigan Department of Environmental Quality estimate additional NOx emissions of

¹³ See http://www.deq.state.mi.us/maers/emissions_query.asp

1,777 tons/yr and VOC emissions of 72 tons/yr. EPA's pending attainment proposal for Manistee County would allow this level of emission from the proposed power plant rather than an emission limitation reflecting Lowest Achievable Emission Rate (LAER) and a requirement to obtain emission offsets and provide for reasonable further progress.

Industrial emission sources are minimal in Oceana County. However, any future new emission sources in Oceana County would have the potential to adversely affect downwind areas in Mason, Manistee and Benzie Counties during wind fields with southerly components.

3.5 Traffic and Commuting Patterns

Because traffic patterns reflect largely rural patterns in Manistee and Oceana Counties, this factor is ascribed as a diminimus factor. However, as noted in Section 6.2, traffic patterns during summer months are markedly increased in Manistee County. The Michigan Department of Transportation's 2002 Average Daily Traffic (ADT) Map for Manistee County describe annual average traffic counts on U.S. 31 in Manistee County as averaging between 14,300-17,200 vehicles per day during the year. Although specific traffic counts for summer months were not available, it is likely that such counts wee compable to ADT levels for the Muskegon Metropolitan Statistical Area of 30,000-40,000 vehicles per day.

3.6 Expected Growth

In addition, 2000 Census data found on EPA Ozone site confirms that Manistee County is currently experiencing a growth rate of 15.3%, which is nearly 3 times the rate of growth Statewide. The Census data also indicate that nearly 20% of Manistee County's population is over the age of 65. An additional 18% of the population is under the age of 18. Elderly and the young children are known to be the segment of the population most at risk from the health effects of excessive ozone levels. These statistics are particularly important to Tribal officials as the Tribe's efforts to develop housing, social services and economic opportunities for Tribal members are encouraging many Tribal Elders and families with young children to relocate to the Tribe's Reservation lands in Manistee County.

Please see also Section 3.4 for discussion concerning a proposed new coal-fired electric power plant for the Manistee County area.

3.7 Factors of Meteorology, Geography/Topography

These factors were addressed in Section 2.

3.8 Jurisdictional Boundaries

As demonstrated by the empirixal modeling the Tribe presented, the entire area of Manistee and Oceana Counties should be included as the most appropriate jurisdictional boundaries for revised additional nonattainment areas.

3.9 Level of Control of Emission Sources

One major emission source in Manistee County, Packaging County of America, reports a very large VOC emission of 1672 tons for year 2001. It is presently unknown if this level of VOC emissions reflects application of reasonable controls.

3.10 Regional Emission Reduction Impacts

In regard to Manistee and Oceana Counties, these areas are affected by overwhelming long range transport. Although EPA has begun to enforce additional multistate controls on NOX emissions, existing ambient air quality in these counties still reflects violation of the ozone NAAQS.

4 The Tribe Supports EPA's Ozone Nonattainment Designations for Michigan's Benzie, Mason and Muskegon Counties

The December 3, 2003 letter from the EPA Regional Administrator to Ogema Lee A. Sprague indicated that Benzie, Mason and Muskegon Counties will be among those counties that EPA will designate as being in nonattainment with the 8 hour National Ambient Air Quality Standard (NAAQS) for human exposure to ozone.

The Tribe strongly supports EPA's decision to designate these counties as being in nonattainment given the results of recent ozone air quality monitoring from 2001 through 2003. In the unlikely event that EPA might change its view on this matter, please notify us so that we may forward further information to the Agency.

Exhibit #1

Interpolations for Manistee County between Scottville and Benzonia Monitors			
Ozone Episode Date	Scottville Monitor Ozone Reading, Max 8 Hr. Average (ppb)	EPA AIRNOW Interpolation Over Manistee County	Benzonia Monitor Ozone Reading, Max 8 Hr Average (ppb)
Year 2003			
06/25/2003	100	Entire County, 85N or over	98
06/24/2003	99	Entire County, 85N or over	98
07/02/2003	93	Entire County, 85N or over	93
06/23/2003	88	Entire County, 85N or over	89
07/03/2003		All but small southern portion, 85N or over	88
06/22/2003		Entire County, 85N or over	88
Year 2002			
06/20/2002	106	Entire County, 105N or over	106
07/17/2002	101	Entire County, 85N or over	88
06/24/2002	90	Entire County, 85N or over	85
09/08/2002	89	Entire County, 85N or over	96
08/12/2002	88	1/4 southern portion , 85N or over	
06/09/2002	87	1/3 southern portion, 85N or over	
08/10/2002	87	Entire County, 85N or over	86
06/23/2002	86	Entire County, 85N or over	
08/01/2002	86	Small southern portion, 85N of over	
06/25/2002		Northern half, 85N or over	85
Year 2001			
08/01/2001	100	Entire County, 85N or over	91
08/06/2001	99	Entire County, 85N or over	94
06/29/2001	98	Entire County, 85N or over	104
08/08/2001	93	Entire County, 85N or over	90
06/13/2001	91	Entire County, 85N or over	89
06/28/2001	91	Entire County, 85N or over	104
06/27/2001	90	Entire County, 85N or over	86
08/05/2001	87	1/4 southern portion, 85N or over	

Exhibit #2

Interpolations for Oceana County between Muskegon and Scottville Monitors			
Ozone Episode Date	Muskegon Monitor Ozone Reading, Max 8 Hr. Average (ppb)	EPA AIRNOW Interpolation Over Oceana County	Scottville Monitor Ozone Reading, Max 8 Hr Average (ppb)
Year 2003			
06/25/2003	109	Southern half at 105N or over, northern half at 85N or above	100
06/24/2003	106	Southern third at 105N or over, northern half at 85N or above	99
06/23/2003	97	Entire county, 85N or over	88
07/03/2003	94	Southern half of county at 85N or over	
08/01/2003	87	AIRNOW interpolation is not valid	
07/02/2003		More than northern half of county, 85N or over	93
Year 2002			
06/23/2002	110	Southern 1/4 at 105N or over, balance of county at 85N or over	86
06/20/2002	107	Entire county, 105N or over	106
06/24/2002	101	Entire county, 85N or over	90
06/22/2002	96	Southern 1/3 at 85N or over	
07/03/2002	93	Entire county, 85N or over	
06/09/2002	88	Entire county, 85N or over	87
08/10/2002	88	Entire county, 85N or over	87
07/17/2002		Northern 3/4 of county, 85N or over	101
09/08/2002		Small portion of NE county, 85N or over	89
08/12/2002		Northern 3/4 of county, 85N or over	88
08/01/2002		Northern 1/2 of county, 85N or over	86
Year 2001			
08/06/2001	101	Entire county, 85N or over	99
06/13/2001	99	Entire county, 85N or over	91
06/30/2001	96	Entire county, 85N or over	
08/01/2001	95	Entire county, 85N or over	100
08/08/2001	93	Entire county, 85N or over	93
06/28/2001	92	Entire county, 85N or over	91
06/27/2001	89	Entire county, 85N or over	90
06/29/2001	88	Entire county, 85N or over	98
07/18/2001	87	Most of county, 85N or over	
08/05/2001		Northern 1/3 of county, 85N or over	87

Exhibit #3

Manistee County Nitrogen Oxide (NOX) and Volatile Organic Compound (VOC) Emission Sources, Year 2001 Emission Inventory		
Emission Source and City of Location	NOX (tons)	VOC (tons)
General Chemical Industrial Products, Manistee	87.94	0.73
Martin Marietta Magnesia Specialties, Manistee	500.74	1.78
Morton Salt & Performance Chem Division, Manistee	233.23	1.57
Packaging Corporation of America, Filer City	252.99	1672.97
Shell Western E & P, Bear Lake 13, Bear Lake	58.37	12.89
Shell Western E & P, Bear Lake 22, Bear Lake	115.95	16.91
Shell Western E & P, Bear Lake 32, Bear Lake	70.75	15.72
Shell Western E & P, Manistee Sulfur Plant, Manistee	220.21	50.99
Shell Western E & P, Springdale 25, Copemish	70.88	14.11
Shell Western E & P, Maple Grove 16, Kaleva	67.48	13.1
Tondu Energy Systems, Filer City Station, Filer City	966.39	0.05
Subtotal, larger sources	2644.93	1800.82
Totals from 16 smaller sources	158.94	165.01
Total Emissions from All Manistee County Point Sources	2803.87	1965.83

Exhibit #4

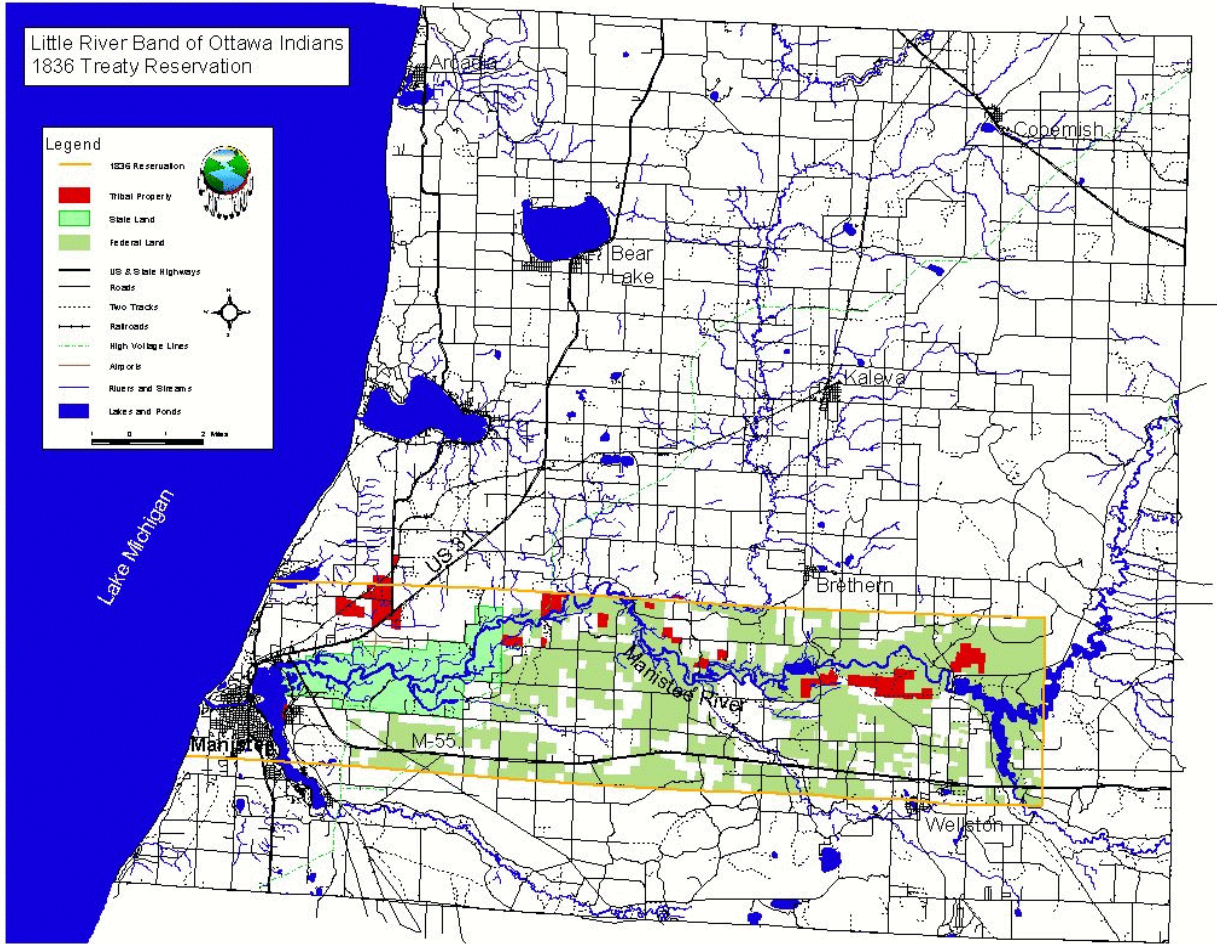


Exhibit #5

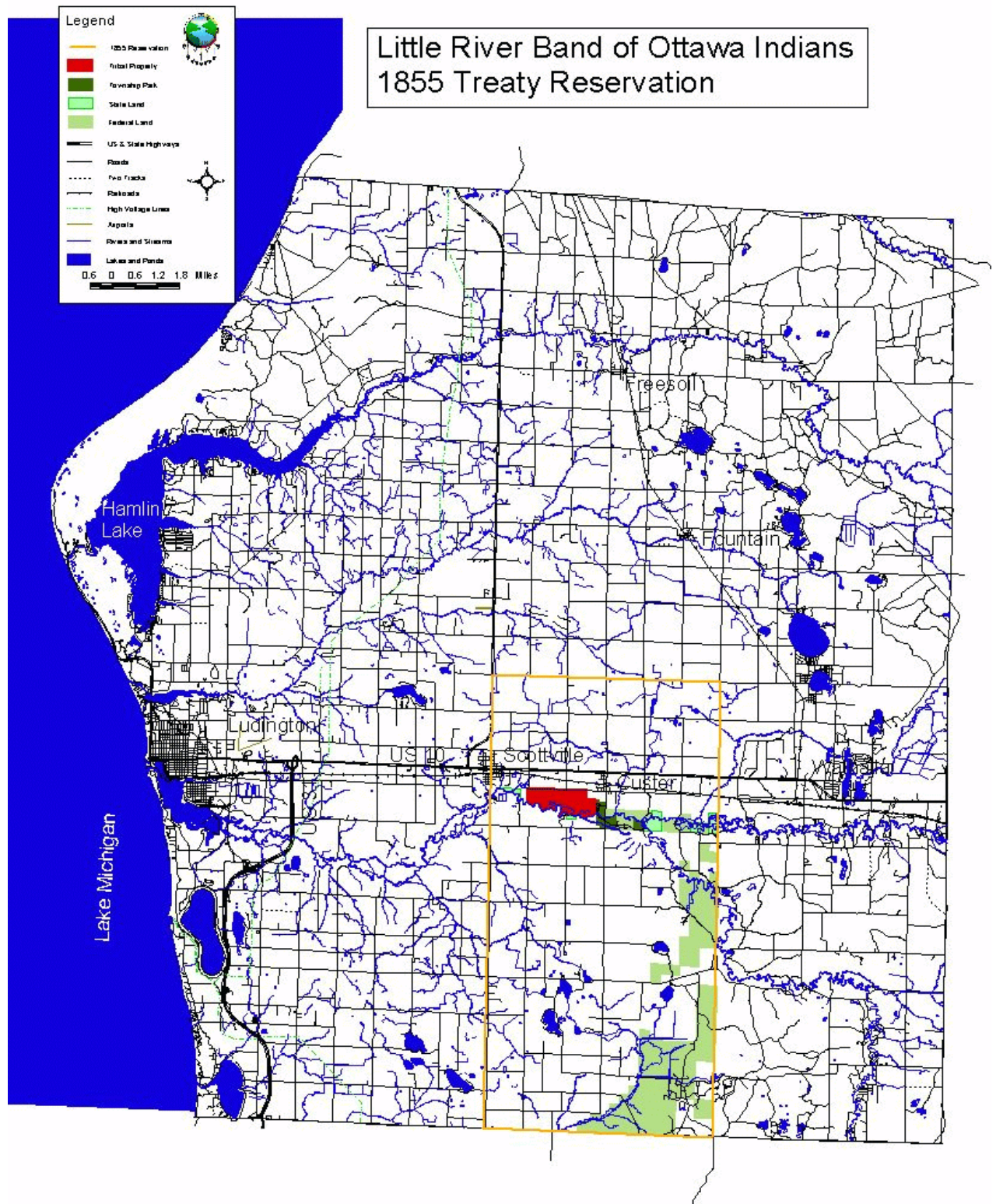
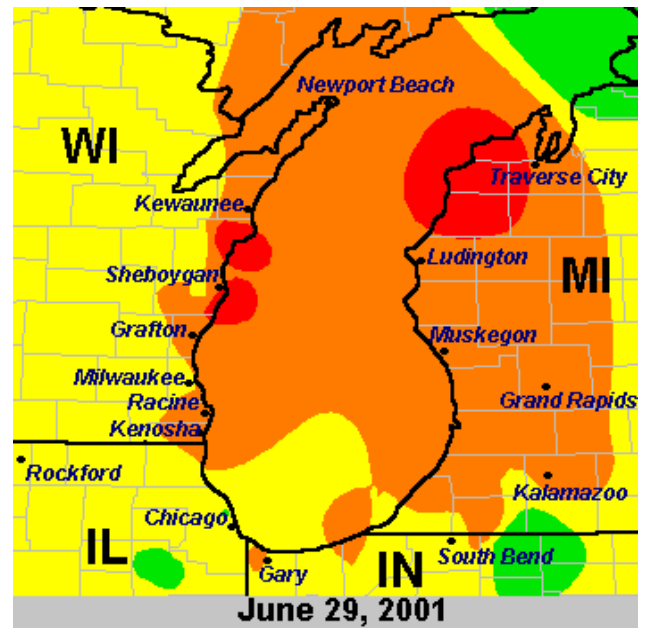
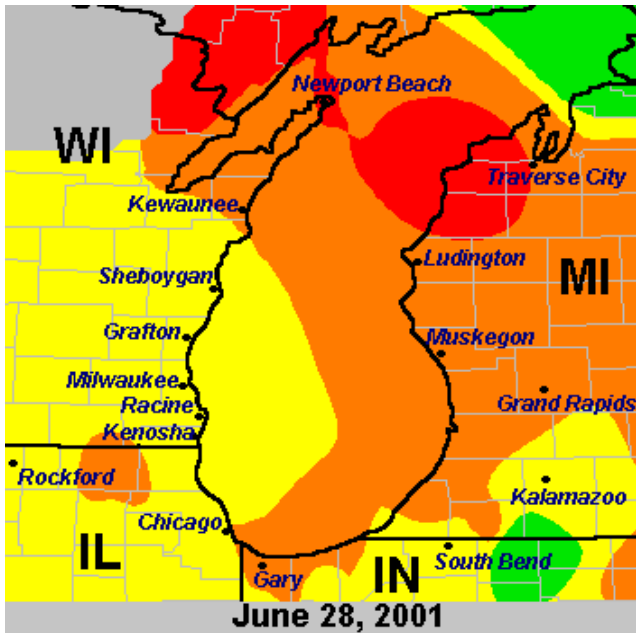
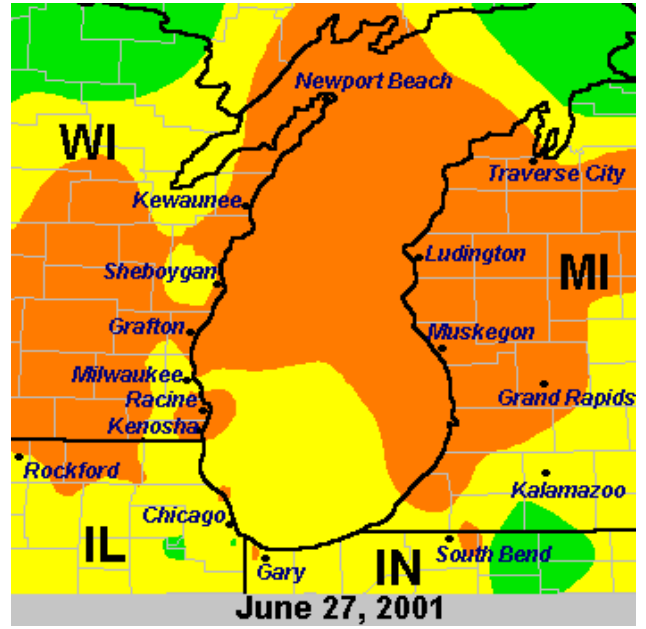
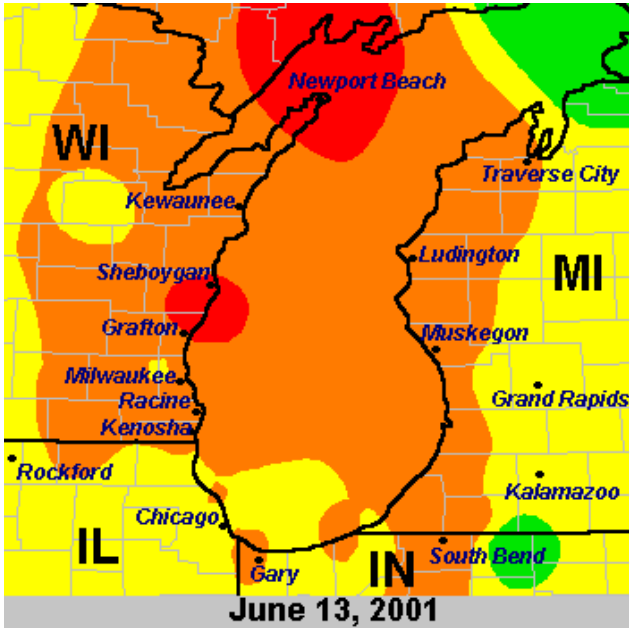
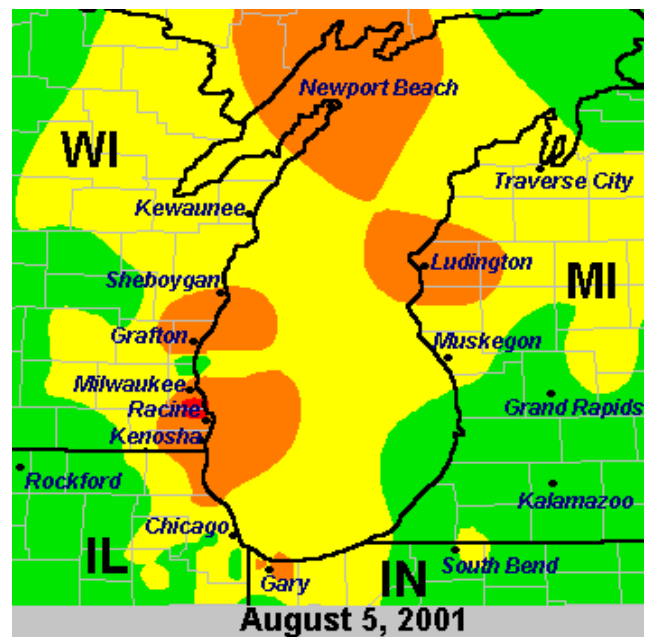
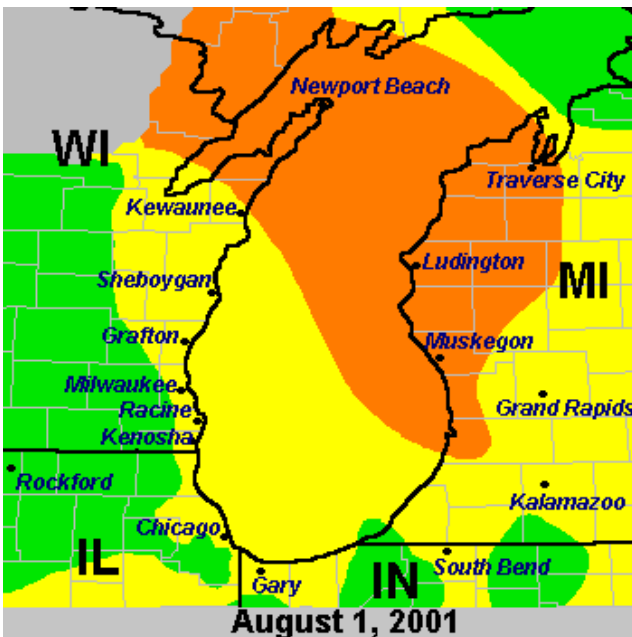
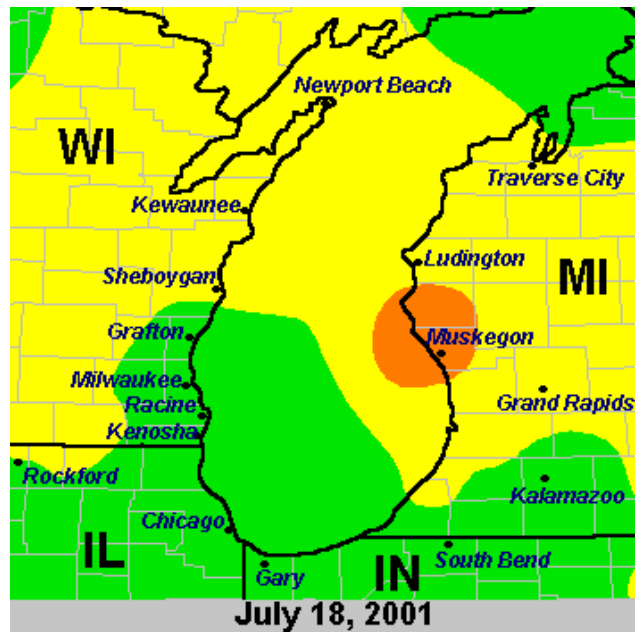
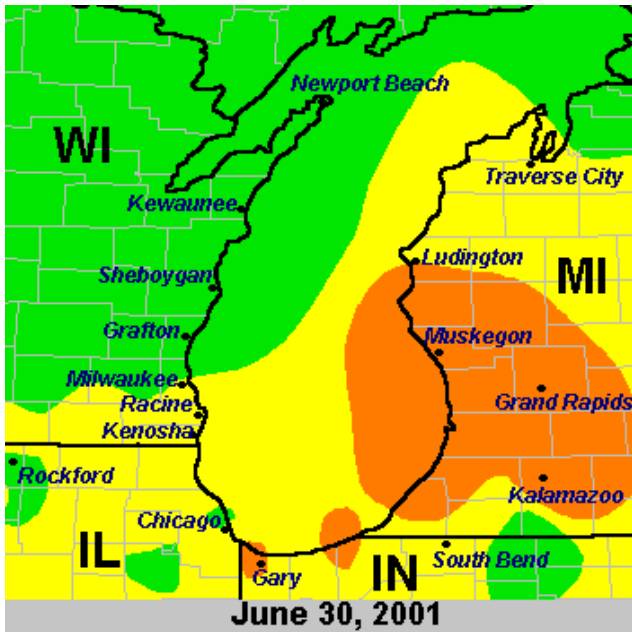
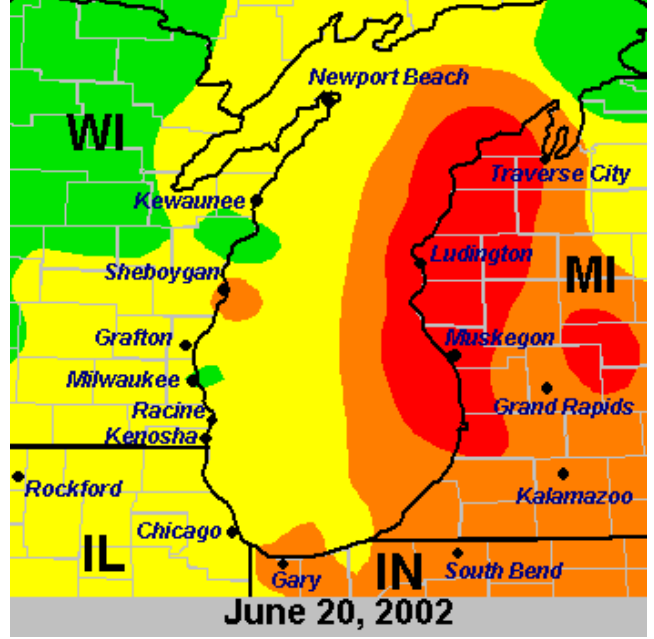
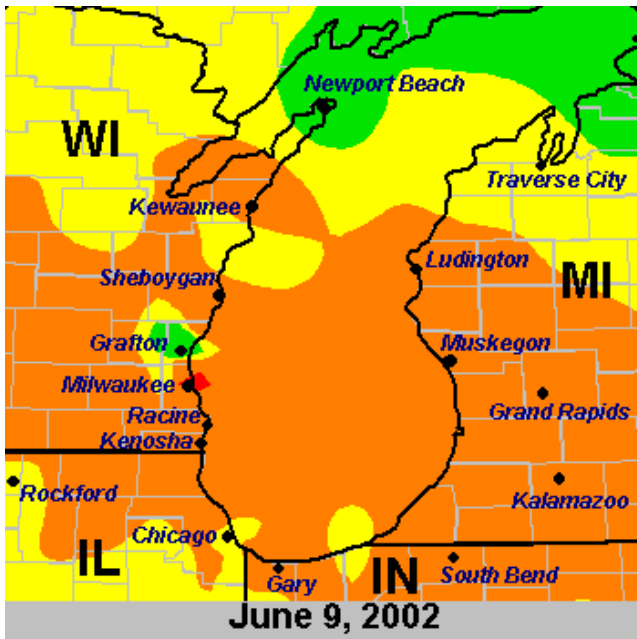
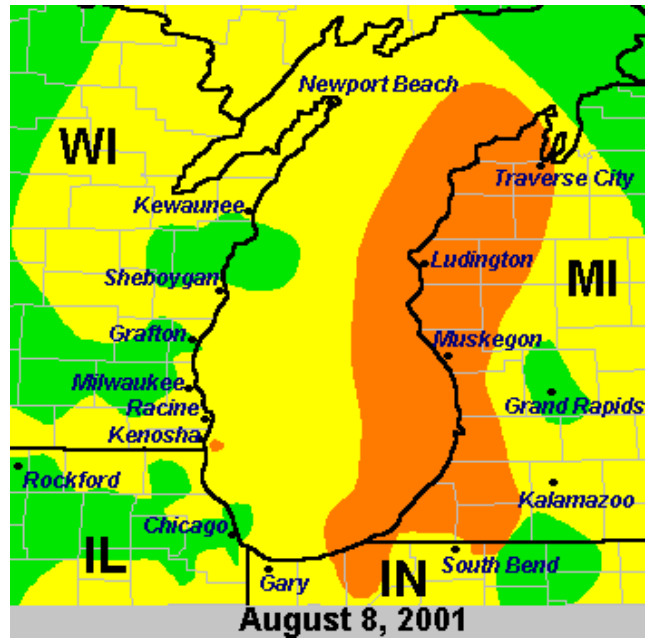
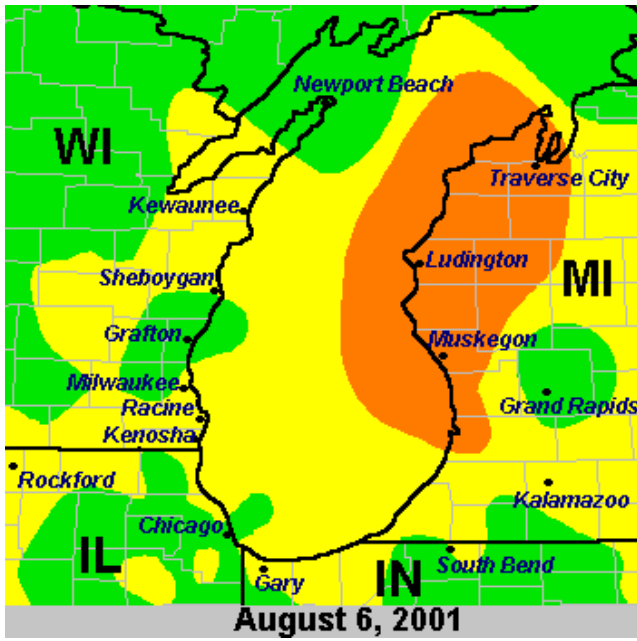
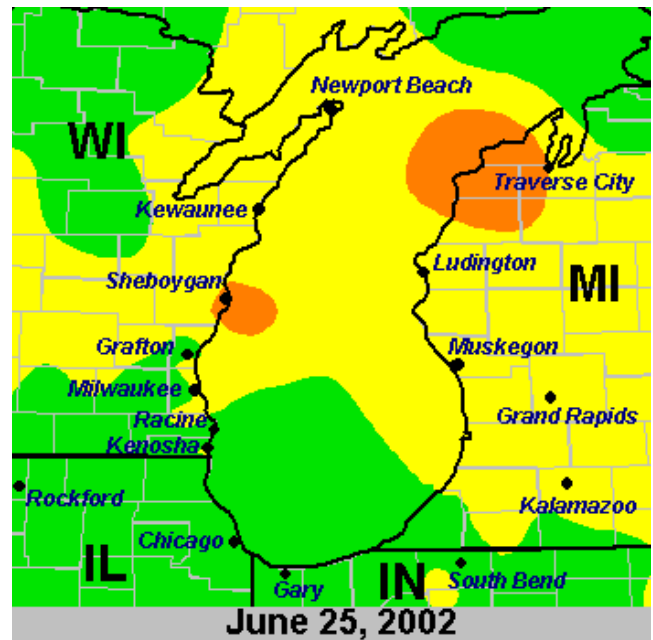
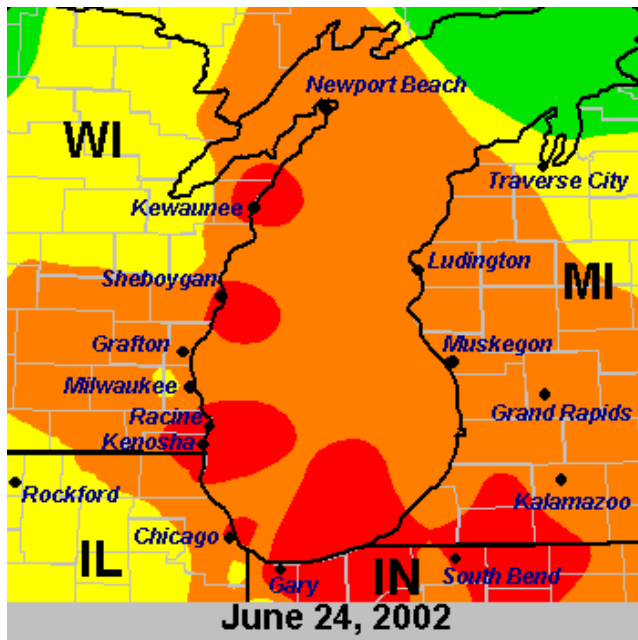
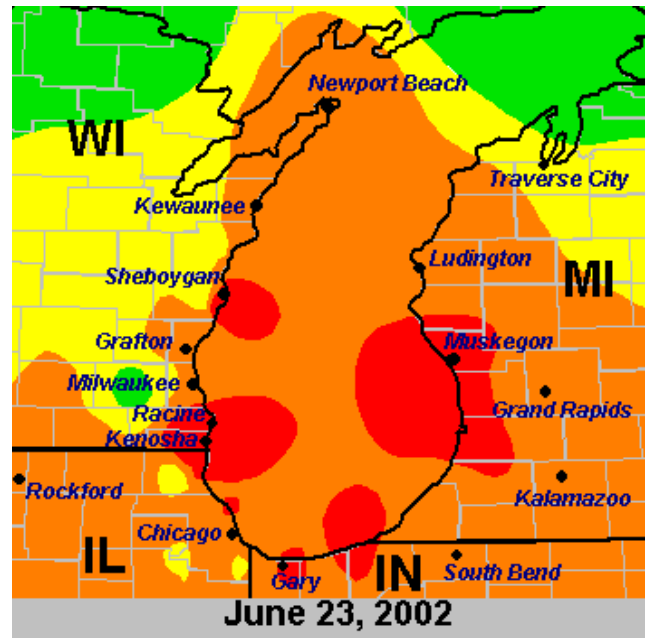
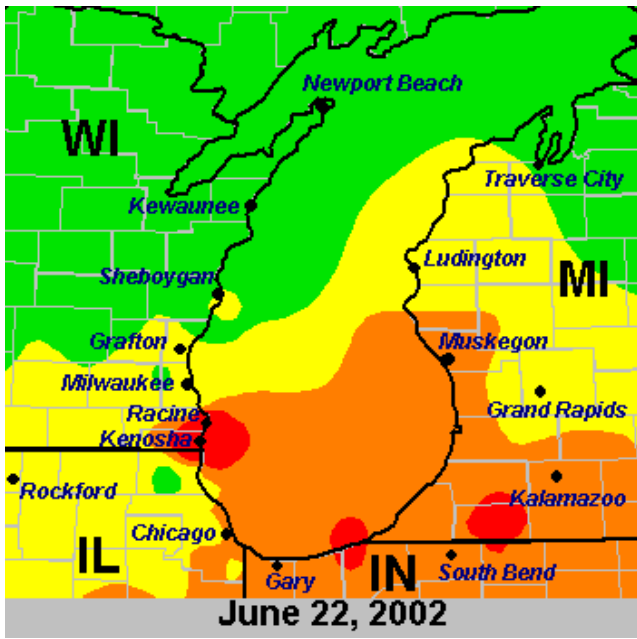


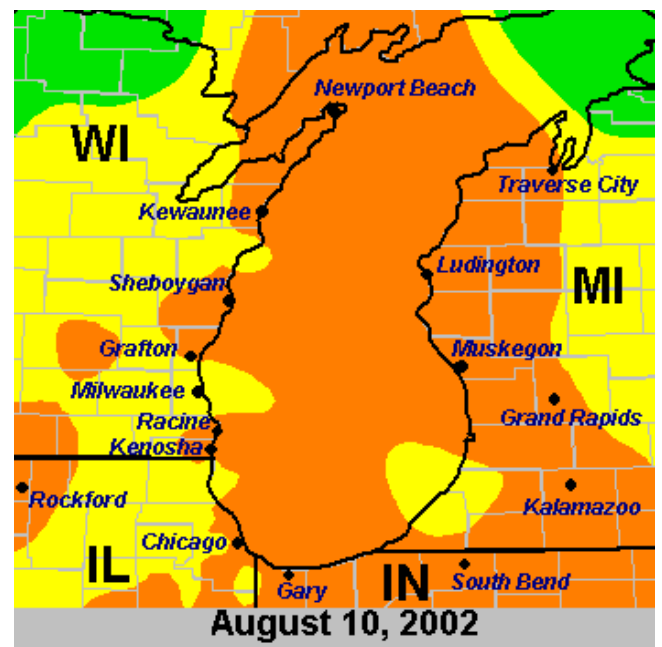
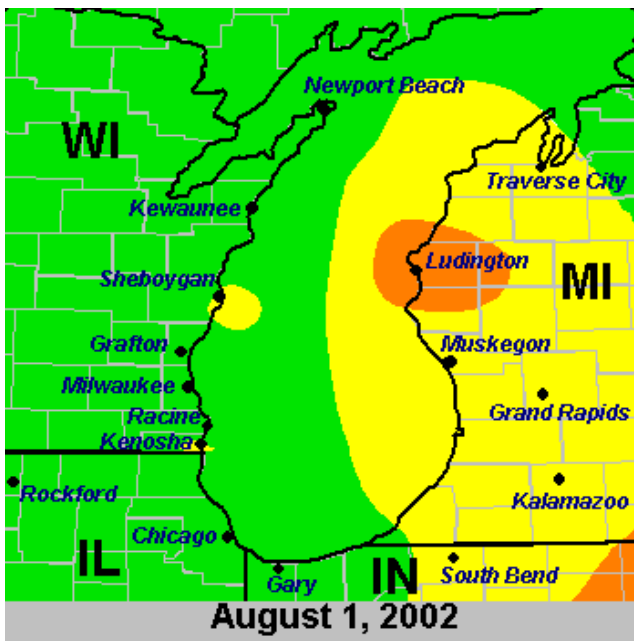
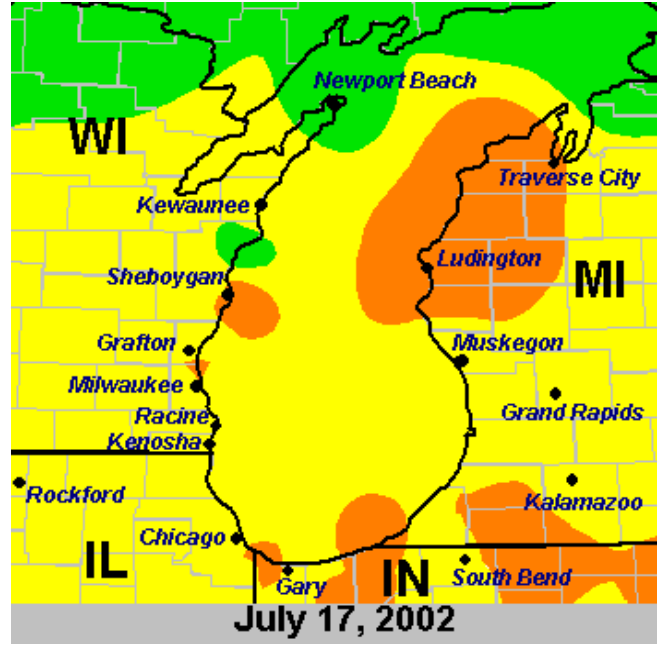
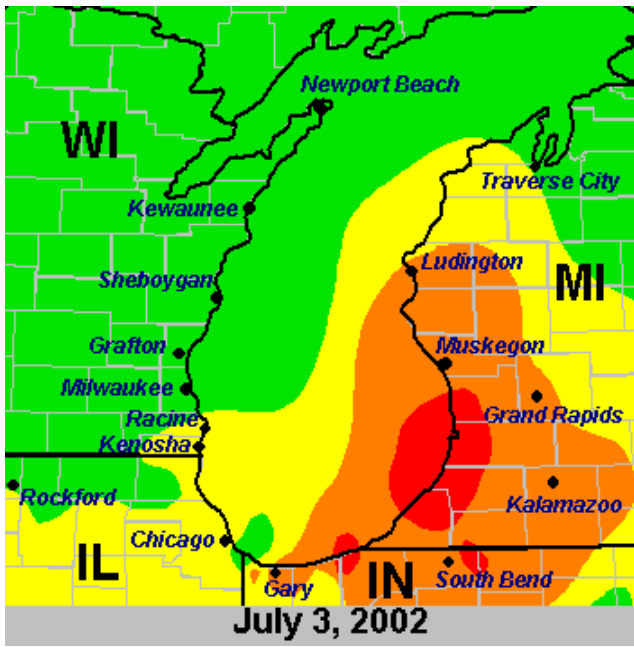
Exhibit #6

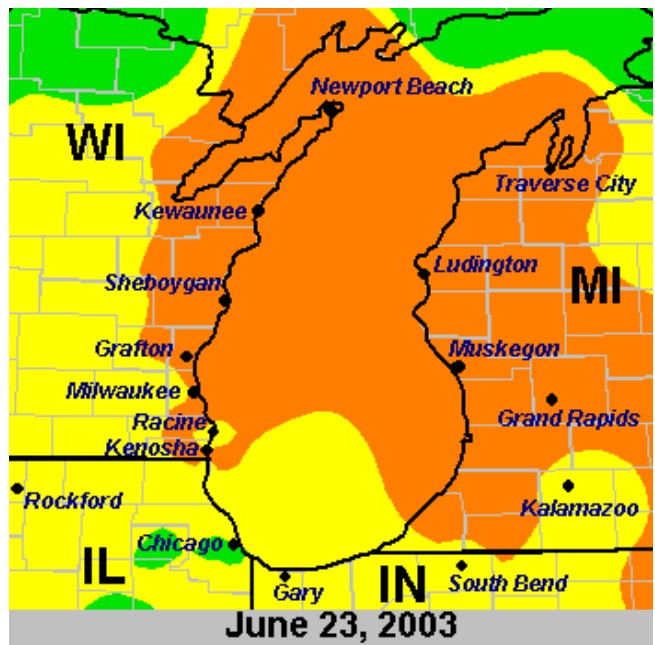
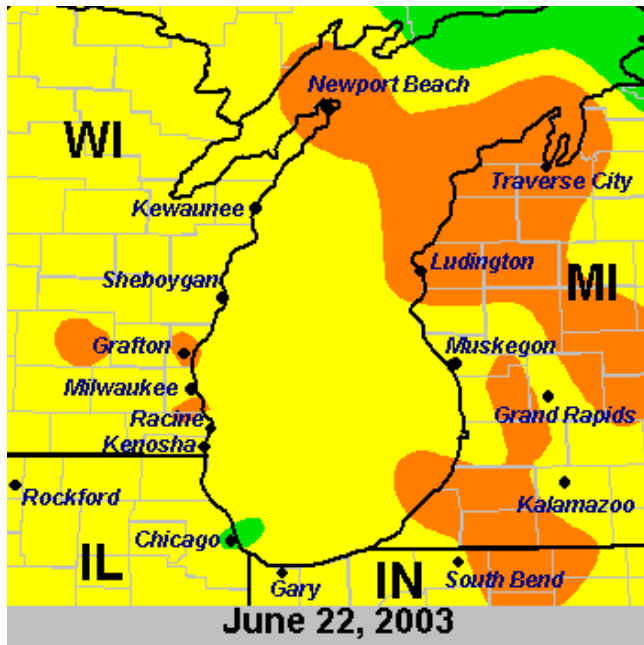
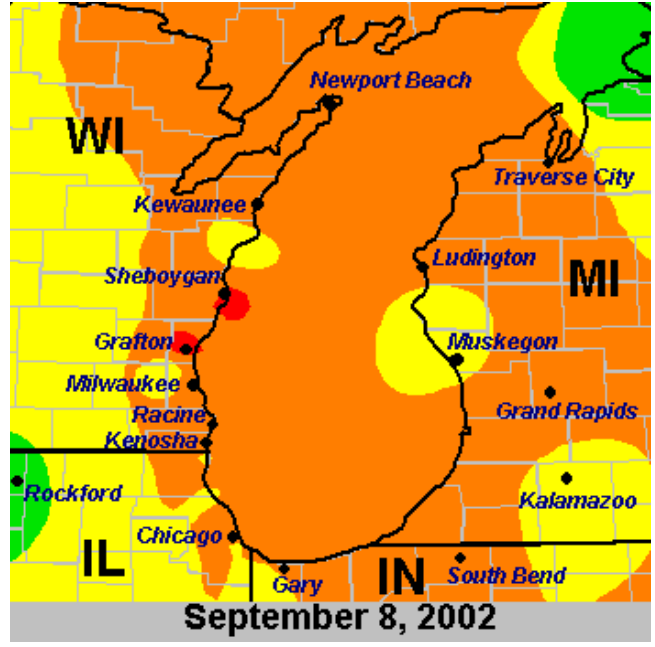
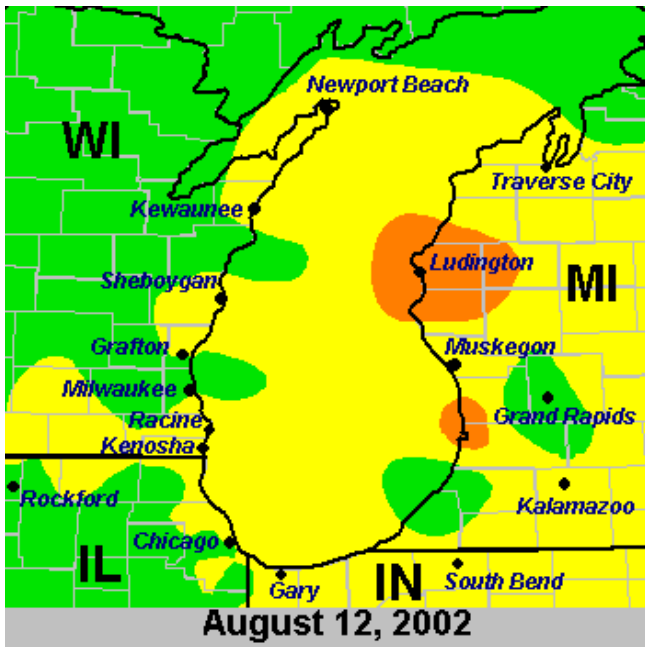












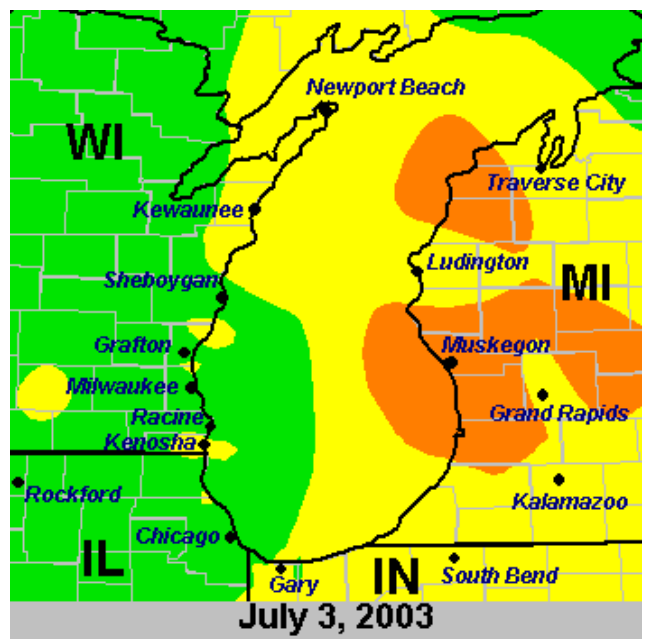
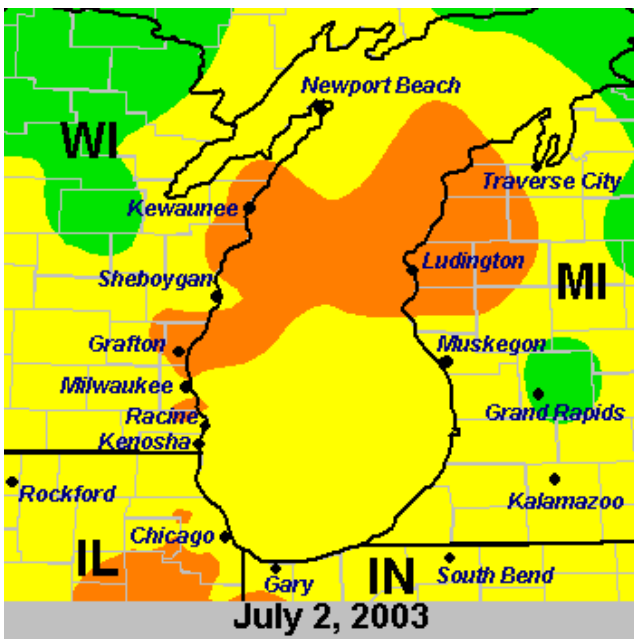
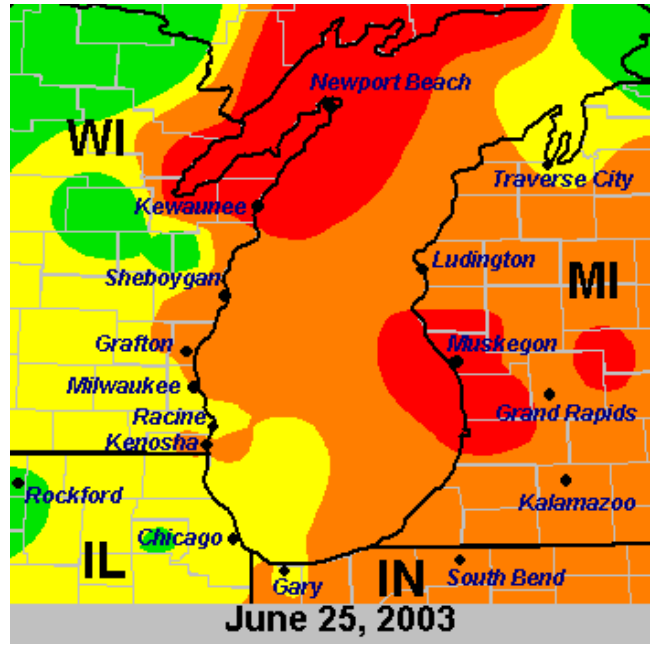
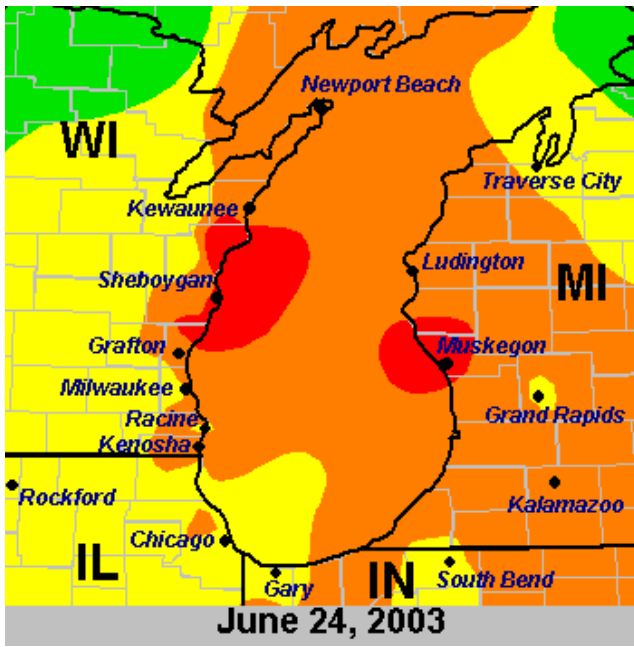


Exhibit #7

Time: 0-2400 July 12, 1951

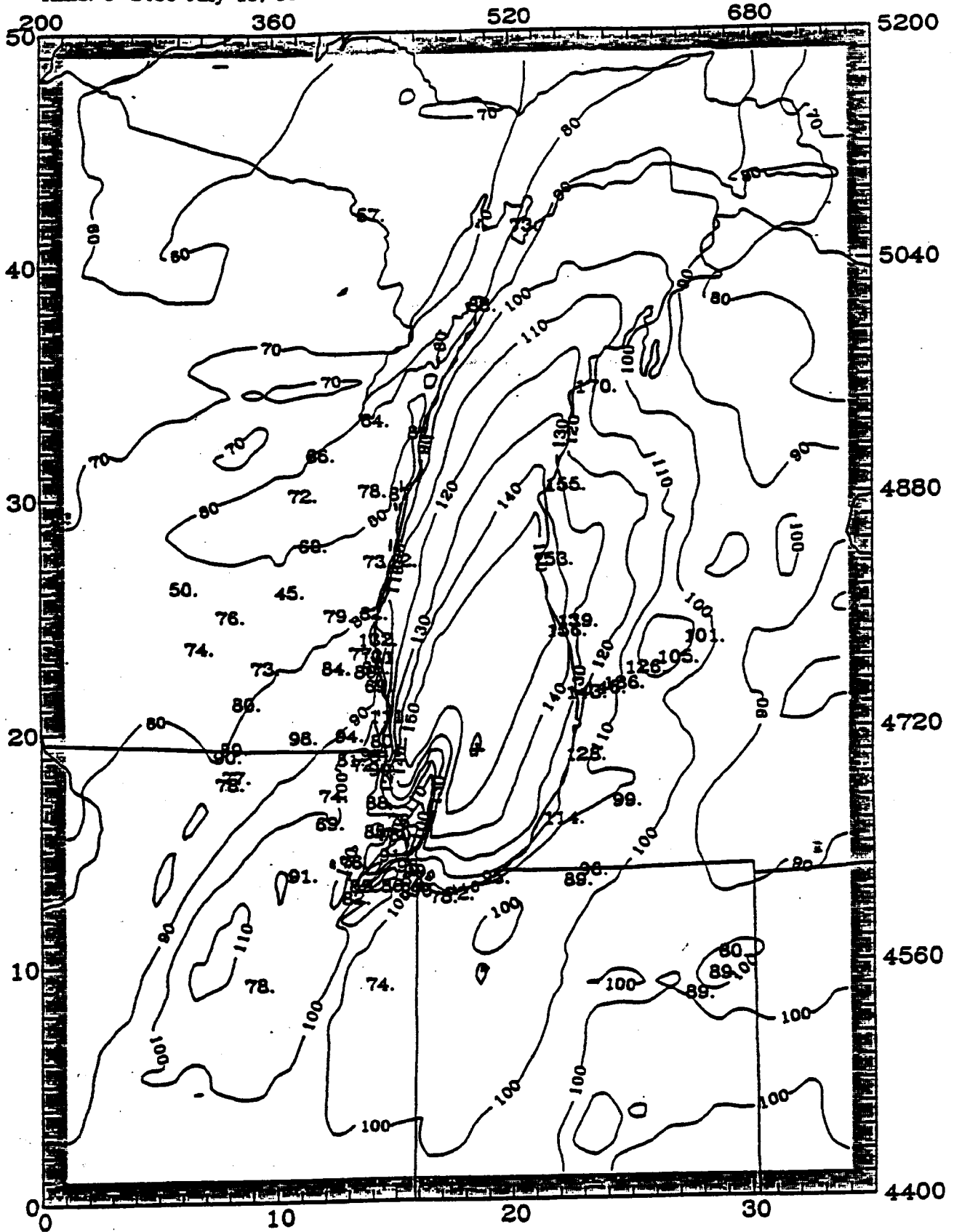


Exhibit #7 (Continued)

Text identifiers cropped from page image are below:

Level 1 Ozone (ppb)	+MAXIMUM = 162.2 ppb
Time0-2400 July 19, 1991	- MINIMUM = 53.9 ppb

LMOS UAM-V Model Predictions of Maximum Hourly Ozone:
XY Map – July 19, 1991 – Grids A & B & C

Exhibit #8



Exhibit #9



Exhibit #10

