July 15, 2015

Ozone Avance
c/o Ms. Laura Bunte
U.S. Environmental Protection Agency
Office of Air Quality Planning and Standards, C304-01 109
TW Alexander Drive
Research Triangle Park, NC 27711

Dear Ms. Bunte:

On behalf of the Dubuque Metropolitan Area Transportation Study (DMATS), the City of Dubuque, and Greater Dubuque Development Corporation (GDDC), I am happy to present the Advance PM 2.5 Path Forward Plan for Dubuque Metro Area to the U.S. Environmental Protection Agency. The plan was approved by DMATS on March 19, 2015 and contains our consolidated effort as a community to reduce the levels of NOx and VOCs thereby reducing PM 2.5 in the area. Plan submittal was moved to July to allow for the inclusion of additional information from Alliant Energy.

This plan details individual and efforts throughout the community to create a more healthful living environment for the current and future citizens of Dubuque County.

We'll be working closely to revise this 'living document' with an annual report of updates which will also be submitted within that timeframe.

If you should have any questions or further guidance, please contact Chandra Ravada at 563-556-4166 or cravada@ecia.org

Sincerely,

Chandra Ravada
Director of Transportation Department

DUBUQUE'S PATH FORWARD TO IMPROVED AIR QUALITY

2014

Help reduce emissions in order to improve health protections and to remain in attainment

Contents

INTRODUCTION

Dubuque is the oldest incorporated community in the state, encompassing 30 square miles adjacent to the Mississippi River in eastern Iowa (see appendix 1 for map). Anchoring a region that encompasses portions of Iowa, Wisconsin, and Illinois, Dubuque serves as the hub for commerce, recreation, and population in the tri-states area. Long a center for manufacturing, early industry in Dubuque evolved from mining and fur-trading to encompass button making, boat building, logging, millworking, meat packing, and other heavy industries in its first hundred years. In the latter half of the 20th century, the community's economy has diversified from its manufacturing base and now includes finance and insurance, professional services, information technology, and more. In addition, Dubuque is now a major retail, medical, and higher education destination for the tri-states area and beyond.

More recently, the story of Dubuque has been about revival and revitalization. Dubuque was a city experiencing difficult times beginning in the early 1980s, suffering from double-digit unemployment, an exodus of residents from the community and the state, and struggling businesses. Dubuque was the hardest-hit community in what was then the worst recession since the Great Depression, and at one point had the highest unemployment rate of any metropolitan area in the nation. However, leadership from both the private and public sectors has been able to turn the tide over the past three decades by focusing on redeveloping numerous parts of the community and expanding Dubuque's commercial and industrial base.

The Dubuque of today is Iowa's tenth-largest city, with three percent of the state's population the Dubuque Metropolitan Statistical Area (MSA) is responsible for over eight percent of the net job gain in the state over the last four years, serving as a model for economic transformation in the Midwest (see appendix two for recent awards).

Dubuque will bring this "can-do" spirit of public/private collaboration to the challenge of PM 2.5

DEMOGRAPHIC INFORMATION (DUBUQUE COUNTY)

Population (2013): 95,697

Population (2010): 93,653

Population under 18 (2013 percent): 23.1 percent

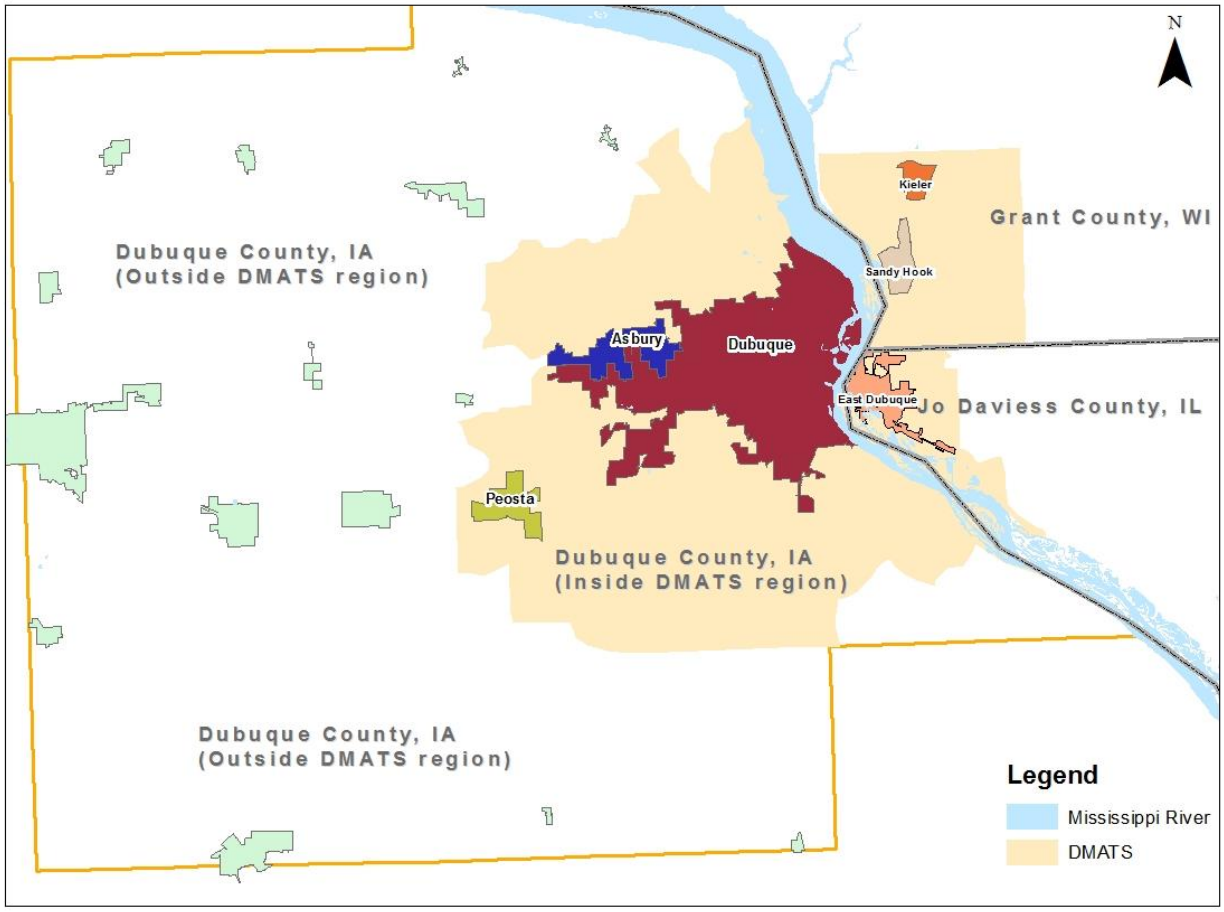
Population over 65 (2013 percent): 15.9 percent

Median Household Income (2012): $50,885

Persons below Poverty Level (2012 percent): 10.3 percent

Unemployment Rate (2013): 4.5 percent

Average Hourly Wage (2013 Private Sector): $23.38

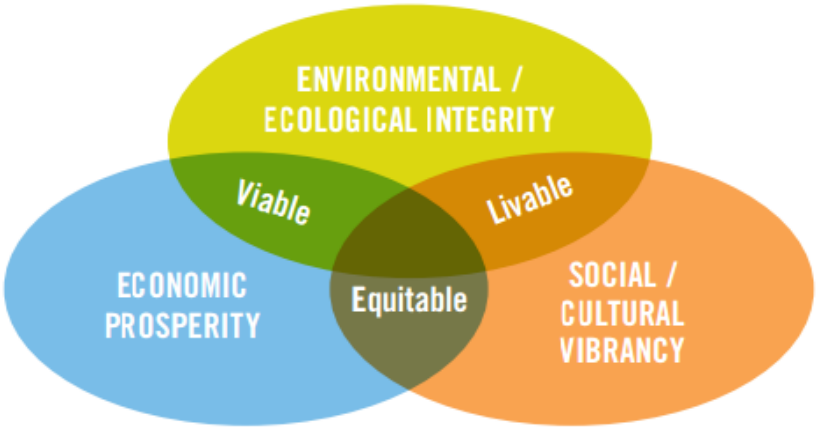


PM 2.5 & AIR QUALITY IMPORTANCE IN DUBUQUE

Fine particulate matter, or PM 2.5, is one of several air pollutants that can affect air quality and public health. PM 2.5 refers to the size of the particles – 2.5 micrometers or smaller. The size of particles is directly linked to their potential for causing health problems. Small particles less than10 micrometers in diameter pose the greatest problems, because they can get deep into your lungs, and affect your health. The Clean Air Act requires EPA to set air quality standards to protect both public health and the public welfare. Particle pollution affects both, and can also impair visibility by producing haze, impact ground and water quality, and impact crops and vegetation.

After serving 10 years on the City Council, Roy D. Buol ran for the office of Mayor in 2005. His platform was based upon "engaging citizens as partners," and what he heard from thousands of citizens was a consistent theme surrounding water quality, air quality, recycling, green space, public transit, cultural vitality, accessibility and downtown revitalization. During the 2006 City Council goal-setting process, Mayor Buol proposed and received full support from his council colleagues to focus on sustainability, including air quality, as a City top priority, stating "cities that get out in front on sustainability will have competitive economic advantages in the future." What soon became known as Sustainable Dubuque is a City Council adopted, community created, and a citizen-led initiative whose story officially began in 2006. A City Council priority each year since, we are

continually working to expand awareness, create partnerships, and encourage initiatives involving all sectors of our community. Dubuque became an early leader on the sustainability front.



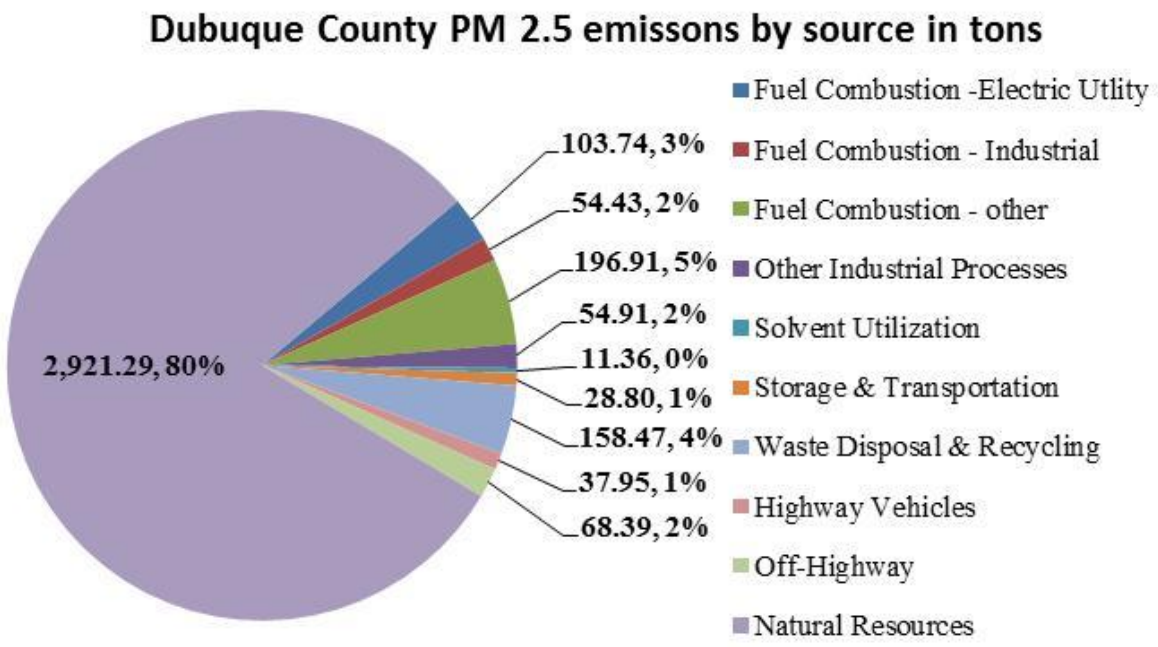
Embodied as one of the 12 principles within the Sustainable Dubuque Vision was a vision for Healthy Air ("Fresh, clean air, reduced greenhouse gas emissions and minimized health risks") as well as a vision for a Strong Regional Economy .

It is a priority for the City of Dubuque and its Sustainable Dubuque vision to assure that both of these priorities (Healthy Air and Strong Regional Economy) can be achieved. In the recent past there have been instances where PM 2.5 emissions have been higher than anticipated. The recently-created PM Advance program is a collaborative effort recently launched by the EPA. The program helps local governments achieve emission reductions in ozone and PM 2.5 in order to protect public health and efficiently direct available resources toward actions to proactively address problems quickly. The program assists governments who are proactively trying to avoid becoming "non-attainment" communities, or communities whose air pollutants persistently exceed EPA standards. The PM Advance program became a key avenue for Dubuque to address the Sustainable Dubuque goals of Healthy Air and a strong Regional Economy, minimizing health risks without threatening economic growth and opportunity.

EXISTING CONDITIONS

EMISSIONS DATA

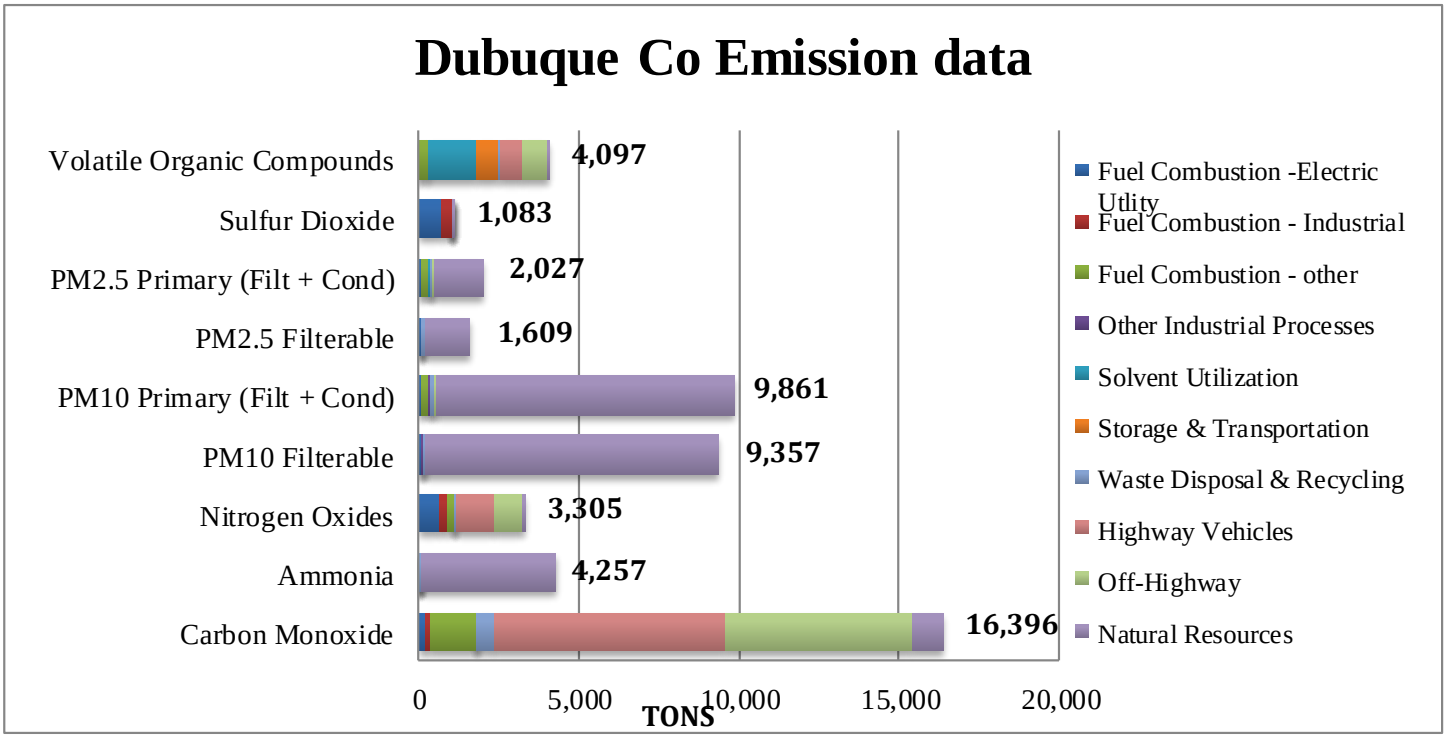
The overwhelming majority of PM 2.5 emissions produced in Dubuque County are generated from natural resources; specifically, the large majority of the emissions are generated by agricultural tilling. The next largest category of PM 2.5 emissions is from fuel combustion from others mobile sources such as heavy-duty diesel vehicles, light-duty gasoline vehicles, and off-road diesel and gasoline equipment. Following that are point-source emissions, with the bulk of these emissions being produced by waste disposal & recycling and other identified sources (Source). The percentage breakdown of emission source for PM 2.5 are shown below



Source: EPA 2011 National Emissions Inventory

As will be outlined, significant efforts are already underway in the community on point-source emissions with additional efforts under active development. Innovative efforts are also being undertaken on mobile sources as well. These efforts will drastically reduce the level of PM 2.5 emissions in Dubuque.

Dubuque County Emissions in 2011



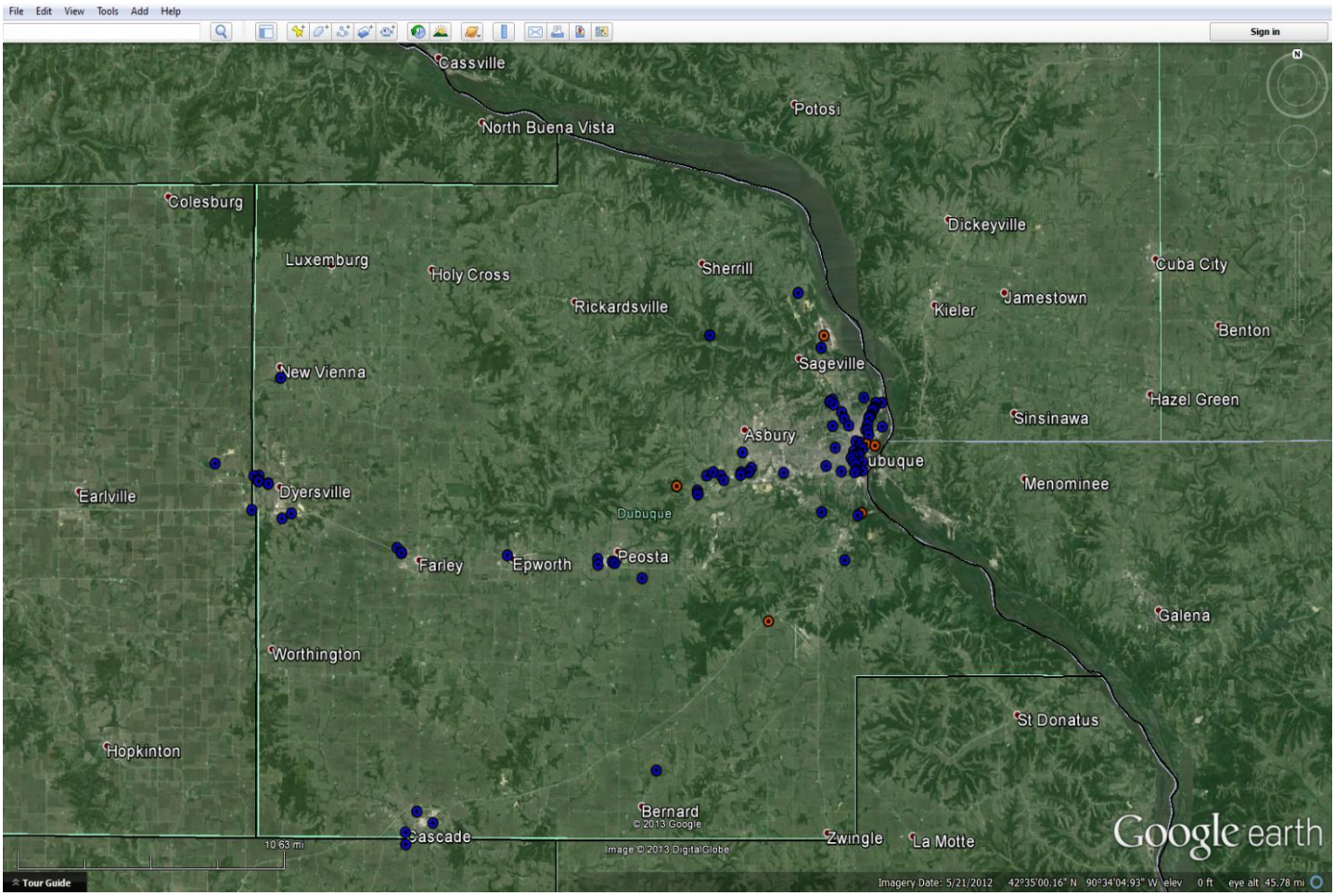
Source: EPA 2011 National Emissions Inventory

	Fuel Combustion - Electric Utility	Fuel Combustion - Industrial	Fuel Combustion - other	Other Industrial Processes	Solvent Utilization
Carbon Monoxide	191.51	198.59	1,409.61	12.51	0.13
Ammonia	0.42	4.86	32.47	0.00	0.00
Nitrogen Oxides	617.72	256.06	239.32	0.30	0.15
PM10 Filterable	49.41	41.05	6.16	32.22	6.13
PM10 Primary (Filt + Cond)	54.32	44.01	192.86	61.64	6.13
PM2.5 Filterable	49.41	25.75	5.17	12.75	5.68
PM2.5 Primary (Filt + Cond)	54.32	28.68	191.74	42.16	5.68
Sulfur Dioxide	667.04	365.63	12.92	0.00	0.00
Volatile Organic Compounds	5.35	15.78	249.73	23.94	1,493.90
TOTAL	**1,689.51**	**980.40**	**2,339.96**	**185.52**	**1,517.80**

Source: EPA 2011 National Emissions Inventory

	Storage & Transportation	Waste Disposal & Recycling	Highway Vehicles	Off-Highway	Natural Resources
Carbon Monoxide	0.00	561.87	7,217.48	5,869.89	934.08
Ammonia	0.00	34.93	25.76	0.98	4,158.08
Nitrogen Oxides	0.00	56.43	1,161.02	937.34	37.02
PM10 Filterable	14.42	93.41	0.00	0.00	9,114.02
PM10 Primary (Filt + Cond)	14.45	93.94	49.31	72.03	9,272.61
PM2.5 Filterable	14.38	78.97	0.00	0.00	1,416.73
PM2.5 Primary (Filt + Cond)	14.41	79.50	37.95	68.39	1,504.55
Sulfur Dioxide	0.00	8.07	6.30	4.81	18.48
Volatile Organic Compounds	730.26	49.57	678.59	747.57	102.37
TOTAL	**787.93**	**1,056.69**	**9,176.42**	**7,701.01**	**26,557.94**

Source: EPA 2011 National Emissions Inventory

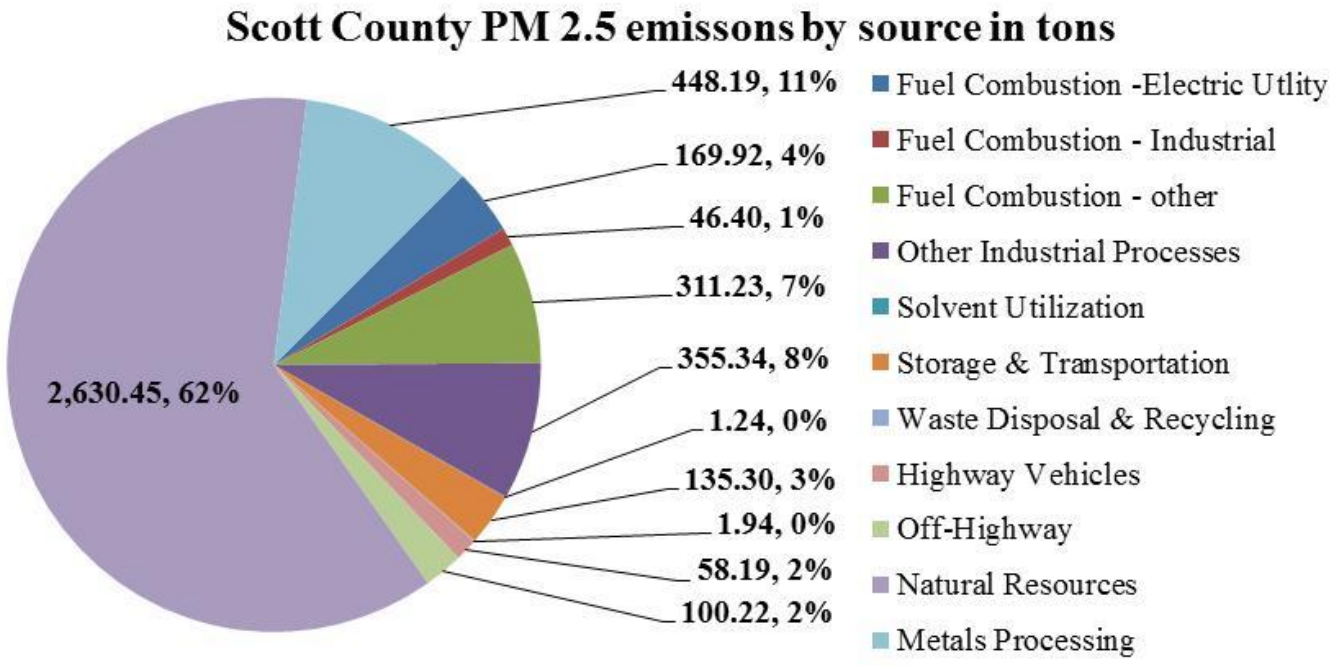


COMPARISON

Dubuque County data is compared to Scott County data as Scott County is located on Mississippi river on Iowa side with twice the population size of Dubuque County. Scott County almost became a non attainment area but the report released by EPA in 2012 shows that Scott County is an unclassifiable/attainment area. (source: http://www.epa.gov/airquality/particlepollution/designations/212standards/final/Davenport_FinalUATSD_Final.pdf) The EPA uses a designation category of "unclassifiable/attainment" for areas where air quality monitoring data indicate attainment of the NAAQS and for areas that do not have monitors but for which the EPA has reason to believe are likely to be in attainment and are not contributing to nearby violations.

EMISSIONS DATA

The overwhelming majority of PM 2.5 emissions produced in Scott County are generated from natural resources; specifically, the large majority of the emissions are generated by agricultural tilling and roadways (both unpaved and paved). The next largest category of PM 2.5 emissions is from Metals Processing and Other Industrial Processes. Following that are point-source emissions, with the bulk of these emissions being produced by Waste Disposal & recycling and other identified sources (Source). The percentage breakdown of emission source for PM 2.5 are shown below



Source: EPA 2011 National Emissions Inventory

The over all PM 2.5 emissions in Dubuque County from different sources is 3,636 tons where as Scott County PM 2.5 emissions are around 4,258 tons. Even though the overall emissions in Dubuqe County are less than Scott County, Dubuque County has higher emissions in Natural Resources, Fuel Combustions – Industrial, Waste Disposal & Recycling and Solvent Utilization. Table below provides the comparison between Dubuque County and Scott County.

PM 2.5 emissions by source in tons		
Source	**Dubuque County**	**Scott County**
Fuel Combustion -Electric Utility	103.74	169.92
Fuel Combustion - Industrial	54.43	46.40
Fuel Combustion - other	196.91	311.23
Other Industrial Processes	54.91	355.34
Solvent Utilization	11.36	1.24
Storage & Transportation	28.80	135.30
Waste Disposal & Recycling	158.47	1.94
Highway Vehicles	37.95	58.19
Off-Highway	68.39	100.22
Natural Resources	2,921.29	2,630.45
Metals Processing	0	448.19
Total	**3,636.22**	**4,258.43**

Source: EPA 2011 National Emissions Inventory

Emissions in tons for Year 2011		
Emissions	**Dubuque County**	**Scott County**
Carbon Monoxide	16,395.66	26,463.39
Ammonia	4,257.50	1,931.74
Nitrogen Oxides	3,305.35	7,152.60
PM10 Filterable	9,356.84	8,617.08
PM10 Primary (Filt + Cond)	9,861.31	9,710.09
PM2.5 Filterable	1,608.84	1,703.64
PM2.5 Primary (Filt + Cond)	2,027.38	2,554.79
Sulfur Dioxide	1,083.25	5,349.02
Volatile Organic Compounds	4,097.04	5,936.48
TOTAL	**51,993.17**	**69,418.84**

Source: EPA 2011 National Emissions Inventory

The overall data shows that Scott County exceeds Dubuque County in all emissions except for ammonia and PM10 Filterable.

The comparison between Dubuque County and Scott County shows that Dubuque is still an attainment area (any area that meets the national primary or secondary ambient air quality standard for the pollutant) with existing EPA standards.

ADDITIONAL DATA

In addition to publicly-available PM 2.5 emissions data provided by the U.S. Environmental Protection Agency (EPA) and the Iowa Department of Natural Resources (DNR), Greater Dubuque Development Corporation financed a study in 2011 to examine the external sources of PM 2.5 emissions. While Dubuque is making significant progress in reducing its emissions, the study (conducted by climate researchers at the University of Wisconsin and the University of Northern Iowa) found that a substantial level of PM 2.5 emissions in Dubuque County are generated from sources many miles south of Dubuque and carried northward by persistent winds, often resulting in high PM 2.5 measurements. PM 2.5 levels in Dubuque are exacerbated by the atmosphere's inability to mix air vertically, especially in colder months. In summary, there may be a unique set of characteristics, caused by Mississippi River Valley wind patterns, that make PM2.5 measurements seem artificially high compared to the diminishing production of point-source PM2.5 emissions in the community. Additionally, cold weather thermodynamics can make these measurements seem even higher in the coldest months (although this characteristic may not be limited to Dubuque).

A summary of the researchers' findings is below, and the full study is included as Appendix 5.

"While there is variability between cases within the high and low sets examined in this project, it is still possible to make some summary statements. The average virtual potential temperature profiles for the high PM2.5 cases consistently depict a stably stratified atmosphere that would resist vertical mixing of air pollution by turbulent processes. On the other hand, the average profiles for the low cases consistently depict a mixed layer where turbulence would act to reduce the concentration of particulates at the surface. Both HYSPLIT back trajectory

calculations and surface wind roses indicate that winds at and near the surface most commonly have a southerly component in the high cases, and a northwesterly component in the low cases. However, southerly surface winds at Dubuque are not necessarily a good predictor of PM2.5 concentration at Potosi. South winds are common at Dubuque every month of the year, yet high PM2.5 episodes are more strongly associated with cold than warm months. The suggestion is that the atmosphere's ability to mix air vertically is a dominant process in explaining high PM2.5 measurements. As seen in this study, the thermodynamic structure of the lower atmosphere is notably and quantifiably different when PM2.5 measurements are high."

PLAN DEVELOPMENT & STAKEHOLDER ENGAGEMENT

This *Path Forward* plan is the collaboration of a wide range of local and regional entities, including, but not limited to, Dubuque Metropolitan Area Transportation Study, City of Dubuque, East-Central Inter-governmental Association and the Greater Dubuque Development Corporation. (For more detailed information on partners, see appendix 3)

Wide community and stakeholder engagement developed the original Sustainable Dubuque vision and its principle of Healthy Air. When air quality was identified as a City Council priority in 2013, an Air Quality Task Force comprised of the City of Dubuque, Dubuque Metropolitan Area Transportation Study, East Central Intergovernmental Association, and Greater Dubuque Development Corporation began meeting and have led the development of this document. In that process wider stakeholder outreach began in its preliminary stages, including with Green Dubuque and the Environmental Stewardship Advisory Commission. Under development is an even wider stakeholder education and engagement process on general issues of air quality, which would complement the Advance PM work. As the first steps, we are working with the Iowa Department of Natural Resources to identify and implement an air quality education program, beginning with the topic of "local air monitoring". The goal would be to conduct this educational and outreach session early in 2015 with known and identified stakeholders. This would be followed by a community-wide educational session on the issue later in 2015. Input from this wide stakeholder outreach process would be incorporated into the future annual updates to this Path Forward. Additionally, it is our intention that a progress report regarding the goals in this document would be provided to the engaged stakeholders and public on an annual basis.

GOAL OF THIS *PATH FORWARD*

The Dubuque community's goal is to remain in attainment status and pursue projects and programs that will improve air quality and public health in the tri-state area while supporting a thriving local economy. Through this Path Forward, we will:

- Outline and recommit to immediate actions being taken to remain in attainment.
- Discuss and strategize additional actions under development.
- Assure additional citizen, stakeholder and expert input on future efforts beyond simple attainment.
- Assess if local action alone can maintain attainment standards.

CURRENT PROJECTS UNDERWAY – IMMEDIATE – POINT SOURCE

EMISSIONS FROM LARGEST POINT-SOURCE IN THE COMMUNITY HAVE BEEN ELIMINATED

Jeld-Wen, one of the world's largest manufacturers of wood doors and windows, operated a manufacturing plant in down-town Dubuque since 1978. This plant, which manufactured door skins using wood fibers, was the single-largest point source emitter of PM 2.5 emissions in Dubuque County. For example, as of 2012 Jeld-Wen released 25.62 tons of PM 2.5 annually, which is more than double the next-highest PM 2.5 emissions contributor in the community. The community worked with Jeld-Wen in 2011 on a plan to actively manage PM 2.5 and precursor emissions. In 2013, Jeld-Wen ceased operation of the plant in Dubuque completely, as the plant is outdated and the site is located adjacent to the Millwork District (a fast growing urban-revitalization and housing area).

EMISSIONS FROM THE COMMUNITY'S ENERGY PLANT HAVE BEEN SIGNIFICANTLY REDUCED AND WILL BE ELIMINATED

The community receives its electrical power from Alliant Energy, a regulated private utility operating in Iowa, Wisconsin and Minnesota. Alliant has historically provided power to the community by operation of the Interstate Power and Light Dubuque Generating Facility, a 61-MW coal fired power plant located on the Dubuque riverfront. That plant was the largest CO2e generator in the community, as well as one of the five largest PM 2.5 emitters. On Septmeber 24th, 2011 Alliant switched the generation fuel source from coal to natural gas, significantly reducing emissions. In addition, the hours of operation for the facility since 2011 have been significantly reduced, also curtailing emissions. Lastly, Alliant filed notice that it will cease operation completely of the Dubuque Generating Facility in mid 2016, removing the remaining emissions from this source. The data table below provides the dropdown values for the energy plant from 2010 to 2014.

	CO TOTAL TONS (ANNUAL)	NOX TOTAL TONS (ANNUAL)	PM TOTAL TONS (ANNUAL)	PM10 TOTAL TONS (ANNUAL)	PM2.5 COAL TONS (ANNUAL)	PM2.5 N GAS TONS (ANNUAL)	SO2 TONS (ANNUAL)	VOC TOTAL TONS (ANNUAL)
	Data Value	Data Value	Data Value	Data Value	Data Value	Data Value	Data Value	Data Value
IPL Dubuque Boiler DB1 Unit 1								
11/30/2010 12:00 AM	139.97	489.34	50.128	39.644	39.6508	0.1350	503.74	2.419
11/30/2011 12:00 AM	106.83	350.79	37.509	29.682	29.6620	0.0197	468.10	2.045
11/30/2012 12:00 AM	28.73	46.18	2.599	2.599	0.0000	2.5992	0.03	1.881
11/30/2013 12:00 AM	15.33	32.30	1.387	1.387	0.0000	1.3897	0.85	1.004
11/30/2014 12:00 AM	5.85	11.99	0.529	0.529	0.0000	0.5292	0.31	0.383
11/31/2014 12:00 AM								
IPL Dubuque Boiler DB5 Unit 5								
12/31/2010 12:00 AM	140.56	305.83	45.715	39.421	39.4100	0.0077	267.55	1.379
12/31/2011 12:00 AM	74.53	191.68	23.093	19.916	19.9000	0.0200	156.64	0.969
12/31/2012 12:00 AM	20.30	65.60	1.837	1.837	0.0000	1.8367	0.62	1.329
12/31/2013 12:00 AM	7.94	28.98	0.719	0.719	0.0000	0.7187	0.51	0.520
12/31/2014 12:00 AM	2.41	9.23	0.218	0.218	0.0000	0.2177	0.21	0.158
IPL Dubuque Boiler DB5 Unit 6								
12/31/2010 12:00 AM	1.57	23.90	1.200	39.660	1.1900	0.0054	11.34	0.123
12/31/2011 12:00 AM	2.91	65.43	3.100	29.680	3.0700	0.0076	41.94	0.257
12/31/2012 12:00 AM	3.32	10.37	0.300	2.600	0.0000	0.3006	0.28	0.218
12/31/2013 12:00 AM	0.19	0.66	0.020	1.390	0.0000	0.0169	0.09	0.012
12/31/2014 12:00 AM	1.08	1.70	0.100	0.530	0.0000	0.0974	0.06	0.071

Source: Alliant Energy

Emissions from community's largest employer will be reduced

The largest employer in Dubuque is the John Deere Dubuque Works. A manufacturer of farm, forestry and construction equipment has also historically been one of the top five PM 2.5 emission sources in the community. It has recently announced that it would cease coal fired energy production at its Dubuque facility. In its initial filing with the Iowa Utilities Board on December 22, 2011 (John Deere will be providing additional on when the coal fired energy ceased which we will be added to the plan when it arrives), John Deere stated it has ceased the "use of coal-fired generation for several reasons including implications of the proposed Maximum Achievable Control Technology (MACT) standards" that are to control the release of mercury and other hazardous pollutants. The Iowa Utilities Board had stated that the plant's annual net generation was 31,496 MWh prior to conversion.

CITY OF DUBUQUE PROGRAMS REDUCE PM 2.5 IN ITS OWN OPERATIONS

Dubuque has committed record resources to the goal of upgrading City facilities, services and operations to increase efficiency, reduce costs and improve environmental outcomes, including the reduction of PM 2.5 in the community. As an example, on October 3, 2013 the City of Dubuque held a ribbon-cutting to celebrate the completion of a $65 million upgrade to the Water and Resource Recovery Center (formerly known as the Water Pollution Control Plant), the single largest capital investment in the community's history. Initially approved by the City Council in 2008, the update included replacement of 40 year old incinerators and construction of four high-capacity anaerobic digesters to treat wastewater and high-strength waste from commercial and industrial sources. This process, often called "codigestion", generates biosolids that can be used as soil fertilizer on local farmland and also produces biogas (largely methane) that is used to heat the digestion process and buildings at the facility and generate electricity to operate the plant and sell back to the local utility. A study is underway to consider converting the facility to produce renewable natural gas for transportation fuel. City projects such as this contribute both directly and indirectly to PM 2.5 emission reductions in the community.

Dubuque's Water & Resource Recovery Center underwent a nearly $70 million upgrade that was completed in 2013 and currently operates at 65 percent of its capacity. It features methane production/capture and co-generation to produce electricity and create heat for the operation of the facility. It is expected to be electrically self-sufficient within a few years and will save $250,000 in annual energy expenses. It also now better serves local industries by accepting high-strength waste. The project is more environmentally friendly than the former waste incineration and responded to a US EPA consent degree.

The $70 million upgrade of Dubuque's Water & Resource Recovery Center was completed in late 2013, the result of the largest capital improvement project in the City's history at that time. The facility now utilizes anaerobic digestion to manage bio-solids, eliminating incineration of solids from the treatment process. The innovative design, construction, and management of this facility are expected to cut heating and cooling usage by up to 30 percent, reduce electrical demands by 75 percent, and improve the quality of treated water released back into the environment. Additionally, the new treatment process produces a beneficial by-product, fertilizer for farm fields.

ACTION PLAN – IMMEDIATE – MOBILE

EMISSION REDUCTION VIA DERA (DIESEL EMISSION REDUCTION ACT) PROGRAMMING

In 2005, the U.S. Congress passed the Diesel Emission Reduction Act (DERA) as an amendment to the Energy Policy Act. DERA was designed to reduce diesel emissions from existing diesel fleets that did not meet recently adopted federal emission standards. Through the State Allocated DERA Funding to Iowa, the Dubuque Metropolitan Area Transportation Study (DMATS) received an $80,000 grant in 2014 to convert City of Dubuque Public Works vehicles to utilize clean diesel technology. Emission reductions for this project will be provided by end of 2015

EMISSION REDUCTION VIA CONVERSION OF TRANSIT SYSTEM.

The Jule is the operator of mass transit systems and services within the City of Dubuque. The Jule offers transit bus routes throughout the city, trolley-replica transportation in Downtown Dubuque and the Port of Dubuque, and on-demand paratransit "MiniBus" service citywide. Operation of the Jule is the responsibility of ECIA and is supervised by a director who reports to the Dubuque City Manager and acts on policy as given by the Dubuque City Council, on advice of the Dubuque Transit Trustee Board. In 2011, The Jule updated the entirety of its 1970s-era 28-vehicle fleet, with the smaller, right-sized busses running exclusively on clean diesel. By reducing the size of some buses and replacing the entire fleet in 2011, emissions were reduced by 514 mt CO2e. In addition to a decrease in pollution from the fleet vehicles, a 28 percent increase in public transit ridership in the last two years means that fewer single-occupancy vehicles are contributing to the PM 2.5 problem as well.

EMISSION REDUCTION VIA USE OF ROUNDABOUTS

In addition to their improvements to public safety, roundabouts can claim numerous environmental benefits, including decreased emissions due to reduced idling. Roundabouts often provide environmental benefits by reducing vehicle delay and the number and duration of stops compared with signalized or all-way stop-controlled alternatives. Even when there are heavy volumes, vehicles continue to advance slowly in moving queues rather than coming to a complete stop. This can reduce noise and air quality impacts and fuel consumption significantly by reducing the number of acceleration/deceleration cycles and the time spent idling. DMATS and the City are partnering on these efforts and the design and construction of several roundabouts in Dubuque. One at Grandview Ave and Delhi St have received Notice of Funding award from the Iowa DOT, three others are planned to be constructed in the next five years for the Southwest Arterial construction and an additional one is under design and seeking funding at Radford Rd and Pennsylvania Ave as part of East/west corridor Improvements.

EMISSION REDUCTION VIA SIGNAL SYNCHRONIZATION

DMATS has long advocated for and worked towards improved traffic signal synchronization in the Dubuque area, which can reduce idling and travel times, lowering emissions levels. Corridor-wide or regional traffic flow improvements are designed to increase average travel speeds, reduce vehicle delay and idling, and result in fewer vehicle accelerations and decelerations. Specific projects include traffic signal synchronization,

regional congestion management systems, and intersection improvements. Many of these projects involve elements of Intelligent Transportation Systems (ITS) managed by the City. In general, traffic flow improvements that reduce congestion should reduce emissions of most pollutants by improving the flow of traffic and minimizing stop-and-go conditions and idling. This has been accomplished by interconnecting the traffic signals with fiber optics, allowing communication between the signals. This, coupled with the installation of traffic cameras allows for signal synchronization and real time signal adjustments according to traffic flows. The major highways through Dubuque, US 20, the NW Arterial and US 52 (which utilizes Central Ave and White Streets) have had significant results on fewer emissions from semi -trucks due to synchronization of signals for dealing with hills and traffic. DMATS is in process of developing the project and will be calculating the emission savings once the project plan is finalized.

ACTION PLAN – LONG TERM

EMISSION REDUCTION THROUGH INCORPORATION OF AIR QUALITY INTO COUNTY HEALTH GOALS

As part of Dubuque County's Community Health Needs Assessment and Health Improvement Plan (CHNA-HIP) for 2011-2016, a goal was adopted to reduce PM emissions. Specifically: *By 2016 the air quality in Dubuque County will be in compliance with the Clean Air Act standards by the number of days of moderately unhealthy and unhealthy air days being reduced by maintaining attainment standards for PM 2.5.* There are numerous sub-goals, such as prohibiting open burning on bad air days and minimizing it overall, providing public education to increase awareness of air quality problems, publicizing the current Air Quality Index, and partnering with other organizations to reduce PM 2.5 emissions. A full copy of the Dubuque Community Health Needs Assessment and Health Improvement Plan is attached as Appendix 6. A new CHNA-HIP is now being drafted and will include community input, with an expected completion date of May, 2015. The plan will be for a period ending in 2018. Since the Air Quality Task Force has worked on this existing goal, more data sources have been identified, which will assist in drafting specific and realistic goals. These goals may align with some of the activities outlined in this Path Forward.

EMISSION REDUCTION THROUGH PUBLIC/PRIVATE PARTNERSHIPS.

One reason that economic recovery and revitalization have occurred so dramatically in Dubuque has been its use of unique public/private partnerships. As it relates to PM 2.5 emission reduction, an example is the Smarter Travel pilots with IBM. The City of Dubuque, along with national and local partners, collaborated with IBM on its City-In-Motion project to conduct the Smarter Travel pilot studies. The Smarter Travel pilot studies are part of *Smarter Sustainable Dubuque*, the City's partnership with IBM Research and the research component of the Sustainable Dubuque initiative. Collaborators include the City of Dubuque, IBM Research, The Jule, East Central Intergovernmental Association, and local private businesses.

Dubuque's initial Smarter Travel pilot study used a smartphone application developed by IBM Research and RFID technology to collect anonymous data on how, when and where volunteer participants travel within the community. The anonymous, aggregate data collected was analyzed by IBM and the findings used by the City of Dubuque and its transit partners to implement practices and policies that incorporate lower-cost and lower-impact travel options within Dubuque (such as the redesign of transit routes). Like other *Smarter Sustainable Dubuque* projects, this research was designed to give residents the information they need to do what they want (reduce costs, save resources, and decrease their environmental impact). Possible outcomes from the on-going pilots include, but are not limited to: reduced travel times, increased fuel efficiency, increased traffic safety, reduced vehicle miles traveled (VMT), and reduced carbon monoxide emissions.

EMISSION REDUCTION VIA INNOVATIVE INFRASTRUCTURE

Earlier this year Dubuque broke ground on its sixteen million dollar intermodal transportation hub, which will centralize innovative infrastructure for transportation conversions. First to be implemented is Vehicle-to-Transit followed by Vehicle-to-Bike, Vehicle-to-Walk and even Vehicle-to-Rail. Innovative

infrastructures such as the intermodal facility, coupled with improved data from the *Smarter Travel* pilots, will also allow acceleration of car-pool, van-pool and other shared ride systems.

EMISSION REDUCTION VIA BUSINESS INNOVATION

The Dubuque business community is a leader in sustainability innovation and implementation. The business community, coordinated by the Greater Dubuque Development Corporation (GDDC) through its Innovation Consortium, develops and hosts specific business programming on sustainability. A recent example impacting PM 2.5 is the Consortium's work on compressed Natural Gas Vehicles and infrastructure. With leadership from Black Hills Energy and private fuel providers, the private sector has embraced compressed natural gas as a more environmentally friendly vehicle fuel and private NG fleets and fueling stations can now be found in Dubuque. The City of Dubuque is currently piloting the use of two CNG pickup trucks and will explore the opportunity to convert additional vehicles to CNG in the future, with potential fueling sources including methane from the Water and Resource Recovery Center, and Dubuque Area Metropolitan Solid Waste Agency. On November 13, 2013 GDDC brought together a natural gas supplier, distributors and end users to discuss benefits (including return on investment) of expansion of NG fueling.

EMISSION REDUCTION VIA REGULATION

While Dubuque is a community where positive change is most often achieved through discussion, consensus and accommodation there are instances where direct regulation is considered and occurs. Attached as Appendix 7 is Dubuque's adopted policy on recreational burning. While not a primary contributor to PM 2.5, in densely-populated areas, a large number of residents can be adversely impacted by the air quality resulting from recreational fires and burning. To mitigate this, the City of Dubuque has adopted the International Fire Code (IFC), which contains regulations and guidelines regarding recreational fires.

EMISSION REDUCTION VIA NON-POINT SOURCE COLLABORATIONS

While point-source reduction efforts are proceeding well within the community, the Dubuque Air Quality Task Force will work to identify remaining point-source emitters and develop an engagement process/campaign to identify additional individual improvements that can be made. In addition, as the majority of the direct PM 2.5 in the region relates to non-point sources of emissions, the Dubuque Air Quality Task Force will reach out to the relevant state agencies and associations to determine if there are collaborative efforts which could be undertaken regionally between Dubuque and identified non-point source groups. Progress in these areas can be added at the annual update of the Path Forward.

ACTION PLAN - ASSURING CITIZEN, STAKEHOLDER AND ENGAGEMENT

ENGAGING CITIZENS THROUGH EFFORTS LIKE SUSTAINABLE DUBUQUE'S WORK ON AIR QUALITY.

"Dubuque is a viable, livable, and equitable community that embraces economic prosperity, environmental integrity, and social/cultural vibrancy to create a sustainable legacy for generations to come" became the vision. In order to implement that vision, a citizen-based task force defined 12 key principles to guide the community's path to a more sustainable future. These include: Regional Economy, Smart Energy Use, Resource Management, Community Design, Green Buildings, Healthy Local Foods, Community Knowledge, Reasonable Mobility, Healthy Air, Clean Water, Native Plants and Animals and Community Health and Safety.

With the support of technical and education assistance through Advance PM, Dubuque would like to increase the focus on Air Quality within its Sustainable Dubuque model. In addition to education efforts to increase the general public's understanding of the causes and effects of PM 2.5, the Air Quality Task Force will explore partnerships with K-12 schools, colleges, non-profits, and citizen groups to raise awareness and affect behavior change.

ENGAGING THE ENTIRE BUSINESSES COMMUNITY THROUGH COLLABORATIONS LIKE THE PETAL PROJECT.

The Petal Project is a regional green business certification program designed to help businesses in the Dubuque area adopt more environmentally-friendly business practices. The program provides businesses with a simple framework for saving money and resources while establishing a community-wide definition of a green business for consumers wishing to shop based on their values. Currently, 30 businesses in the Dubuque area are participating in the Petal Project, with 15 certified. These organizations span across a range of sectors including retail, education, non-profit, manufacturing, finance, printing, and medical. Together these companies employ over 4,000 people. For additional information on the Petal Project, see Attachment 8. The Air Quality Task Force will explore opportunities to add air quality outreach to existing business program such as the Petal Project.

ENGAGING EXPERTS THROUGH GOVERNMENTAL COLLABORATIONS SUCH AS ADVANCE PM.

Dubuque has continually sought the input of state, national and international experts as it works toward its Sustainable Dubuque vision. Advance PM is a perfect example of proactively engaging experts on a key environmental issue. The areas and opportunities for technical assistance are many, with four specific areas of interest to Dubuque at this time:

- Assistance in measuring progress from existing efforts and extrapolating into the future.
- Assessing the ability to improve capacity for change through scientific, educational and engagement efforts in the community.
- Assessing whether local action alone can be sufficient to maintain attainment status.
- Assistance with community education, outreach and engagement

APPENDICES

Appendix 1 – Dubuque County and City Map

Appendix 2 – Dubuque Awards

Appendix 3 – Path Forward Partners Information

Appendix 4 – Dubuque County PM Emissions Data

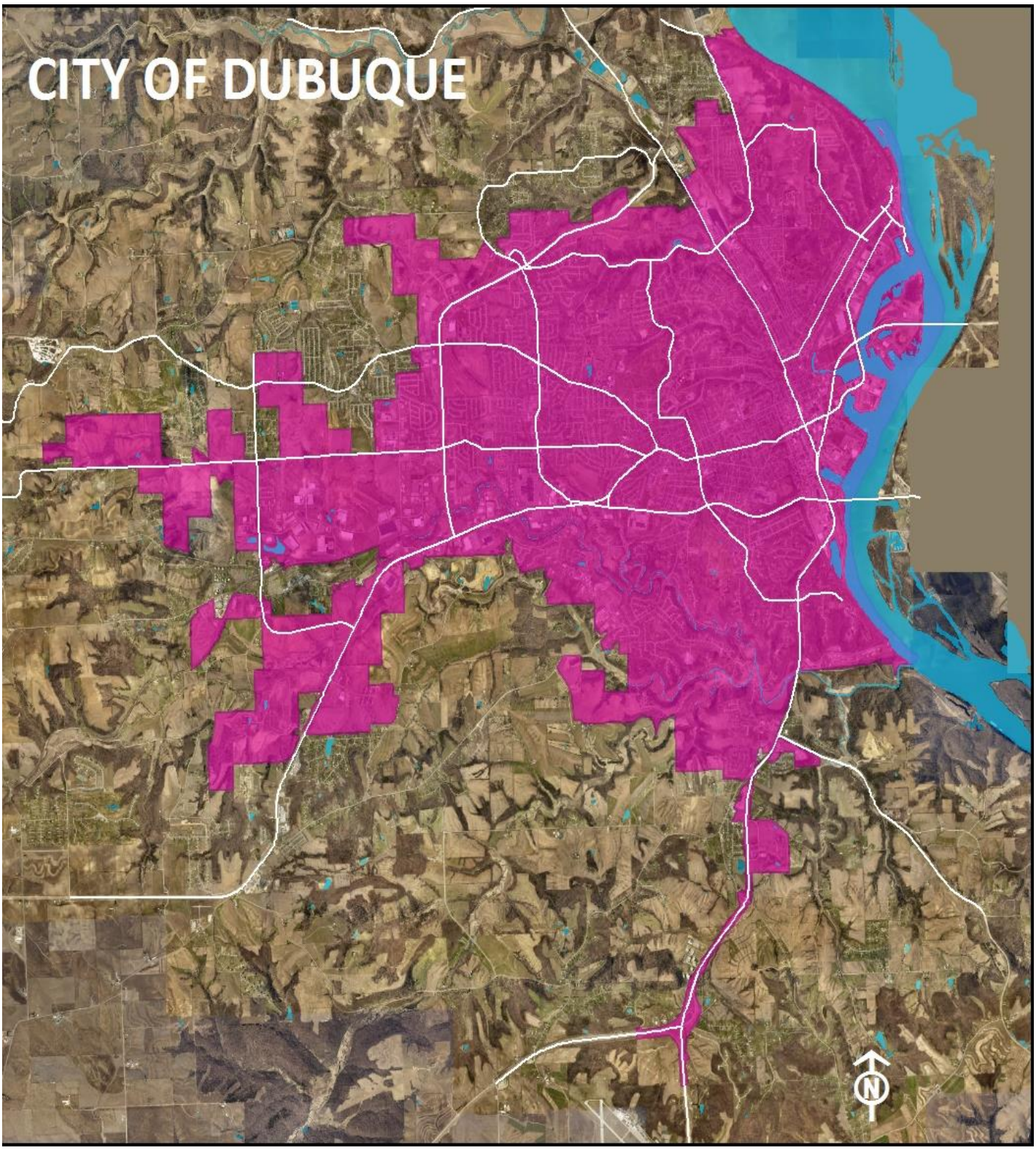
Appendix 5 - Dubuque Air Quality Study

Appendix 6 – Dubuque Health Needs Assessment and Health Improvement Plan

Appendix 7 – Dubuque Fire Regulations

Appendix 8 – Petal Project

APPENDIX 1- DUBUQUE COUNTY AND CITY MAP



APPENDIX 2 – DUBUQUE AWARDS

EPA National Award for Smart Growth Achievement - 2013
The U.S. Environmental Protection Agency (EPA) named Dubuque a recipient of its 2013 National Award for Smart Growth Achievement. Competing in the "Corridor or Neighborhood Revitalization" category, Dubuque was selected for revitalization efforts in the Historic Millwork District and Washington Neighborhood. The EPA produced a video featuring Dubuque's efforts related to smart growth. The video will be shown at the awards ceremony and link is available at:www.cityofdubuque.org/smartgrowthaward.

Read News Release

All-America City - 2013, 2012, 2007
For the third time in six years, Dubuque has been named an All-America City. The All-America City award recognizes communities whose citizens work together to identify and tackle community-wide challenges and achieve uncommon results. Awarded by the National Civic League, it is the nation's most prestigious and oldest civic recognition program. Read News Release.

America's Crown Community - 2013, 2009, 2003
Dubuque was one of only three cities in the country to receive this award. The award acknowledges the recent completion of Dubuque's Water & Resource Recovery Center project, a three-year, $65 million upgrade of the city's wastewater treatment plant.. Read News Release

#14 on "America's Best Small Cities To Move To" - 2013
MOVOTO Real Estate named Dubuque to it's list of "America's Best Small Cities To Move To."

10th Most Secure Small City in the U.S. - 2013
Farmers Insurance named Dubuque to it's list of most secure small cities in the U.S.

Fastest-Growing Economy in Iowa in 2012, 27th Fastest-Growing Nationally - 2013
The U.S. Department of Commerce, Bureau of Economic Analysis has named Dubuque the fastest-growing economy in Iowa and the 27th fastest-growing nationally (2012)

THE EQUALITY OF OPPORTUNITY PROJECT

Dubuque Soars in Upward Mobility
Recent findings from The Equality of Opportunity Project show that children raised in the greater Dubuque area are among the most likely in the nation to move upwards into a higher income class. The study, conducted by researchers at Harvard University and the University of California, Berkeley, found that children who were born to parents in the nation's lowest income quintile had a 17.9% chance of being in the highest income quintile before reaching age 30. This is well above the national average of 10.6% and, of the 741 metropolitan commuting areas examined, places Dubuque in the top 60.

When compared to similar-sized commuting areas with a population between 150,000 and 200,000, Dubuque ranks first out of 58, and by a sizable margin; Dubuque's 17.9% likelihood is 2.1% greater than the next-highest probability, and is nearly double the national average of 9%. Dubuque ranks first among the ten largest cities in Iowa, also, with nearly a 3% higher probability than the next-largest city at 14%.

To view the study findings, click here.

Kiplinger

Timely, Trusted Personal Finance Advice and Business Forecasts

Ten Great Places to Live - Kiplinger, July 2013

Dubuque was named to Kiplinger Personal Finance's list of 10 Great Places to Live for 2013.

The rankings place an emphasis on small and mid-size cities, considering metro areas with a population of 1 million or less that have good jobs, reasonably priced homes, decent schools and access to great health care, according to a news release.

Click here for more information.

HARVARD Kennedy School
ASH CENTER
for Democratic Governance and Innovation

Smarter Sustainable Dubuque Named to Top 25 Innovations in Government - Ash Center for Democratic Governance and Innovation, May 2013

The Ash Center for Democratic Governance and Innovation at the John F. Kennedy School of Government, Harvard University has named Smarter Sustainable Dubuque as one of the Top 25 programs in this year's Innovations in American Government Award competition. The Top 25 government initiatives represent the dedicated efforts of city, state, federal, and tribal governments and address a host of policy issues including crime prevention, economic development, environmental and community revitalization, employment, education, and health care..

Read News Release

MILKEN INSTITUTE
Changing the world in innovative ways

Dubuque Named 10th "Best-Performing" Small Metro - 2013

The Milken Institute's 2013 Best-Performing Cities Index, which ranks U.S. metropolitan areas by how well they are creating and sustaining jobs and economic growth, ranks the Dubuque metropolitan area 10th out of 179 small U.S. metropolitan areas. Dubuque moved up 5 spots from 2011's 15th place ranking.

Ranked 14th in Nation "Best Small Places for Business and Careers" - Forbes, August 2013
Dubuque has scored another U.S. Top 20 recognition ranking 14th on Forbes' list of "Best Small Places for Business and Career."

The ranking took into consideration 12 metrics related to job growth (past and projected), costs (business and living), income growth over the past five years, educational attainment (college and high school) and projected economic growth through 2014.

Click here for more information

#50 Among 179 Small Cities for "Cost of Doing Business" - 2013

Named 5th in the U.S. in "Top Metropolitan Areas" - Site Selection Magazine, 2013
The nation's leading publication for site-location and corporate real estate professionals has placed Dubuque with some elite company for business growth and expansion. Site Selection Magazine's annual "Top Metropolitan Areas" places Dubuque at 5th in the U.S. for Metro areas with under 200,000 people.

100 Best Communities for Young People - 2012, 2011, 2010, 2008, 2007
The America's Promise Alliance 100 Best competition recognizes the 100 outstanding communities across

America—large and small, rural and urban—that are the best places for young people to live and grow up. Dubuque has been recognized for the honor in 2007, 2008, 2010, 2011, and 2012.

#1 in Iowa for Private Sector Job Growth - 2012, 2011, 2010
Iowa Workforce Development ranks Dubuque as #1 in Iowa for Private Sector Job Growth in 2010, 2011, and 2012.

One of 26 Metros to Completely Recover Jobs Lost During Recession - 2012
The U.S. Conference of Mayors named Dubuque as one of only 26 metros to completely recover jobs lost during the recession.

#4 Among Overall Metros with the Biggest Average Annual Increases in Wages and Salaries - 2012
The Atlantic Cities named Dubuque as #4 among metros with the biggest average annual increases in wages and salaries.

AREA DEVELOPMENT
SITE AND FACILITY PLANNING

#3 Among Top 20 Midwest Cities - 2012

#7 Among Top 50 Small Cities - 2012

#6 Among Top 25 Small Cities in Economic Strength Factors - 2012

#16 Among Top 100 Overall Cities - 2012

#8 Among Top 25 Small Cities in "Recession Busting" Factors - 2012

THE COMMONWEALTH FUND

#2 Among Top 10 Places for Healthcare - 2012

A study by The Commonwealth Fund looked at 43 indicators of health system performance in four major areas: access, prevention and treatments, costs and potentially avoidable hospital use, and health outcomes. Dubuque was named #2 out of the Top 10 Places for Healthcare.

NATIONAL LEAGUE of CITIES

Second-Place Honors in the City Cultural Diversity Awards - 2012

The National League of Cities' National Black Caucus of Local Elected Officials awarded Dubuque second-place honors in its City Cultural Diversity Awards, which showcase examples of how cities achieve excellence in diversity.

Dubuque Ranks #5 for Resiliency - Building Resilient Regions, 2011
Dubuque was named one of the most resilient cities in the nation. The city was ranked fifth out of 361 cities nationwide in a study of resiliency capacity that evaluates a community's economic capacity to bounce back from adversity, strength of demographics, and community connectivity.

Comprehensive Annual Financial Report (CAFR) Certificate of Achievement - 2014
This is the Certificate of Achievement for Excellence in Financial Reporting. **The City has received this award for 26 consecutive years.** Read News Release

Distinguished Budget Presentation Award - 2014
According to the GFOA, this award reflects the commitment of the City and City staff to meeting the highest principles of government budgeting. **The City has received this award for nine consecutive years**. Read News Release

Top 20 in U.S. for Job Growth - 2011
The Dubuque metropolitan statistical area ranks 18th nationally, the only Midwestern region in the U.S. Top 20 job growth rankings by Moody's. Moody's analyzes the top 392 metro areas in the country.

Most Connected Locales in the U.S. - 2010

Dubuque was named one of the seven "Most Connected Locales" in the United States in 2010 by Connected World Magazine.

LivCom 2010

International LivCom Awards, 3rd Place - 2010

Dubuque was named a third-place finalist and gold-standard community at the International Awards for Livable Communities (LivCom). Dubuque was the highest-ranked American city in the "whole city" award category for communities with populations of 20,000 - 75,000. Read News Release

Forbes

Best Small City to Raise a Family - 2010

Dubuque was named the top-ranked city in the nation on Forbes' list of "The Best Small Cities to Raise a Family." The listing ranked cities with populations under 100,000 by quality-of-life measures that make living easier for families, such as education level, median household income, rate of home ownership, housing affordability, and average commute time. Read News Release

#1 in the Nation among Mid-sized Cities for Projected Job Growth - 2010

FAST COMPANY

One of the Ten Smartest Cities on the Planet - 2010

Fast Company, a business magazine, recently named Dubuque number eight among their Top 10 Smartest Cities on the Planet. The magazine focused on IBM's impact on the city and the 2009 declaration that Dubuque would become the "first integrated, smart city" in America, with interlocking systems watching the interplay between water, electricity and transportation.

Dubuque was the only city in America on the list.

Healthy Iowa Community - 2010

Dubuque was awarded for its efforts in wellness, activity, programming, financial commitment, measurability and sustainability. Read News Release

Excellence in Economic Development Award - 2010

Dubuque earned the Excellence in Economic Development Award in the category of Public-Private Partnerships for the redevelopment of the Roshek Building. This program annually recognizes the world's best economic development programs and partnerships, marketing materials, and the year's most influential leaders.
Read News Release

All-Star Community - 2010

Dubuque was one of five of Iowa's 947 cities to be named a 2010 All-Star Community. The project was recognized specifically for sustainability. The All-Star Community Award is one of the most prestigious honors presented by the League to cities.
Read News Release

One of 22 'Smarter Cities' in the U.S. - 2010

The Natural Resources Defense Council (NRDC) named Dubuque one of its "2010 Smarter Cities," a list of 22 municipalities that are leading the way in green power, energy efficiency, and conservation.
Read News Release

Distinguished Budget Presentation Award - 2010

According to the GFOA, this award reflects the commitment of the City and City staff to meeting the highest principles of government budgeting. **The City has received this award for five consecutive years**. Read News Release

Comprehensive Annual Financial Report (CAFR) Certificate of Achievement - 2010

This is the Certificate of Achievement for Excellence in Financial Reporting. **The City has received this award for 22 consecutive years**. Read News Release

Excellence in Economic Development Award for Excellence in Historic Preservation-led Strategies - 2009

Dubuque received the award for its commitment to research-based, market driven economic development in helping grow the local economy. Read News Release

Top 100 Places to Live - 2009

Awarded by RelocateAmerica.com to the Top 100 communities with visionary leaders, improving or thriving economies including housing & realization of "green" initiatives. Read News Release

Most Livable Small City - 2008

Outstanding Achievement Award for Cities Under 100,000 Population. This award honors mayors and their city governments for developing programs that enhance the quality of life in urban areas. Presented by the U.S. Conference of Mayors.

APPENDIX 3 – PATH FORWARD PARTNERS INFORMATION

Dubuque Metropolitan Area Transportation Study (DMATS)

The Dubuque Metropolitan Area Transportation Study (DMATS) is a tri-state Metropolitan Planning Organization (MPO) located at the boundary intersections of the states of Iowa, Illinois and Wisconsin.

The committee is responsible for approving goals and plans for the development of a seamless transportation system for the safe and efficient movement of people and goods within and between modes of transportation (roads, bicycle and pedestrian facilities, transit, rail, water and air) in Dubuque County. DMATS encourages and fosters cooperation between local, regional, state and federal agencies to discuss transportation issues and plans. Examples of DMATS projects include the U.S. Highway 20 Corridor Study, Julien Dubuque Bridge Capacity Improvements Study, and the Southwest Arterial planning and programming.

Greater Dubuque Development Corporation (GDDC)

Greater Dubuque Development is a regional economic development organization serving the Greater Dubuque area. Greater Dubuque Development focuses on business retention and expansion, workforce solutions, new business recruitment, and sustainable innovation.

Business retention and expansion: Local employers are the source of more than 85 percent of the area's job growth. They are key to Dubuque's success. Recognized as the number-one program in North America by Business Retention and Expansion International, Greater Dubuque's InfoAction aims to continually identify and assess the needs of the area's existing employers, then takes the necessary actions to address both challenges and opportunities.

Workforce solutions: Greater Dubuque Development takes a unique, proactive approach to workforce solutions in the Greater Dubuque area. Greater Dubuque provides incoming and existing businesses exceptional workforce assistance and services. Greater Dubuque Development offers the tools that employers need for recruiting talented workforce.

New business recruitment: Greater Dubuque Development is committed to the highest level of service to businesses or site-locators considering a location in the Greater Dubuque area. From project conception to reality, Greater Dubuque partners with businesses every step of the way, helping them navigate the course with valuable resources, information, and services.

Sustainable innovation: Greater Dubuque Development is helping to create innovation in the Dubuque region. Focusing on sustainability, analytics, and entrepreneurial development, Greater Dubuque provides support and solutions to our existing business base, entrepreneurs, and region.

City of Dubuque

Dubuque operates under the council-manager form of local government, which combines the political leadership of elected officials in the form of a city council, with the managerial experience of an appointed local

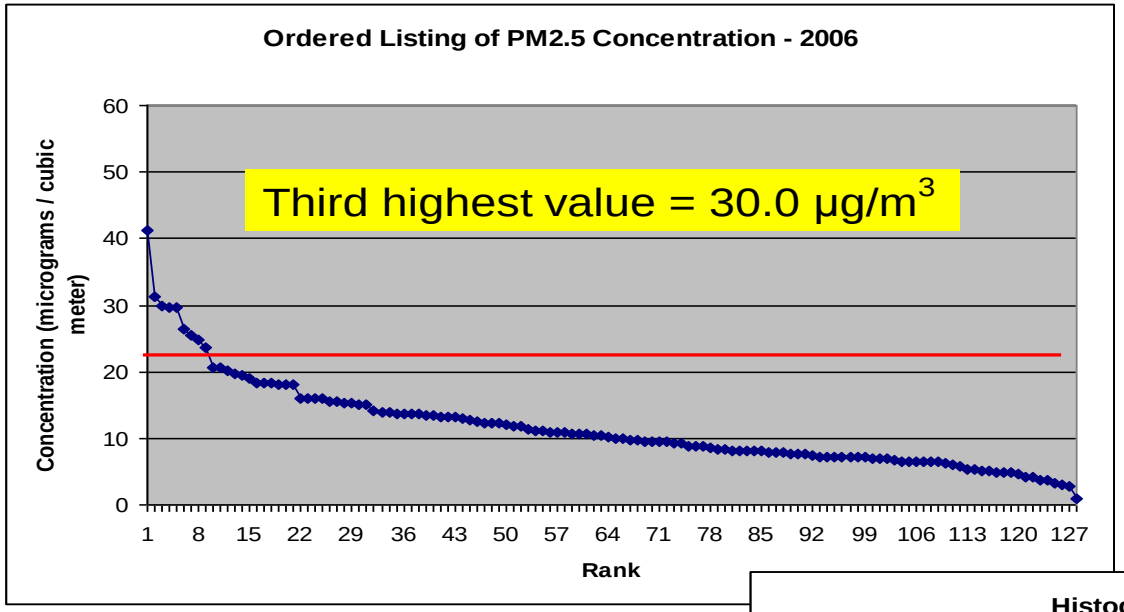
government manager. The current City Manager is Michael C. Van Milligen, who has served in this capacity since 1993. The council-manager form of government was adopted by citizen referendum in 1920. Mayor Roy D. Buol and the Dubuque City Council members are the leaders and policy makers elected to represent the community and to concentrate on policy issues that are responsive to citizens' needs and wishes. The city manager is appointed by the city council to carry out policy. The city council also appoints the city attorney and city clerk. The council is the legislative body; its members are the community's decision makers. Power is centralized in the elected council, which approves the budget and determines the city portion of the tax rate, for example. The council also focuses on the community's goals, major projects, and such long-term considerations as community growth, land use development, capital improvement plans, capital financing, and strategic planning. The council hires a professional manager to carry out the administrative responsibilities and supervises the manager's performance.

The Dubuque City Council consists of seven elected representatives: a mayor and two council members elected at large, and one council member elected from each of Dubuque's four wards. The mayor and other council members serve four-year staggered terms. City council positions are considered part-time positions. The mayor is a member of the city council and may vote on all matters before the council. The Dubuque City Council meets on the first and third Monday of each month in the Council Chambers on the second floor of the Historic Federal Building at 350 West 6th Street. City council agenda items are due in the city clerk's office in City Hall by noon on the Wednesday preceding the council meeting. Copies of the agenda are available after 9:00 a.m. on the Friday preceding the meeting.

East Central Intergovernmental Association (ECIA)

East Central Intergovernmental Association is committed to working with member governments, their citizens, and others to empower eastern Iowa communities and enhance the quality of life in Cedar, Clinton, Delaware, Dubuque and Jackson Counties. ECIA exists because of the need for local governments facing similar problems to cooperate in finding solutions. Through ECIA membership, local governments share resources they could not afford individually. The services and programs provided by ECIA cover six broad categories: Community Development, Economic Development, Housing Assistance, Employment and Training, Transit, and Transportation and Planning. The mission of ECIA is to work with member governments, their citizens, and others to empower communities and enhance the quality of life throughout the region.

APPENDIX 4 – DUBUQUE COUNTY PM EMISSIONS DATA



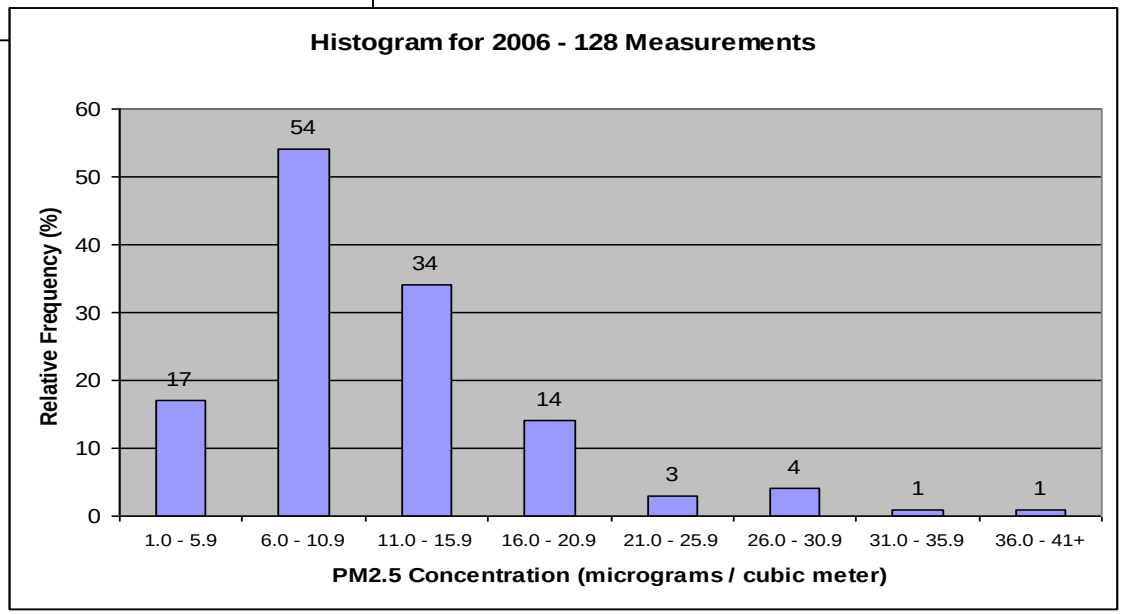
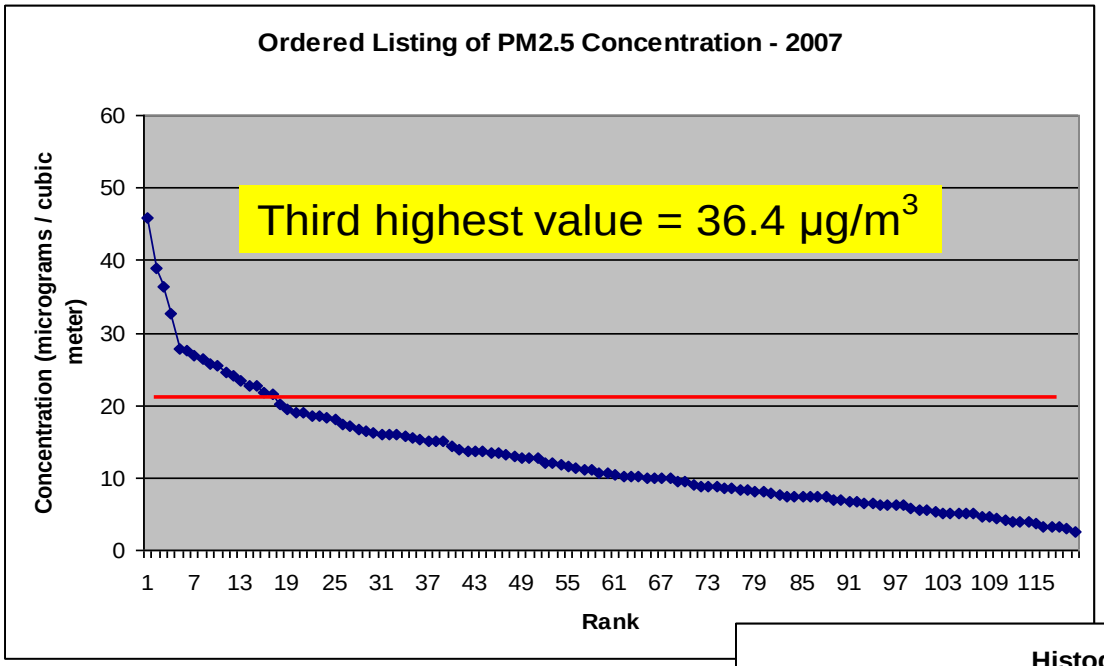


Fig. 1. Ranking of the 128 Potosi PM2.5 measurements in 2006 and their relative frequency. The 9 highest measurements (above the red line) were selected for further study.



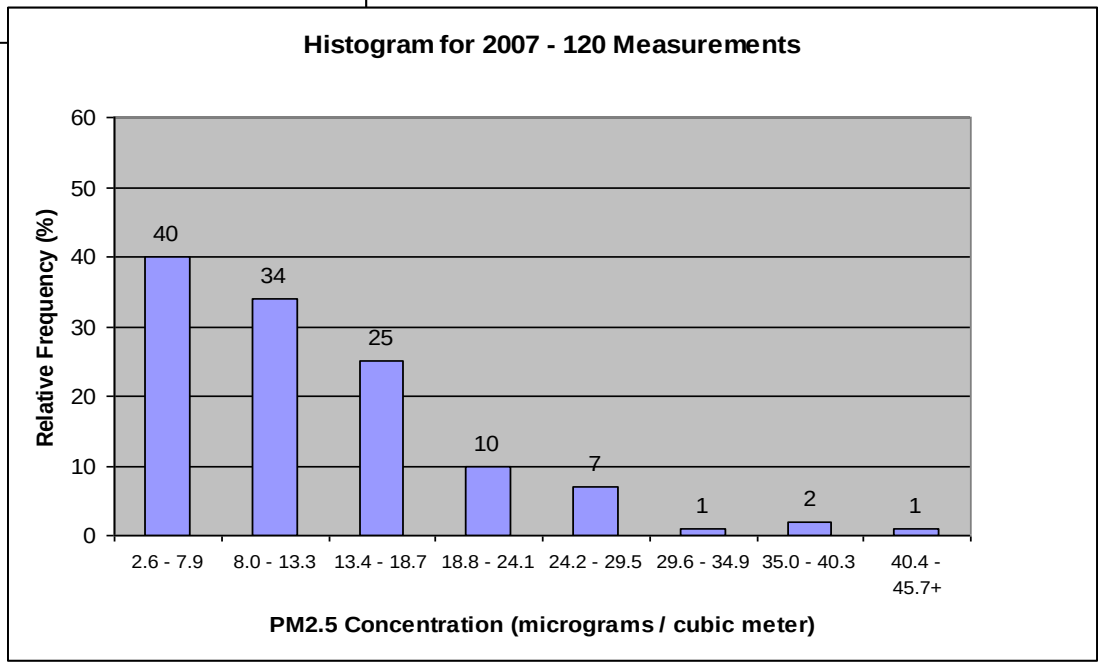
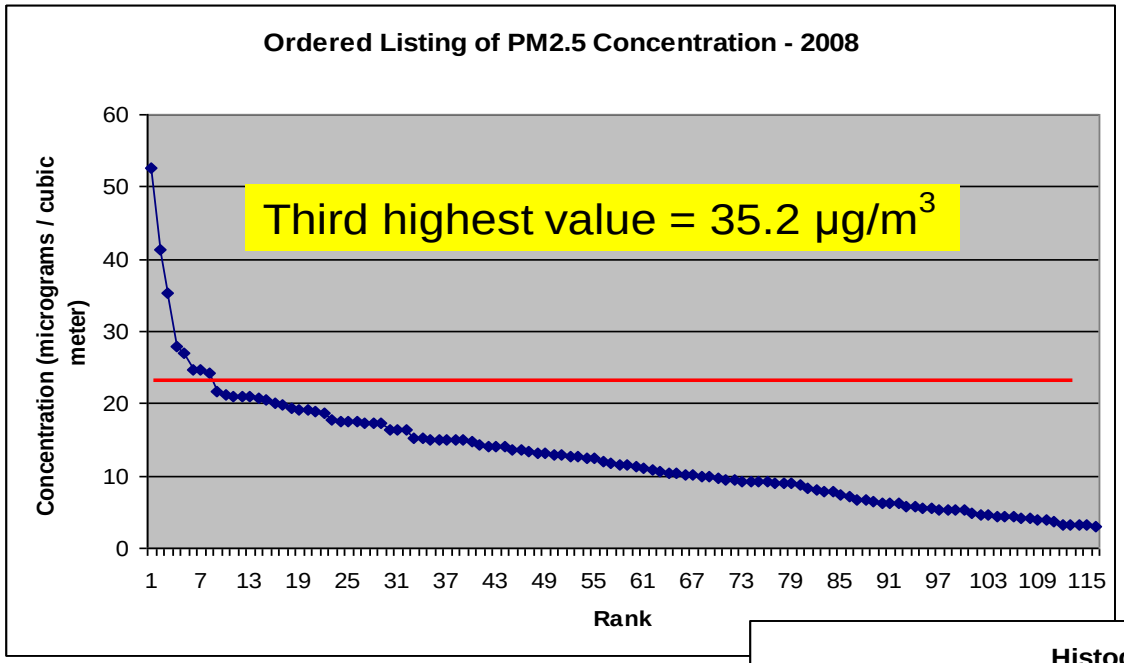


Fig. 2. Ranking of the 120 Potosi PM2.5 measurements in 2007 and their relative frequency. The 17 highest measurements (above the red line) were selected for further study.



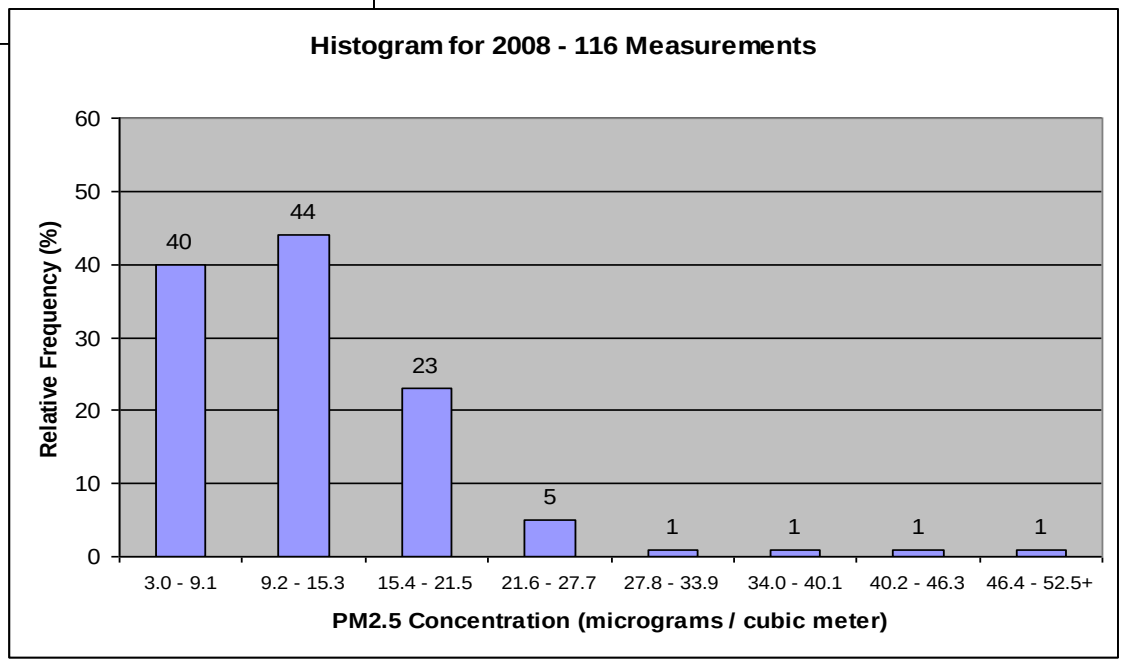
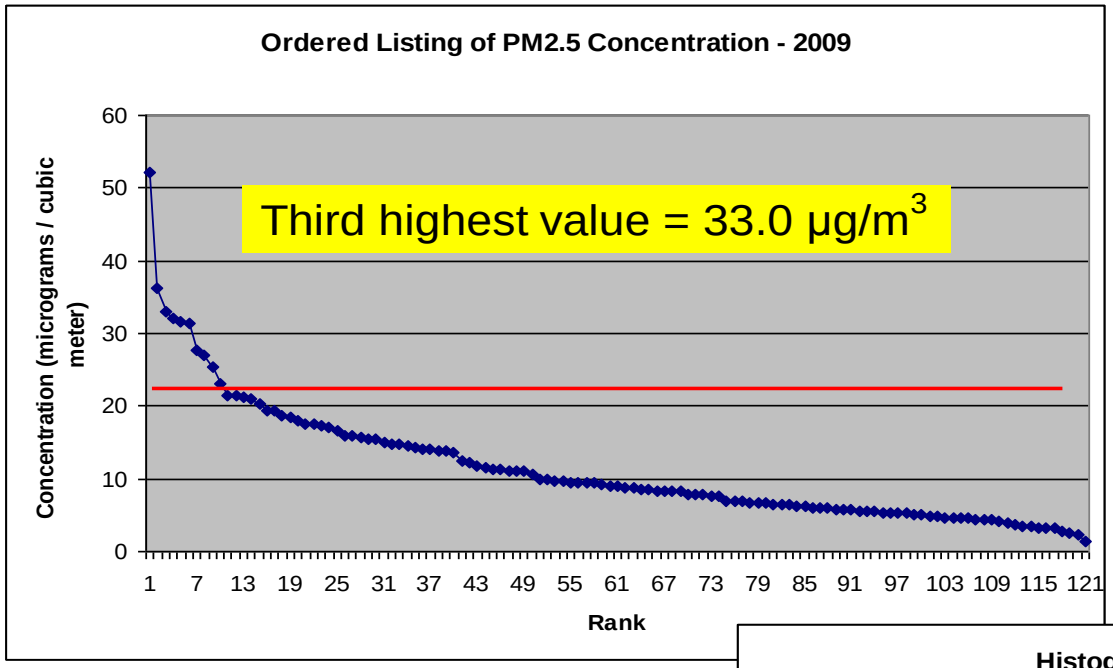


Fig. 3. Ranking of the 116 Potosi PM2.5 measurements in 2008 and their relative frequency. The 8 highest measurements (above the red line) were selected for further study.



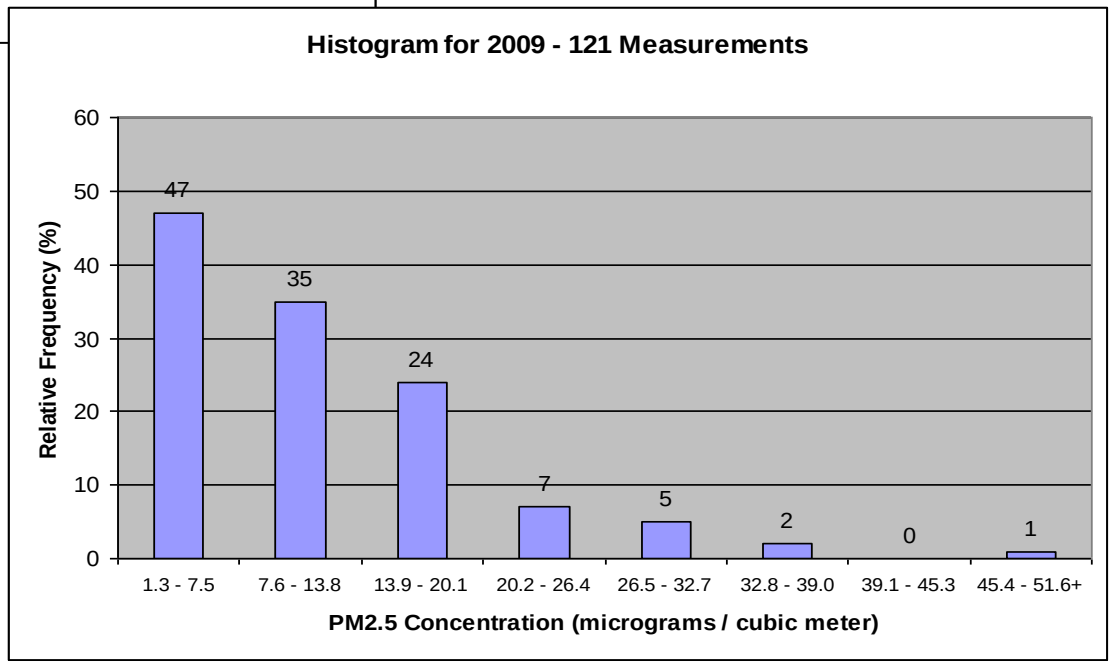


Fig. 4. Ranking of the 121 Potosi PM2.5 measurements in 2009 and their relative frequency. The 10 highest measurements (above the red line) were selected for further study.

2006 – Highest PM2.5		
Case	Date	PM2.5
1	11/25/2006	41.2
2	8/18/2006	31.2
3	3/9/2006	**30.0**
4	3/6/2006	29.6
5	3/30/2006	29.6
6	1/11/2006	26.5
7	6/16/2006	25.5
8	1/20/2006	24.8
9	8/6/2006	23.7

2007 – Highest PM2.5		
Case	Date	PM2.5
1	12/20/2007	45.9
2	12/11/2007	39.0
3	11/20/2007	**36.4**
4	12/17/2007	32.7
5	1/21/2007	27.9
6	1/24/2007	27.5
7	5/30/2007	26.8
8	7/26/2007	26.4
9	10/15/2007	25.6
10	12/29/2007	25.4
11	2/11/2007	24.5
12	11/11/2007	24.0
13	3/7/2007	23.4
14	1/18/2007	22.7
15	12/26/2007	22.7
16	8/1/2007	21.7
17	9/24/2007	21.6

2008 – Highest PM2.5		
Case	Date	PM2.5
1	2/24/2008	52.6
2	2/3/2008	41.2
3	3/10/2008	**35.2**
4	2/9/2008	28.0
5	5/1/2008	26.9
6	1/25/2008	24.7
7	7/27/2008	24.7
8	1/16/2008	24.3

2009 – Highest PM2.5		
Case	Date	PM2.5
1	1/22/2009	52.2
2	2/6/2009	36.2
3	2/9/2009	**33.0**
4	1/28/2009	32.1
5	1/7/2009	31.7
6	12/18/2009	31.4
7	11/24/2009	27.7
8	12/21/2009	27.0
9	3/23/2009	25.4
10	10/28/2009	23.0

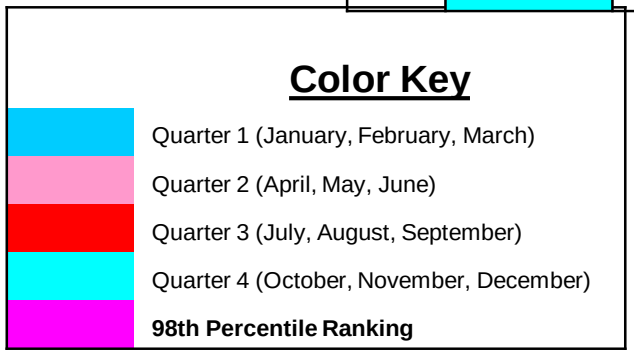


Fig. 5. Cases with highest PM2.5 concentration for each year in the study. PM2.5 concentrations have units of $\mu g/m^3$.

2006 – Lowest PM2.5		
Case	Date	PM2.5
1	9/20/2006	1.0
2	10/14/2006	2.8
3	9/11/2006	3.0
4	6/19/2006	3.2
5	9/30/2006	3.7
6	10/5/2006	3.8
7	6/10/2006	4.1
8	4/20/2006	4.2
9	5/11/2006	4.6
10	10/11/2006	4.9

2007 – Lowest PM2.5		
Case	Date	PM2.5
1	9/12/2007	2.6
2	6/5/2007	3.0
3	10/9/2007	3.2
4	9/15/2007	3.2
5	7/11/2007	3.2
6	5/27/2007	3.7
7	11/14/2007	4.0
8	10/24/2007	4.0
9	10/18/2007	4.0
10	10/3/2007	4.2

2008 – Lowest PM2.5		
Case	Date	PM2.5
1	5/18/2008	3.0
2	11/17/2008	3.2
3	10/27/2008	3.2
4	4/15/2008	3.2
5	6/8/2008	3.3
6	10/3/2008	3.6
7	8/24/2008	4.0
8	5/12/2008	4.0
9	11/20/2008	4.2
10	9/30/2008	4.2

2009 – Lowest PM2.5		
Case	Date	PM2.5
1	10/22/2009	1.3
2	10/31/2009	2.4
3	10/4/2009	2.5
4	5/7/2009	2.7
5	8/29/2009	3.2
6	7/18/2009	3.2
7	10/7/2009	3.3
8	9/28/2009	3.4
9	4/28/2009	3.5
10	10/10/2009	3.8

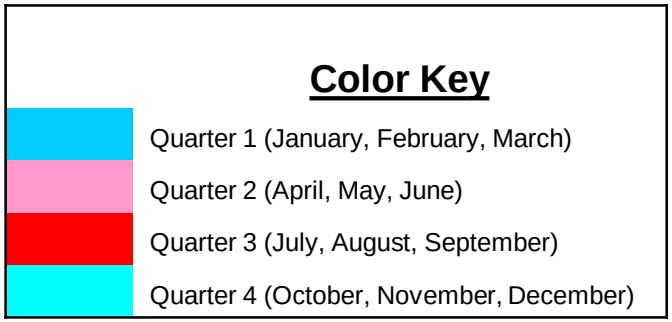


Fig. 6. The 10 lowest PM2.5 concentrations for each year in the study. PM2.5 concentrations have units of $\mu g/m^3$.

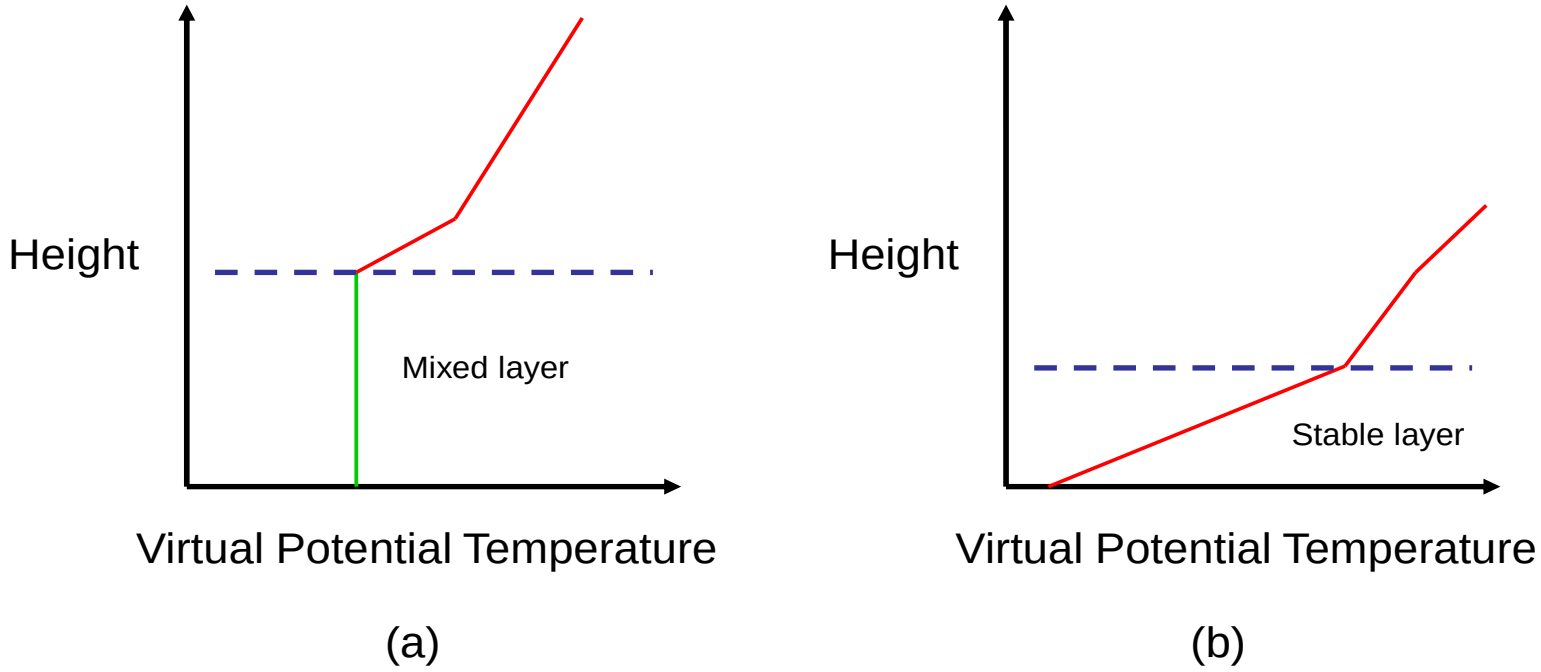


Fig. 7. Typical profile of virtual potential temperature for a) a well-mixed layer, and b) a stable layer that would resist vertical mixing by turbulence.

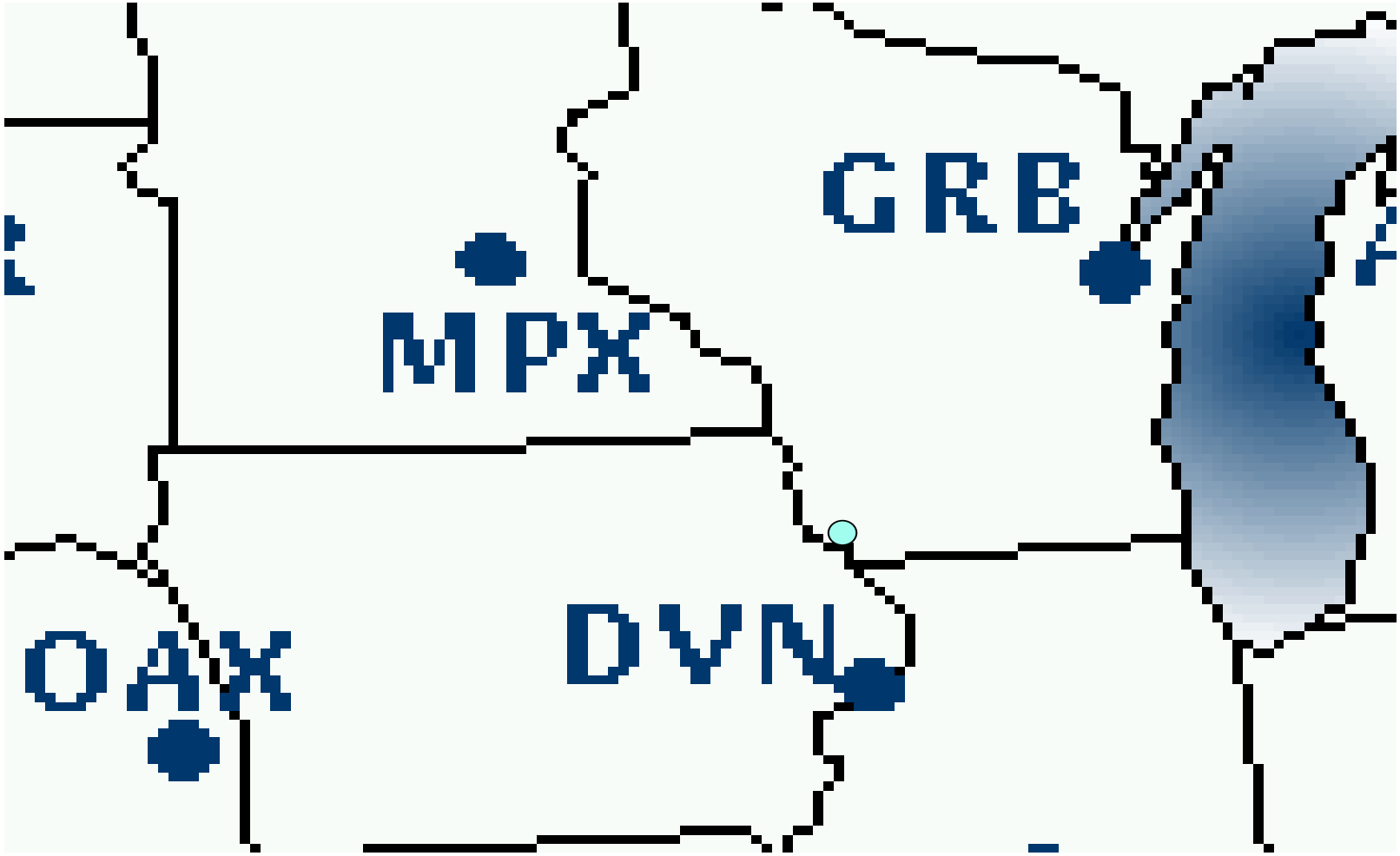


Fig.8. Upper air observation stations nearest Potosi (indicated with small circle). Base map accessed at: http://weather.cod.edu/analysis/analysis.raob.html

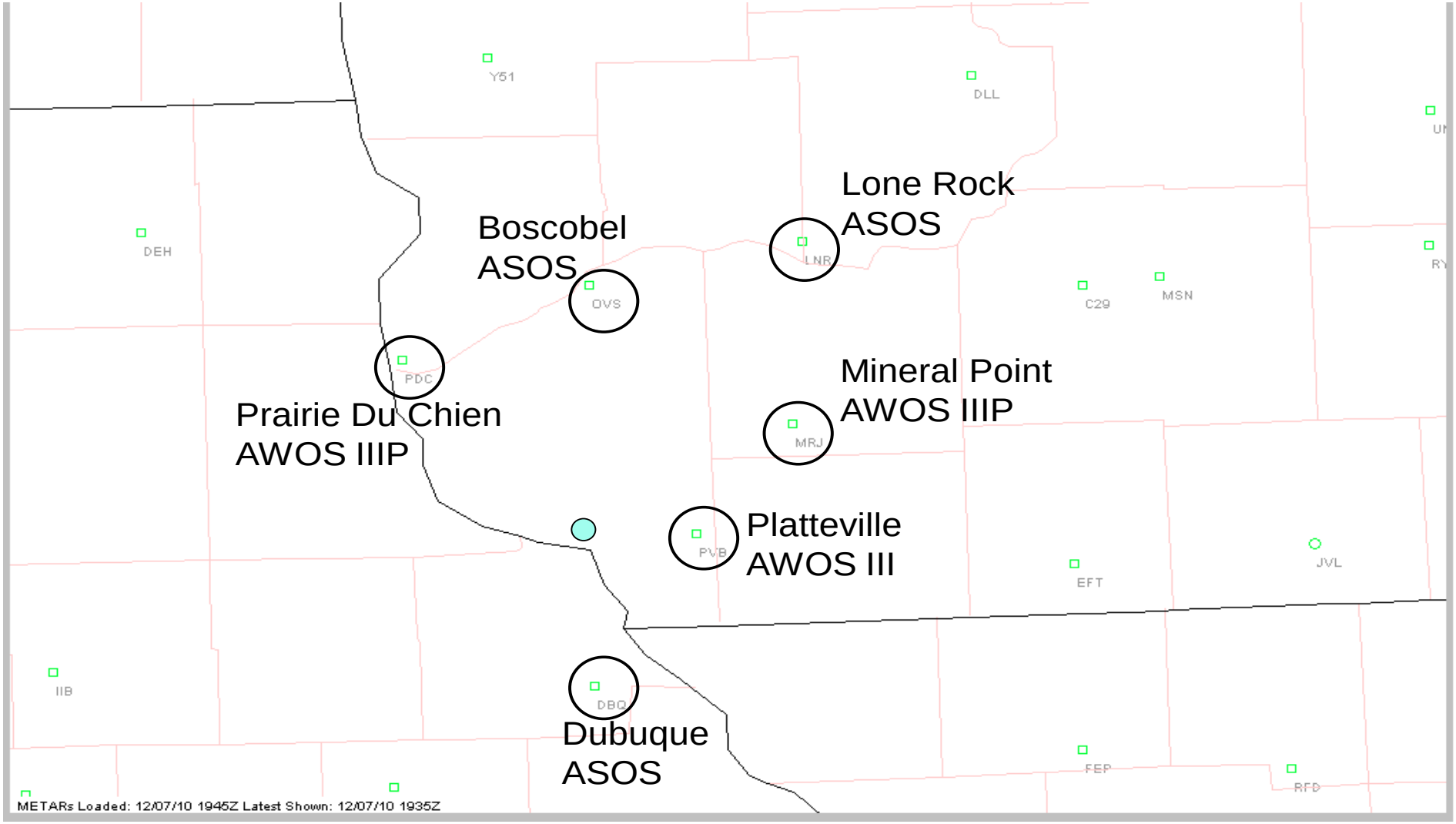
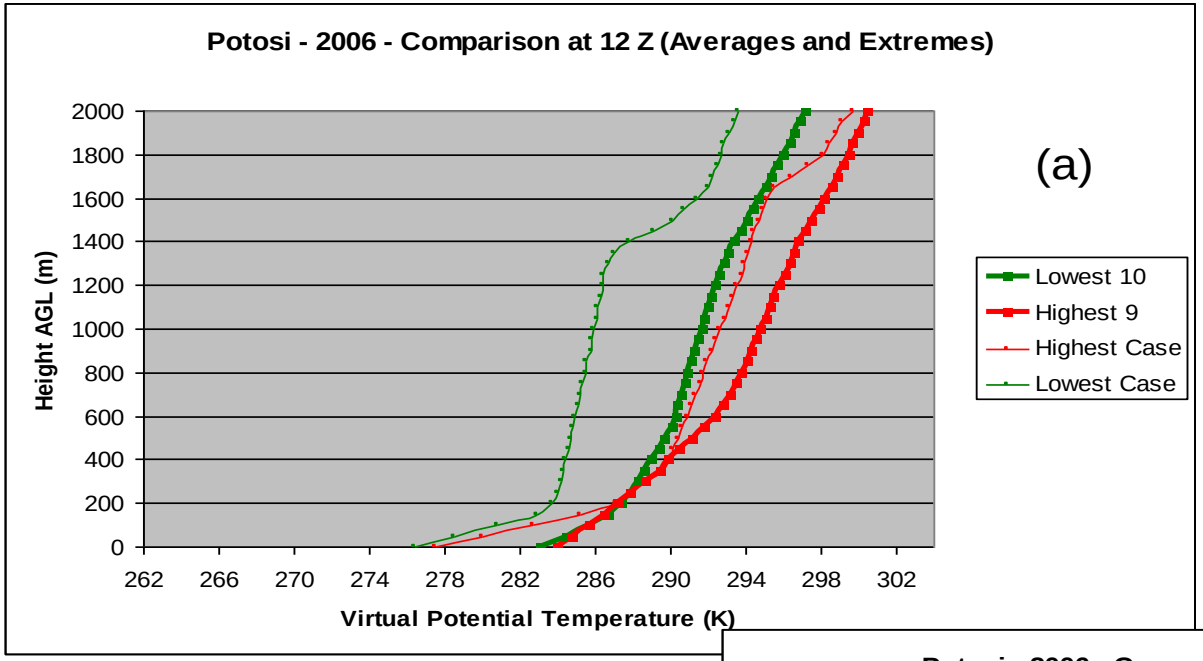


Fig.9. Surface weather observation stations nearest Potosi (indicated by small filled circle). Base map accessed at: http://www.rap.ucar.edu/weather/surface/java_metars/index.php?appletsize=large



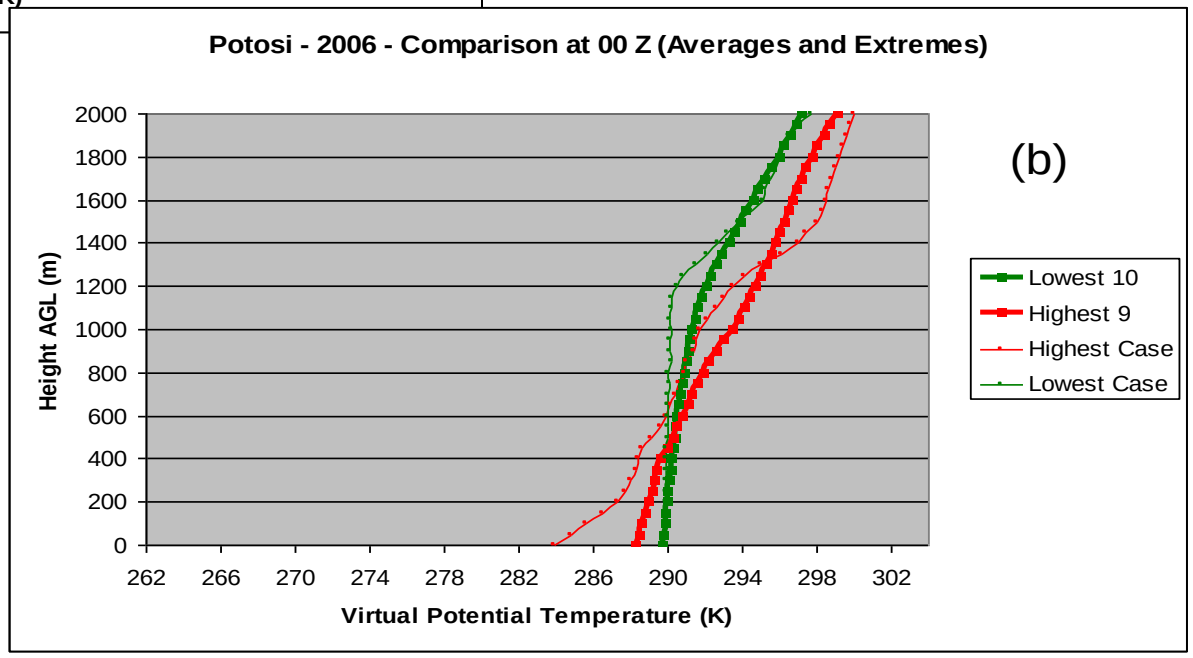
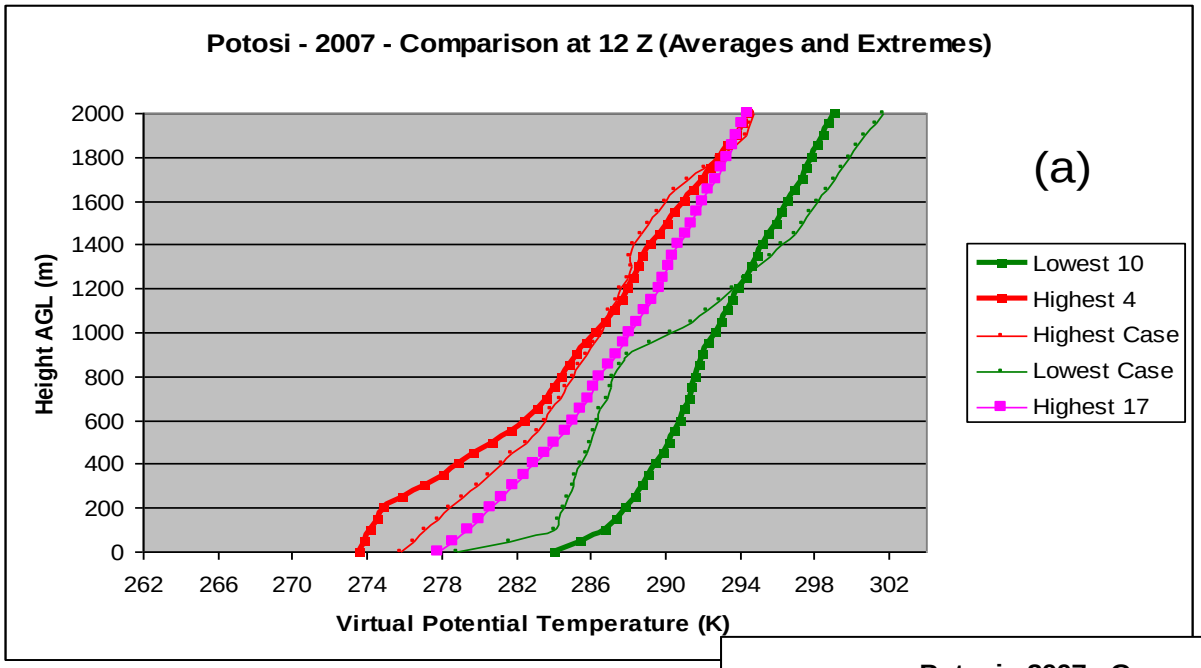


Fig. 10. Virtual potential temperature profiles for the a) morning (12 Z) and b) evening (00 Z) in 2006. The 'Lowest 10' and 'Highest 9' are average profiles for that number of cases.



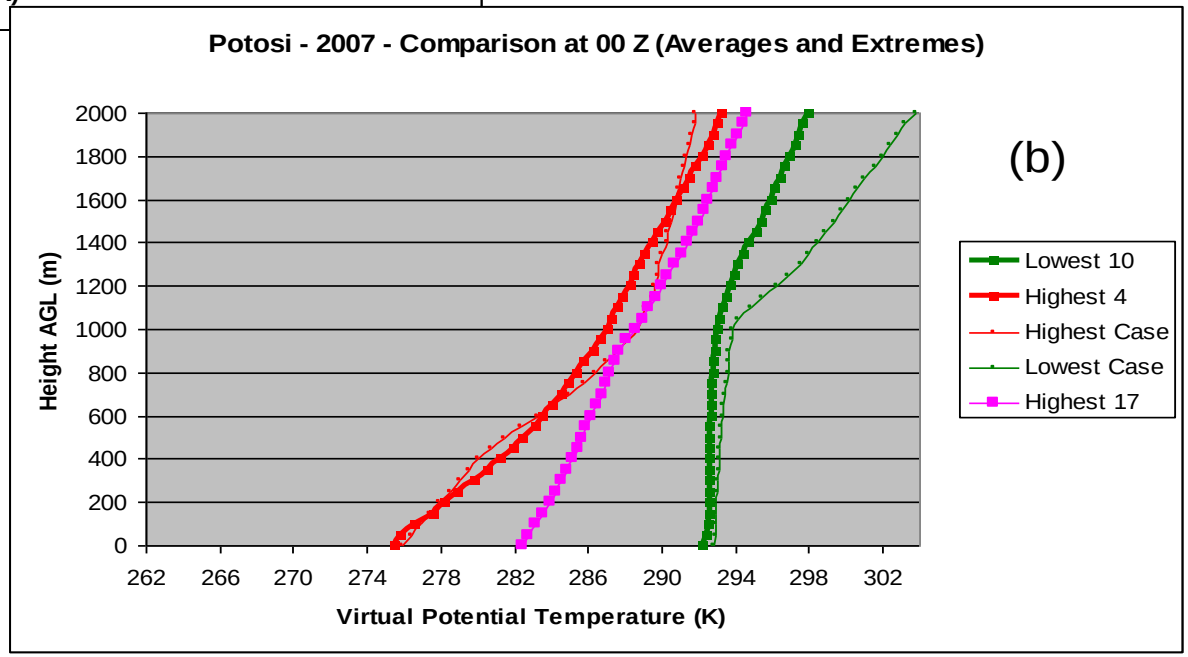
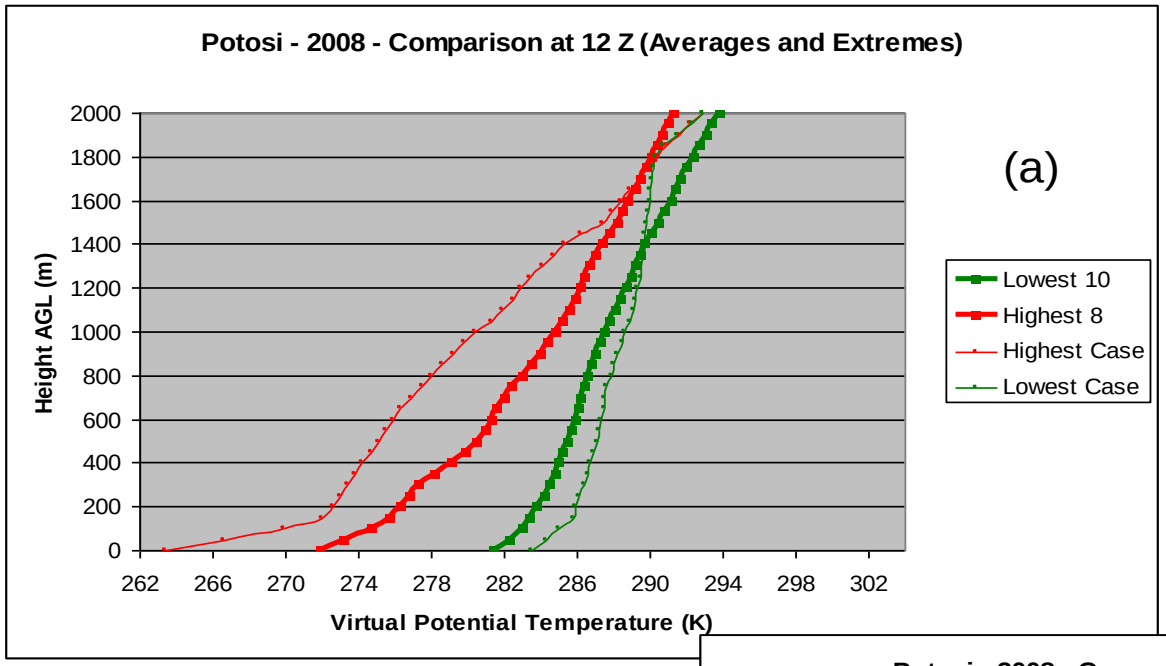


Fig. 11. Virtual potential temperature profiles for the a) morning (12 Z) and b) evening (00 Z) in 2007. The 'Lowest 10', 'Highest 4', and 'Highest 17' are average profiles for that number of cases.



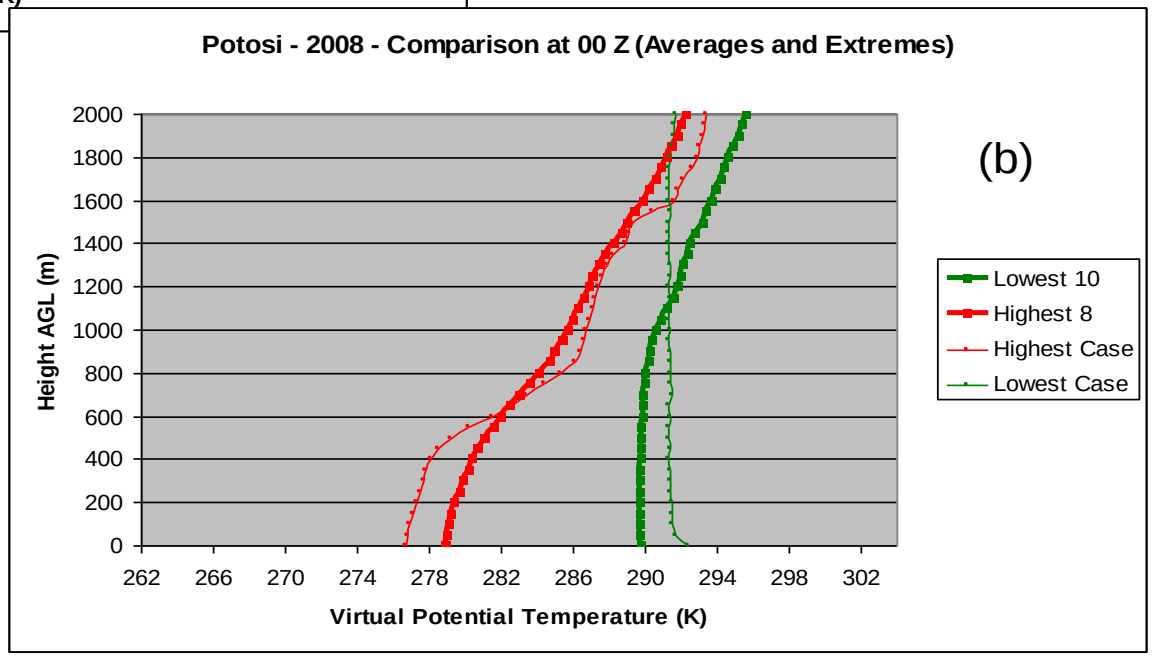
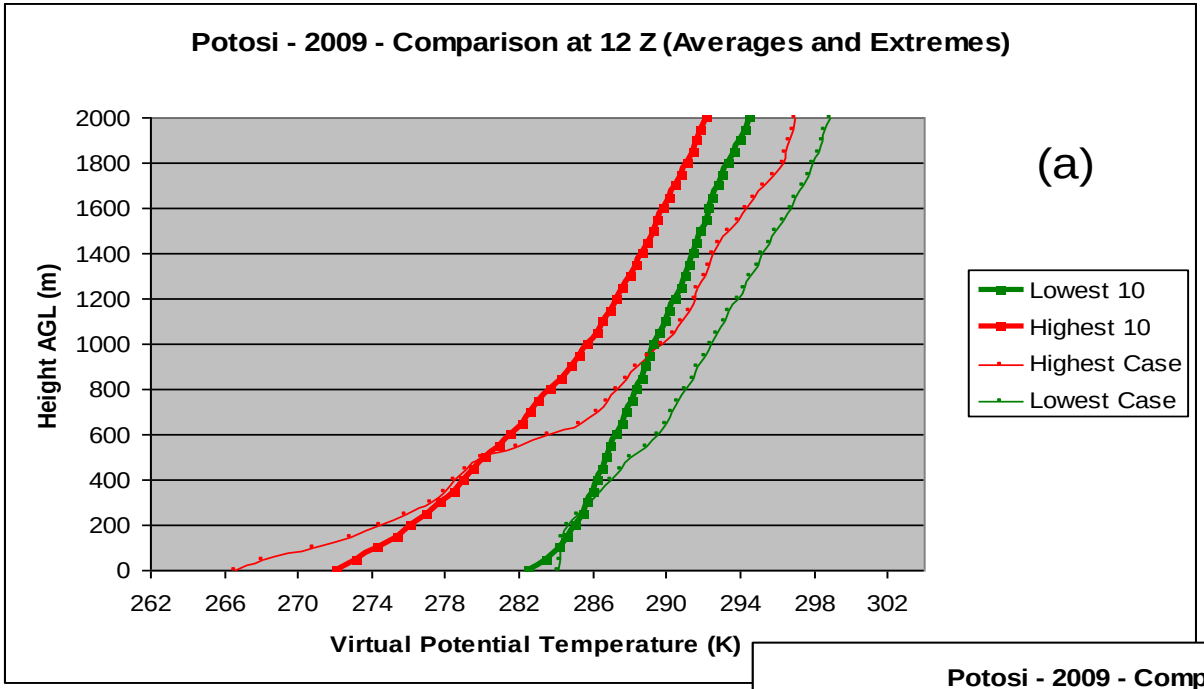


Fig. 12. Virtual potential temperature profiles for the a) morning (12 Z) and b) evening (00 Z) in 2008. The 'Lowest 10' and 'Highest 8' are average profiles for that number of cases.



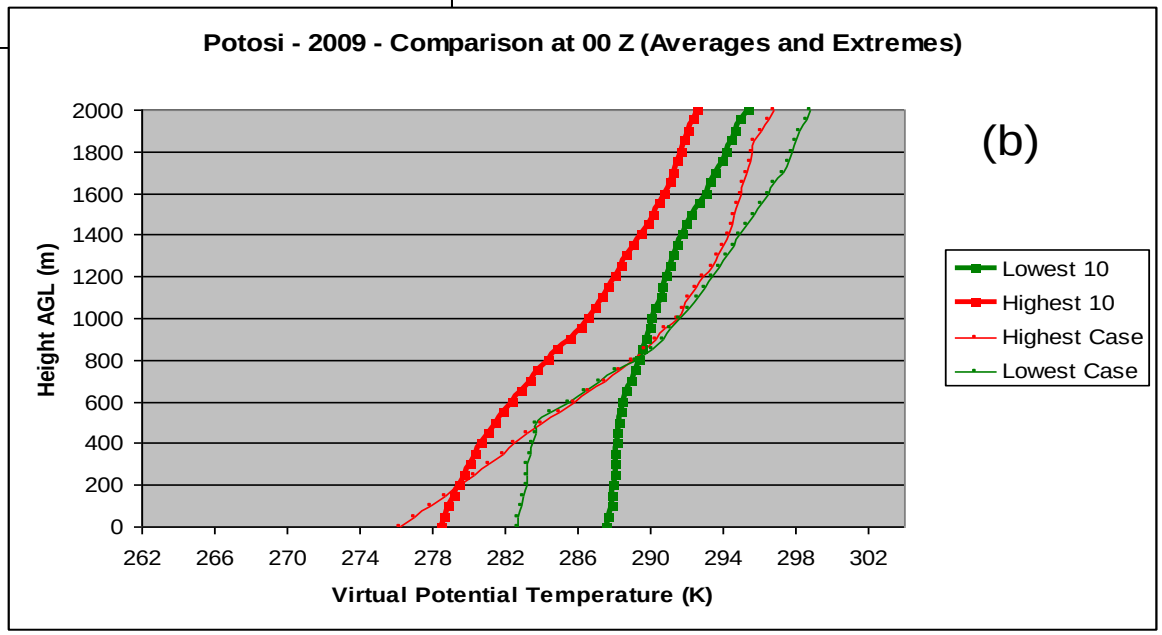


Fig. 13. Virtual potential temperature profiles for the a) morning (12 Z) and b) evening (00 Z) in 2009. The 'Lowest 10' and 'Highest 10' are average profiles for that number of cases.

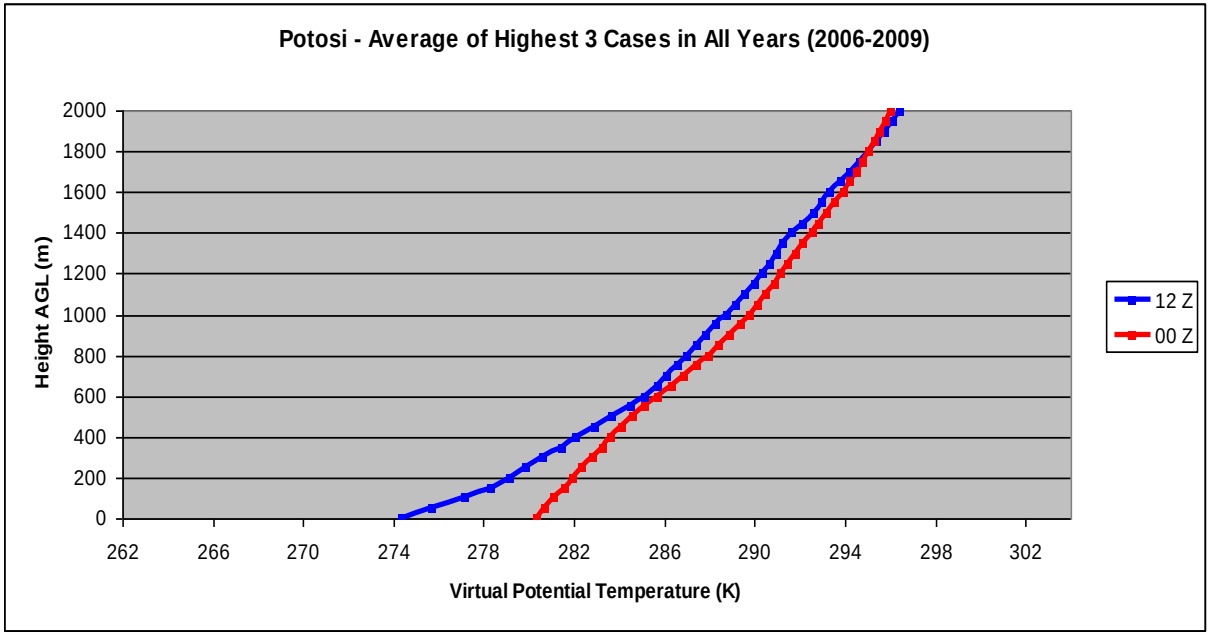


Fig. 14. Average virtual potential temperature profiles for the 3 highest cases in all years for a) morning (12 Z) and b) evening (00 Z).

2006 – 9 Highest PM2.5 Cases

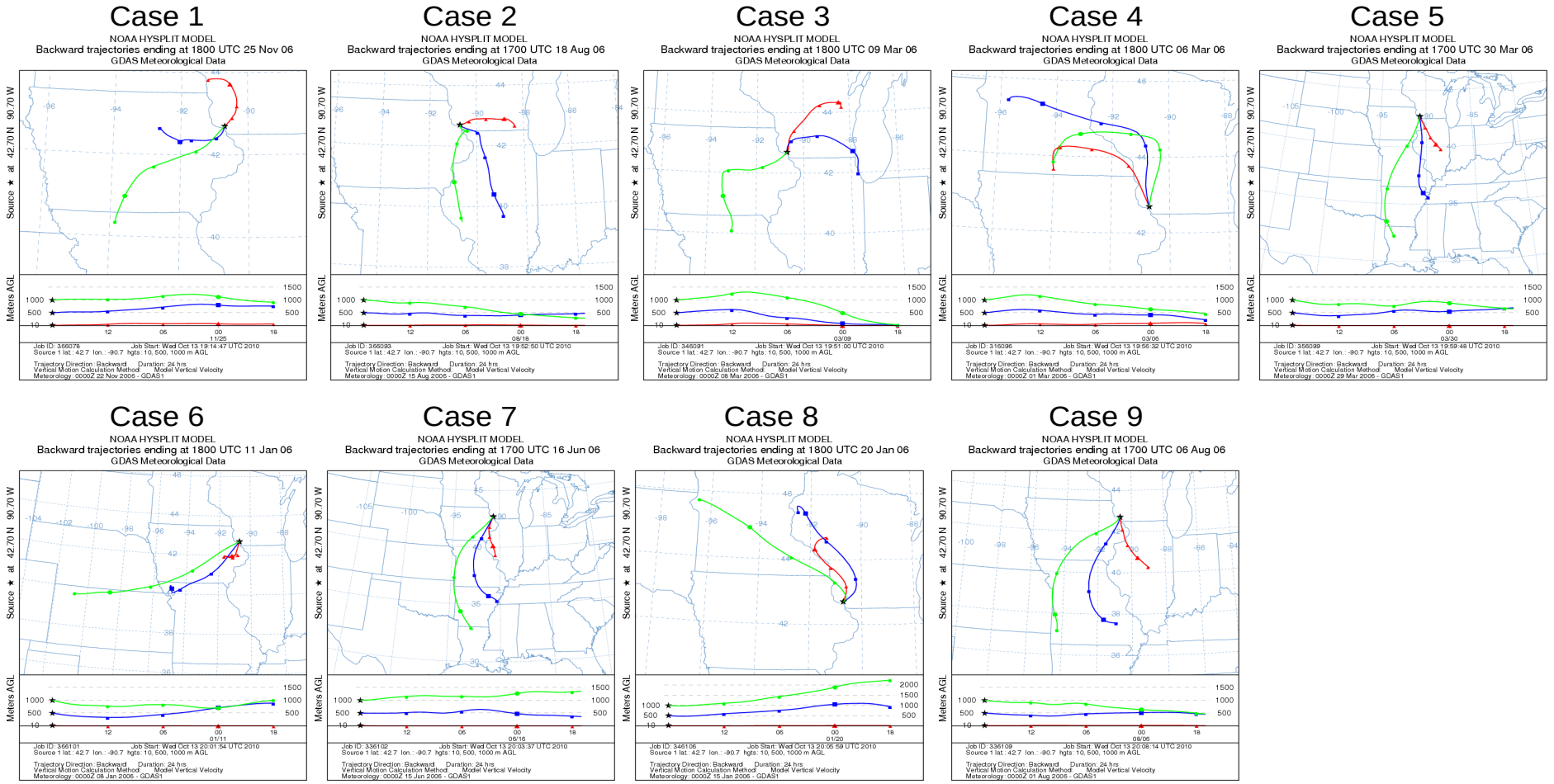


Fig. 15. HYSPLIT back trajectories terminating at Potosi at noon (local time) for the 9 highest PM2.5 concentration cases in 2006. Case numbers refer to Fig. 5.

2007 – 10 Highest PM2.5 Cases

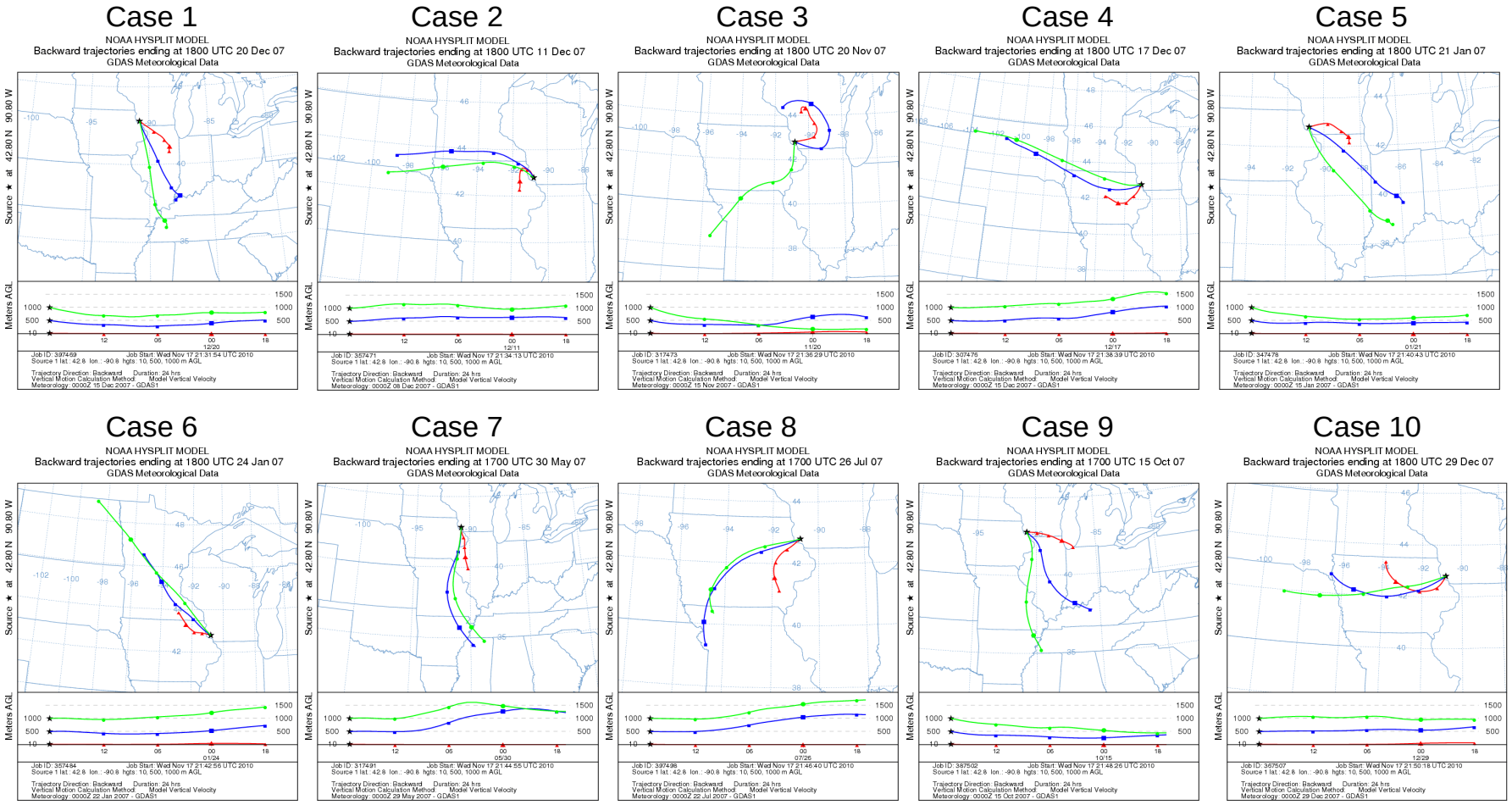


Fig. 16. HYSPLIT back trajectories terminating at Potosi at noon (local time) for the 10 highest PM2.5 concentration cases in 2007. Case numbers refer to Fig. 5.

2008 – 8 Highest PM2.5 Cases

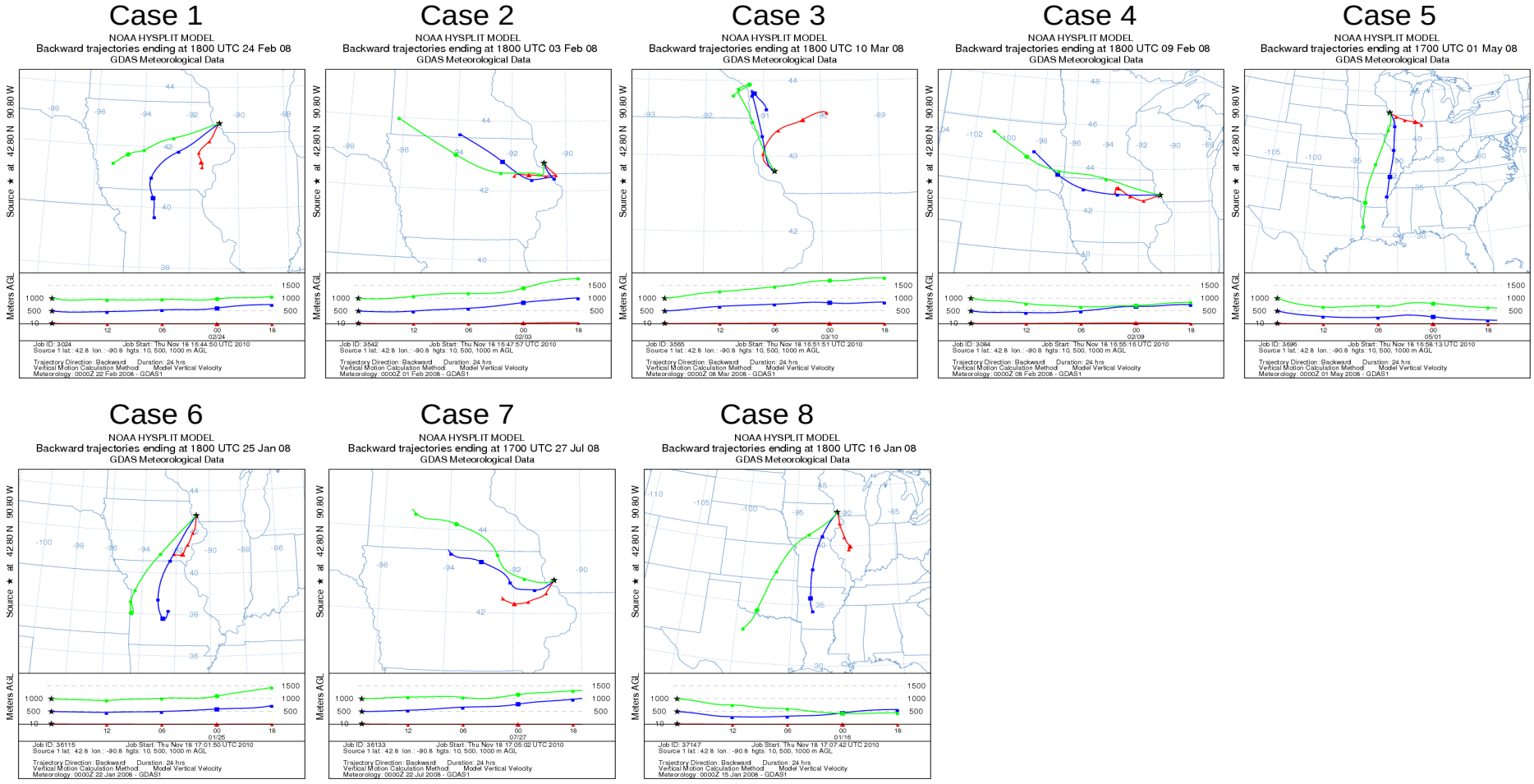


Fig. 17. HYSPLIT back trajectories terminating at Potosi at noon (local time) for the 8 highest PM2.5 concentration cases in 2008. Case numbers refer to Fig. 5.

2009 – 10 Highest PM2.5 Cases

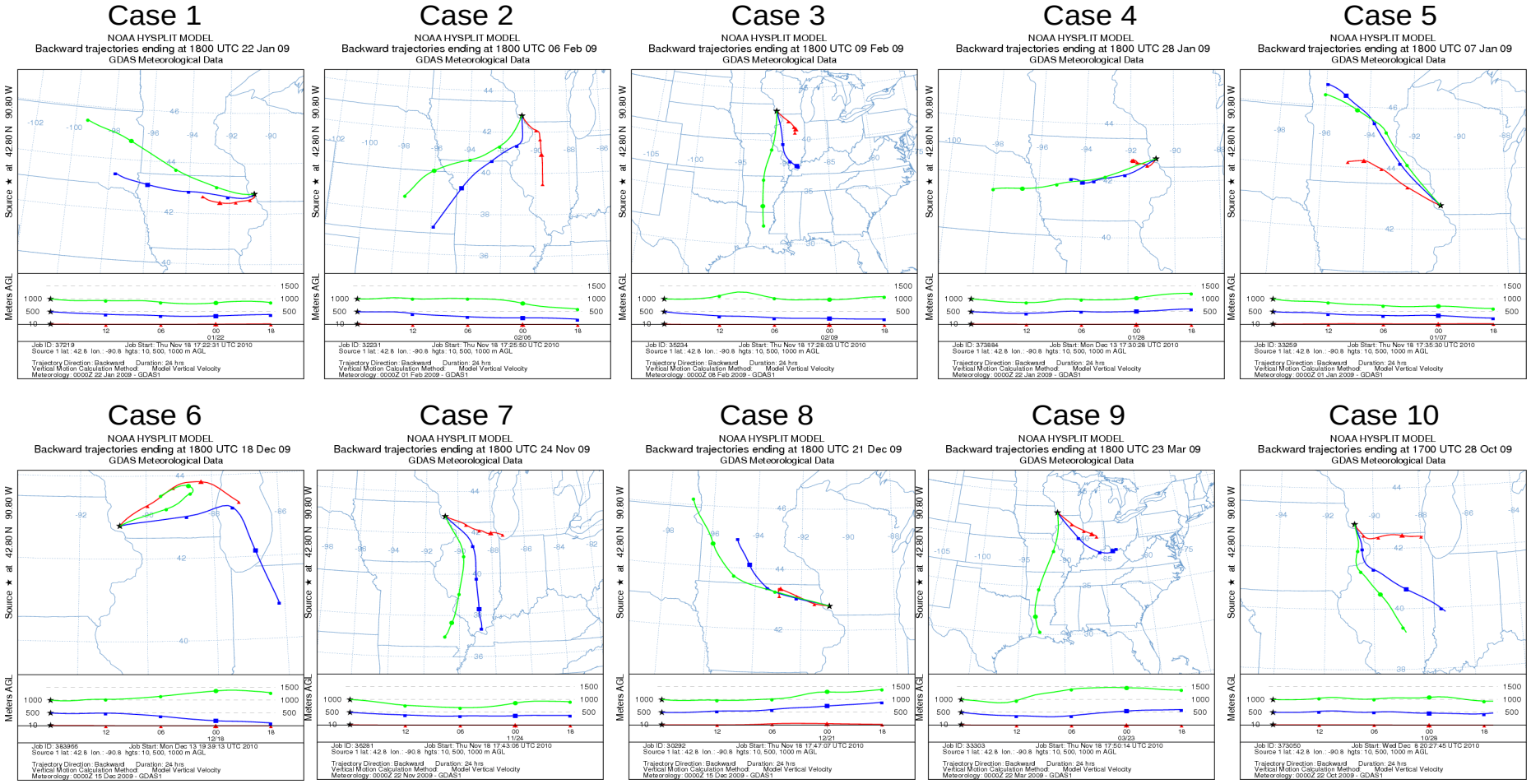


Fig. 18. HYSPLIT back trajectories terminating at Potosi at noon (local time) for the 10 highest PM2.5 concentration cases in 2009. Case numbers refer to Fig. 5.

2006 – 10 Lowest PM2.5 Cases

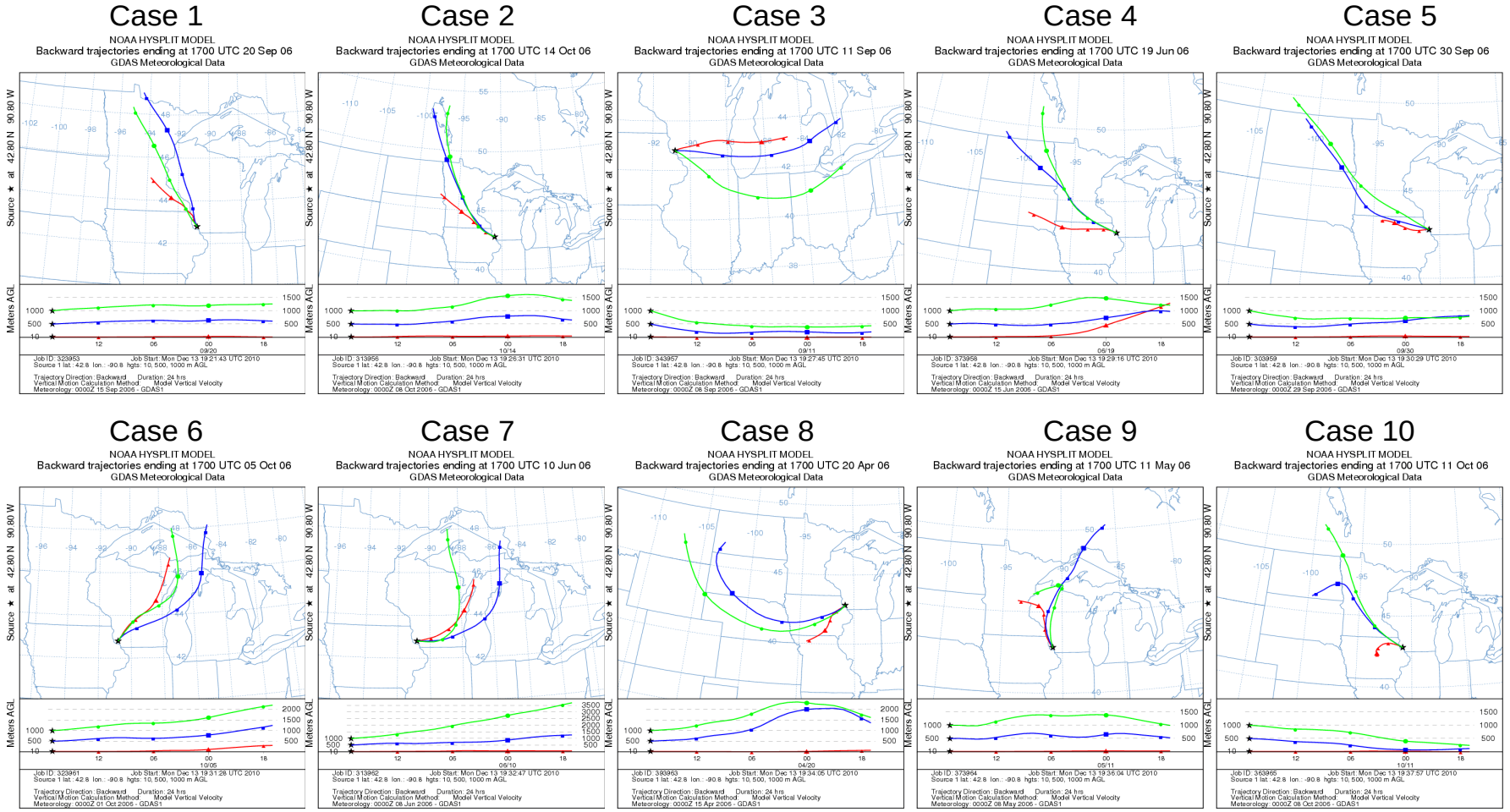


Fig. 19. HYSPLIT back trajectories terminating at Potosi at noon (local time) for the 10 lowest PM2.5 concentration cases in 2006. Case numbers refer to Fig. 6.

2007 – 10 Lowest PM2.5 Cases

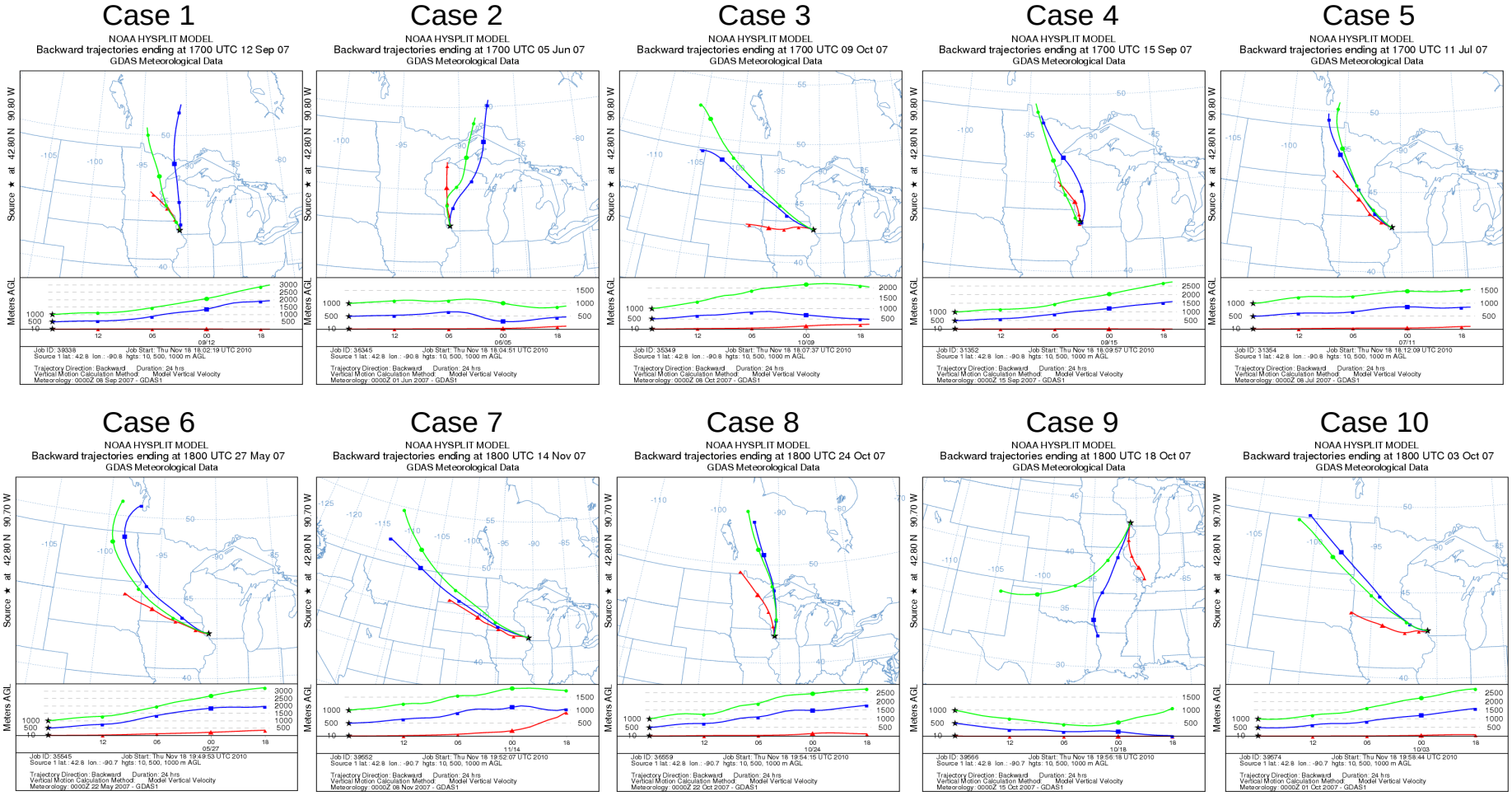


Fig. 20. HYSPLIT back trajectories terminating at Potosi at noon (local time) for the 10 lowest PM2.5 concentration cases in 2007. Case numbers refer to Fig. 6.

2008 – 10 Lowest PM2.5 Cases

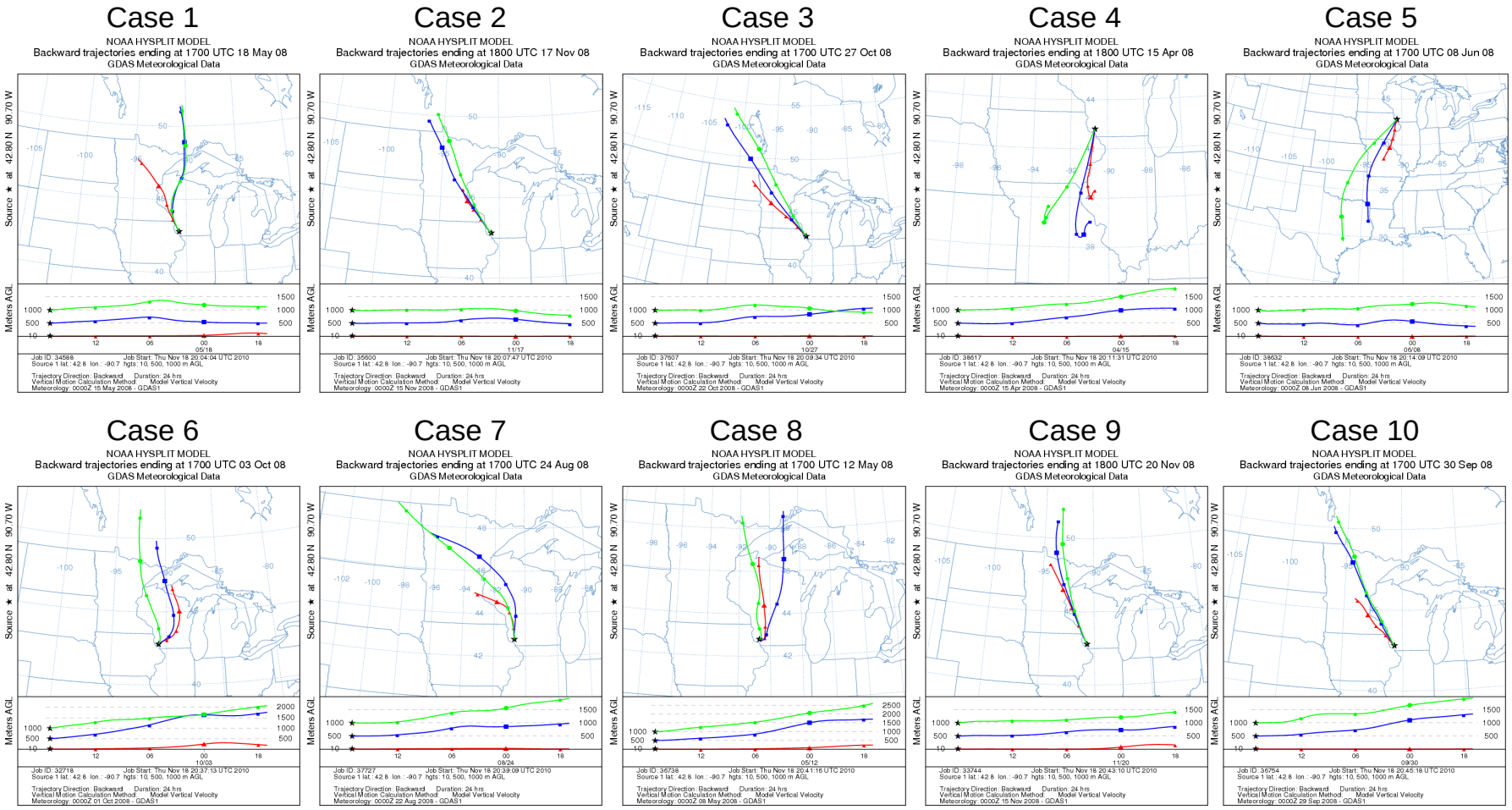


Fig. 21. HYSPLIT back trajectories terminating at Potosi at noon (local time) for the 10 lowest PM2.5 concentration cases in 2008. Case numbers refer to Fig. 6.

2009 – 10 Lowest PM2.5 Cases

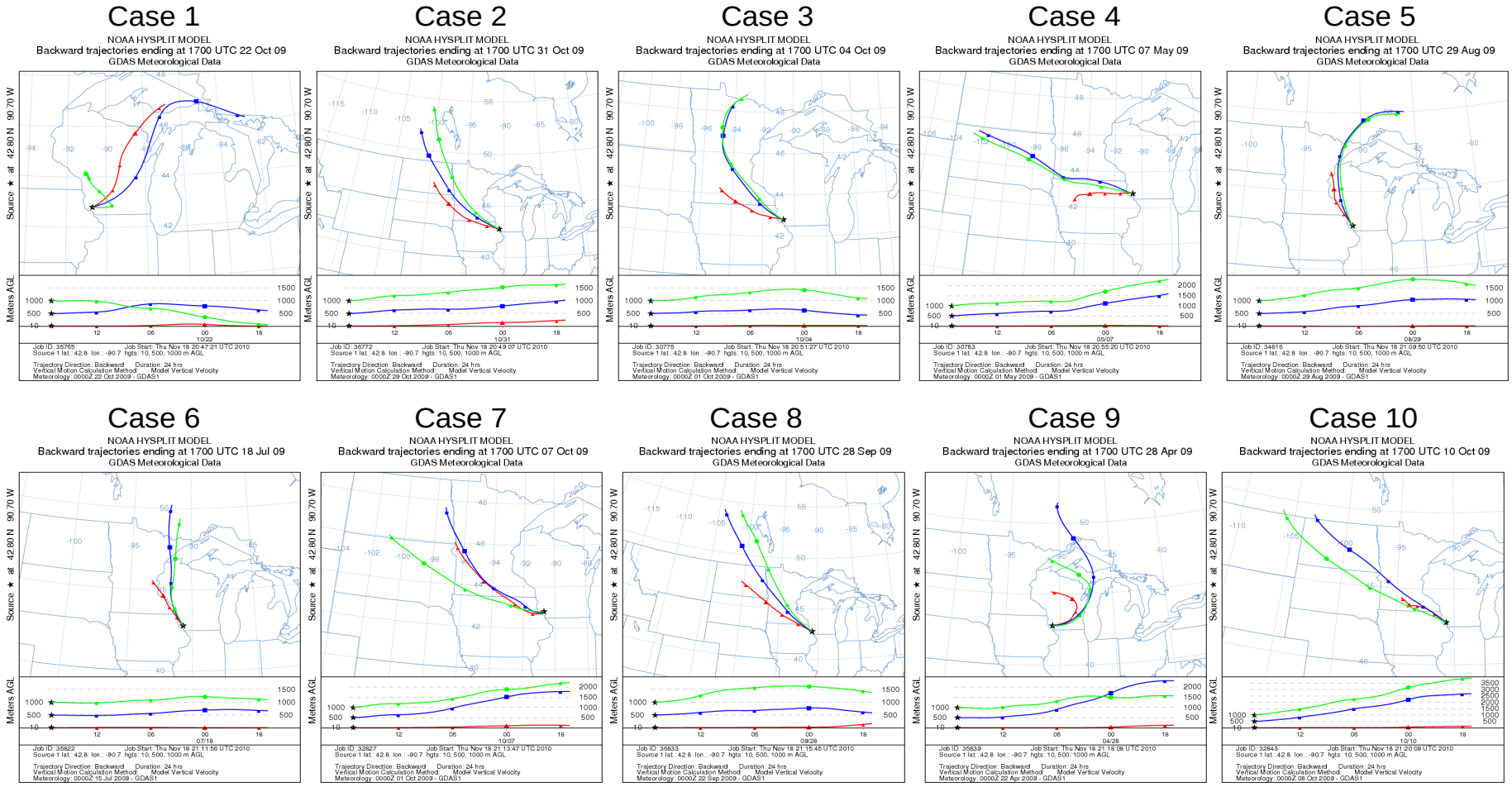
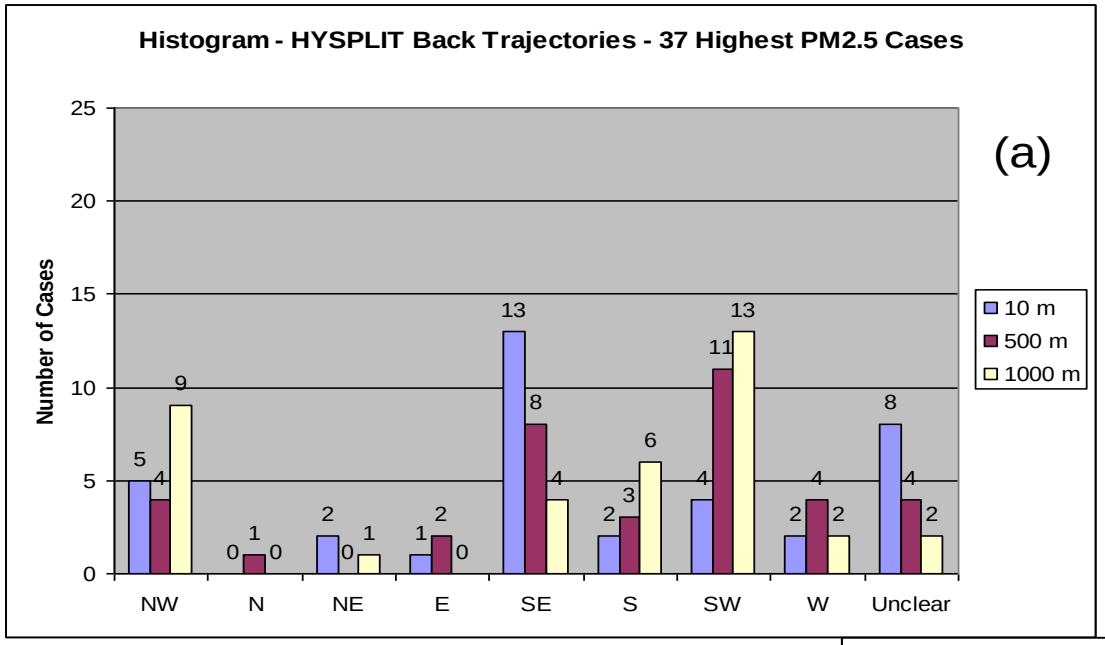


Fig. 22. HYSPLIT back trajectories terminating at Potosi at noon (local time) for the 10 lowest PM2.5 concentration cases in 2009. Case numbers refer to Fig. 6.



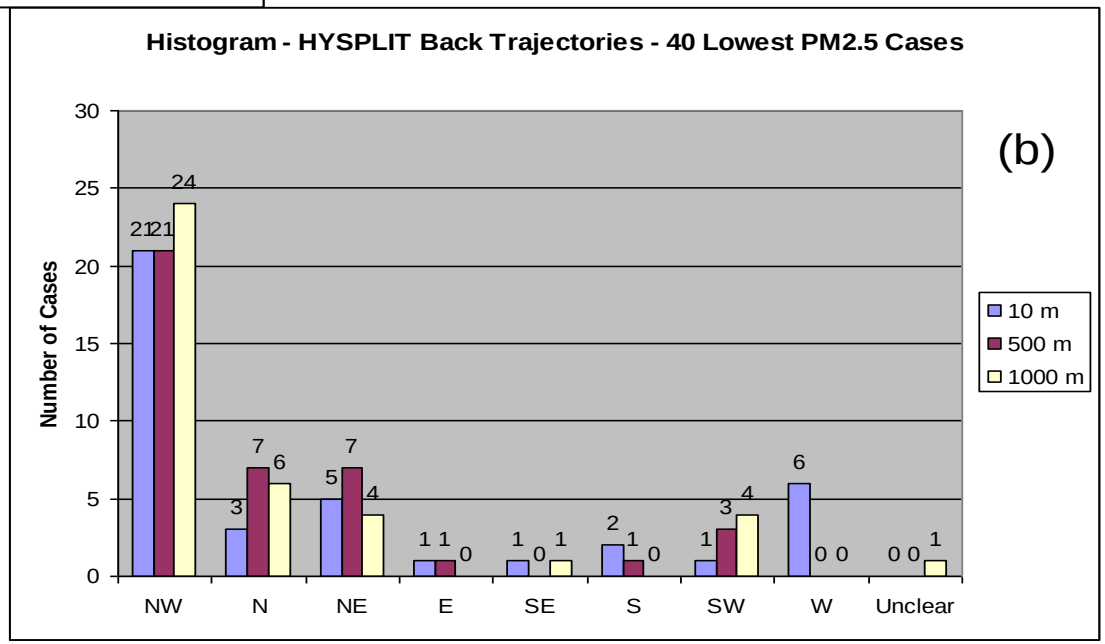
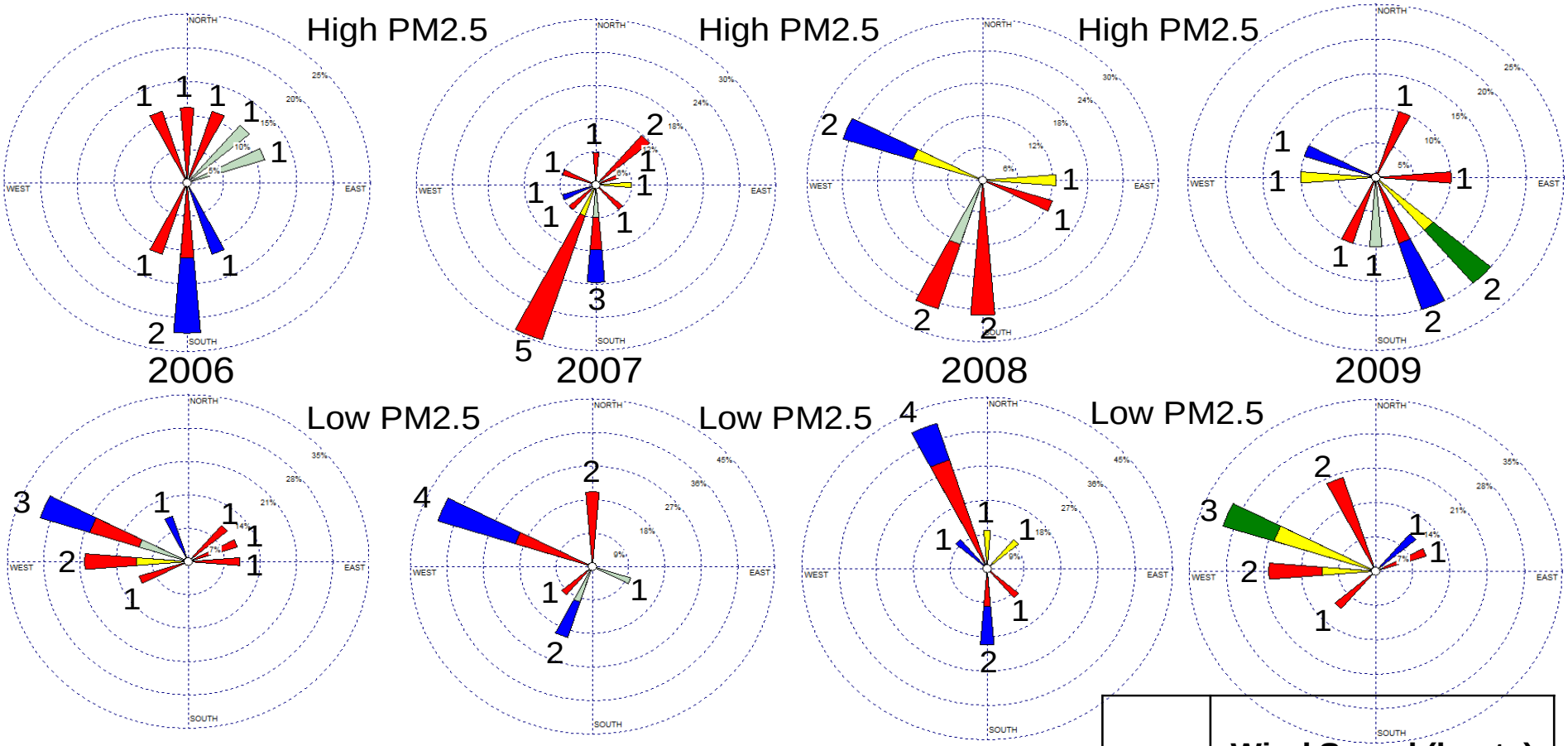


Fig. 23. Histogram for HYSPLIT 24-hour back trajectories at 10, 500, and 1000 m AGL for a) 37 highest PM2.5 cases and b) 40 lowest PM2.5 cases. Actual number of cases are indicated above each bar.



	Wind Speed (knots)
	22 or more
	17 - 21
	11 - 17
	7 - 11
	4 - 7
	1 - 4

Fig. 24. Wind roses depicting frequency of daily average surface wind at Dubuque. Top row depicts the cases with the highest PM2.5 concentration and the bottom row the lowest concentration. Numbers distributed around each wind rose indicate the number of cases along that particular radial.

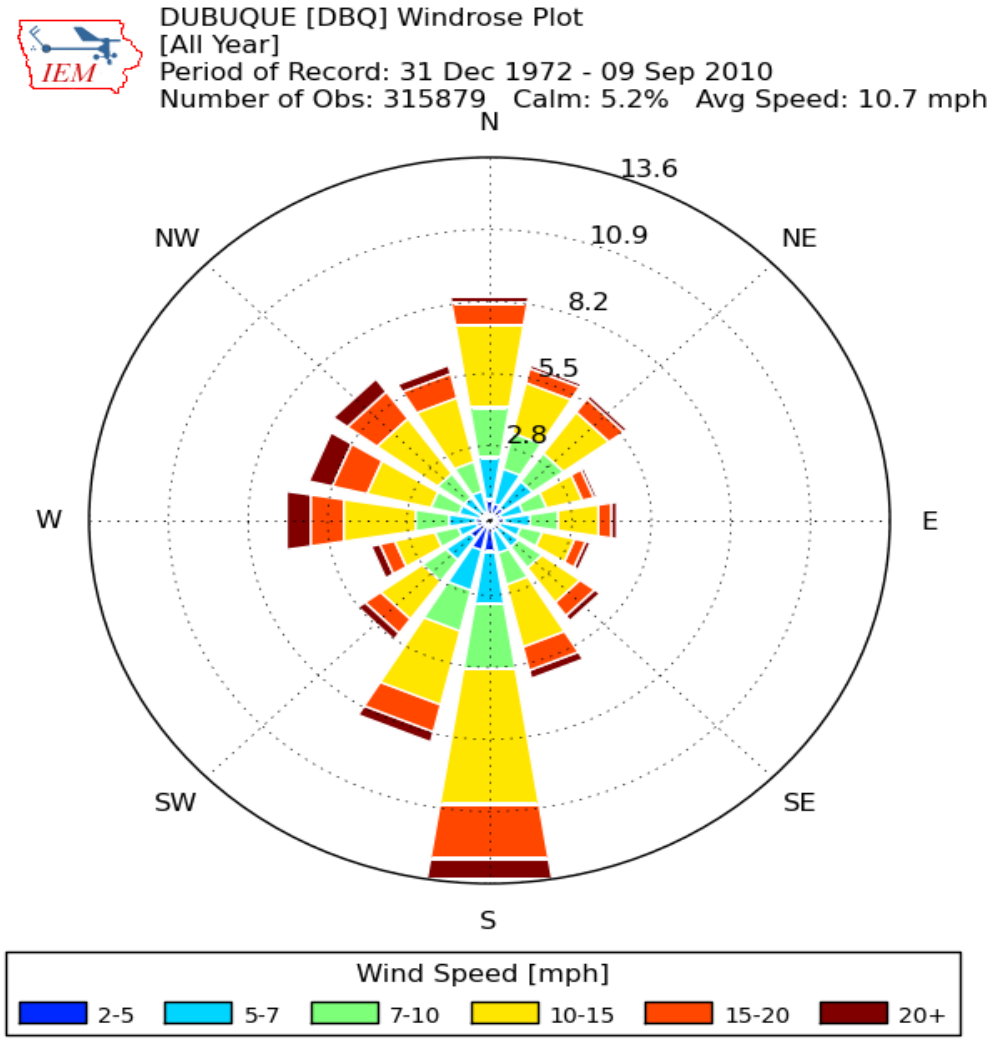


Fig. 25. Wind rose for surface winds at Dubuque. From the Iowa Environmental Mesonet. The period of record in noted above the figure. (http://mesonet.agron.iastate.edu/sites/windrose.phtml?network=IA_ASOS&station=DBQ)

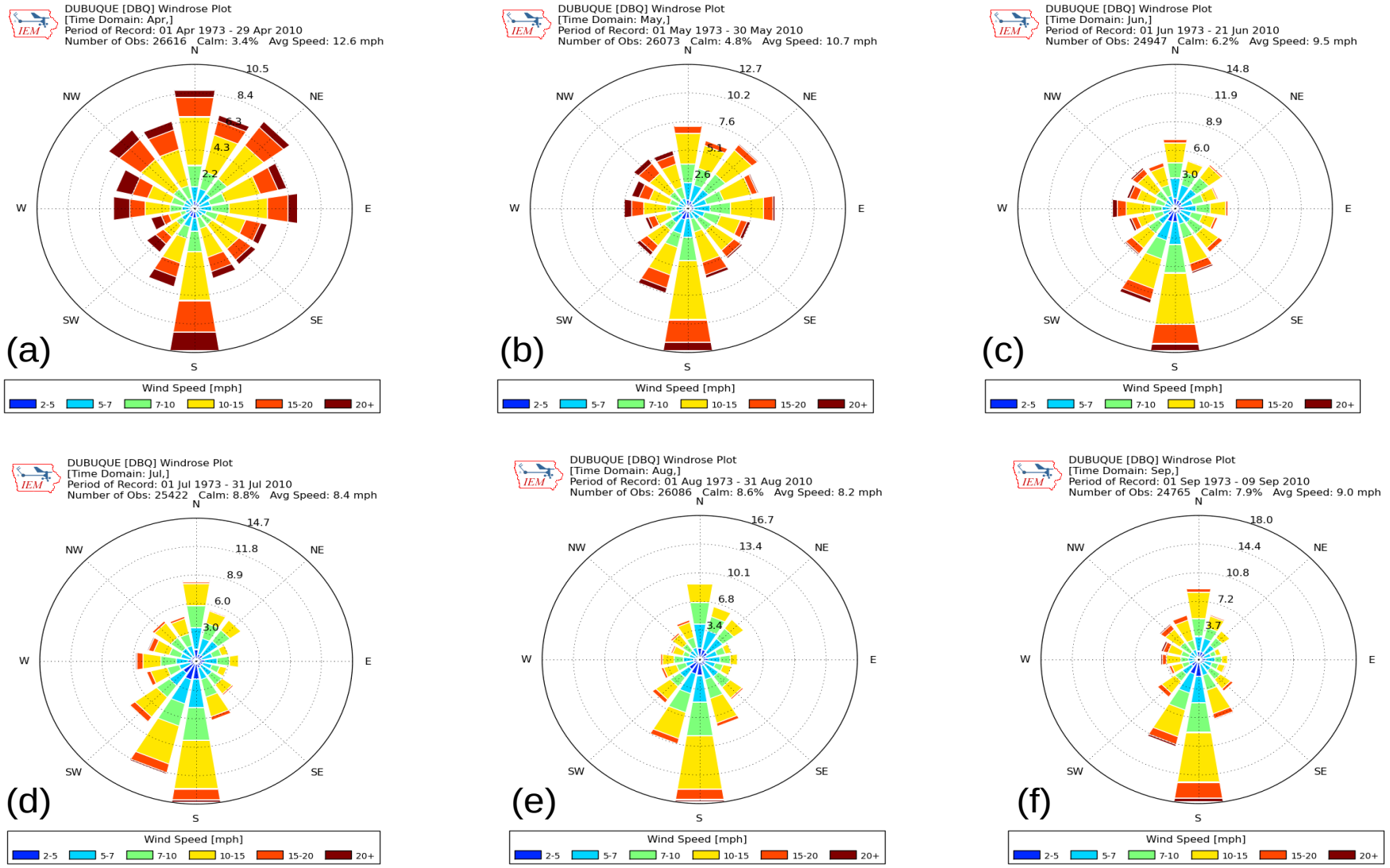


Fig. 26. Wind rose for surface winds at Dubuque in a) April, b) May, c) June, d) July, e) August, and f) September. From the Iowa Environmental Mesonet. (http://mesonet.agron.iastate.edu/sites/windrose.phtml?network=IA_ASOS&station=DBQ)

APPENDIX 5 – DUBUQUE AIR QUALITY STUDY

An Examination of Atmospheric Conditions Associated with High PM2.5 Concentrations at the Potosi (Wisconsin) SLAMS Monitor, 2006-2009

Alan C. Czarnetzki
(Ph.D. Atmospheric and Oceanic Sciences, University of Wisconsin)

and

Sean K. Newlin
(B.S. Air Quality, University of Northern Iowa)

Prepared for the Greater Dubuque Development Corporation
January 2011 – with corrections in first paragraph

1. Introduction

The concentrations of particulate matter with an aerodynamic diameter of 2.5 microns and smaller (PM2.5) measured at Potosi (Wisconsin) have recently raised concern. The 24-hour National Ambient Air Quality Standard (NAAQS) for PM2.5 is 35 micrograms per cubic meter (jig/m^3). To determine compliance with the standard, a *design value* is calculated from 24-hour concentration measurements. The Code of Federal Regulations (CFR 2010) defines the 24-hour PM2.5 design value as the 3-year average, rounded to the nearest units value, of the 98th percentile measurements. The State and Local Monitoring System (SLAMS) PM2.5 monitor at Potosi operates on a 1-in-3 day sampling schedule. On this schedule, the 98th percentile corresponds to the third highest measurement for a given year. Quality controlled PM2.5 measurements at Potosi for 2006-2009 were obtained from the Wisconsin Department of Natural Resources (WIDNR 2010) and are presented in Figs. 1-4 as listings ordered from highest to lowest concentration and as histograms over 8 concentration classes. The histogram in each figure emphasizes that most PM2.5 measurements during any given year are well below the 24- hour standard. However, it is the third highest value that is most important. That value for each year is noted in the corresponding figure. As such, the 24-hour PM2.5 design value at Potosi was 34 jig/m^3 for 2006-2008 and 35 jig/m^3 for 2007-2009, each being at or near the NAAQS.

This project has examined specific atmospheric conditions associated with the highest concentrations. For comparison, the 10 lowest concentrations each year are also presented. Selection of the highest cases each year was based on the ordered set of observations as presented in Figs. 1-4. Most of the measurements in a given year fall along a reasonably smooth curve of increasing concentration.

However, each ordered listing in Figs. 1-4 also depicts that the highest measurements depart from this curve. The departure in 2006, 2008, and 2009 occurs at concentrations around 22 jig/m^3, indicated by the red line in each figure. The ordered listing for 2007 was somewhat unique. It can be argued that the 'reasonably smooth curve' in 2007 extends to concentrations of about 28 jig/m^3, yielding only 4 'highest' measurements that year. In order to be consistent (and include more cases from 2007), days when PM2.5 concentration was above about 22 jig/m^3 were selected from each year. Days above the red line in Figs. 1-4 were included in this study. Figure 5 lists this subset of measurements. In all, 44 days were examined.

For comparison, a subset of the lowest measurements was also examined. Atmospheric conditions on these days provide context for evaluating conditions on days with high particulate concentrations. The 10 lowest measurements each year were selected, giving a total of 40 cases for comparison to the 44 highest measurements. Figure 6 lists the set of lowest measurements used in the project.

2. Methods

The concentration of an air pollutant at a given location depends on a number of factors. These include the background concentration, transport from emission sources, diffusion by turbulent motion in the atmosphere, chemical transformation, and removal mechanisms such as gravitational settling and scavenging by precipitation. The processes examined in this study are limited to diffusion by turbulent motion and transport by the wind.

Diffusion is a down-gradient process, meaning that turbulent mixing moves air pollution from regions of higher to lower concentration. Turbulence through a deep layer of the atmosphere near the surface will produce a near uniform, low concentration throughout the layer. When turbulence is restricted to a shallow layer, or when the atmosphere sufficiently resists turbulence, air pollution will be more concentrated. Thus, the depth of the so-called *mixed layer* is an important component to understanding the atmosphere's contribution to pollutant concentrations.

Air density decreases with increasing height in the atmosphere because air is a compressible fluid. The ability of turbulent processes to mix air (and air-borne particles) vertically depends on the rate at which density decreases (i.e., the vertical density gradient). The density of air depends on its temperature, pressure, and water vapor content. There is a critical value of the vertical density gradient that separates stable conditions, which would resist vertical mixing, from unstable conditions, which would enhance it. This critical value can be evaluated by examining vertical profiles of *virtual potential temperature*. This thermodynamic variable incorporates the effects of temperature, pressure, and water vapor content into a single value that allows for the evaluation of vertical air density gradients. Virtual potential temperature can be used to evaluate the potential for thunderstorms (e.g., Czarnetzki 1996) and the mixing ability of the atmosphere (Kunkel et al. 1996). The virtual potential temperature will increase (i.e., become warmer) with increasing height in a layer of air that will resist mixing (i.e., the layer is stably stratified). A layer of air that is well mixed will have a near constant value of virtual potential temperature. Figure 7a depicts a vertical profile of this thermodynamic variable as it would appear for a

well-mixed layer. On the other hand, air that is stably stratified would appear as in Fig. 7b. Here, virtual potential temperature notably increases with increasing height.

A layer is well mixed because of turbulent motion in the layer. The turbulence that would produce a virtual potential temperature profile as shown in Fig. 7a can be generated by mechanical (e.g., wind shear) or thermal (e.g., heating by the sun) processes. Turbulence usually is least in the morning and increases during the day, producing a mixed layer that is deepest by mid to late afternoon. Turbulence that would produce the profile in Fig. 7a would also mix air pollutants throughout the layer. All other factors being equal, a deeper mixed layer would be associated with lower pollutant concentration near the surface. A stable near-surface layer would resist turbulence and be associated with higher pollutant concentration near the surface. In this study, virtual potential temperature profiles are used to infer the degree of vertical mixing that is occurring near the surface.

Detailed observations of temperature, pressure, and water vapor content from radiosonde measurements are needed to calculate virtual potential temperature profiles. Radiosondes, which are carried aloft by weather balloons, are released twice daily (00 and 12 Coordinated Universal Time, corresponding to 6 p.m. and 6 a.m. Central Standard Time and 7 p.m. and 7 a.m. Central Daylight Time) from a network of surface stations around the world. Figure 8 shows the location of Potosi relative to the nearest radiosonde sites: Davenport (DVN), Minneapolis (MPX), and Green Bay (GRB). Radiosonde observations from these stations on the days of interest were interpolated by a distance-weighted scheme to Potosi. The interpolated data were used to construct virtual potential temperature profiles. The highest and lowest cases in each year were examined individually and used to construct average profiles that will be shown here.

Transport of air by large scale wind will also affect pollutant concentration. To examine the source region for the air that was in Potosi, numerical simulations were run backward in time in order to identify the path (or trajectory) traveled by the air that arrived in Potosi on the days of interest. The National Oceanic and Atmospheric Administration's Hybrid Single Particle Lagrangian Integrated Trajectory model (HYSPLIT) (Draxler and Rolph 2010; Rolph 2010) was used. Twenty-four-hour back trajectories of the air at 10, 500, and 1000 m above ground level at noon local time in Potosi were calculated on the days with highest and lowest PM2.5 concentration. Data for the simulations came from the Global Data Assimilation System (McPherson et al. 1979).

To further examine the association between transport and PM2.5 at Potosi, surface wind reports from Dubuque's Automated Surface Observing System (ASOS) were examined. Figure 9 shows the location of Potosi relative to the nearest surface observing stations. While the Platteville Automated Weather Observing Station (AWOS) is physically closer to Potosi, it did not come into service until September 2008. Also, it is the Dubuque area's potential contribution to the Potosi monitor's measurements that are of concern. For these reasons, hourly wind measurements from Dubuque were used to determine

resultant (or average) wind vectors (direction and speed) on the days of interest. The results were used to construct *wind roses*, which depict the frequency of wind direction and speed.

3. Results

a. Virtual potential temperature

Figures 10-13 depict vertical profiles of average and extreme virtual potential temperature over Potosi from the morning ('12 Z') and evening ('00 Z') for each year in the study. The lowest 2000 m above ground level (AGL) are displayed, a height sufficient to determine the presence or absence of a surface based mixed layer. In these figures, legend captions such as 'Lowest 10' and 'Highest 9' refer to the average profiles based on the indicated number of cases. The captions 'Lowest Case' and 'Highest Case' refer to the lowest and highest cases respectively for that year.

In 2006, the average profiles of both the high and low cases have nearly the same virtual potential temperature at the surface in the morning (Fig. 10a). However, the low average is notably cooler at altitudes above about 200 m AGL. Both profiles are stably stratified at this time (virtual potential temperature increasing with increasing height), which is characteristic of morning. Both extreme cases in 2006 have substantial stable layers below about 200 m in the morning. By the early evening (Fig. 10b), the high average profile is still stably stratified but the low average profile is nearly vertical below at least 600 m. This indicates that the lowest 600 m is well-mixed in the low average, but no mixed layer is apparent in the high average. The profile for the lowest case is nearly vertical up to about 1200 m, while the highest case is characterized by a strongly stable layer below 200 m.

For 2007, average profiles were constructed for the 4 highest cases and the 17 highest cases. The 4 cases of highest PM2.5 concentration stand out significantly in Fig. 2 and may have resulted from conditions that are notably different from the other 13 cases selected for study that year. The histogram in Fig. 2 supports this as well. All of the profiles depicted in Fig. 1 1a are stably stratified. Interestingly, the average and extreme low profiles are more stable in the lowest 100 m than any of the average or extreme high profiles. However, by early evening (Fig. 1 1b) the average and extreme low profiles are nearly vertical up to about 1000 m, while the average and extreme high profiles are still stably stratified. In fact, by early evening the average profile for the 4 highest PM2.5 cases in 2007 had become more stable in the lowest 200 m! This kind of change was not seen in the average profile for any other year.

In 2008 (Fig. 12), the average high profile is stably stratified in the morning and evening, but the stability has weakened by evening. The average low profile is also stable in the morning, but has a well-defined mixed layer up to at least 800 m by evening. The extreme low case in Fig. 12b had a mixed layer that was nearly 2000 m deep! The highest case is remarkably stable in the lowest 150 m in Fig. 12a. Similar results were found in 2009 (Fig. 13). Again, the average high profile is stable both in the morning and evening (though less so) while the average low profile

changes from stable in the morning to well-mixed in the lowest 600 m by evening. As with the extreme case in 2008, the highest case in 2009 is also exceptionally stable in the lowest 150 m (Fig. 13a).

Figure 14 depicts the average virtual potential temperature profiles for the 3 highest cases in all years. These cases determine the 98th percentile concentrations used to calculate the PM2.5 design value. In the figure, the blue line is the average morning profile and red is the evening average. Both profiles are entirely stable and would offer great resistance to turbulent mixing. The morning profile is especially stable near the surface. Aloft, the profiles are very similar, though the evening profile is slightly warmer at most levels.

It is revealing to consider the season in which most of the highest concentrations were measured. In Fig. 5, each quarter of the year is colored coded. Dark and light blues are used for the 2 coldest quarters of the year ('winter' and 'fall', respectively), while pink is used for what could be considered the 'spring' quarter and red the 'summer' quarter. Each year is dominated by cold season cases. Note that all of the highest cases in 2009 occurred during the cold season. Twenty-two of the 44 cases examined occurred in the first ('winter') quarter, 13 in the fourth ('fall'), 6 in the third ('summer'), and only 3 in the second ('spring'). The distribution of cleanest cases (Fig. 6) is considerably different. Seventeen of the 40 cleanest cases occurred in the fall, 12 in the spring, 11 in the summer, and none in the winter! The average virtual potential temperature profiles for the highest PM2.5 cases are consistent with a model of very cold surface air overlain by much warmer air aloft, a situation that is far more likely during the coldest months of the year.

b. HYSPLIT back trajectories

Back trajectories for the cases of highest PM2.5 concentration in the study are presented in Figs. 15-18. Simulations were run for the 10 highest of the 17 cases in 2007. The back trajectories for the cases of lowest PM2.5 concentration are presented in Figs. 19-22. Case numbers in these figures refer to the ranking of cases used in Figs. 5 and 6. In the figures' maps, a star denotes the location of Potosi. Colored lines indicate the 24-hour back trajectory of air that arrived in Potosi at noon local time at 10 m AGL (red), 500 m (blue), and 1000 m (green). These levels were selected because they are representative of the lower atmosphere. For example, the green line in case 1 of Fig. 15 indicates that the air 1000 m above Potosi at noon on November 25, 2006, traveled from northern Missouri and across eastern Iowa during the preceding 24 hours. Beneath each map, a graph depicts the elevation of the trajectories as a function of time over the 24 hours prior to arrival at Potosi. The arrival time appears at the far left of each graph, and time (in Universal Coordinated Time) is marked every 6 hours along the graph's bottom proceeding back in time as you progress to the right. For example, the air 500 m above Potosi in case 1 of Fig. 15 originated between 500 and 1000 m above northeast Iowa 24 hours earlier.

There is a great deal of information in Figs. 15-22 that can be effectively gathered by visual inspection and that is difficult to summarize concisely. HYSPLIT simulations were produced for a total of 37 high and 40 low PM2.5 cases. A subjective evaluation of the dominant direction of each trajectory in

all cases is summarized by the histograms in Fig. 23. If it was difficult to assign a single dominant direction, a trajectory was counted in the 'Unclear' category of the histograms. For the highest cases (Fig. 23a), trajectories at all 3 levels are clustered

around a direction that has a southerly component (i.e., from the south), while trajectories in the lowest cases (Fig. 23b) were most commonly from the northwest at all levels. The length of each trajectory is a measure of the wind speeds the air experienced prior to arrival in Potosi. Subjective visual inspection indicates that, in general, the winds may be stronger for the low cases. This is suggested by longer trajectories at many levels in the low versus high cases. Some of the low case trajectories originate several states away from Potosi or even in southern Canada.

c. Wind roses

Wind roses depicting the daily average surface wind at Dubuque for the 44 highest and 40 lowest PM2.5 cases are presented in Fig. 24. Most of the high cases were associated with surface winds having a southerly component at Dubuque. Twenty-four of the 44 high cases were associated with average daily surface winds ranging from southwest to southeast at Dubuque.

On the other hand, most of the low cases were associated with surface winds having a northwesterly component at Dubuque. Eighteen of the 40 low cases were associated with average daily surface winds ranging from north/northwest to west/northwest. As suggested by the HYSPLIT simulations, stronger average surface wind speeds are slightly more common with the low PM2.5 cases (10 of 40 cases had average wind speeds of 11 knots or higher) than with the high PM2.5 cases (8 of 44 cases had average wind speeds of 11 knots or higher).

It is worth noting that south surface winds are most common throughout the year in Dubuque. This is supported by Fig. 25, which shows the wind rose for 315,879 surface wind observations in Dubuque over a nearly 38-year time period. However, south winds at Dubuque are not, by themselves, a good predictor of high PM2.5 concentration at Potosi. Figure 26 depicts wind roses for the 'spring' and 'summer' quarters (April – September). South winds are most common during these quarters. If these are representative of 2006-2009, then south winds were most common in April through September during the period of study. However, Potosi experienced only 9 of its 44 highest PM2.5 cases (20%) during these months, and had 23 of its 40 lowest cases (58%) during the same time period (see Figs. 5 and 6).

4. Summary

While there is variability between cases within the high and low sets examined in this project, it is still possible to make some summary statements. The average virtual potential temperature profiles for the high PM2.5 cases consistently depict a stably stratified atmosphere that would resist vertical mixing of air pollution by turbulent processes. On the other hand, the average profiles for the low cases consistently depict a mixed layer where turbulence would act to reduce the concentration of particulates at the surface. Both HYSPLIT back trajectory calculations and surface wind roses indicate that winds at and

near the surface most commonly have a southerly component in the high cases, and a northwesterly component in the low cases. However, southerly surface winds at Dubuque are not necessarily a good predictor of PM2.5 concentration at Potosi. South winds are common at Dubuque every month of the year, yet high PM2.5 episodes are more strongly associated with cold than warm months. The suggestion is that the atmosphere's ability to mix air vertically is a dominant process in explaining high PM2.5 measurements. As seen in this study, the thermodynamic structure of the lower atmosphere is notably and quantifiably different when PM2.5 measurements are high.

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APPENDIX 6 – DUBUQUE HEALTH NEEDS ASSESSMENT AND HEALTH IMPROVEMENT PLAN

DUBUQUE COUNTY

COMMUNITY HEALTH
NEEDS ASSESSMENT

AND

HEALTH IMPROVEMENT PLAN

FOR 2011-2016

DUBUQUE COUNTY COMMUNITY HEALTH NEEDS ASSESSMENT

AND HEALTH IMPROVEMENT PLAN FOR 2011-2015

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THIS REPORT IS PUBLISHED ONLINE AND AVAILABLE AT:

HTTP://WWW.DUBUQUECOUNTYHEALTH.COM/CLINICALSERVICESPROGRAMS/COMMUNITYHEALTHPLANNING.HTM

DUBUQUE COUNTY COMMUNITY HEALTH NEEDS ASSESSMENT

AND HEALTH IMPROVEMENT PLAN FOR 2011-2015

PURPOSE

The Community Health Needs Assessment and Health Improvement Plan (CHNA & HIP) is a report documenting a community-wide effort to assess the community's health needs and decide how to meet them. Every five years, local boards of health lead this community-wide discussion with stakeholders. This Iowa Department of Public Health standard is a requirement of local boards of health in order to receive funding from the State and to fulfill the duties of a local board of health.

Since assessment is a primary, core function of public health, it is important for local communities to periodically conduct needs assessments and share them with the community to provide guidance on resource needs to successfully address health priorities. Appropriate allocation of resources and consistent planning efforts help insure successful implementation of all core functions of public health. Although local boards of health lead the CHNA-HIP Initiative, it is the commitment among diverse stakeholder groups to collaborate in the assessment and development and implementation of the community-wide health improvement plan.

DESCRIPTION OF THE PROCESS

Timeline:

A steering committee formed to oversee individual subcommittees that meet independently on each of the six topic areas. *(August 2010)*

Six task forces are formed. *(August 2010)*

Task forces do SWOT analysis, statistical analysis, identification of problems and needs, and finally selection of 1-3 areas for consideration as elements in the county health improvement plan. *(August-October 2010)*

Four Community Health Forums are held to allow public input into the process of identifying problems, needs and solutions. *(October 2010)*

Steering committee narrows the list of possible HIP objectives to a more focused list of approximately 6. *(November 2010)*

Problems, needs, and a 5-year health improvement plan are presented to County Board of Health for initial reaction. *(December 2010)*

Final detailed report is prepared and presented to the County Board of Health for approval. *(February 2011)*

Following County Board of Health approval, the CHNA/HIP document is submitted to the Iowa Department of Public Health. *(February 2011)*

The more detailed report is published and widely distributed to the general public and to agencies for use in planning, and to gain collaboration for executing the Health Improvement Plan. *(May 2011)*

The process involved gathering community stakeholders who have a role in the delivery and partnership of public health services. A steering committee was formed to oversee the Dubuque County CHNA-HIP process. The steering committee consisted of staff from the County Board of Health, County Health Department, Dubuque Visiting Nurse Association and the City of Dubuque Health Services Department, and Mercy Medical Center. The Iowa Department of Public Health framework provided six focus areas for the County CHNA-HIP. The following local public health staff formed the steering committee and provided leadership to each task force:

Task Force Leader	Health Responsibility
Patrice Lambert, Executive Director Dubuque County Public Health	*County Public Health*
Mary Rose Corrigan, City of Dubuque Health Services Department	*Promoting Healthy Behaviors*

Deb Borley, Dubuque VNA	*Prevent injuries*
Tim Link, City of Dubuque Health Services Department	*Protecting against Environmental Hazards*
Cathy Tieskoetter, Dubuque VNA	*Preventing Epidemics and Spread of Disease*
Tom Berger, Dubuque County Emergency Management	*Preparing for, Responding to, and Recovering from Public Health Emergencies*
Nan Colin, Dubuque VNA	*Public health infrastructure*

Each task force leader formed subcommittees specific to their topic to begin the assessment. Stakeholders invited to participate included the local board of health, local health care providers, other public health system agencies (e.g., substance abuse, problem gambling, and mental health providers), community-based organizations, consumers, emergency management, fire department, educational system, law enforcement, business/industry representatives, human service agencies, local government officials and EMS, obtaining broad input and representation in the assessment and planning provides support and commitment to implement the health improvement plan.

Participants

Dubuque County Board of Health Members

Pearl Scherrman RN, BSN - Chair

Dr. John Viner, MD - Vice-Chair

Dr. Valerie Peckosh, DMD

Dr. Richard Fairley, MD, MPH

Ron Bell

Steering Committee Members

Deb Borley Dubuque VNA

Nan Colin	Dubuque VNA
Mary Rose Corrigan	City of Dubuque Health Services Department
Tim Link	City of Dubuque Health Services Department
Cathy Tieskoetter	Dubuque VNA
Tom Berger	Dubuque County Emergency Management
Art Roche	Mercy Medical Center

TASK FORCE MEMBERS

Promoting Healthy Behaviors:

Sheila Knapp	Western Dubuque Schools
Michele Malone	The Finley Hospital
Janna Beau,	City of Dubuque Leisure Services
Crystal Kilgore	VNA
Trish Kemp	VNA
Gina Dowling	WIC–Hillcrest
Clare Jones	Helping Services
Art Roche	Mercy Medical Center
Sherry McGinn	Hillcrest Family Services
Tim Link	City of Dubuque Health Services Department
Pat Prevenas	City of Dubuque Leisure Services
Nancy Van Milligen	Community Foundation of Greater Dubuque
Pat Fisher	Hy Vee
Megan Horstman	HyVee
Mary Nauman	Medical Associates
Mary Rose Corrigan	City of Dubuque Health Services Department

Prevent Injuries:

Deb Borley	VNA
Cindy Weidemann	Finley Hospital
Sue Davison	Iowa Department of Human Services
Cyd Klein	VNA
Kimberly Gonzales	VNA
Sharon Frye	The Finley Hospital
Amy Smith	VNA
Charlene Schrodt	VNA
Dean Nelson	Helping Services for NE Iowa

Protecting Against Environmental Hazards:

Sue Miller	Iowa Department of Natural Resources, Manchester
Ron Cunningham	Shawver Well Company
Liz Kemp	MSA
Travis Kemp	TW Excavation (septic installer)
Rich Miller	City of Dubuque Health Services Department
Dean Mattoon	City of Dubuque Engineering Department
Lalith Jayawickrama	University of Dubuque Environmental Science
David Koch	University of Dubuque Environmental Science
Kim Glaser	City of Dubuque Housing Services & Community Development Department
Bonnie Brimeyer	Dubuque County Health Department
Mary Rose Corrigan	City of Dubuque Health Services Department

Prevent Epidemics & Spread of Disease:

Annette Hall	UCL
Ann Burds	Mercy Medical Center
Patty Dissell	The Finley Hospital
Eric Manternach	Board of Supervisors
Gail Gates	Mercy Medical Center
Gayla Roarig	Sunnycrest
Kimberly Gonzales	VNA
Jacquie Roth	The Finley Hospital
Kathy Kane	Medical Associates
Patricia Lehmkuhl	The Finley Hospital
Lori Konrardy	VA Clinic
Patrice Lambert	Dubuque County Health Department
Rhonda Simpson	Dubuque Community Schools
Dr. John Viner	Dubuque County Board of Health
Diane Link	Medical Associates
Cathy Tieskoetter	VNA
Eric Manternach	Dubuque County Supervisor

Preparing for, Responding to, and Recovering from Public Health Emergencies:

Don Vrotsos	Dubuque County Sheriff
Michelle Zurcher	VNA
Wayne Dow	Dubuque Fire Department
Gwen Hall-Driscoll	County Medical Examiner Office
Nan Colin	VNA
Kathy Kane	Medical Associates

Sherry Frye	The Finley Hospital

Public Health Infrastructure:

Julie Woodyard	Crescent Community Health Center
Gerry Rea	Stonehill Adult Center
Cathy Hedley	Sunnycrest Manor
Jacquie Roseliep	VNA
Kay Takes	Mercy Medical Center
Dr. Rich Fairley	Dubuque Internal Medicine and Dubuque County Board of Health
Linda McDonald	Scenic Valley Area Agency on Aging
Patrice Lambert	Dubuque County Health Department
Cathy Tieskoetter	VNA
Nan Colin	VNA
Kathy Kane	Medical Associates Clinics
Mary Rose Corrigan	City of Dubuque Health Services Department
Pearl Scherrman	Dubuque County Board of Health Chair
Diana Batchelor	The Finley Hospital

Task Force Report:

Promoting Healthy Behaviors **Task Force**

Chair: Mary Rose Corrigan, City of Dubuque Health Services Department

The Task Force examined statistical data from many sources, but notably:

- County Health Rankings (Source: www.countyhealthrankings.org from The Robert Wood Johnson Foundation is collaborating with the University of Wisconsin Population Health Institute.)
- Profile of Prenatal Health in Dubuque County (Source: Iowa Barriers to Prenatal Care Project, Iowa Department of Public Health, University of Northern Iowa Center for Social and Behavioral Research: 2008 Data)
- 2009 Iowa Health Fact Book (Source: The University of Iowa College of Public Health and the Iowa Department of Public Health)
- Iowa Youth Survey (conducted by the Iowa Department of Public Health's Division of Behavioral Health in collaboration with the Iowa Department of Education, the Governor's Office of Drug Control Policy, the Iowa Department of Human Rights' Criminal and Juvenile Justice Planning and Statistical Analysis Center, and the Iowa Department of Human Services.)
- Iowa Policy Project

Dubuque County Health Indicators

Indicator: Stroke Mortality

Time Period: 2002-2006

County measure: 56.9 deaths per 100,000 (Adj to 2000 pop)

Iowa measure: 50.0

Compare to past: (1988-1996) 73.5

Source: 2009 Iowa Health Fact Book

Indicator: COPD Mortality

Time Period: 2002-2006

County measure: 39.4 deaths per 100,000 (Adj to 2000 pop)

Iowa measure: 44.9

Compare to past: (1988-1996) 37.8

Source: 2009 Iowa Health Fact Book

Indicator: Pneumonia/Flu Mortality

Time Period: 2002-2006

County measure: 26.2

Iowa measure: 22.3

Compare to past: (1988-1996) 40.8

Source: 2009 Iowa Health Fact Book

Indicator: Diabetes Mortality

Time Period: 2002-2006

County measure: 14.6 deaths per 100,000 (Adj to 2000 pop)

Iowa measure: 20.3

Compare to past: (1988-1996) 20.0

Source: 2009 Iowa Health Fact Book

Indicator: Atherosclerosis Mortality

Time Period: 2002-2006

County measure: 11.0 deaths per 100,000 (Adj to 2000 pop)

Iowa measure: 6.2

Compare to past: (1988-1996) 20.3

Source: 2009 Iowa Health Fact Book

Indicator: Alzheimer's Mortality

Time Period: 2002-2006

County measure: 22.1 deaths per 100,000 (Adj to 2000 pop)

Iowa measure: 23.6

Compare to past:

Source: 2009 Iowa Health Fact Book

Indicator: All Cancer Incidence

Time Period: 2002-2006

County measure: 474.2 cases per 100,000 (Adj to 2000 pop)

Iowa measure: 473.6

Compare to past: (1988-1996) 513.9

Source: 2009 Iowa Health Fact Book

Indicator: All Cancer Mortality

Time Period: 2002-2006

County measure: 178.7 deaths per 100,000 (Adj to 2000 pop)

Iowa measure: 184.3

Compare to past: (1988-1996) 218.8

Source: 2009 Iowa Health Fact Book

Indicator: Prostate Cancer Incidence

Time Period: 2002-2006

County measure: 147.6 cases per 100,000 (Adj to 2000 pop)

Iowa measure: 144.9

Compare to past: (1988-1996) 185.1

Source: 2009 Iowa Health Fact Book

Indicator: Prostate Cancer Mortality

Time Period: 2002-2006

County measure: 27.2 deaths per 100,000 (Adj to 2000 pop)

Iowa measure: 26.7

Compare to past: (1988-1996) 35.7

Source: 2009 Iowa Health Fact Book

Indicator: Lung Cancer Incidence

Time Period: 2002-2006

County measure: 70.8 cases per 100,000 (Adj to 2000 pop)

Iowa measure: 68.5

Compare to past: (1988-1996) 76.8

Source: 2009 Iowa Health Fact Book

Indicator: Lung Cancer Mortality

Time Period: 2002-2006

County measure: 50.0 deaths per 100,000 (Adj to 2000 pop)

Iowa measure: 52.3

Compare to past: (1988-1996) 63.0

Source: 2009 Iowa Health Fact Book

Indicator: Female Breast Cancer Incidence

Time Period: 2002-2006

County measure: 115.7 cases per 100,000 (Adj to 2000 pop)

Iowa measure: 124

Compare to past: (1988-1996) 142.3

Source: 2009 Iowa Health Fact Book

Indicator: Female Breast Cancer Mortality

Time Period: 2002-2006

County measure: 18.1 deaths per 100,000 (Adj to 2000 pop)

Iowa measure: 22.9

Compare to past: (1988-1996) 33.1

Source: 2009 Iowa Health Fact Book

Indicator: Colorectal Cancer Incidence

Time Period: 2002-2006

County measure: 51.3 cases per 100,000 (Adj to 2000 pop)

Iowa measure: 56.3

Compare to past: (1988-1996) 68.9

Source: 2009 Iowa Health Fact Book

Indicator: Colorectal Cancer Mortality

Time Period: 2002-2006

County measure: 16.2 deaths per 100,000 (Adj to 2000 pop)

Iowa measure: 19.0

Compare to past: (1988-1996) 28.4

Source: 2009 Iowa Health Fact Book

Indicator: Non-Hodgkin's Lymphoma Incidence

Time Period: 2002-2006

County measure: 22.2 cases per 100,000 (Adj to 2000 pop)

Iowa measure: 20.6

Compare to past: (1988-1996) 21.7

Source: 2009 Iowa Health Fact Book

Indicator: Non-Hodgkin's Lymphoma Mortality

Time Period: 2002-2006

County measure: 7.8 deaths per 100,000 (Adj to 2000 pop)

Iowa measure: 7.8

Compare to past: (1988-1996) 9.9

Source: 2009 Iowa Health Fact Book

Indicator: Skin Melanoma Incidence

Time Period: 2002-2006

County measure: 17.9 cases per 100,000 (Adj to 2000 pop)

Iowa measure: 18.3

Compare to past: (1988-1996) 16.6

Source: 2009 Iowa Health Fact Book

Indicator: Skin Melanoma Mortality

Time Period: 2002-2006

County measure: 1.8 deaths per 100,000 (Adj to 2000 pop)

Iowa measure: 2.5

Compare to past: (1988-1996) 2.9

Source: 2009 Iowa Health Fact Book

Indicator: Heart Disease Mortality

Time Period: 2002-2006

County measure: 212.6 deaths per 100,000 (Adj to 2000 pop)

Iowa measure: 198.3

Compare to past: (1988-1996) 306.6

Source: 2009 Iowa Health Fact Book

Indicator: Alcohol Binge Drinking- 11th Grade

Time Period: 2008

County measure: 38% 1 or more times in last 30 days

Iowa measure: 27%

Compare to past: (1999): 46%

Source: Iowa Youth Survey

Indicator: Marijuana Use- 11th Grade

Time Period: 2008

County measure: 17% 1 or more times in last 30 days

Iowa measure: 12%

Compare to past: (1999): 18%

Source: Iowa Youth Survey

Indicator: Cigarette Use- 11th Grade

Time Period: 2008

County measure: 20% 1 or more times in last 30 days

Iowa measure: 19%

Compare to past: (1999): 33%

Source: Iowa Youth Survey

Indicator: Suicide Attempt- 11th Grade

Time Period: 2008

County measure: 14% ever tried

Iowa measure: 13%

Compare to past: (1999): 13

Source: Iowa Youth Survey

Indicator: Children's HAWK-I and Medicaid Coverage

Time Period: 2010

County measure: 32.8% of all qualifying children served

Iowa measure: 36.9%

Compare to past: (2007) 25.3

Source: Iowa Policy Project

Indicator: Low Birthweight

Time Period: 2000-2006

County measure: 5.8%

Iowa measure: 6.7%

Compare to past:

Source: County Health Rankings

Indicator: Adult Smoking

Time Period: 2000-2008

County measure: 14%

Iowa measure: 21%

Compare to past:

Source: County Health Rankings

Indicator: Adult Obesity

Time Period: 2006-2008

County measure: 27% reporting BMI >=30

Iowa measure: 28%

Compare to past:

Source: County Health Rankings

Indicator: Adult Binge Drinking

Time Period: 2002-2008

County measure: 21%

Iowa measure: 20%

Compare to past:

Source: County Health Rankings

Indicator: Uninsured Adults

Time Period: 2005

County measure: 9% under age 65 without health insurance

Iowa measure: 10%

Compare to past:

Source: County Health Rankings

Indicator: Children in Poverty

Time Period: 2007

County measure: 11% living below Federal Poverty Line

Iowa measure: 14%

Compare to past:

Source: County Health Rankings

SWOT Analysis

Strengths:

- Dubuque County Harkin Wellness Grant in year 2 of 3-year funding cycle
- Reinventing the Family Meal, a very successful program with partnerships and outcome data. Harkin Wellness & Scenic Valley – fruits and vegetables coupons for farmers markets and grocery stores.
- Dubuque Community Schools Wellness Policy
    - Healthy Kids Act compliance with *nutrition* section
- Dubuque Eats Well, promoting local foods
- Power Prevention
- Biking/Walking/Hiking Trails and Paths and their interconnectivity in the city of Dubuque
- Rescue Mission bike repair shop
- Walking School bus beginning this fall
- Dubuque Community School District health curriculum improvements which will include health literacy education

- CSAs
- Diabetes management and education
    - Finley Hospital
    - Crescent Community Health Center
    - Medical Associates
- City of Dubuque recreation programs
- City of Dyersville recreation programs
- Farmers Markets
- Live Healthy Dubuque Initiative/Program
- Community health preventive screening opportunities, i.e., skin cancer, colorectal cancer, cholesterol, etc.
- Backpack program
- Workplace wellness programs
- Iowa Healthy Community Award
- Strong non-profit organizations
- Community resources – rich
- New dental exam State law for K & 9th graders
- Hillcrest mental health wellness center
- Healthy Kids Act – in compliance (Dubuque Schools) and WDCS on their way
- Dubuque Community School District Mental Health System integration grant, which included staff training for schools

Weaknesses:

- Taking advantage of routine physicals
- Preventive screenings – access to/education about
- DCSD not compliant on all aspects of Healthy Kids Act
- Health care providers unaware of local wellness programs/activities
- Getting resources to the people, DCSD & WDSD, linkages, etc.
- Obesity rates/BMIs
- Lack of State level support for community health data – less data available
- Youth binge drinking twice the rate of national average (5 or more drinks on one occasion)
- Fund raising by selling unhealthy foods (schools, organizations, daycares, etc.)
- Economy, limited funds, budget cuts
- Person health is reactive vs. proactive
- Access to healthy fresh food, i.e., food desserts, lack of grocery stores in neighborhoods, rural small towns, etc.
- Mental health care access
- Elderly nutrition
- Dept of Ag – summer food program food quality is limited by preparation facilities.
- After school and childcare programs – exercise and nutrition

- Mental health illness incidence
- Backpack food program (families don't like backpack food)

Opportunities:

- Physician prescription cards with education on smoking
- Mental health and First Aid training continuing from the Mental Health System Integration Grant
- Mayo study on quitting smoking recommendations from physicians
- Hillcrest Tobacco grant now educates physicians
- Schools – way of getting info out to well population
- Cardio trails/exercise/fitness trails
    - Bergfeld & City parks
    - One on Clarke's campus
    - County parks
- Connect with food and fitness grant from Kellogg in NE Iowa (NE/FFI) or apply for similar grant from Kellogg
- Substance abuse coalition and Safe Youth coalition – binge drinking and other initiatives/educations
- Work with PTO's and organizations for positive fundraising
- Eisenhower School walk-a-thon raised $11,000 (instead of selling unhealthy food products)
    - Total profit for fundraising
    - Green products/toolkit
- Walgreen's/Kwik Stop selling bananas, potatoes, onions, etc.
- Holy Family exercise contacts
- Food stamp rules – federal policy changes for what can be purchased with food stamps
- Websites for community health/wellness education and information
- Prevention/early intervention for mental health
- Mass marketing – help people in creative ways how to be healthy
- Involve youth – Every Child Every Promise, or create a youth coalition
- Workplace wellness programs and incentives
- Every Child Every Promise
- Smarter City Health/Wellness silo development with IBM

Threats:

- Economy/budget cuts
- Sustainability of new programs/initiatives.
- Coordination and tracking of community wellness/health activities, successes etc.

Promote Healthy Behaviors Assessment

Includes topics such as addictive behaviors (tobacco, alcohol, drugs, gambling), chronic disease (mental health, cardiovascular disease, cancer, asthma, diabetes, arthritis, etc.), elderly wellness, family planning, infant, child & family health, nutrition, oral health, physical activity, pregnancy & birth, and wellness.

The first two are addressed in Dubuque County's *Health Improvement Plan*:

1. Poor nutrition/obesity: 27% obesity rate (County health ranking); 80% not eating adequate fruits/vegetables; 6.1% Diabetes rate (includes both Type I & Type II diabetes); 14% of deaths attributed to diet/activity; 12.9% Diabetes hospitalization rate (IDPH 1995-2006) (11.5% State rate).

2. Lack of physical activity/exercise: 19% county residents do not exercise; 29% residents have high blood pressure; 6.1% rate Diabetes.

The remaining problems or needs were identified, but not included in the *Health Improvement Plan* because of competing projects or priorities in the community or other reasons listed.

3. Cancer prevention/early detection: tobacco use (smoking 16%) 44% rate (State 39.5%/100,000).

4. Substance abuse (binge drinking, underage EOTH use, marijuana use, prescription drugs, tobacco, alcohol); includes high risk behavior by youth using alcohol and drug use.

5. Mental health access. (Not included in the *Health Improvement Plan* because of competing projects or priorities in the community and lack of human resources or staff.)

6. High risk sexual behaviors including youth initiating sexual activity at younger age. (Not included in the *Health Improvement Plan* because of competing projects or priorities in the community and lack of financial resources.)

7. Prevention/screening for chronic disease.

8. Access to prenatal care in 1st trimester of pregnancy.

9. Need for increased education on healthy lifestyle behaviors (including regular exercise and healthy diet/nutrition habits) among young (pre-school to grade school) children. (Not included in the *Health Improvement Plan* because of competing projects or priorities in the community and community partners do not exist.)

10. Access to medical and dental care for all ages; access to vaccines for adults. (Not included in the *Health Improvement Plan* because of competing projects or priorities in the community and lack of financial resources.)

11. Respite care services for caregivers in the home setting. (Not included in the *Health Improvement Plan* because of competing projects or priorities in the community and lack of access to technical assistance and services.)

12. Community awareness to access services for residents/families discharged from the military and veterans regardless of age. . (Not included in the *Health Improvement Plan* because of competing projects or priorities in the community, lack of access to technical assistance and services, and lead organization does not exist.)

Task Force Report:

Prevent Injuries **Task Force**

Chair: Deb Borley, Dubuque VNA

The Task Force reviewed the following data:

- Iowa Child Abuse Prevention Program-Prevent Child Abuse 2006-2009 (source: Iowa Dept. of Human Services)
- Burden of Injury in Iowa: 2002-2006 (source: Iowa Department of Public Health)
- The National Children's Center for Rural and Agricultural Health and Safety 2010 (source: National Farm Medicine Center)
- Safe Community Task Force Recommendations to Dubuque City Council July 15, 2010.

Following data review, the Task Force identified the following areas of concern:

- Housing safety including falls of the elderly, fire safety and hoarding.
- Denial of Critical care for vulnerable populations (children and elderly).
- Mental Health care access.
- Healthcare for children.
- Child abuse: shaken baby syndrome, uncontrolled crying.
- Prescription drug abuse.
- Motor vehicle, motorcycle, boat and bicycle accidents.
- School, county and city playground accidents.
- Domestic violence: increase of 12% in past 12 months.

<u>Prevent Injuries</u> Assessment

Includes topics such as brain injury, disability, EMS trauma & system development, intentional injuries (violent & abusive behavior, suicide), occupational health & safety, and unintentional injuries (motor vehicle crashes, falls, poisoning, drowning, etc.).

The first item is addressed in Dubuque County's *Health Improvement Plan*:

1. Prevention of injuries due to alcohol impaired drivers all types vehicles (automobile, bicycle, boating, all-terrain vehicle, snowmobile, jet ski, motorcycle accidents). Baseline rate Dubuque County adult binge drinking 21% (Iowa 20%). Alcohol use Dubuque County 6th-11th students 23% (State of Iowa 19%); Dubuque County 11th grade 46% (State of Iowa 36%).

The remaining problems or needs were identified, but not included in the *Health Improvement Plan* because of competing projects or priorities in the community or other reasons listed.

2. Prevention of MV accidents including those linked to alcohol/substance abuse and distracted driving (i.e., cell phone/texting while driving). (Not included in the *Health Improvement Plan* because of competing projects or priorities in the community and lack of community or public support.)

3. Fall prevention for all ages. (Not included in the *Health Improvement Plan* because of competing projects or priorities in the community, lead organization does not exist, and lack of community or public support.)

4. Violence prevention: includes sexual, domestic assault, and bullying. Baseline data on bullying: 51% of Dubuque County grades 6, 8, and 11 had unfavorable response on bullying questions (DBQ Co Youth Survey 2008); Dubuque County 8th grade females 61% unfavorable response to bullying questions.

5. Prevention of accidents on city and county playgrounds; includes injuries resulting from organized/school sports (i.e., violent hits occurring in football). (Not included in the *Health Improvement Plan* because of competing projects or priorities in the community, lead organization does not exist, and lack of financial resources.)

6. Child abuse prevention includes identification and reporting in all settings as well as education of day care providers in recognizing/reporting abuse. (Not included in the *Health Improvement Plan* because of competing projects or priorities in the community, lead organization does not exist, and lack of community or public support.)

7. Prevention of physical assault includes all violent crimes.

8. Farm safety and prevention especially with minors working in the agriculture industry/community.

Task Force Report:

Protecting Against Environmental Hazards Task Force

Chair: Tim Link, City of Dubuque Health Services Department

The Task Force studied data from

EPA AIR Data 2008, (Air)

Scorecard for Dubuque County for Clean Water Act Status Report, Iowa Department of Natural Resources (Surface Water)

Iowa Statewide Rural Well Water Survey Phase 2 (SWRL2) for well water

The Task Force noted that Dubuque County is very close to being deemed a non-attainment area due to p m 2.5 (fine particulate), which is a known trigger for respiratory problems.

Wastewater input was mainly due to group problem identification and well data and surface water data.

SWOT Analysis

Strengths:

- Requiring photo documentation for septic installations
- City Stormwater Management Plan
- Air Quality Task Force
- Decreasing lead levels in children

Weaknesses:

- Homeowners allowed to install septic systems;
- Storm Water Mgmt. - No staff in County to review/enforce

- Number of homes approved for subdivisions - no limits and minimal lot size requirement, multiple septics/wells
- Minimum area for residential is 1 acre in county
- EIRUSS - County does not participate
- Air Quality- excessive PM2.5 exceeding threshold
- Lack of air quality expertise locally
- Lack of data on air quality
- Standing/ponding water
- Lack of knowledge on open burning
- Private wells - no regulations on testing especially non-public water supplies
- Lack of education of citizens regarding testing of private wells
- State well construction standards are weak and only minimum requirements. Many existing old wells don't meet code.
- Lack of records on old wells
- Dubuque County has not used the septic system database put out by the IDNR

Opportunities:

- Proposed Local Urban conservation Program from Dubuque Soil & Water conservation District
- Decentralized wastewater systems
- Enforcement/education of current well/septic regulations on a county level
- Healthy Homes Pilot Program
- County.& City Nuisance Ordinances
- Existing well and septic databases
- Permit fees wells/septics)
- EIRUSS Eastern Iowa Regional Utility Service System
- County and City Stormwater Management Ordinances

Protect Against Environmental Hazards Assessment

Includes topics such as drinking water protection, food safety, hazardous materials, hazardous waste, healthy homes, lead poisoning, nuisances, onsite wastewater systems, radon, radiological health, and vector control.

The first two are addressed in Dubuque County's *Health Improvement Plan*:

1. Poor Air Quality: Dubuque County Particulate Matter days=4 days; State of Iowa=2 days (County Rankings data).

2. Unsewered Communities: includes improper sewage disposal threatening safety of surface and drinking water.

The remaining problems or needs were identified, but not included in the *Health Improvement Plan* because of competing projects or priorities in the community or other reasons listed.

3. Improved regulations to limit subdivision size in areas where public utilities are unavailable.

4. Need for Environmental Health Community Education for general public. (Not included in the *Health Improvement Plan* because of competing projects or priorities in the community, lack of community or public support, and lack of financial resources.)

5. Need for enforcement of Environmental Health Ordinances. (Not included in the *Health Improvement Plan* because of competing projects or priorities in the community, and lack of community or public support.)

6. Need for Healthy Homes with environmental health hazards (lead, radon, pests and vermin) eliminated. (Not included in the *Health Improvement Plan* because of competing projects or priorities in the community, lack of community or public support, and lack of financial resources.)

7. Access to safe food from producer to consumer includes safe storage of food. (Not included in the *Health Improvement Plan* because of competing projects or priorities in the community, and lack of community or public support.)

8. Need for improvements in surface water protection. (Not included in the *Health Improvement Plan* because of competing projects or priorities in the community, lack of community or public support, and lack of financial resources.)

9. Need to explore mass transit options and promote use of public transportation. (Not included in the *Health Improvement Plan* because of competing projects or priorities in the community, lack of community or public support, and lack of financial resources.)

10. Promote/explore use of alternative energy including ways to reduce carbon footprint; expand/promote for eSustainable community and energy efficiency. (Not included in the *Health Improvement Plan* because of competing projects or priorities in the community, and lack of financial resources.)

Task Force Report:

Preventing Epidemics and Spread of Disease **Task Force**

Chair: Cathy Tieskoetter, Dubuque VNA

The Task Force reviewed Public Health Standards for Preventing Epidemics and Spread of Disease. Many of the Standards have already been addressed by Dubuque County in Annex H of the Preparedness Plan – Continuous Quality Improvement Plan for Reportable Disease Surveillance System, and the Dubuque County Isolation and Quarantine Procedure. These documents were circulated to Task Force members for review.

SWOT Analysis

Strengths:

- Personnel in place
- Bi-Hospital Infection Control Committee
- Dubuque County Preparedness Committee
- Immunization rates 98% - daycare through 12th grade
- Number of H1N1 vaccinations (30, 459) given in Dubuque County

Weaknesses:

- Communication with independent physician offices, long term care, home care and Veterans Administration
- 24/7 reporting
- Limited number of physicians who contact VNA for reportable diseases.
- Lack of testing for Norovirus by practitioners.
- Only 1/3 of daycares represented in immunization rate. Maybe be lower for those under 4 years of age.

Opportunities:

- Physician education on reportable disease
- Education for school nurses
- Easy reference for 24/7 surveillance plan
- Relationships with college health offices
- Employer education

Threats:

- Lack of funding leading to decrease in personnel
- Employer and community buy - in to support employee absences due to control spread of disease.
- Colleges and their transient populations
- Drug resistant organisms
- Lack of ill child care
- Communication with bordering state health departments

Top three weaknesses:

- Communication
- Norovirus testing available locally
- Immunizations

Top Threat:

- Multidrug-resistant organisms

After lengthy discussion the group decided on the following recommendations for the Steering Committee:

- Need to evaluate and improve communication between all providers/facilities/PH in Dubuque County and evaluate the use of new technologies to enhance communication.
- Need to educate local providers regarding the process to report communicable diseases.
- Need to increase the number of local providers who report communicable diseases to PH as required by state law.
- Need to investigate the feasibility of local laboratory to increase availability of testing and decrease the turnaround time for test results, i.e. Norovirus for the Dubuque area.
- Need for community education to include immunizations and multi-drug resistant organisms.

Prevent Epidemics & the Spread of Disease Assessment

Includes topics such as disease investigation, control & surveillance, HIV/AIDS, immunization, reportable diseases, sexually transmitted diseases, and tuberculosis (TB).

The first item is addressed in Dubuque County's *Health Improvement Plan*:

1. Need to evaluate and improve communication between all providers, facilities, and Public Health in Dubuque County. Includes need to improve timely reporting of mandatory communicable disease cases by providers to Local and State Public Health.

The remaining problems or needs were identified, but not included in the *Health Improvement Plan* because of competing projects or priorities in the community or other reasons listed.

2. Need to investigate the feasibility of local Dubuque laboratory to increase availability of testing and decrease the turnaround time for test results (i.e., Norovirus testing).

3. Need to educate the community on benefits of immunizations and on prevention of multi-drug resistant organisms.

4. Need for public education on ways to decrease spread of communicable diseases especially at mass gatherings (i.e., 3 C's used during H1N1). (Not included in the *Health Improvement Plan* because of competing projects or priorities in the community, and lack of community or public support.)

5. Need for increased education for providers on IDPH recommendations/protocols for treatment of communicable diseases (includes protocol for rabies post exposure).

Task Force Report:

Preparing for, Responding to, and Recovering from Public Health Emergencies Task Force

Chair: Tom Berger, Dubuque County Emergency Management

Task Force members reviewed the Preparedness Public Health standards. The Preparedness Standard are part of the overall Iowa Public Health standards adopted by Iowa Department of Public Health in 2007. Of the 4 Preparedness Standards, group identified possible gaps/needs in some areas as follows:

- ER2b-L as PH is present at EOC but not confident in role at EOC.
- ER3a-L as participates in local multidisciplinary drills but only done full scale POD exercise once. Need to drill again but a) now State/Regional plan is a 5 year plan with full scales drills at the end of the 5 yrs and b) cost of full scale is a barrier.
- ER4a-L training needs identified esp NIMS 700 and 800 for many county partners as well as training of partners' staff on County plan.

SWOT Analysis:

Strengths:

- Play well together
- Lengthy partnerships
- Cumulative knowledge
- Diverse/multidisciplinary membership
- Many providers/resources
- Training Center-well equipped EOC/updated phone system
- Multiple drills
- Open communication
- New Public Health Director (new opportunities)
- EMA direction excellent, knowledgeable and willing to help
- Good Links with State PH/IDPH
- Engaged local Board of Health

Weaknesses:

- Communication!
- Unfamiliar with IC (Incident Command)
- Decreased funding result in decreased staff (school districts)
- Decreased people

- Tri-State (involvement): travel through county and IL/WI residents come to DBQ for health care and other services-puts strain on DBQ Co resources.
- Barriers to WI and IL
- Perception of importance of Preparedness work (some people get tired of hearing about preparedness, i.e. H1N1)
- Dissemination of information/training etc beyond leadership level to staff level
- People learning new roles, responsibilities (new PH director, new school nurse leader

Opportunities:

- Additional opportunity to partner among organizations (training, planning, exercises)
- Educational sessions
- Public Information with outreach to citizens
- New leadership - Health Dept and schools
- Special Needs populations-planning, guidance, transportation issues.
- Diversity-culture issues in approaching all parts of community.

Threats:

- Miscommunication/misinformation, lack of communication (leads to rumors)
- Major events: pandemic diseases/terrorist acts/natural disasters, man-made disasters
- Non-vaccinated patients (possibly non-compliant) refusing vaccine, put rest of community at risk
- Deceased funding, decreased staffing due to budget cuts
- Loss of experience/PH knowledge with retirements at IDPH

The Task Force agreed on the following weaknesses:

1. Lack of direction from CDC and State
2. Communication
3. Decreased funding, decreased staff (school district)
4. Tri-State Area-travelers/transients across state lines (IL and WI)
5. Dissemination of information, training etc beyond leadership level to staff at partner agencies.

The following threats were prioritized:

1. Miscommunication/misinformation, lack of communication (leads to rumors)
2. Deceased funding, decreased staffing due to budget cuts
3. Major events: pandemic diseases/terrorist acts/natural disasters, man-made disasters
4.

The Task Force used the prioritized Weaknesses and Threats to develop the following recommendations to go back to the CHNA-HIP Steering Committee:

1. Improve communication from the top down (federal, state to local) so we can improve EOC operations, PIO functions, and communication among partners.
2. Identify current and potential community partners (promoting participation) and assess the level of preparedness knowledge training.
3. Promote collaboration/communication among tri-state agencies, providers, and residents in preparation for PH events/disasters.
4.

The proposed goal is: "By 2015 Dubuque County Preparedness partners will participate in planned drills and be familiar with their agency's role in county plan; local PH staff will be able to meet Incident Command competencies and use Incident Command in drills/actual events."

Discussion on strategies centered mainly on education to improve local PH staff and community partners' knowledge of plans and Incident Command. Need to review County PH NIMS matrix to see education needs. ICS-300 and 400 course already planned for Dec 2010 and Jan 2011. Schools have had drills, but the parochial school system has not participated. Need to include special populations in drill planning. Need to involve county partners in linking their internal plan with County's PH plan and encourage use of IC model. Also encourage training at staff level and to retrain with staff turnover.

Prepare for, Respond to, & Recover from Public Health Emergencies Assessment

Includes topics such as communication networks, emergency planning, emergency response, recovery planning, risk communication, and surge capacity.

The first item is addressed in Dubuque County's *Health Improvement Plan*:

1. Need to actively engage community partners in Preparedness training and information which includes ensuring competency in Incident Command.

The remaining problems or needs were identified, but not included in the *Health Improvement Plan* because of competing projects or priorities in the community or other reasons listed.

2. Communication and miscommunication during an event or PH emergency/misinformation that leads to rumors. (Not included in the *Health Improvement Plan* because of competing projects or priorities in the community, and lack of community or public support.)

3. Decreased Preparedness funding each year/decreased available staff (especially school nurses). (Not included in the *Health Improvement Plan* because of competing projects or priorities in the community, lack of community or public support, lack of financial resources, and lack of human resources or staff.)

4. Tri-State area (Wisconsin and Illinois): residents and transients accessing preparedness/services across State lines. (Not included in the *Health Improvement Plan* because of competing projects or priorities in the community, lack of community or public support, and lack of human resources or staff.)

5. Inadequate PH personnel and volunteers to staff positions during an event. (Not included in the *Health Improvement Plan* because of competing projects or priorities in the community, lack of financial resources, and lack of human resources or staff.)

6. Barriers to WI and IL in tri-state area including limited access for personnel and supplies across state lines. (Not included in the *Health Improvement Plan* because of competing projects or priorities in the community, lack of financial resources, and lack of human resources or staff.)

7. Declining public perception of importance of Preparedness work (some people get tired of hearing about preparedness; i.e., H1N1). (Not included in the *Health Improvement Plan* because of competing projects or priorities in the community, and lack of community or public support.)

8. People/staff learning new roles and responsibilities (new staff in partner organizations, new County Health Executive Director and new school nurse leader). (Not included in the *Health Improvement Plan* because of competing projects or priorities in the community, and the need will be met as new public health staff learn their roles.)

9. Potential magnitude of major events: pandemic diseases, terrorists acts, natural disasters, man-made disasters.

10. Non-vaccinated people (possibly non-compliant) refusing vaccination putting rest of community at risk. (Not included in the *Health Improvement Plan* because of competing projects or priorities in the community, and lack of human resources or staff.)

11. Loss of experience/PH knowledge with retirement of many IDPH staff. (Not included in the *Health Improvement Plan* because of competing projects or priorities in the community, and the issue will resolve as newly assigned IDPH staff learn their role in helping local partners.)

12. Need to simplify planning and communicate PH Emergency Planning to community and PH partners. (Not included in the *Health Improvement Plan* because of competing projects or priorities in the community, and IDPH/CDC requirements for local plan make it difficult to keep plan simple and less complex.)

13. PH Risk Communication targeted to high risk populations; PH Public Information Officer able to develop clear message to target audience for desired action/response.

14. Need to hold regular drills and exercises that include partners/agencies (including physicians). (Not included in the *Health Improvement Plan* because of competing projects or priorities in the community, lack of community or public support, lack of financial resources, and lack of human resources or staff.)

Task Force Report:

Public Health Infrastructure **Task Force**

Chair: Nan Colin, Dubuque VNA

The Task force reviewed the Public Health (PH) Governance Standards. The Governance Standards are part of the overall Iowa Public Health Standards adopted by Iowa Department of Public Health in 2007. (The six goals/PH responsibilities for this CHNA-HIP 2011 report are from these PH standards.) Of the six Governance Standards, the Task Force identified possible gaps/needs in some areas as follows:

- GV2cL: Comply with other requirements of Iowa code and IAC pertaining to local Board of Health (area of Environmental Health)
- GV3eL: Advocate for adequate resources for state and local public health to comply with the Iowa Public Health Standards (advocate at all levels for funding and resources).
- GV4bL: Serve as the public health policy making body for the jurisdiction in accordance with Iowa code (need for review/update of County policies).
- GV5bL: Review local public health regulations and ordinances at least every five years and update as needed.

SWOT Analysis:

Strengths:

- Partnerships including school districts (DBQ Comm and Western DBQ), VNA, Crescent CHC, Hospitals throughout County, Hillcrest, SASC (Substance Abuse Services Center), physicians offices including MA, DIM and Independent providers.
- Quality of Providers: Comprehensive, high quality in City and County, Oral Health providers
- Automation: IT and data collection
- Transportation : strong for health related trips for T19 children
- Economics: prosperous community
- Go Green: strong sustainability efforts/initiative in City
- Some successful grant writing
- Health Education: workforce with vast knowledge
- Crescent Community Health Center
- Experienced Emergency Preparedness Planning

Opportunities:

- Include Long Term Care needs (nursing homes, home care providers, hospice providers)
- Partnerships across State lines (Grant and Jo Daviess Counties)
- Access to neurosurgery and psychiatry

- Need improved infrastructure for Mental Health services both in local and State systems.
- Increased reporting and integration of data.
- Increased education for wellness of community/individuals and training of future PH and clinical workforce
- Increase County green/sustainability efforts
- Increased support resources to structure grants
- Increase transportation within City for Medicare/uninsured adults
- Increase health education addressing chronic disease, prevention, and health literacy.
- Increase support/resources to identify and secure grants for infrastructure (i.e. DRA, state and federal grants).
- Health Care Reform as details are released; will increase access to care for many

Weaknesses:

- Communication with all partners and providers
- Transportation to patient appointments
- Lack of leadership in PH infrastructure and no one understands structure of County PH
- Less than desirable PH County offices
- Low priority of PH by some in community
- Limited PH workforce (only 2 staff at County PH Dept)
- Marketing of PH (don't understand what PH does)
- Working with private providers (could involve providers more in decision making especially when PH problem needs to be addressed)
- Poor understanding by private providers on how to apply for PH reimbursement when invoicing for PH grant funds.
- Duplication of efforts/lack of coordination between partners

Threats:

- Availability of funding-shrinking state and federal grants-(should PH issues be publicly funded?)
- Some issues/programs not on priority list for community
- Health Care Reform: unknown future
- Lack of qualified/experienced PH workforce (aging of experienced workforce)
- System of access to specialty care, mental health providers
- State expectation to funds programs locally)

Top 3 Weaknesses:

1. Communication with all partners and providers
2. Working with private providers (could involve providers more in decision making especially when PH problem needs to be addressed).
3. Poor understanding by private providers on how to apply for PH reimbursement when invoicing for PH grant funds.

Top 3 Threats:

1. Availability/instability of funding
2. Perception of or low importance Public Health; lack of understanding of what PH does.
3. Workforce issues/recruitment to PH jobs.

After lengthy discussion, the group decided on the following two recommendations for Steering Committee:

1. Need for improved/better integral relationships between public and private providers through better communications. (Includes need for more transparency, definition of roles, improved perception of PH roles, decreased duplication, strengthen coordination of partnerships, optimization of resources, reduced barriers to access, and leadership).
2. Need for secure funding base for locally-defined/prioritized PH programs.

Strengthen the Public Health Infrastructure Assessment

Includes topics such as access to quality health services, community engagement, evaluation, health facilities, health insurance, medical care, organizational capacity, planning, quality improvement, social determinants (e.g., education & poverty levels), transportation, and workforce.

None of these are addressed in Dubuque County's *Health Improvement Plan*, because of competing projects or priorities in the community or other reasons listed.

1. Need to expand Dubuque County Infrastructure to meet Local Public Health Standards.

2. Need for improved/better integral relationships between public and private providers through better communications. (Includes need for more transparency, definition of roles, improved perception of PH roles, decreased duplication, strengthen coordination of partnerships, optimization of resources, reduced barriers to access, and leadership). (Not included in the *Health Improvement Plan* because of competing projects or priorities in the community, lack of community or public support, and lack of financial resources.)

3. Need for secure funding base for locally prioritized PH programs.). (Not included in the *Health Improvement Plan* because of competing projects or priorities in the community, and lack of financial resources.)

4. Need for improved transportation system throughout Dubuque County to enable residents to travel to health related appointments. Work with transportation partners in planning for better systems that will be used by residents. (Not included in the *Health Improvement Plan* because of competing projects or priorities in the community, lack of community or public support, and lack of financial resources.)

5. Inadequate County Public Health offices due to lack of space, supplies, etc. (Not included in the *Health Improvement Plan* because of competing projects or priorities in the community, and currently BOH and BOS are working together to improve HD office conditions.)

6. Lack of public and health care providers understanding of what PH does/needs to promote or market value of PH. (Not included in the *Health Improvement Plan* because of competing projects or priorities in the community, and lack of community or public support.)

7. Improve working relationships with private providers and involve private providers in decision making when a PH problem needs to be addressed. Include service providers during planning. (Not included in the *Health Improvement Plan* because of competing projects or priorities in the community, lack of access to technical assistance and services, and lack of access to staff training and development.)

8. Poor understanding by private providers on how to apply for PH reimbursement when invoicing for PH grant funds. (Not included in the *Health Improvement Plan* because of competing projects or priorities in the community, and it is addressed in County H1N1 AAR plan to establish clear direction for partners for billing.)

9. Duplication of efforts/lack of coordination between partners. (Not included in the *Health Improvement Plan* because of competing projects or priorities in the community, lack of community or public support, and community does not understand PH structure and role of PH partners in Dubuque County.)

10. Some issues/programs not on priority list for community. (Not included in the *Health Improvement Plan* because of competing projects or priorities in the community, and lack of community or public support.)

11. Health Care Reform: Unknown future of impact on PH and healthcare access. (Not included in the *Health Improvement Plan* because of competing projects or priorities in the community, and when Feds publish administrative rules for implementing the Affordable Health Care Act, local partners and PH will understand roles in implementing the law.)

12. Aging PH workforce; need for planning for future PH needs. (Not included in the *Health Improvement Plan* because of competing projects or priorities in the community, and lack of human resources or staff.)

13. System of access to specialty care especially mental health services. (Not included in the *Health Improvement Plan* because of competing projects or priorities in the community, lack of financial resources, and lack of human resources or staff.)

Dubuque County Health Improvement Plan

GOAL	Strategies	Who is responsible?	When? (Timeline)
1. By 2016 the obesity rate in Dubuque county will decrease from 28% to 24%.	a. Encourage community-wide implementation of "Let's Move" through local governments, schools, families, community-based organizations and schools.	City/County Public Health	By December 2011
	b. Offer affordable community-wide opportunities for physical fitness/exercise such as Live Healthy Dubuque, Let's Move, Reinventing the Family Meal, local government recreation programs, etc.	Dubuque County Wellness Committee	2011-2016
`	c. Provide physician/health care provider information/resources for prescribing proper nutrition and physical activity interventions for their clients/patients.	Dubuque County Wellness Committee, health care organizations (i.e., hospitals, clinics, etc.), Dubuque County Health Dept, City of Dubuque Health Services Dept.	By January 2012

	d. Encourage adoption of policies by community-based organizations, institutions, businesses and local government aimed at improving fruit and vegetable consumption and physical activity for their employees, customers, and clients.	Dubuque County Health Dept, City of Dubuque Health Services Dept. working with local businesses	By January 2012
2. By 2016 the rate of adult binge drinking in Dubuque County will decline from 21% to 17% (County Health Ranking data); the rate of Dubuque County 11th graders who use alcohol will decline from 46% to 36% (Youth Survey 2008 data).	a. The Board of Health/Health Department will partner with other agencies, such as Dubuque County Safe Youth Coalition, Helping Services for Northeast Iowa, Substance Abuse Services Center, and school districts to develop and implement a County plan to re	Dubuque County Health Dept Ex. Director working with other partners such as Dubuque County Law Enforcement, Dubuque County Safe Youth Coalition, Helping Services for Northeast Iowa, Substance Abuse Services Center.	By December 2011
	b. PSA/media releases will be used to increase public awareness of the severity of alcohol use problem in adults and teenagers.	Dubuque County Health Dept Ex. Director working with other partners such as Dubuque County Law Enforcement, Dubuque County Safe Youth Coalition, Helping Services for Northeast Iowa, Substance Abuse Services Center.	By December 2011
	c. County Public Health will encourage/promote grant writing among partners to increase available funding for implementing plan.	Dubuque County Health Dept Ex. Director working with other partners such as Dubuque County Law Enforcement, Dubuque County Safe Youth Coalition, Helping Services for Northeast Iowa, Substance Abuse Services Center.	Through 2016

	d. County partners will work with governmental bodies to adopt ordinances and policies to reduce alcohol use when operating vehicles and reduce underage alcohol use.	Dubuque County Health Dept Ex. Director working with other partners such as Dubuque County Law Enforcement, Dubuque County Safe Youth Coalition, Helping Services for Northeast Iowa, Substance Abuse Services Center.	Through 2016
3. By 2016 the air quality in Dubuque County will be in compliance with the clean Air Act standards by the number of days of moderately unhealthy and unhealthy air days being reduced (from 22 and 2) and by maintaining attainment standards for PM 2.5	a. Prohibit open burning on bad air days. Minimize open burning.	Dubuque County Board of Health and Board of Supervisors	By January 2013
	b. Provide public education to increase awareness of air quality problems, solutions, and develop best management practices to distribute to the community.	Dubuque County Health Dept Ex. Director working with other partners including Air Quality Task Force.	By December 2012
	c. Publicize and educate community on current Air Quality Index with various media outlets.	Dubuque County Health Dept Ex. Director working with other partners including Air Quality Task Force.	By December 2012
	d. A Public Health representative will participate in the Air Quality Task force.	City of Dubuque Health Services Dept	Through 2016
	e. Work with sources/generators of pm 2.5 to reduce emissions.	The Air Quality Task Force	By January 2016
	f. Partner with community based organizations (i.e., Dubuque 2.0, ISU Extension) to engage the public to achieve cleaner air.	Dubuque County Health Dept Ex. Director working with other partners including Air Quality Task Force, Dubuque 2.0, and ISU Extension.	By December 2012

4. Through 2016, develop and implement a plan to provide adequate wastewater treatment for unsewered and inadequately sewered communities.	a. Explore Health Department participation in Eastern Iowa Regional Utilities Service Systems (EIRUSS) through ECIA.	Dubuque County Health Dept Ex. Director working with other partners including Iowa DNR and ECIA.	By January 2012
	b. Prioritize list of unsewered communities within Dubuque County.	Dubuque County Health Dept Ex. Director working with other partners including Iowa DNR.	By January 2012
	c. Develop timeline for plan implementation of top priority communities.	Dubuque County Health Dept Ex. Director working with other partners including Iowa DNR.	By September 2011
	d. Enforce State code for non-compliant systems.	Dubuque County Board of Health working with BOS and DNR	Through 2016
	e. Research/secure funding to implement plan.	Dubuque County Health Dept Ex. Director working with other partners including Iowa DNR and ECIA.	Through 2016
5. Through 2016 Dubuque County providers will report communicable disease cases as required by Iowa Code to Local Public Health and Iowa Department of Public Health (IDPH).	a. County PH will annually review and update the County Communicable Disease CQI Plan.	Dubuque County HD Ex Director, VNA Communicable Disease nurse, County Preparedness Committee	By June 2011 and annually through 2016
	b. Distribute IDPH/CADE Communicable Disease reporting poster to all community partners responsible for mandatory reporting.	Dubuque County HD Ex Director, VNA Communicable Disease nurse	By June 2011
	c. Annually update County Preparedness Plan so provider contact information is correct and current.	Dubuque County HD Ex Director, VNA Communicable Disease nurse, County Preparedness Committee	By June 2011 and annually through 2016.

	d. Identify instances/cases when gaps in mandatory reporting affected disease control; work with the specific provider to provide education for future timely reporting.	VNA Communicable Disease nurses	Through 2016.
	e. Offer education on communicable disease reporting according to Iowa Code to providers (hospital emergency department staff, medical staff, clinic nurses, long-term care staff).	Dubuque County HD Ex Director, VNA Communicable Disease nurse	By June 2012
6. Through 2016 Dubuque County Preparedness partners will participate in required drills and be familiar with their agency's role in County plan; local PH staff will meet Incident Command competencies and use Incident Command in drills/actual events.	a. Dubuque County Board of Health will empower local PH staff and the County Preparedness Committee which meets quarterly to implement strategies for the goal.	Dubuque County HD Ex Director	By March 1, 2011
	b. Preparedness Stakeholders Committee will report to the Dubuque County Preparedness Committee on CHNA-HIP the Preparedness Goal and Plan so committee understands role in implementing strategies.	Dubuque County HD Ex Director, CHNA-HIP Steering Committee chair, County EMA director	By April 1, 2011
	c. HD Ex Director will review County NIMS matrix to identify NIMS training needs for PH staff covering key positions.	Dubuque County HD Ex Director	By August 2011
	d. PH will work with County EMA Director to evaluate preparedness education needs, develop an annual education plan, and schedule training sessions.	County Preparedness Committee and PH leaders	By August 2011

	e. PH and County EMA will schedule Preparedness drills to exercise key parts of County plan such as drilling preparedness to special needs populations, Universal Volunteer Operations Center (UVOC), functioning of EOC and IC structure, interfacing with par	County Preparedness Committee and PH leaders	Annually through 2016
	f. Preparedness Committee will work with member organizations to assist with linking their organization's Preparedness Plan to County PH Plan. Encourage partners to incorporate Incident Command structure into their agency plan	County Preparedness Committee members and PH leaders	Annually through 2016
	g. Encourage new partners/organizations to start attending quarterly Preparedness meetings.	PH leaderships and County organizations, agencies, businesses.	Annually through 2016
	h. Annual review of County Preparedness MOU's with local partners and agencies who will assist with implementing the County Plan during an event.	County HD Ex Director	Annually through 2016

APPENDIX 7- DUBUQUE FIRE REGULATIONS

6-9-2: BURNING RESTRICTIONS:

A. Solid Waste:

1. It shall be unlawful for any person to burn or incinerate any solid waste within the city except by permission of the city manager. This subsection shall apply to all solid waste as defined by the Iowa department of natural resources and shall specifically include all wastepaper, boxes, building materials, yard waste, tree stumps, and all other materials other than conventional materials used as fuels for a furnace or boiler.

2. This subsection shall not apply to any incinerator operated under a license granted by the Iowa department of natural resources nor to any burning conducted under the direction of the fire department for training purposes.

3. This subsection shall not apply to outdoor cooking using charcoal, natural or propane gas as a fuel, small wood fires consistent with section 307.3.2, recreational fires, of the international fire code, bonfires or prescribed fires as regulated by this chapter. (2007 Code § 19-7)

B. Special Permission To Burn Yard Waste:

1. The city manager may allow the burning of yard waste, including tree stumps, and other yard generated waste, for limited and specific periods. This provision shall apply only to the burning of such waste on the premises where such waste was generated.

2. The city manager may only permit such open burning when the ambient air quality of the city has met all air quality standards of the Iowa department of natural resources for the preceding six (6) month period. (2007 Code § 19-8)

3. Cancellation Of Permitted Open Burning: Permitted open burning of yard waste may be cancelled immediately by the city manager in the event of unfavorable local weather or atmospheric conditions, or such other conditions as the city manager deems appropriate. (2007 Code § 19-9)

Bon Fire Permit
Application and Requirements

Definition: Bon Fires shall be identified as a controlled fire with wood piled more than 24" high and 36" in diameter and flames exceeding 5 feet in height.

Bon Fire Permit Applicants shall comply with the following requirements before a permit may be issued.

1. Only grown form wood (firewood) may be used. No processed wood such as 2 x 4's, plywood, furniture, or building materials may be burned.
2. Bon Fire sites shall be a minimum of fifty feet (50') from any combustible structure. Distances may be increased as deemed necessary by the Fire Marshal.
3. Bon Fires may require a standby fire company as determined by the Fire Marshal. Cost of the standby fire company to be paid for by event organizer.
4. Bon Fire sites will require site inspection by the Fire Marshal's Office at least two working days prior to the event.
5. Fire shall be completely extinguished at the conclusion of the event.

Applications shall include the following information:

1. Name of event organizer and / or contact person.
2. Billing Address.
3. Phone number.
4. Location of Bon Fire site.

Permit Fee: $20.00 (If the Fire Marshal requires a standby fire company the permit fee would be included as part of the standby company charge.)

Standby fire company fee: $60.00 per hour. (2 personnel)

Special Conditions:

Fire may be extinguished at any time the Fire Department deems necessary due to a hazardous condition that creates a fire danger. Weather and atmospheric conditions may be a factor.

UPDATED April 23, 2004

Land Clearing
Open Burning Permit

Application and Requirements

Definition: The purpose of this permit is for the removal of large amounts of natural vegetation or growing form wood as the result of land clearing activities for the purpose of land development or remote land maintenance.

Applicants for a Land Clearing Open Burning Permit shall comply with the following requirements before a permit may be issued.

1. Fire location shall be a minimum distance of ¼ mile (1320 feet) from the nearest inhabitable structure of neighboring property and a minimum of 50 feet clearance from any structure on the property of which the fire is located.
2. Permission of a building owner/tenant closer than ¼ mile (1320 feet) shall be obtained in writing on a form provided by the Fire Marshal's office and shall be submitted with the permit application.
3. Fire shall be located in an enclosed pit, trench or manufactured equivalent and shall be connected to an approved mechanical blower or equivalent to enhance the combustion process.
4. Burning shall be conducted during the hours of sunrise to sunset on calm clear days.
5. Burning may be suspended by the Fire Marshal's office for air quality concerns, inappropriate weather or atmospheric conditions or other hazardous conditions. A burn ban as declared by the Iowa State Fire Marshal will cause the permit to be suspended until such burn ban would be lifted.
6. The burning site shall be constantly attended and the fire shall be allowed time to burn out prior to sunset.
7. Only natural vegetation or growing form wood originated from the affected property shall be burned. The burning of any construction materials, tires or other garbage or waste is strictly prohibited.
8. Application shall contain a site plan showing the propose fire location and distances to structures located on the property.
9. The Fire Marshal's office shall make a site visit prior to the issuance of the permit and shall monitor the progress until burning is complete.
10. Application shall be submitted by the property owner or their representative.
11. Permit may be issued for up to 30 days as determined by the Fire Marshal's Office.

Applications shall include the following information:

1. Name of person or company doing the burn
2. Address.
3. Name of landowner if different from above.
4. Location of burn.
5. Phone number

Permit Fee: $500.00

Special Conditions:

Fire may be extinguished at any time the Fire Department deems necessary due to a hazardous condition that creates a fire danger. Weather and atmospheric conditions may be a factor.

What is the "Petal Project"?

- It is easy for a business to claim they are "green" or environmentally friendly.
- "Green" means different things to different people
- The Petal Project provides
  - a clear verifiable sustainability framework
  - technical assistance from a Petal Project representative
  - a universally understood definition of a green business
  - Attraction from consumers wishing to shop based on their values.

petal
Certified

Waste Reduction

Energy Conservation

Pollution Prevention

Staff Education

Water Conservation

Energy Conservation Examples

9 measures required plus 5 of 17 optional

- ✓ Contact your heat provider for a free energy audit
- ✓ HVAC: Complete regularly scheduled maintenance at least twice a year
- ✓ Assign a person to monitor each energy bill for sudden rises in energy use and log the kWh in a spreadsheet or EPA Portfolio Manager
- ✓ All hot water pipes and cold suction lines must be insulated
- ✓ Set the temperature on water heaters to no more than 120 degrees Fahrenheit
- ✓ Post signs reminding employees to turn off lights and appliances when they are not needed

Pollution Prevention Examples

11 measures required plus 2 of 10 optional

- ✓ Provide transportation benefits to employees who carpool, take mass transit, or ride their bicycles to work
- ✓ Collect items that are prohibited from the garbage (batteries, CFLs, cell phones and other electronics, etc.) and institute a program for their safe disposal
- ✓ Keep dumpsters covered and impermeable to rainwater. Keep them from overflowing and keep dumpster/parking areas clean
- ✓ Develop a fleet greening plan and provide criteria for buying new and efficient vehicles.
- ✓ Provide secure bicycle storage for staff and customers

Water Conservation Examples

10 measures required plus 3 of 8 optional

- ✓ Understand your water bill and review it monthly for indications of leaks, spikes, or other problems
- ✓ Check the property for leaks every 6 months. Leaks in toilet tanks can be detected with leak detecting tablets
- ✓ Install low flow aerators or flow reducing valves with flow rates not to exceed .5 gpm for hand washing sinks, 1.5 gpm for kitchen and lavatory sink faucets, and 1.5 gpm high efficiency showerheads.
- ✓ Install toilets with maximum flush volume of 1.6 gpf or less
- ✓ Adjust sprinklers for proper coverage-optimize spacing, avoid runoff onto paved surfaces

Staff Education Examples

8 measures required

- ✓ Adopt a written environmental policy statement stating your business' commitment to operate as an eco-friendly business and some practices that your business is implementing as an eco-friendly business
- ✓ Create awareness of water and energy usage and solid and hazardous waste generation
- ✓ Provide three ongoing incentives or training opportunities to encourage management and employee participation
- ✓ Organize a green team to ensure continued monitoring of green practices
- ✓ Inform your customers about your business' environmental efforts

Partnerships/Resources

LOCAL

- DMASWA/Green Vision Schools
- Sustainable Dubuque
- Dubuque Area Chamber of Commerce

STATE

- Pollution Prevention Services
- Iowa Waste Exchange
- Iowa Waste Reduction Center

FEDERAL

- EPA Portfolio Manager
- Energy Star

Program Strengths

- Community-wide definition of a "green" business
- Community recognition
- Petal Project staff assistance
- Simple framework
- Increased access to partners and resources
- Documented cost savings
- Recognized
  - Governor's Environmental Excellence Award, 2010
  - National Award for Innovation from the National Association of Development Organizations, 2010
  - Iowa Green Advisory Committee – Highlighted in the *Recommendations for Creating an Iowa Green Certification Program report (2010)*