June 12, 2025

Mr. Brian Hutchins
Air Quality Bureau
Department of Natural Resources - Environmental Services Division
6200 Park Ave Suite 200
Des Moines, IA 50321

Re: Comments on the 2025 Air Monitoring Network Plan

Dear Mr. Hutchins:

The Iowa Environmental Council (IEC), Sierra Club, and Environmental Law & Policy Center (ELPC) offer the following comments on the Iowa Ambient Air 2025 Network Plan, noticed for public comment on May 13, 2025.

The Iowa Environmental Council is an alliance of more than 100 organizations, over 500 individual members, and an at-large board of farmers, business owners, and conservationists. IEC works to build a safe, healthy environment and sustainable future for Iowa. Our members care about air and water quality across the state, and they hike, recreate, and enjoy the outdoors in Iowa and beyond.

Sierra Club is a national nonprofit organization with 67 chapters and approximately 650,000 members dedicated to exploring, enjoying, and protecting the wild places of the earth; to practicing and promoting the responsible use of the earth's ecosystems and resources; to educating and enlisting humanity to protect and restore the quality of the natural and human environment; and to using all lawful means to carry out these objectives. Sierra Club's Iowa Chapter has over 5,200 members. Sierra Club has long participated in Clean Air Act rulemaking and litigation across the country in order to advocate for clean air and public health.

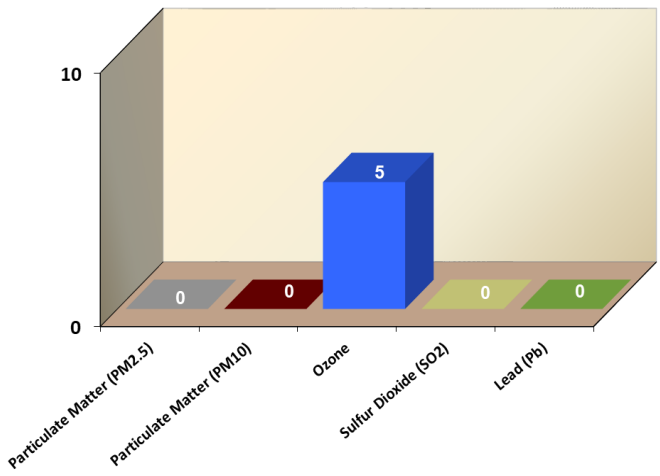
Environmental Law and Policy Center is a Midwest-based not-for-profit public interest environmental advocacy organization dedicated to improving environmental quality and public health, including protecting the Great Lakes and other Midwest natural resources. For nearly 30 years, ELPC has used litigation, policy advocacy, and strategic communications to improve environmental quality and protect the Midwest's natural resources.

Our organizations are concerned about the limited monitoring the Iowa Department of Natural Resources (DNR) has proposed for susceptible populations required under the Clean Air Act and request expansion of the state's air monitoring network.

I. Ambient Air Standards

Air pollution is a well-recognized threat to public health and environmental quality.[1] Two key criteria air pollutants can affect asthma: ozone (found in smog) and particle pollution (found in haze, smoke, and dust). When ozone and particle pollution are in the air, adults and children with asthma are more likely to have symptoms.[2] The NAAQS for 8-hour ozone is 70 ppb (parts per billion), with an annual $PM_{2.5}$ standard of 9.0 µg/m^3 (micrograms per cubic meter), and a 24-hour $PM_{2.5}$ standard of 35 µg/m^3.[3] In 2025 through May 22, Iowa air monitoring showed exceedance of the ozone standard 5 times (see chart below). [4]

2025 Iowa NAAQS Exceedances
(through May 22)



The challenge in an air monitoring network is addressing "gaps in health protection that can occur for criteria pollutants and HAPs near strong local sources" because air monitoring is often insufficient.[5] There are gaps nationwide and in Iowa between health protection and atmospheric research. Inadequate monitoring of emission, air quality, and health relationships can "result in inappropriate SIPs [State Implementation Plans], gaming, or paralysis by analysis."[6] Although

[1] Stern, *History of Air Pollution Legislation in the United States*; 32 J. AIR POLLUTION CONTROL ASS'N 44–61 (1982).
[2] U.S. EPA, Asthma and Outdoor Air Pollution," available at https://www.airnow.gov/sites/default/files/2018-03/asthma-flyer.pdf.
[3] U.S. EPA, "Ozone National Ambient Air Quality Standards (NAAQS)," available at https://www.epa.gov/ground-level-ozone-pollution/ozone-national-ambient-air-quality-standards-naaqs (last visited May 29, 2025); U.S. EPA, "National Ambient Air Quality Standards (NAAQS) for PM," available at https://www.epa.gov/pm-pollution/national-ambient-air-quality-standards-naaqs-pm (last visited May 29, 2025).
[4] Iowa DNR, "NAAQS_Exceedances_2025.pdf," available at https://www.iowadnr.gov/media/8322/download?inline
[5] Chow et al., *Critical Review Discussion: Will the Circle Be Unbroken: A History of the U.S. National Ambient Air Quality Standards*, 57 J. AIR & WASTE MANAG. ASS'N. 1151, 1160 (2007).
[6] *Id.* at 1159.

states, in the SIP process, have more leeway in developing *monitoring*, a state must act to ensure that its monitoring plan is protective of public health—not to simply "ensure compliance" by failing to look closer at public health concerns.[7]

II. Air Monitoring Network

The Clean Air Act requires every state to establish a network of air monitoring stations for criteria pollutants, using criteria set by EPA for their location and operation, as part of the State Implementation Plan (SIP).[8] The monitoring stations in this network are called the State and Local Air Monitoring Stations (SLAMS). State and local agencies use another type of monitor, the Special Purpose Monitor (SPM), to fulfill very specific or short-term monitoring goals.[9]

Iowa has a continuing duty to ensure that its air monitoring is consistent with statutory and regulatory obligations. As a part of those obligations, the DNR must complete both network assessments[10] and network plans.[11] Those processes detail monitoring purpose and compliance with minimum monitoring requirements. Minimum monitoring requirements rely on population, measured concentrations, and air pollution emissions data.[12] Critically, they establish that Iowa must place monitors to protect at-risk communities.

In the planning and assessment process, Iowa must design a monitoring system that enables protection of public health: the network "must be designed with a variety of types of monitoring sites."[13] That variety must include sites that are designed to capture the highest concentration of a pollutant at micro to neighborhood scale. Iowa may also define other sites as appropriate, for example, sites that detail the public health impacts or lack thereof of pollutant exposure.[14]

Iowa must also develop monitoring to address at-risk populations—such as populations that experience high levels of environmentally-related disease like asthma. Iowa must develop sites in at-risk communities to monitor fine particulate matter. In network plans, Iowa must submit to the EPA by the 2025 planning year a "PM2.5 network design to address at-risk communities."[15] Moreover, Appendix D is clear that "[a]t least one monitoring station is to be sited at neighborhood or larger scale in an area of expected maximum concentration."[16] The neighborhood scale is the most important scale. In areas with "additional required SLAMS, a monitoring station is to be sited in an at-risk community with poor air quality, particularly where there are anticipated effects from sources in the area."[17]

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[7] 40 C.F.R. pt. 58, Appendix D at 1.1.1.
[8] 42 U.S.C. § 7410(a)(2)(B).
[9] 40 C.F.R. § 58.20.
[10] 40 C.F.R. § 58.10(d).
[11] 40 C.F.R. § 58.10(a) (1).
[12] 40 C.F.R. pt. 58, Appendix D.
[13] *Id.*
[14] *Id.*
[15] 40 C.F.R. 58.10(b) (14).
[16] 40 C.F.R. pt. 58, Appendix D at 4.7.1(b).
[17] *Id.*

Iowa's network assessment must ensure that monitoring provides an adequate assessment of whether and how air quality impacts susceptible populations. "The network assessment must consider the ability of existing and proposed sites to support air quality characterization for areas with relatively high populations of susceptible individuals (e.g., *children with asthma*) and other at-risk populations."[18]

Iowa law does not constrain Iowa's ability to execute a monitoring scheme that effectively complies with the purpose and black-letter requirements of federal regulation. The DNR Director is to "determine by field studies and sampling the quality of atmosphere and the degree of air pollution" and both "conduct and encourage" research on air pollution and its *causes, effects*, abatement, control, and prevention."[19] Likewise, the Environmental Protection Commission has the broad authority to "adopt, amend, or repeal ambient air quality standards for the atmosphere of this state on the basis of providing air quality necessary to protect the public health and welfare" and take other measures "as necessary to assure attainment and maintenance of ambient air quality standards."[20] Ensuring compliance with federal air quality standards is a key duty. In fact, the duty to protect the public health is paramount not only federal law but also Iowa law.

III. Air Monitor Locations and Asthma in Iowa

It is critical that Iowa specifically investigate the ambient air where peoples' health may be especially harmed by pollution. Recent reporting highlights the declining air quality in some areas of Iowa.[21] In particular, Sioux City has seen nearly a 15 percent increase in particulate matter.[22]

We used U.S. EPA's Environmental Justice screening and mapping tool[23] to identify areas of the state with high rates of asthma. On each area with high asthma rates, IEC superimposed the location of any current air monitor on the image and identified by a red circle (see Appendix A). IEC submitted this in comments on the Iowa Ambient Air 2024 Network Plan on June 14, 2024, noticed for public comment on May 16, 2024.[24] IEC requested that DNR expand the SLAMS network to include ozone and PM 2.5 monitors in all of the areas identified with asthma rates higher than 80% of the national population. DNR has not done so.

Each of the 13 identified communities contains at-risk populations with asthma rates higher than 80% of the population nationally. Four of the communities have at-risk populations with asthma

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[18] 40 C.F.R. § 58.10(d) (emphasis added).
[19] IOWA CODE § 455B.134 (4–5) (2024) (emphasis added).
[20] IOWA CODE § 455B.133 (1–3) (2024).
[21] Jason Clayworth, "DSM faces declining air quality while most U.S. cities improve," Axios (May 27, 2025), available at https://www.axios.com/local/des-moines/2025/05/27/dsm-air-pollution-increase.
[22] *Id.*
[23] U.S. EPA, "EJScreen: EPA's Environmental Justice Screening and Mapping Tool (Version 2.2)," previously available at https://ejscreen.epa.gov/mapper/ (last visited June 5, 2024); *see also* "EJScreen," Public Environmental Data Partners, available at https://pedp-ejscreen.azurewebsites.net/.
[24] Available at https://www.iaenvironment.org/webres/File/2024%20Air%20network%20comments%20%206_6_24%20Final-formatted.pdf.

rates higher than 95% of the population nationally, with at-risk populations in Ames at 99%, Iowa City at 96%, Cedar Falls at 98%, and Waterloo at 97%.

Of the 13 communities with at-risk populations, five (Ames, Burlington, Dubuque, Fort Dodge and Ottumwa) do not have *any* monitors for either Ozone or PM 2.5. Only Cedar Rapids, Davenport and Des Moines have both Ozone and PM 2.5 monitors. However, as shown in Table 1 below, only Davenport has Ozone and PM 2.5 monitors located in an area with an at-risk population experiencing asthma at rates greater than 80% of the population nationally.

Table 1. Correlation of Iowa Ambient Air Monitoring Sites and High Asthma Rates

City	Site	Address	County	Ozone Monitor	PM 2.5 Monitor	Ozone Monitor in >80%	PM 2.5 Monitor in >80%
Ames				No	No	No	No
Burlington				No	No	No	No
Cedar Rapids	Public Health	500 11th St. NW	Linn	Yes	Yes	No	No
Council Bluffs	Franklin School	3130 C Ave.	Pottawattamie	No	Yes	No	No
Davenport	Jefferson School	10th St. & Vine St.	Scott	Yes	Yes	Yes	Yes
Davenport	Hayes School	622 South Concord St	Scott	No	Yes	No	No
Des Moines	Health Dept.	1907 Carpenter	Polk	Yes	Yes	No	No
Des Moines	Public Works	5885 NE 14th	Polk	No	Yes	No	No
Dubuque				No	No	No	No
Fort Dodge				No	No	No	No
Iowa City	Hoover School	2200 East Court	Johnson	No	Yes	No	No
Ottumwa				No	No	No	No
Sheldahl	Southern Crossroads	15795 NW 58th St	Polk	Yes	No	No	No
Sioux City	Irving School	901 Floyd Blvd.	Woodbury	Yes	Yes	No	No
Waterloo/Cedar Falls	Water Tower	Vine St. & Steely	Black Hawk	No	Yes	No	Yes

Current monitoring does not necessarily mean that Ozone levels are within safe levels where adverse health impacts are occurring. In its 2024 response to IEC's comments, DNR argued that the correlation between monitors meant that the existing network already captures variation across the state. However, the ozone and PM 2.5 monitors are clearly not in locations with the most significant rates of asthma, and are not adequately capturing the public health impacts on at-risk populations as required by the Clean Air Act.

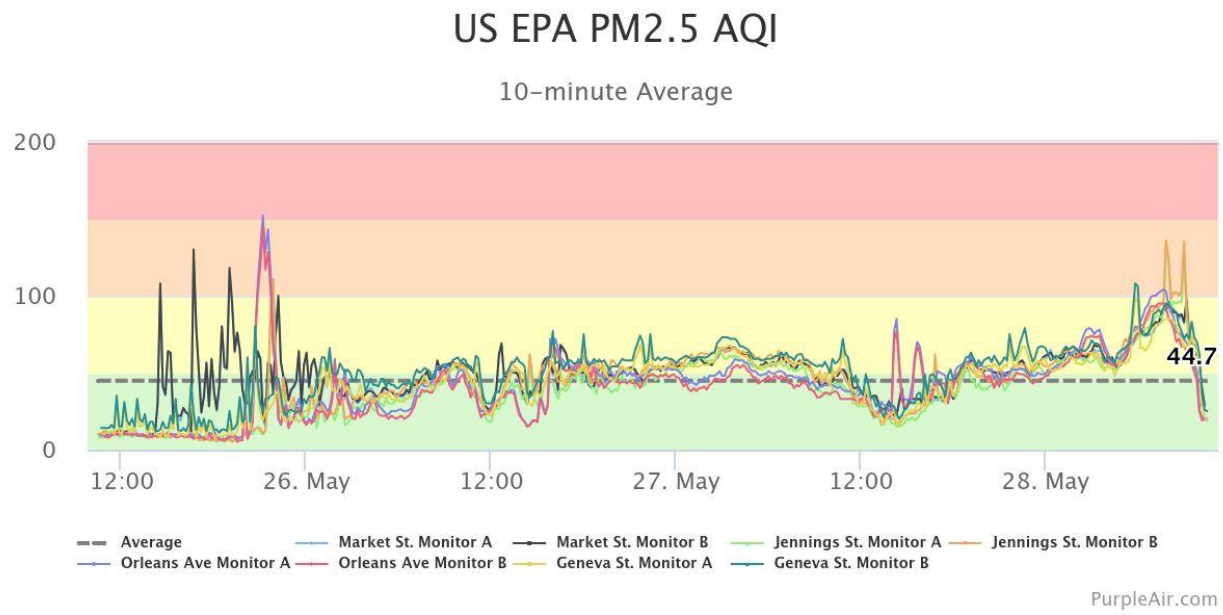
IV. Sioux City Monitoring

Although the Iowa Ambient Air 2025 Network Plan is changing three existing PM2.5 special purpose monitors in Des Moines, Iowa City, and Sioux City to SLAMS monitors, the 2025 Network Plan does not call for implementation of those changes until January 1, 2027.[25] Importantly, it does not expand the SLAMS network to include ozone and PM 2.5 monitors in the areas identified with asthma rates higher than 80% of the national population, nor add SPM ozone and PM2.5 monitors as IEC had requested in 2024.

[25] Iowa DNR, "Iowa Ambient Air Monitoring 2025 Network Plan" (hereinafter "Draft Plan") (May 13, 2025), available at https://www.iowadnr.gov/media/7934/download?inline.

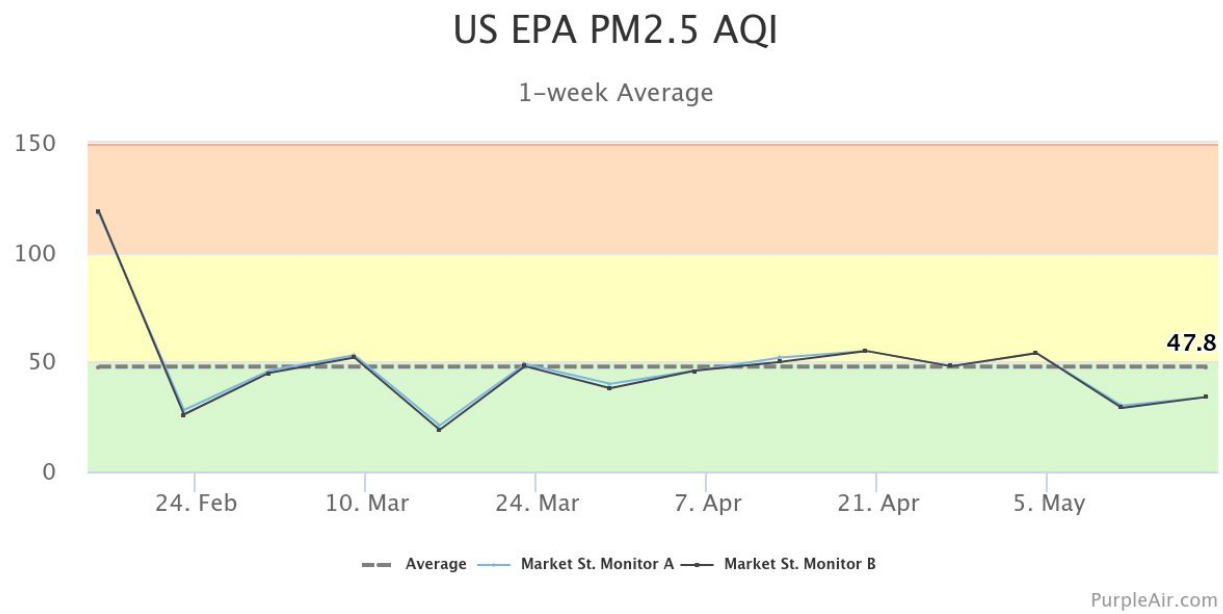
Sioux City has a PM2.5 design value of 8.1 ug/m^3, equal to 90 percent of the ambient standard.[26] This ranks among the highest in the state. The monitor in Sioux City being converted from SPM to SLAMS will operate on a "1 in 3" basis, meaning that it samples one out of every three days rather than on a continuous basis.[27]

Partially in response to the lack of PM2.5 network monitors to address at-risk communities, IEC located three Purple PM 2.5 monitors in Sioux City. DNR's draft Five-year Monitoring Network Assessment notes that the Purple Air monitoring network is becoming as dense as the SLAMS network and the state itself is operating the monitors at 14 locations.[28] The annual $PM_{2.5}$ standard is 9.0 µg/m^3 (micrograms per cubic meter), and the 24-hour $PM_{2.5}$ standard is 35 µg/m. As shown below, the PM 2.5 level in the snapshot below peaked at 152 µg/m^3 and over a three day span averaged 44.7 µg/m^3. Meanwhile, nearly all statewide PM2.5 monitoring by DNR showed daily averages well below that level, not reflecting the potential effects on a susceptible population.[29]



In the graph below, the one week average PM 2.5 concentrations are shown for one of the purple monitors in Sioux City. It is noteworthy that the 1-week average over a period of months is 47.8 µg/m^3, well above the 24-hour $PM_{2.5}$ standard of 35 µg/m^3.

[26] "Iowa Fine Particulate Monitoring Network Design Values 2022-2024," Iowa DNR, at 7, available at https://www.iowadnr.gov/media/7939/download?inline (last visited May 29, 2025).
[27] Draft Plan Appendix D at 7,
[28] Iowa DNR, "lowa DNR Five-Year Ambient Monitoring Network Assessment," Appx. E, available at https://www.iowadnr.gov/media/8393/download?inline.
[29] "AirNow," U.S. EPA, available at https://www.airnow.gov/state/?name=iowa (last visited June 9, 2025) (historical data for May 25-28).



The high annual design values and the exceedances of the 24-hour standards support continuous monitoring in Sioux City. Consistent with this request, IEC has requested increased monitoring in areas with asthma rates higher than 80% of the national population. This is particularly important since studies have shown that asthma rates increase at PM 2.5 levels below the annual and 24 hour standards. 14-day average PM2.5 $\geq$ 7.07 µg/m^3 was associated with an estimated 4-5% higher asthma symptom prevalence, and in the range of 4.00-7.06 µg/m^3 of PM2.5, each 1-µg/m^3 increase was associated with a 3.4% increase in symptom prevalence.[30]

V. Recommendations

At-risk, susceptible populations often cluster together and tend to be closest to sources of pollution. As documented using the Environmental Justice screening tool, Iowa has areas of the state with at-risk populations experiencing extremely high asthma rates. Federal regulations require the network assessment to "consider the ability of existing and proposed sites to support air quality characterization for areas with relatively high populations of susceptible individuals (e.g., *children with asthma*) and other at-risk populations."[31] Numerous communities in Iowa have susceptible populations, but not air quality monitoring stations. Locations such as Sioux City have exceeded the 24-hour standard based on local monitoring. As such, Iowa needs to expand the ozone and PM 2.5 monitoring network to accurately characterize air quality for these at-risk populations.

IEC requests that the SLAMS network be expanded to include ozone and PM 2.5 monitors in all of the areas identified with asthma rates higher than 80% of the national population. In the alternative, SPM ozone and PM 2.5 monitors need to be located in these areas with high rates of asthma.

[30] Outdoor PM2.5, Ambient Air Temperature, and Asthma Symptoms in the Past 14 Days among Adults with Active Asthma, December 2016, https://pubmed.ncbi.nlm.nih.gov/27385358/.
[31] 40 C.F.R. § 58.10(d) (emphasis added).

Thank you for the opportunity to comment. If you have questions or we can clarify these comments further, please feel free to contact us.

Sincerely,

/s/ Steve Guyer

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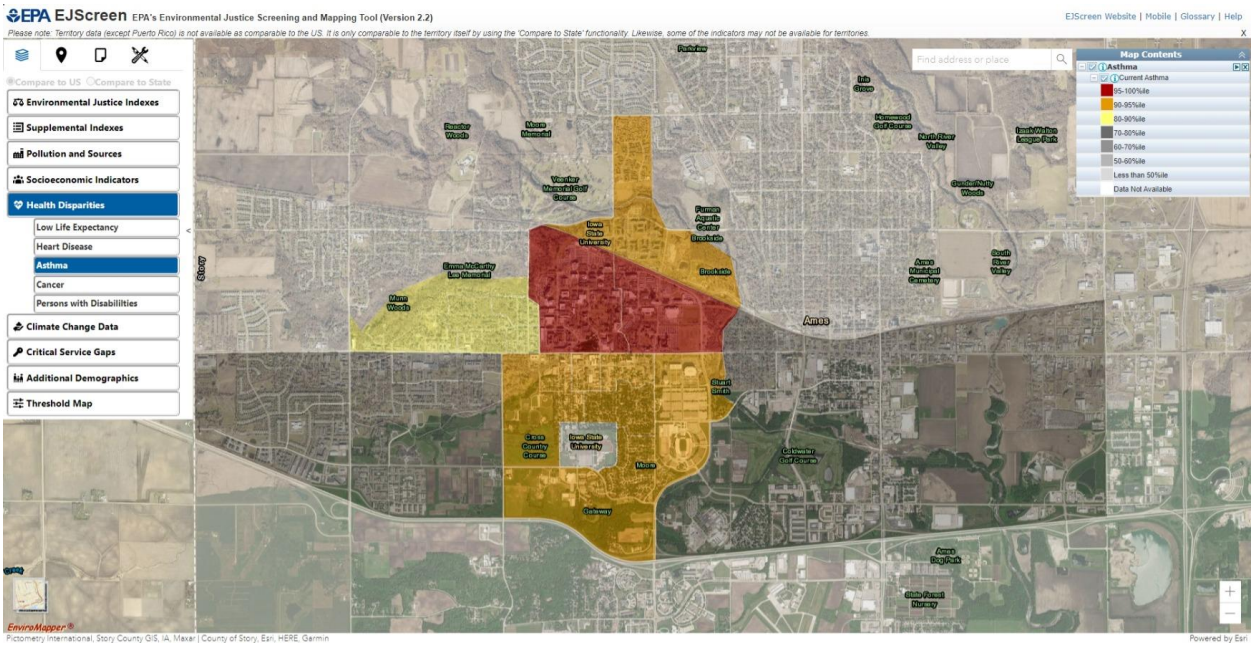
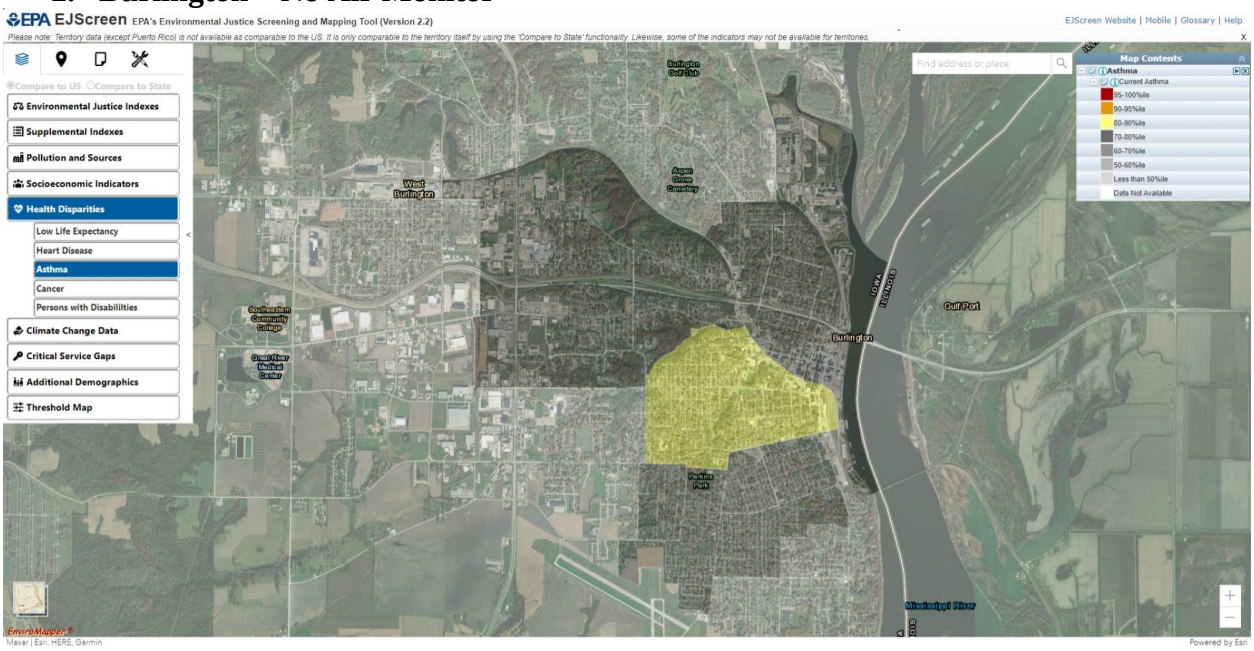
Appendix A: Asthma Rates and Monitoring Locations

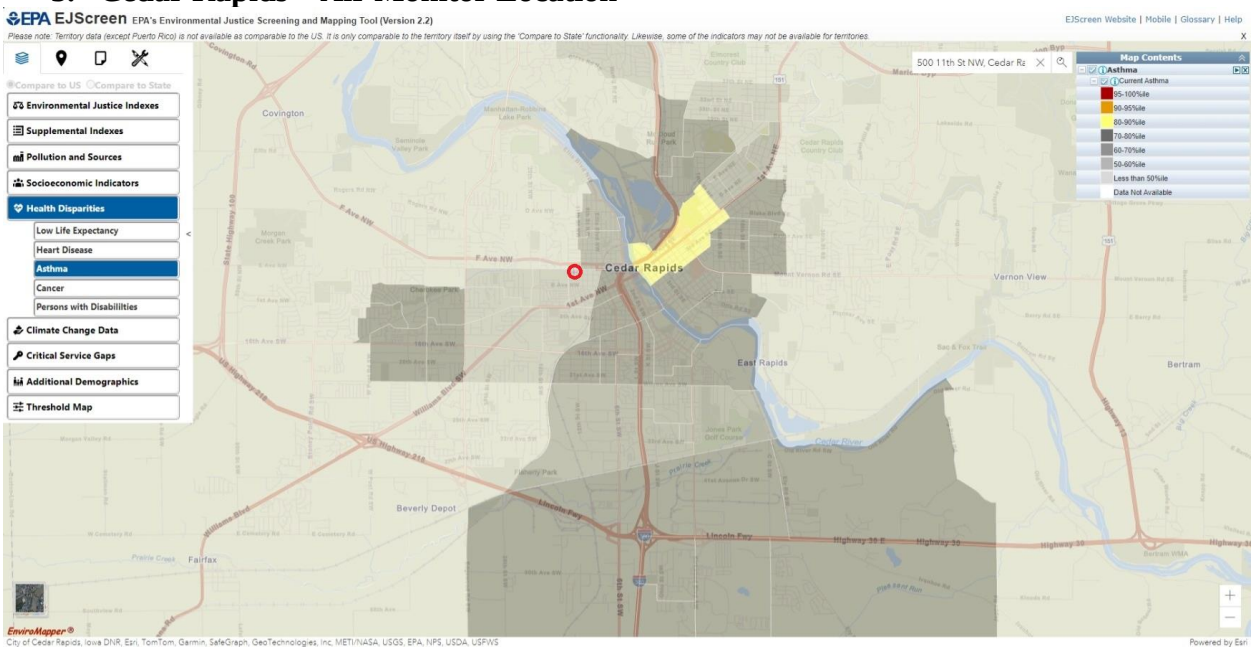
1. Ames – No Air Monitor



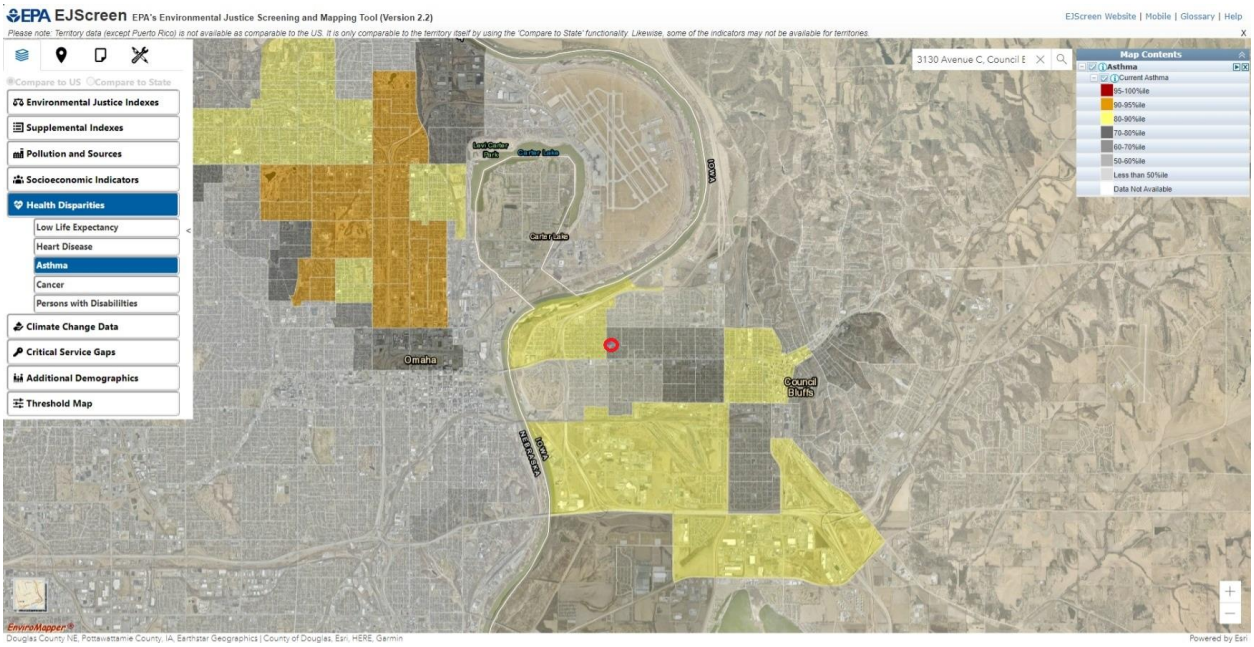
2. Burlington – No Air Monitor



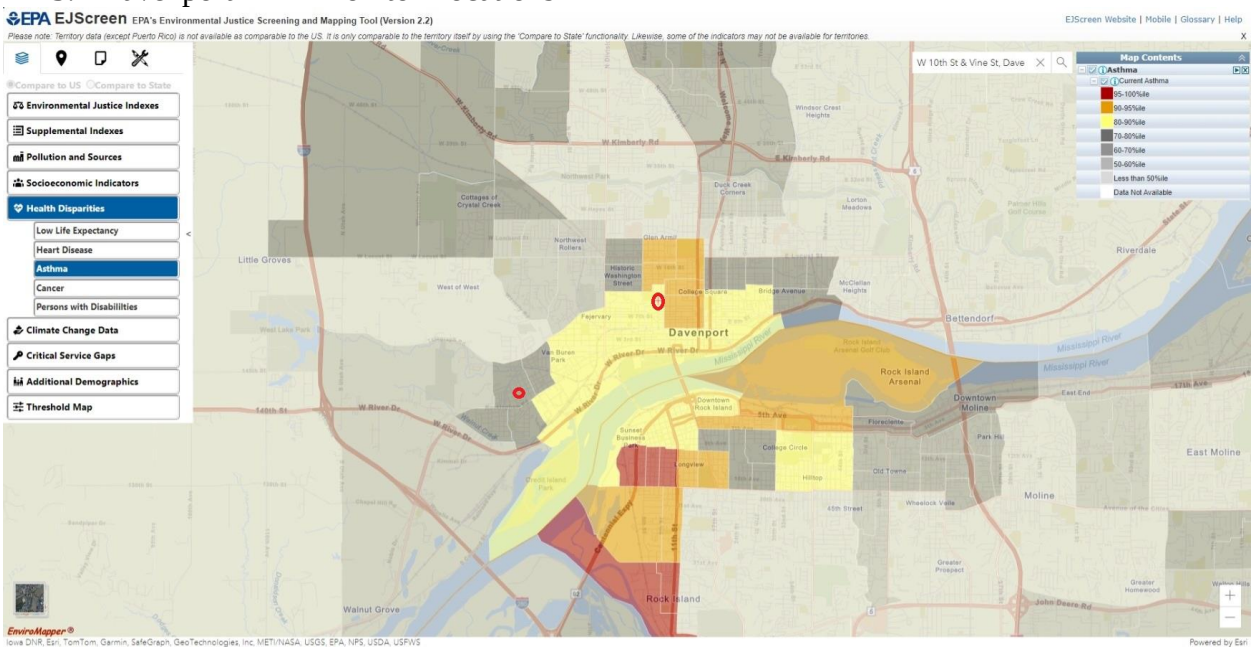
3. Cedar Rapids – Air Monitor Location



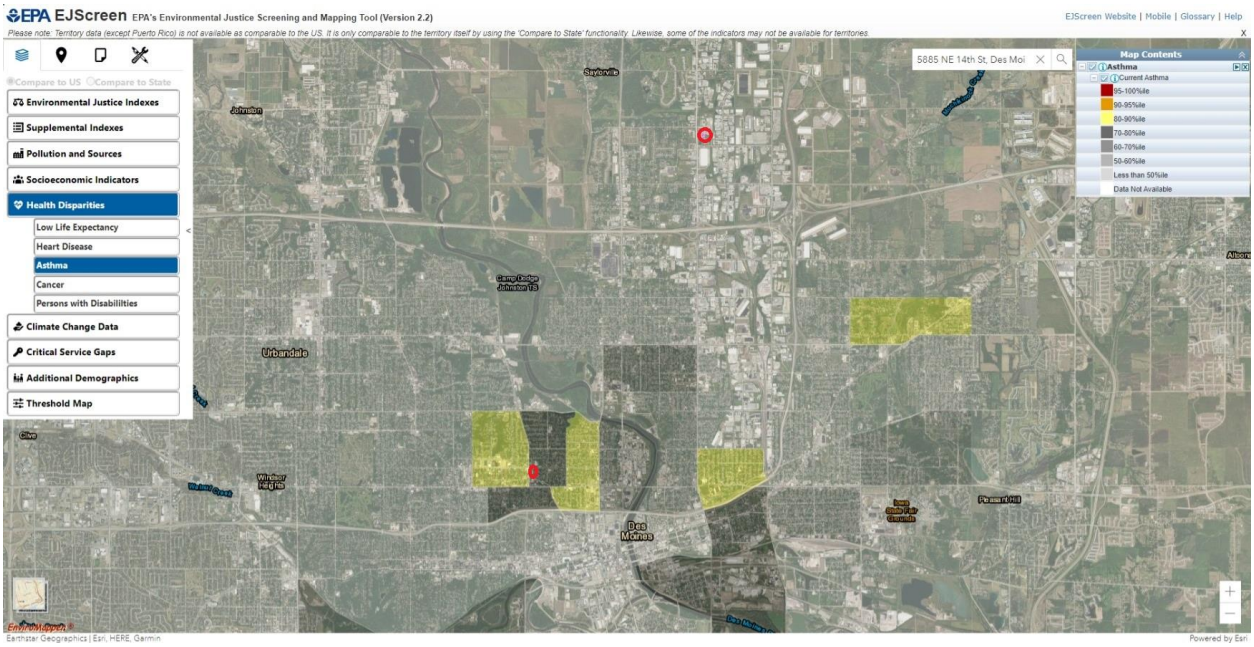
4. Council Bluffs – Air Monitor Location



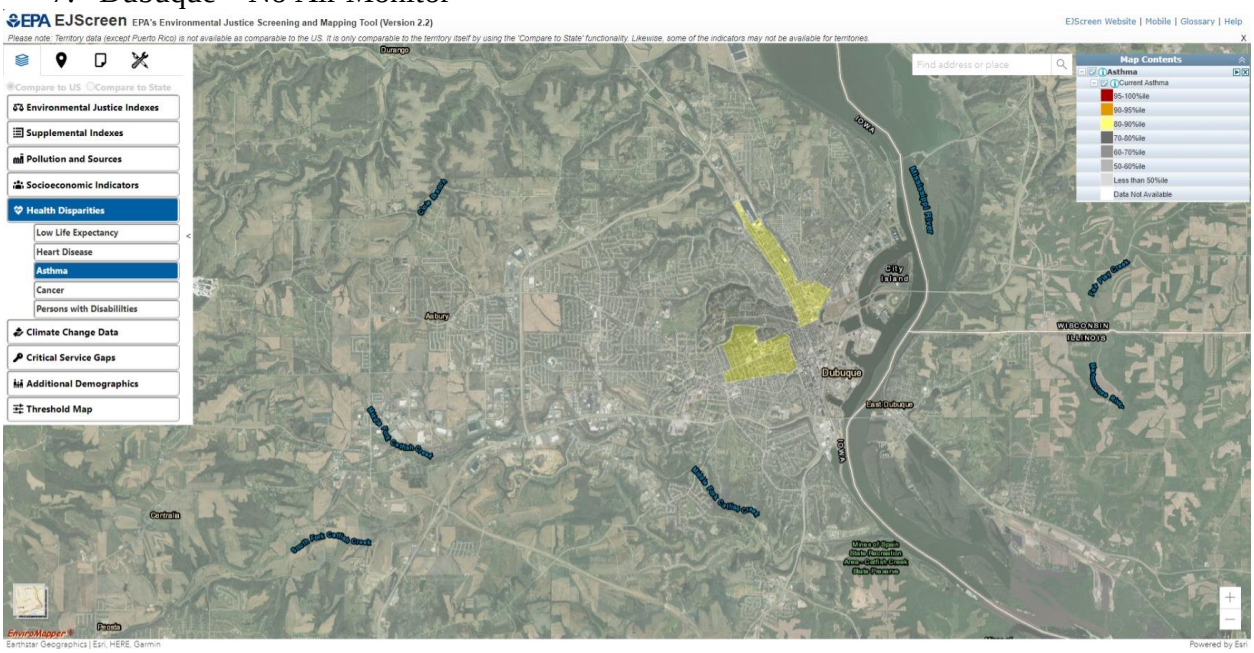
5. Davenport – Air Monitor Locations



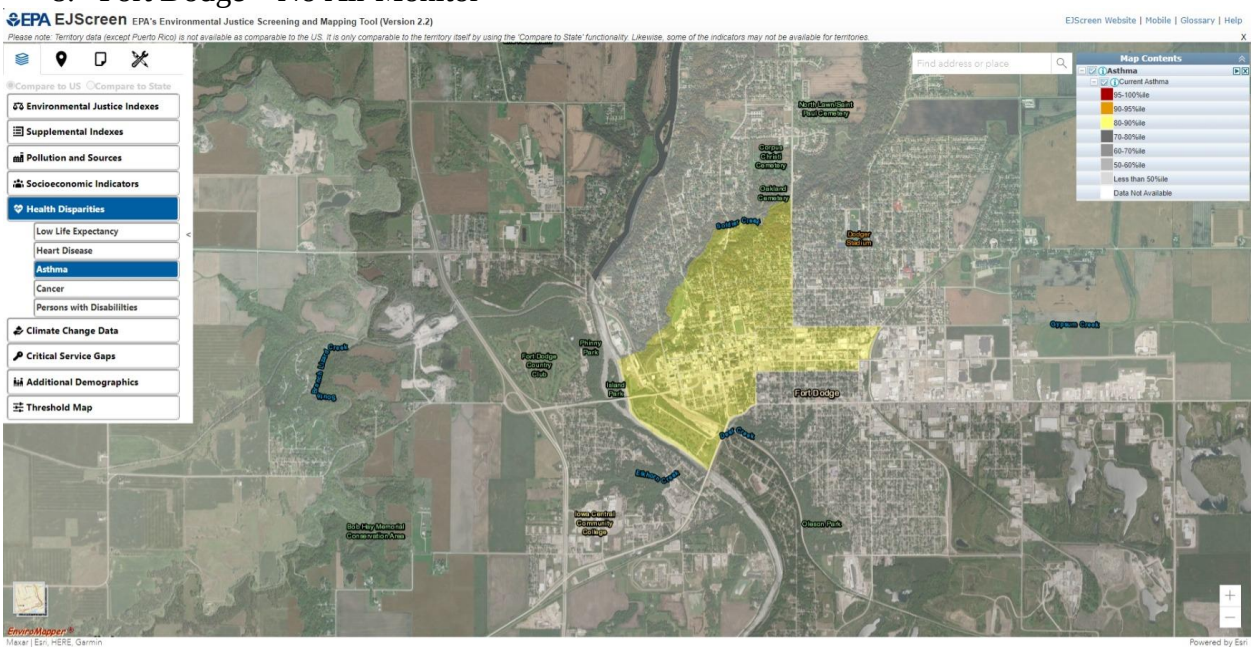
6. Des Moines – Air Monitor Locations



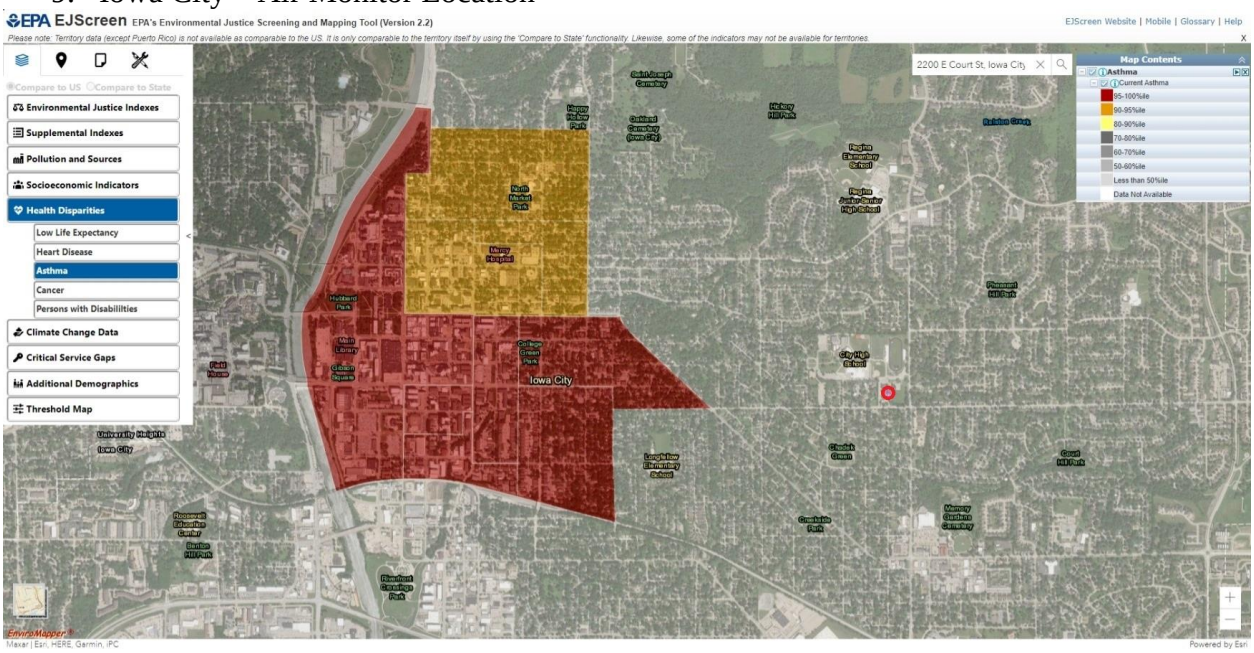
7. Dubuque – No Air Monitor



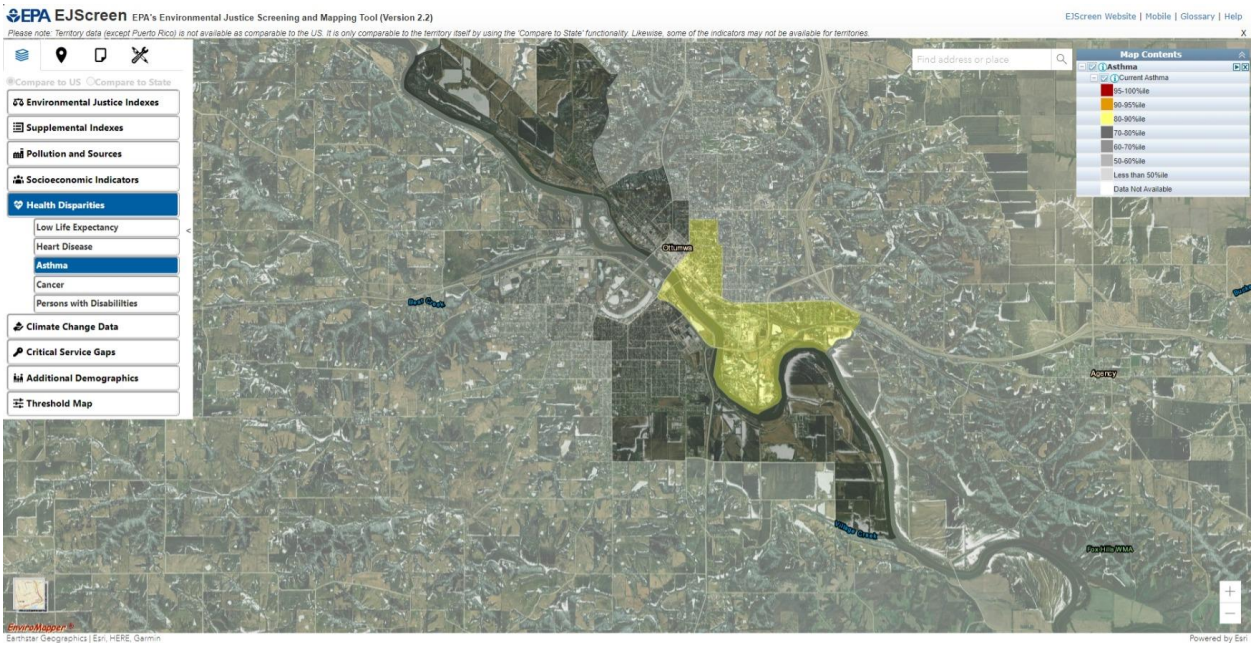
8. Fort Dodge – No Air Monitor



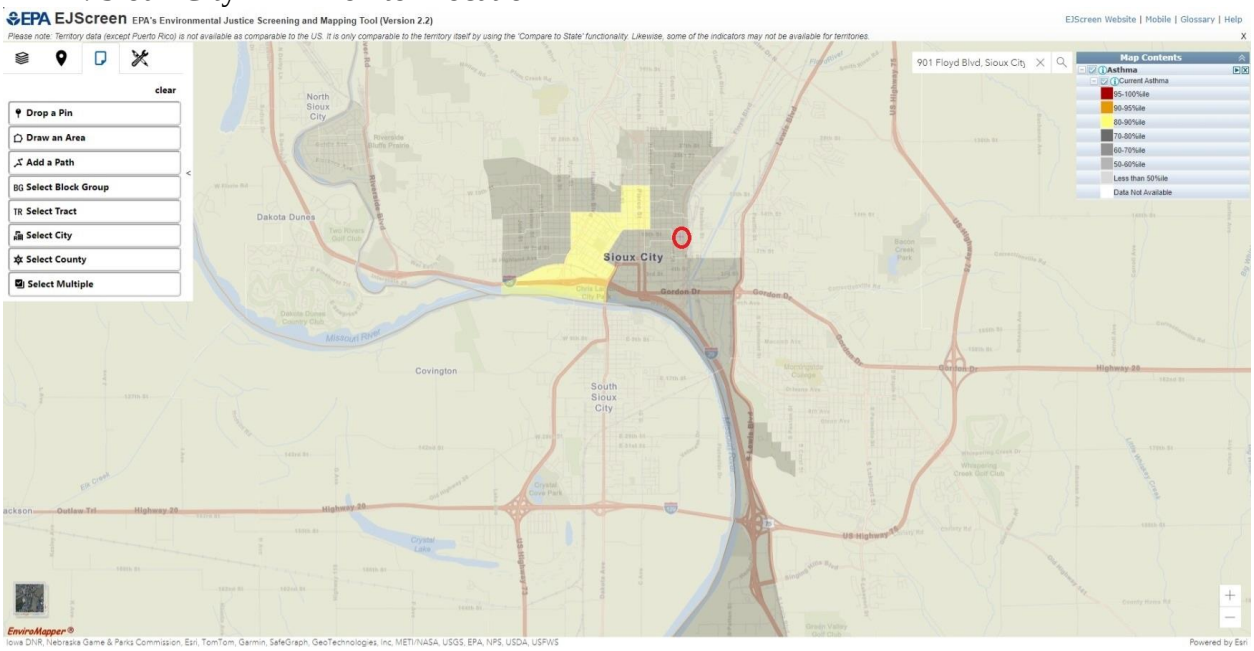
9. Iowa City – Air Monitor Location



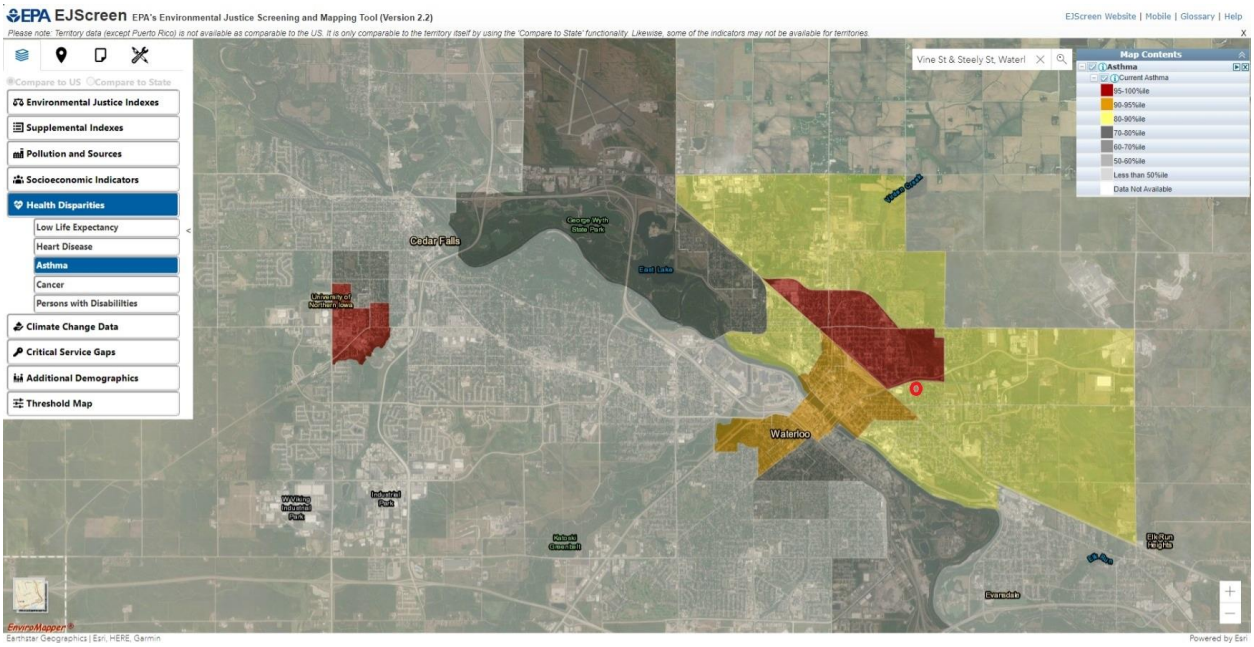
10. Ottumwa – No Air Monitor



11. Sioux City - Air Monitor Location



12. Waterloo/Cedar Falls – Air Monitor Location



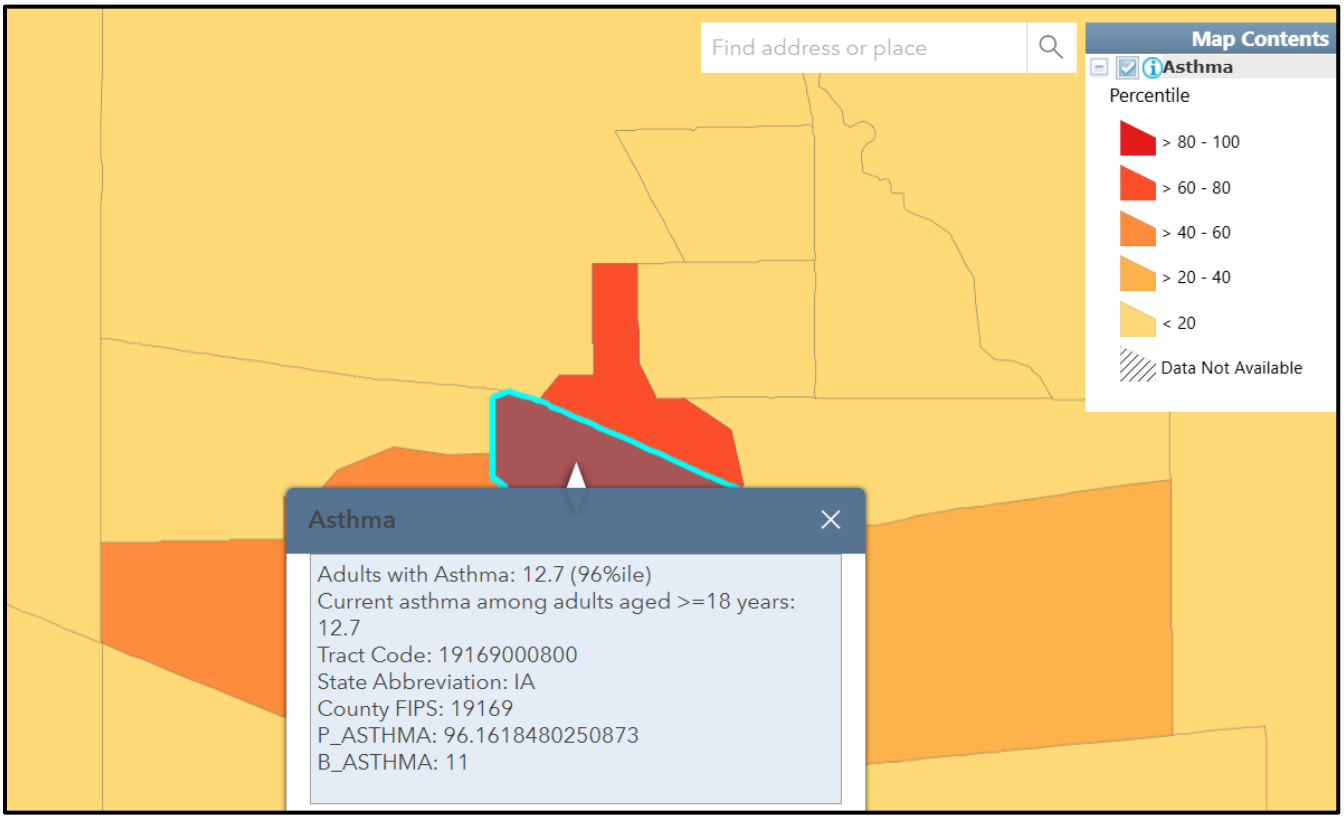
On 6/12/2025 the Iowa Environmental Council (IEC), Sierra Club, and Environmental Law & Policy Center (ELPC) submitted a 14 page document with comments regarding the Iowa Ambient Air 2025 Network Plan. The Iowa Department of Natural Resources (IDNR) wishes to thank these groups for their comments regarding our annual monitoring network plan, and interest in maintaining Iowa's air quality. The IDNR offers responses to those comments below. In the response, IDNR refers to the 14-page document as "the comment". IDNR's response to the comment first outlines some general observations and background information regarding ambient monitoring, and then responds specifically to concerns about PM2.5, followed by issues involving ozone.

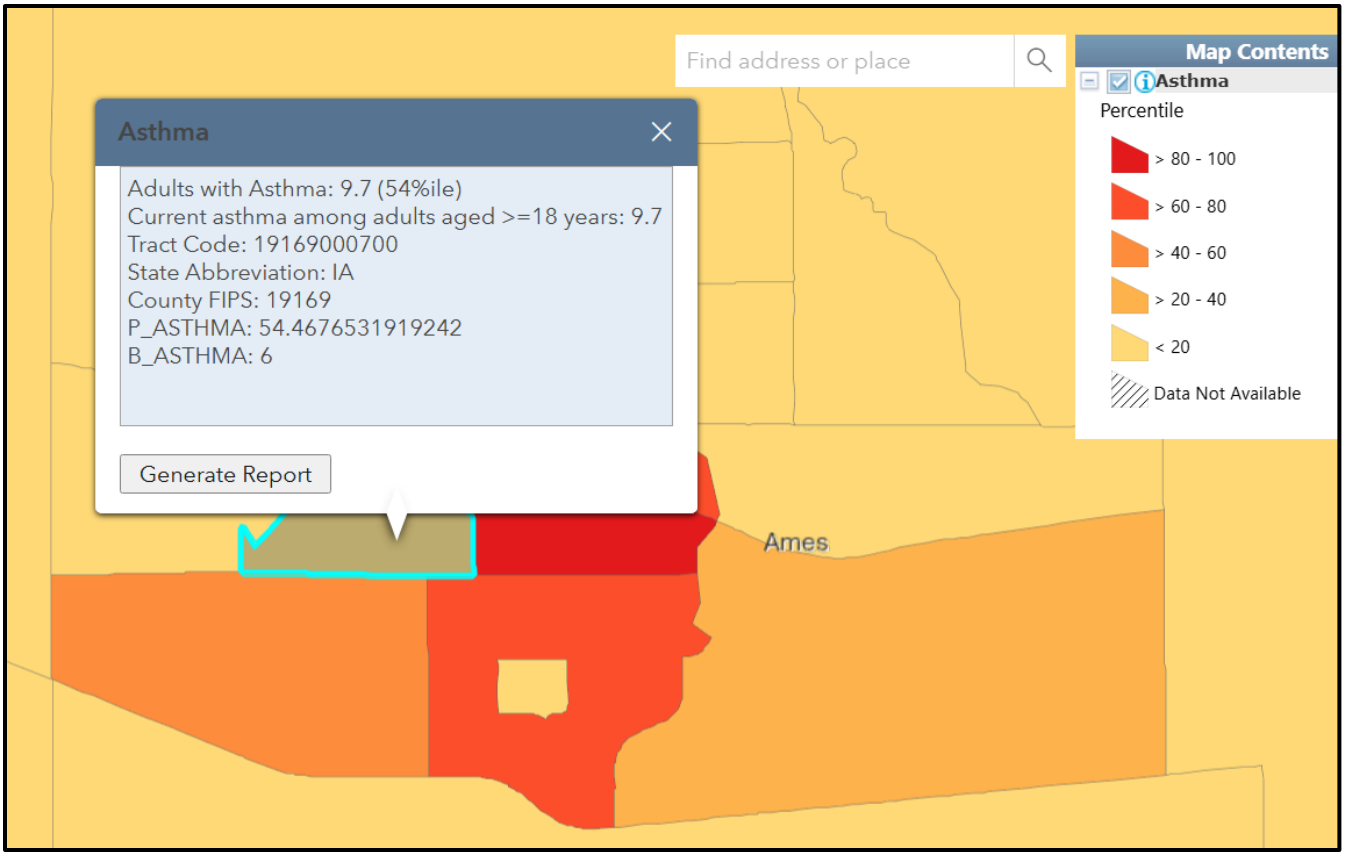
General Issues and Background Information:

Fine particulate (PM2.5) and ozone are considered regional pollutants. Both are commonly formed from precursors and degraded air quality frequently affects large regions containing multiple cities and even several states. Absent significant local sources the levels of PM2.5 and ozone are generally similar across wide regions. The difference between the PM2.5 annual design values at the highest and lowest sites in Iowa has never been greater than 3 µg/m3 for each of the last 10 years. The difference between the highest annual PM2.5 site's design values and the lowest site's design value has averaged 2.0 µg/m3 over that 10-year period. Iowa ozone sites show a similar pattern with the annual design value difference between the highest and lowest sites normally around 5-6 ppb.

IDNR notes that much of the comment pertains to siting monitors in relation to at risk communities. As alluded to in footnote #23 of the comment, the Environmental Justice Screening and Mapping Tool (EJ Map) is no longer maintained by EPA. The screen shots in Appendix A of the comment are derived from an older version (version 2.2) of the mapping tool. Version 2.3 is available at https://pedp-ejscreen.azurewebsites.net/ which is the second link referenced in footnote 23 of the comment. Based on our review, there are some significant differences between versions 2.2 and 2.3. (See additional details regarding this in Appendix I of this response.)

According to page 4-5 of the comment "Four of the communities have at-risk populations with asthma rates higher than 95% of the population nationally, with at-risk populations in Ames at 99%, Iowa City at 96%, Cedar Falls at 98%, and Waterloo at 97%.". IDNR was not able to replicate the 99 percentile ranking for the city of Ames using Version 2.3 of the EJ map. The census track showing the highest asthma incidence (deepest red) is only at the 96 percentile. A census tract in the second highest category is only at the 54 percentile rank. (See the two screen shots below).





Additionally, the Asthma and Allergy Foundation of America produced a report titled "2024 Asthma Capitals™ – Full Ranking List of 100 U.S. Metro Areas" that provides different information as well. (See https://aafa.org/asthma-allergy-research/our-research/asthma-capitals/). Pages 7-9 of this report list the top 100 Asthma Capitals for 2024 based on estimated asthma prevalence, emergency department visits due to asthma, and asthma-related fatalities. None of these cities (Ames, Iowa City, Cedar Falls, and Waterloo) are included in the list. The only Iowa city that is mentioned is Des Moines; but among the 100 locations, its ranks the very lowest (at 100 exactly) implying less asthma problems than any of the other 99 cities on the list.

About 62% of Iowa's population lived in MSA's in 2023. 69% of Iowa's ozone sites, and 54% of our PM2.5 monitoring sites are also in MSA's. Of the groups sensitive to the effects of air pollution, 63% of children under 5, 55% of adults over 65, 62% of children with asthma, 62% of adults with asthma, 59% of individuals with COPD which includes chronic bronchitis and emphysema, and 62% of individuals with lung cancer live in MSA's. This relationship holds for individual MSA's; the ratio of the population in any MSA to the total state's population is roughly equivalent to the ratio of the population of any sensitive group in that MSA to the total population of that sensitive group in the state.

It appears there is a misunderstanding regarding the scope of Federal requirements to site monitors in at-risk areas. The italicized quote below is taken from 40 C.F.R. pt. 58, Appendix D at 4.7.1(b). The quote makes references to monitoring scales. While these are defined in the Network Plan, we have repeated them below for the convenience of the reader, and the same definitions can be found in Section 1.2 (b) of Appendix D to Part 58 of the Code of Federal Regulations (CFR):

- Neighborhood scale - defines concentrations within some extended area of the city that has relatively uniform land use with dimensions in the 0.5 to 4.0 kilometers range. The neighborhood and urban scales listed below have the potential to overlap in applications that concern secondarily formed or homogeneously distributed air pollutants [emphasis by IDNR].
- Urban scale - defines concentrations within an area of city-like dimensions, on the order of 4 to 50 kilometers. Within a city, the geographic placement of sources may result in there being no single site that can be said to represent air quality on an urban scale.

"(b) Specific Design Criteria for PM2.5. The required monitoring stations or sites must be sited to represent area-wide air quality. These sites can include sites collocated at PAMS. These monitoring stations will typically be at neighborhood or urban-scale; however, micro-or middle-scale PM2.5 monitoring sites that represent many such locations throughout a metropolitan area are considered to represent area-wide air quality.

> *(1) At least one monitoring station is to be sited at neighborhood or larger scale in an area of expected maximum concentration.*

(2) For CBSAs with a population of 1,000,000 or more persons, at least one PM2.5 monitor is to be collocated at a near-road NO2 station required in section 4.3.2(a) of this appendix.

(3) For areas with additional required SLAMS, a monitoring station is to be sited in an at-risk community with poor air quality, particularly where there are anticipated effects from sources in the area (e.g., a major industrial area, point source(s), port, rail yard, airport, or other transportation facility or corridor).

(4) Additional technical guidance for siting PM2.5 monitors is provided in references 6 and 7 of this appendix."

As shown on page 5 of the 2025 Network Plan, there are only two MSA's in Iowa, and only one MSA that is entirely within Iowa's borders, that are required to have more than one PM2.5 monitor. These two MSA's are Des Moines and Omaha. Point #3 ("areas with additional required SLAMS") in the quote above is only applicable to areas with two or more required PM2.5 monitors. Therefore, in terms of Federal requirements, the "at risk siting requirement" is not applicable to most of the metropolitan and micropolitan areas cited in Table 1 on page 5 of the comment.

Moreover, through discussions between the IDNR and EPA Region 7, EPA clarified that the word "in" that appears in point #3 in the quote above (i.e. "sited <u>in</u> an at-risk community") can be correctly interpreted to mean that the scale of the monitor should extend into an at-risk community; even though the monitor itself may be sited outside the at-risk community.

There are a multitude of factors that must be considered when siting an ambient monitor as detailed in Appendix E to Part 58 of 40 CFR. For example, there are minimum distance requirements with respect to roads, other emission sources, as well as to buildings and trees. Considerations such as the security of the site, the security of the operators, proximity to electrical power, and winter time access during heavy snow must also be taken into account. Once all these factors have been satisfied and an acceptable site is identified, the landowner must be agreeable to hosting a monitor. This severely restricts areas a monitor can be successfully located. Additionally, even within a single type of at risk parameter (for example asthma) it is to be expected that there will be some year to year fluctuations in the census block that is deemed most at risk. (This is especially the case with small sample sizes, where a few more or less cases will result in a large percentage change.) Attempting to place the monitor <u>physically inside</u> the census block with the highest rate may therefore require frequent relocations, which would likely preclude IDNR from being able to determine a DV from the data.

Issues specific to PM2.5:

All FRM or FEM PM2.5 monitors operated by the IDNR in the cities mentioned in Table 1 of the comment have a spatial scale of "neighborhood". As noted above, the neighborhood scale is designated as being representative of at least a 4 kilometer (km) radius. If there are no significant local sources of emissions, the actual area that a monitor represents is equivalent to the area around the monitor with similar land usage. The area of representation may be as large as 50 km, due to overlap between the neighborhood and urban scales. Considering the partial overlap of the two scales, the PM2.5 sites shown in Appendix I of this document characterize an area that at least extends into, and sometimes completely covers, the region that is identified by the EJ map as having an above 80 percentile ranking asthma incidence.

In 2024, the IDNR received an IRA grant from EPA to be used in part to establish three new monitoring sites. These sites and the pollutants that will be monitored are listed below:

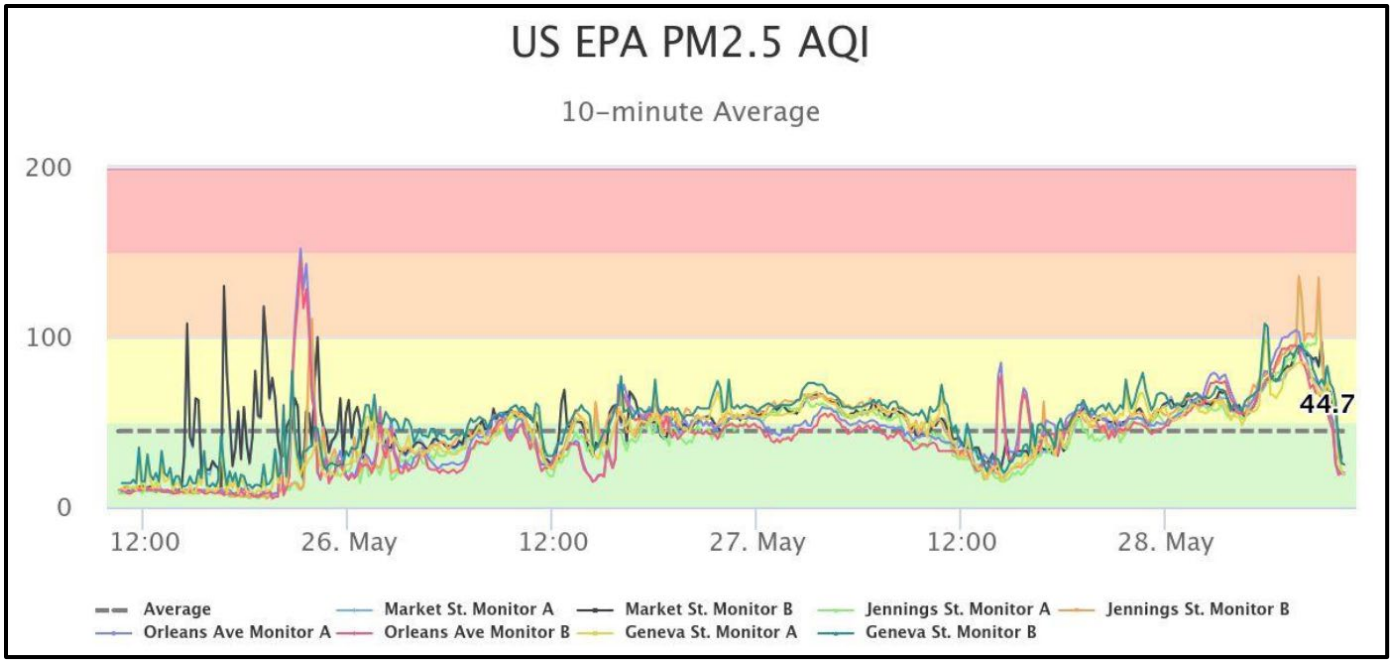
- Fort Dodge – operated by the Iowa DNR and discussed in greater detail in a subsequent section (see "Cities without PM2.5 monitors:"). This site will have both PM2.5 and PM10 FRM filter samplers as well as collocated continuous samplers that each measure and report both PM2.5 and PM10.
- Des Moines East High School – operated by Polk County Public Works Dept. This site will include an FRM PM2.5 monitor running on a 1 in 3 day schedule, and a continuous FEM PM2.5 monitor. Sampling for aldehyde toxics, analyzed using EPA method TO-11A, will also be carried out at this site.
- Cedar Rapids – operated by Linn County Health Dept. This site will include an FRM PM2.5 monitor running on a daily schedule, and a continuous FEM PM2.5 monitor. Linn County will also conduct sampling for toxics (volatile organic compounds) at this site. Toxic compounds will be collected in cannisters and analyzed using EPA method TO-15A.

To date, a site license agreement has only been obtained for the Fort Dodge and Des Moines sites, and location of the Cedar Rapids site is yet to be determined. Linn County has identified their goal area of siting the monitor near or within Osborn Park / New Bohemia. These sites will be operated until the allotted IRA funds are exhausted (approximately 3-5 years). Depending on the results of the monitoring, IDNR and the Local Programs may look to alternative funding sources to continue their operation.

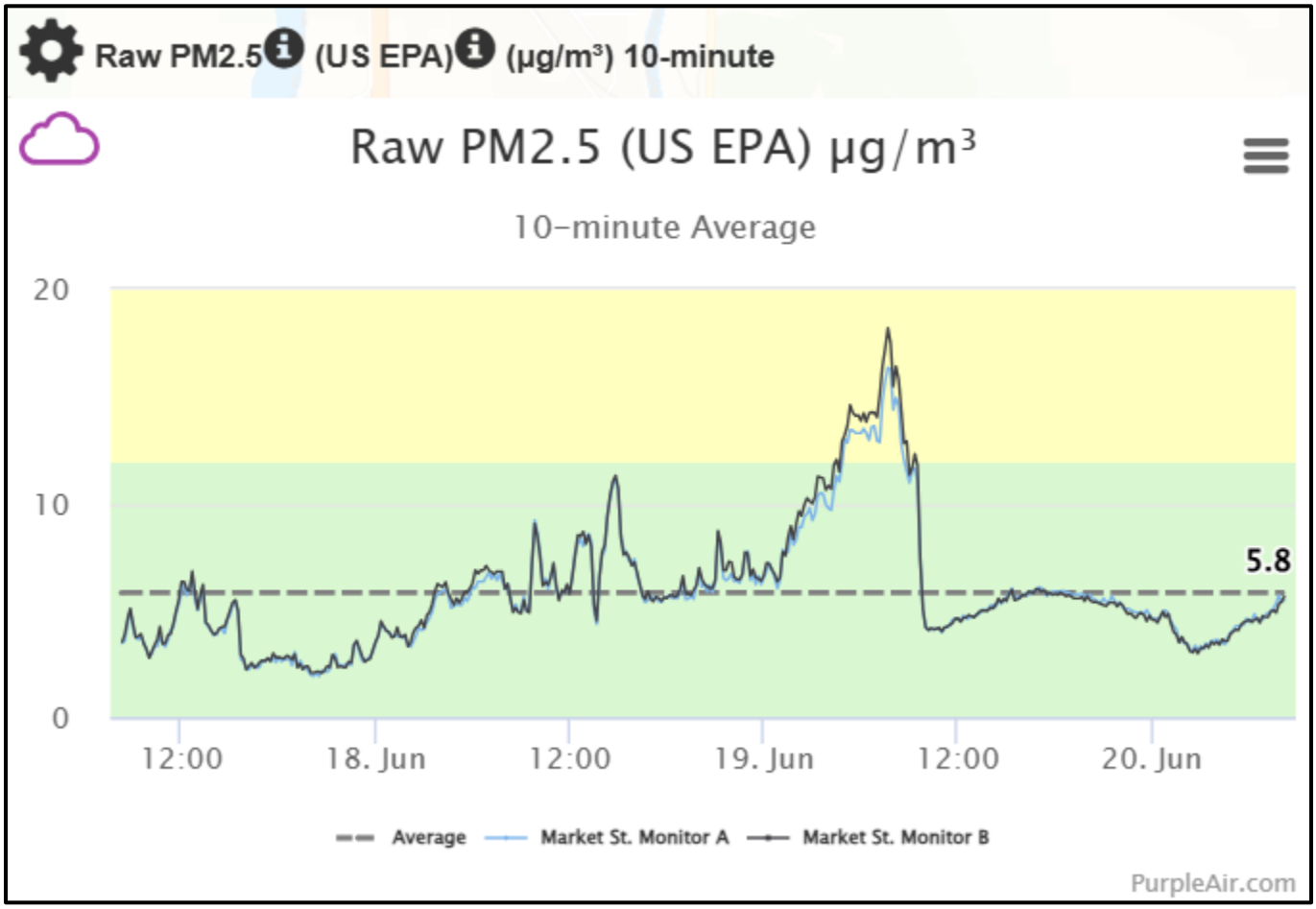
Purple Air plots from Sioux City:

Page 6 of the comment contains the image reproduced below. In reference to this image the comment states "The annual PM2.5 standard is 9.0 µg/m3 (micrograms per cubic meter), and the 24-hour PM2.5 standard is 35 µg/m. As shown below, the PM2.5 level in the snapshot below peaked at 152 **µg/m3** (IDNR emphasis added) and over a three day span averaged 44.7 **µg/m3** (IDNR emphasis added). Meanwhile, nearly all statewide PM2.5 monitoring by DNR showed daily averages well below that level, not reflecting the potential effects on a susceptible population.[29]"

IDNR highlighted references to units of µg/m3 at two locations in the above quote. This is because, as evidenced by the title of the plot itself, the numerical values of 152 and 44.7 refer to the Air Quality Index (AQI) rather than a concentration stated in micrograms per cubic meter. EPA's Air NOW calculator (https://www.airnow.gov/aqi/aqi-calculator/) can be used to convert an AQI value to µg/m3. Once the conversion is done, the above quote should be revised to read: "peaked at 56.9 µg/m3 and over a three day span averaged 8.1 µg/m3". Additionally, the numbers cannot directly be compared to the NAAQS because they are based on 10 minute averages (as is noted in the chart). While there were some 10 minute averages with an AQI above 100 (which is equivalent the NAAQS standard of 35 µg/m3) the averaging period used to determine whether or not there was an exceedance of the NAAQs is 24 hours, from midnight to midnight. Despite temporary excursions above the NAAQS on May 26 by some of the monitors, visual inspection of the plot shows that the daily average for all the Purple Air monitors in the plot was below the 24 hour PM2.5 NAAQS. An AQI level of 44.7, corresponding to 8.1 ug/m3, is actually in the green or good air quality category.

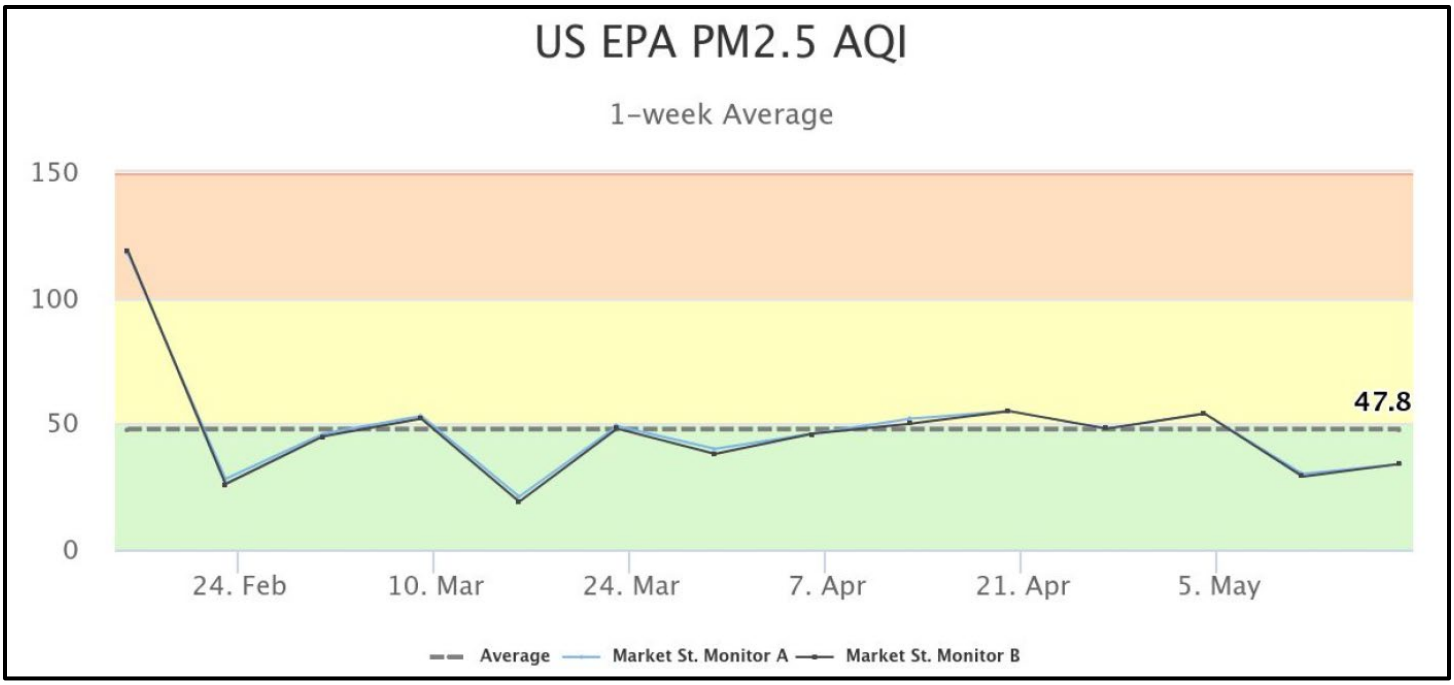


When the settings on the national Purple Air map are set to display the concentrations in µg/m3, that will be apparent in the title of the plot, as evidenced by the screen shot shown below for the IDNR's Purple Air monitors at Irving school. Please note that the readings are still based on a 10 minute average and are still not directly NAAQS comparable.



The comment's second plot from Purple Air sensors (reproduced below) repeats the confusion of units already discussed above. With respect to this plot the commenter's write "It is noteworthy that the 1-week average over a period of months is 47.8 **µg/m3** (IDNR emphasis added), well above the 24-hour PM2.5 standard of 35 µg/m3." When applying the conversion, the corrected text should read

"… the 1-week average over a period of months is 8.6 µg/m3, which is equivalent to an AQI of 47.8, and is in the green or good category, …"



The comment also requested or suggested an increase in the sampling frequency from the current "1 day out of 3 days" schedule at the Irving School site in Sioux City. 40 CFR Part 58 specifies that the minimum frequency for manual PM2.5 sampling at required SLAMS sites is one sample every three days. Required SLAMS sites with a 24-hour design value within 5% of the 24-hour PM2.5 NAAQS (i.e. 34 µg/m3 to 36 µg/m3) must assume a daily sampling schedule until the design value no longer meets the criteria for three consecutive years. Since the most recent three year design value at the Irving School site (based on data collected in years 2022-2024) is only 20 ug/m3, the DNR is not required to move to an accelerated sampling schedule. The sampling schedule will be increased to daily if levels reach the threshold noted above.

IDNR could voluntarily increase the sampling frequency of the Irving School site, however in addition to it not being required, it is not necessary because the form of the 24-hour PM2.5 standard adjusts for the fact that a sampler operating on a 1 in 3 day schedule may miss high values on the two days that it is not sampling. To attain that standard, the 3-year average of the 98th percentile of 24-hour concentrations must not exceed 35 ug/m3. Assuming there are no missed samples, a sampler operating on a daily schedule will collect 365 samples per year, while one operating on a 1 in 3 day schedule will only collect 121 samples in a year. In this scenario, the 98th percentile rank corresponds to the 3rd highest sample in the year for the 1 in 3 day sampler, but only the 8th highest day in the year for the daily sampler.

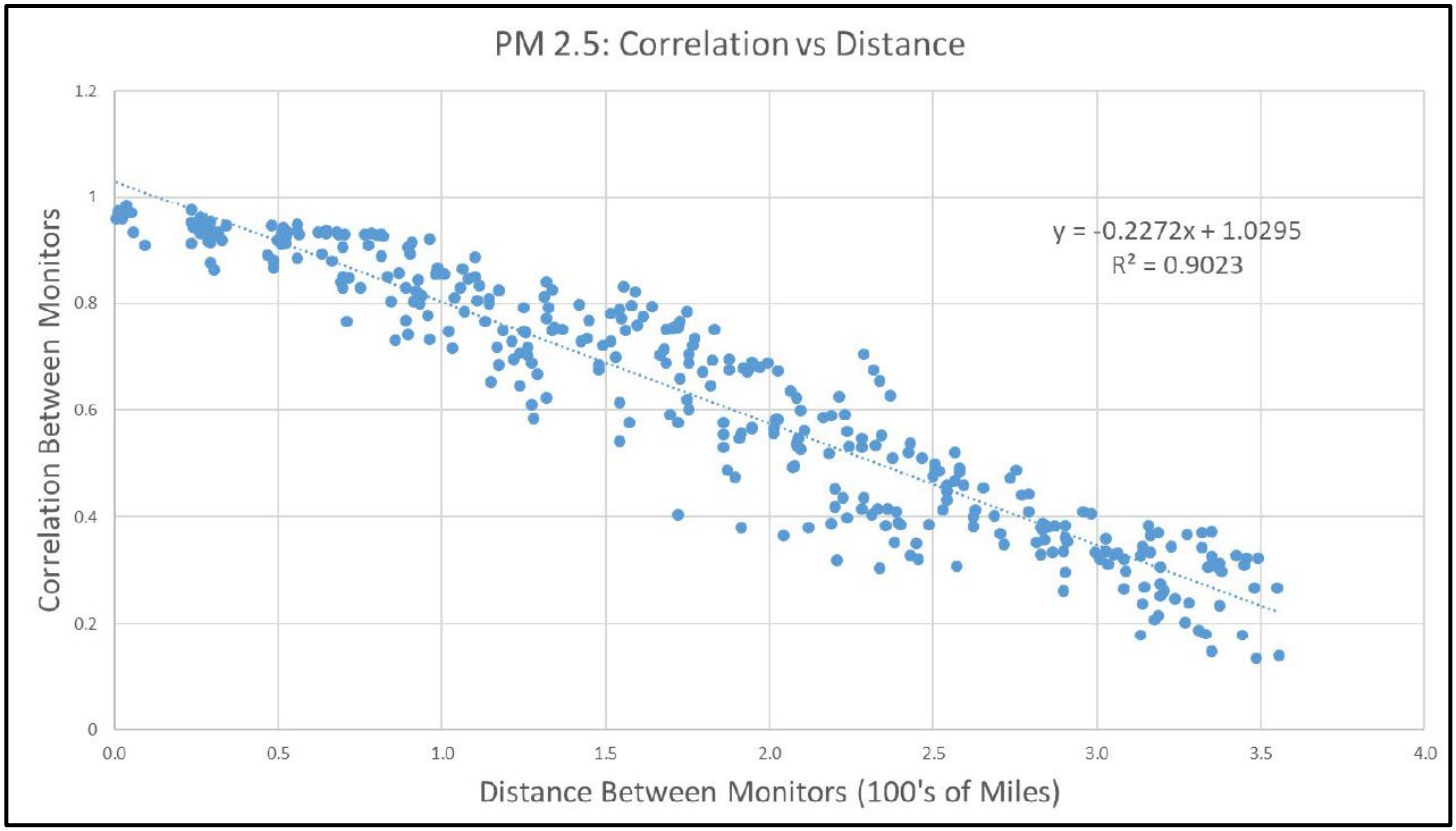
<u>Cities without PM2.5 monitors:</u>

The comment also correctly indicates the IDNR does not currently run any PM2.5 monitoring sites that are located in the cities of Ames, Burlington, Dubuque, Fort Dodge, and Ottumwa.

DNR will be adding a new site in Fort Dodge that will start operations on 7/1/2025. The site will be located at the intersection of 1st Ave. S. & S. 15th Street and will include an FRM PM10 monitor, an FRM PM2.5 monitor, and two FEM continuous monitors that will simultaneously measure both PM2.5 and PM10.

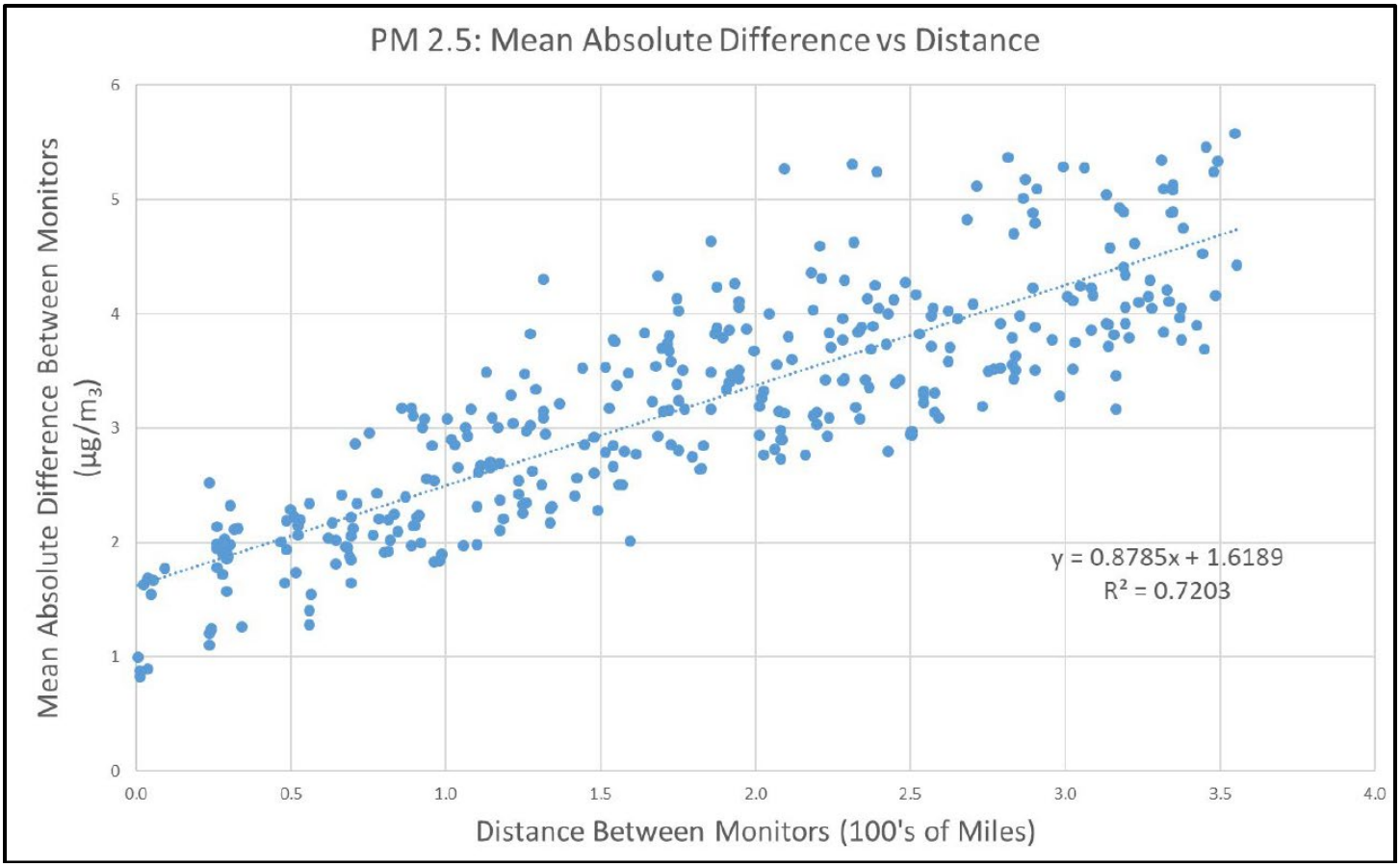
Appendix F of the IDNR's 2025 five year Network Assessment contains an extensive discussion of the spatial variability of PM2.5. This appendix utilized the "Netassess2025" tool developed by EPA to obtain the following two plots and observations.

As shown in the plot below, performing linear regression analysis on R (the Pearson product-moment correlation coefficient) and the distance between monitor pairs shows that the two parameters are correlated with an R^2 of about 0.90. The correlation at zero separation is about 0.95 and decreases by about 0.23 for every 100 miles.



$PM_{2.5}$: Dependence of Correlation between Monitors on the Distance between Monitors

As shown in the plot below performing linear regression analysis on the mean absolute difference, and the distance between monitor pairs, shows that the two parameters are correlated with an R^2 of about 0.72. The mean absolute difference at zero separation is about 1.6 µg/m3 and increases by about 0.88 µg/m3 for every 100 miles.



$PM_{2.5}$: Dependence of Mean Absolute Difference on the Distance between Monitors

The difference between the 5 cities without PM2.5 monitors cited in the comment, and the nearest PM2.5 monitor is always less than 100 miles. Based on the plot above, at a distance of 100 miles two PM2.5 monitors would show an average mean difference of 0.88 µg/m3. This is only 2.5% of the 24 hour standard of 35 µg/m3, or 9.8% of the newest annual standard of 9.0 µg/m3. Based on this information, the DNR does not propose to install any additional PM2.5 sites beyond Ft. Dodge. However, DNR does acknowledge that local PM2.5 contributions from sources can also impact monitored values and will continue to evaluate each year whether additional monitoring is warranted in any areas of the state.

Nearby PM2.5 monitors run by surrounding states are also indicative of conditions in Iowa's cities that are located on or near the border. For example, the monitor in Potosi, Wisconsin is only about 11 miles from Dubuque.

Issues specific to Ozone:

Table 1 of the comment indicates that the Council Bluffs, and Waterloo / Cedar Falls MSAs do not have an ozone monitoring site. According to 40 CFR Appendix D to Part 58 "Within an O3 network, at least one O3 site for each MSA, or CSA if multiple MSAs are involved, must be designed to record the maximum concentration for that particular metropolitan area. … In many cases, these maximum concentration O3 sites will be located 10 to 30 miles or more downwind from the urban area where maximum O3 precursor emissions originate." This is because ozone is a "secondary" pollutant, and the highest levels are typically reached after ozone precursor gases have had enough time to interact with heat and sunlight to participate in ozone forming reactions.

Iowa's downwind ozone sites and the MSA's that they correspond to are shown below:

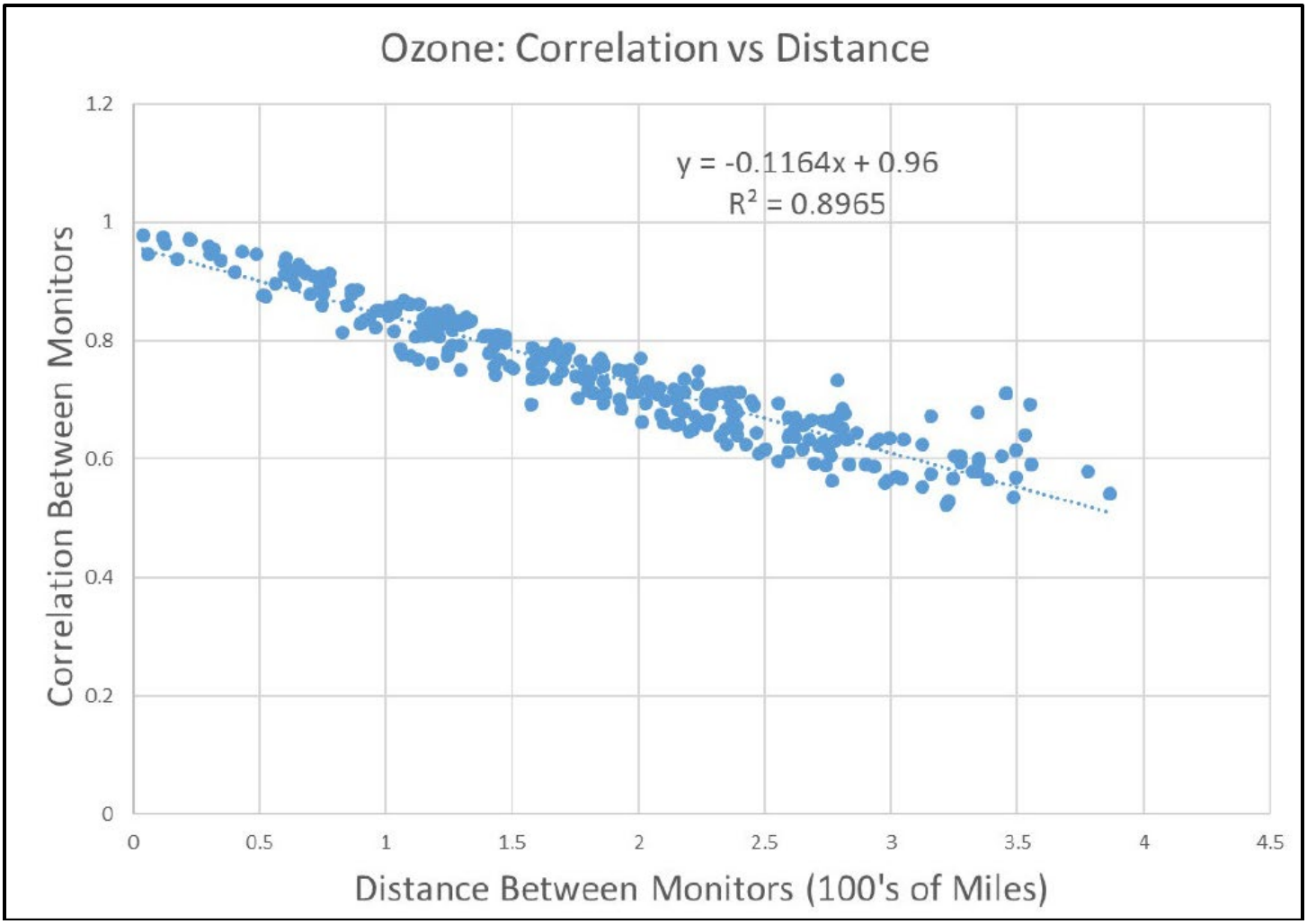
- Pisgah covers Council Bluffs
- Stone State Park covers Sioux City
- Waverly covers Waterloo
- Coggon covers Cedar Rapids
- Sheldahl covers Des Moines
- Scott Co. Park covers Davenport

The monitoring scale associated with each of the six sites noted above is "urban" which "defines concentrations within an area of city-like dimensions, on the order of 4 to 50 kilometers." By locating the ozone monitor in the areas shown on the EJ maps that represent the highest incidence of asthma, or lowest income levels, the DNR would both fail to meet EPA siting requirements and would also underestimate the ozone levels attributed to the metro area.

Cities without ozone monitors:

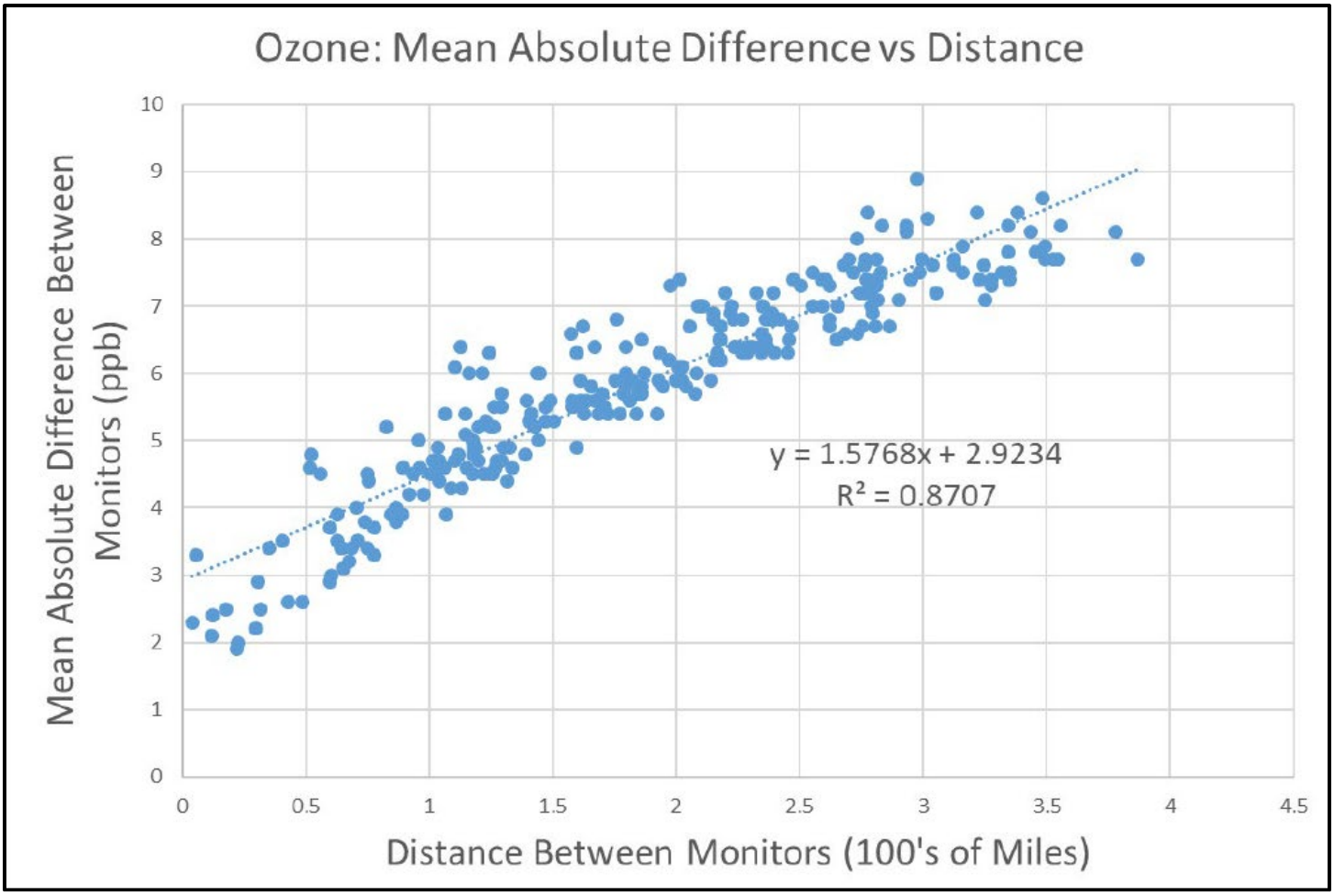
The comment correctly indicates the IDNR does not have any monitoring sites that are located in the cities of Ames, Burlington, Dubuque, Fort Dodge, Iowa City and Ottumwa. Appendix F of the IDNR's 2025 five year network assessment contains an extensive discussion of the spatial variability of ozone. This appendix utilized the "Netassess2025" tool developed by EPA to obtain the following two plots and observations.

As shown in the plot below linear regression analysis on R, and the distance between monitor pairs, shows that the two parameters are correlated with an $R^2 = 0.90$. The correlation at zero separation is about 0.95 and decreases by about 11% for every 100 miles.



Ozone: Dependence of Correlation on the Distance between Sites

As shown in the plot below performing linear regression analysis on the mean absolute difference, and the distance between monitor pairs, shows that the two parameters are correlated with an $R^2 = 0.87$. The mean absolute difference at zero separation is 2.9 ppb and increases by about 1.6 ppb for every 100 miles.



Ozone: Dependence of Mean Absolute Difference on the Distance between Sites

The difference between the 6 cities without ozone monitors cited in the comment, and the nearest ozone monitor is always less than 100 miles. Based on the second plot above, at a distance of 100 miles two ozone monitors would show an average mean difference of 1.6 ppb, which is only 2.3% of the 70 ppb standard. Based on this information, the DNR does not propose to install any additional O3 sites but will continue to evaluate each year whether additional monitoring is warranted in any areas of the state.

Nearby ozone monitors run by surrounding states are also indicative of conditions in Iowa's cities that are located on or near the border. For example, the monitor in Stockton, Illinois is only about 36 miles from Dubuque.

Thank you for taking the time to review and provide feedback on the 2025 Network Plan. Please contact me with any questions.

Sincerely,

Brian Hutchins

Digitally signed by Brian Hutchins
Date: 2025.06.27 14:52:15 -05'00'

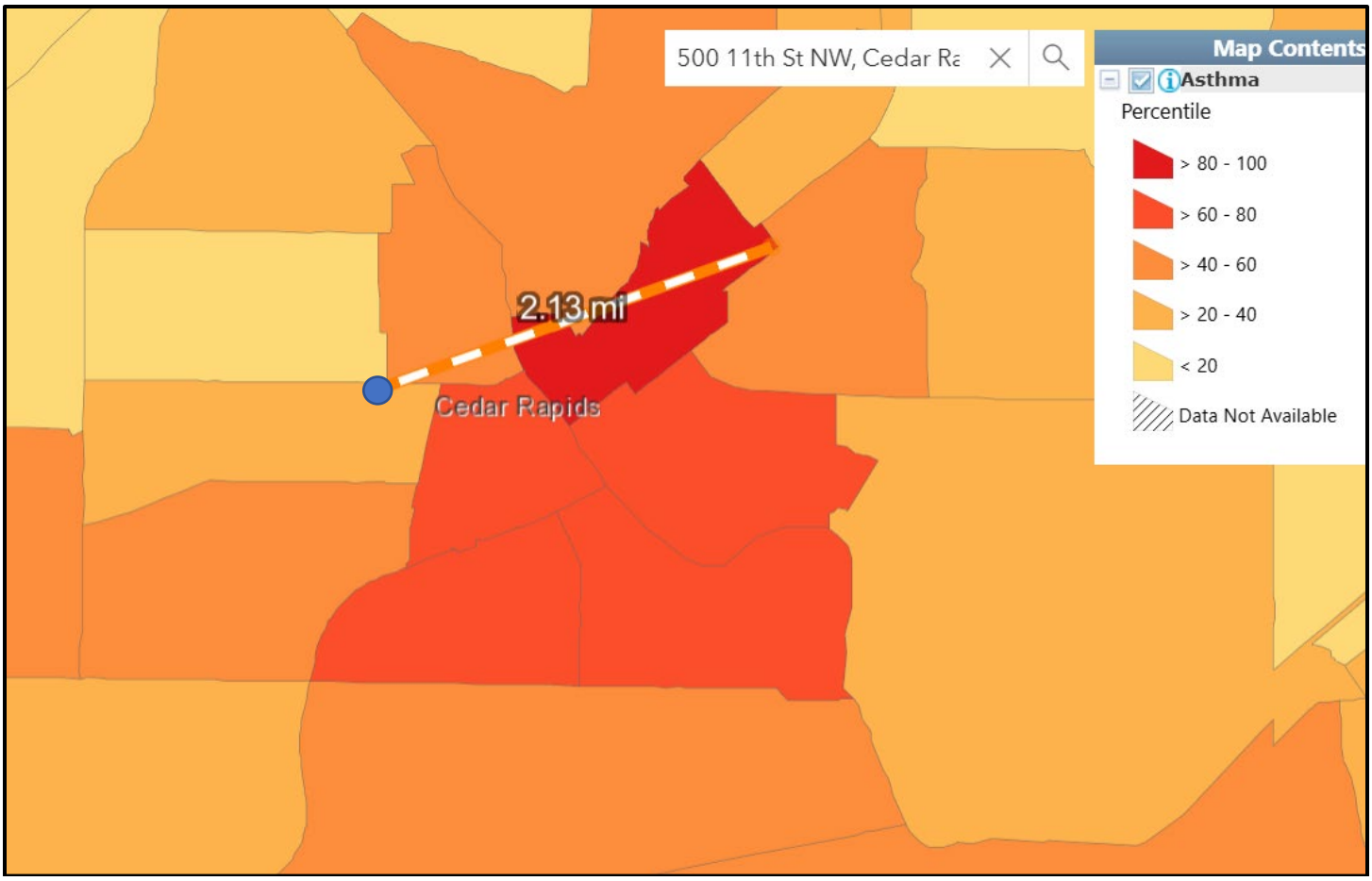
Brian Hutchins
Compliance & Ambient Air Monitoring Section
Air Quality Bureau

Appendix I

The following screen shots were taken from the Environmental Justice Screening and Mapping Tool (EJ map) (Version 2.3) available at https://pedp-ejscreen.azurewebsites.net/ which is the second link referenced in footnote 23 of the comment. Note that the screen shots in the comment utilized a slightly earlier version (version 2.2 instead of version 2.3) of the EJ map. Table 1 of the comment references seven PM2.5 monitoring sites, that are characterized as not addressing any census block with a >80 percentile national ranking for asthma. This subset of sites is also indicated in the table below.

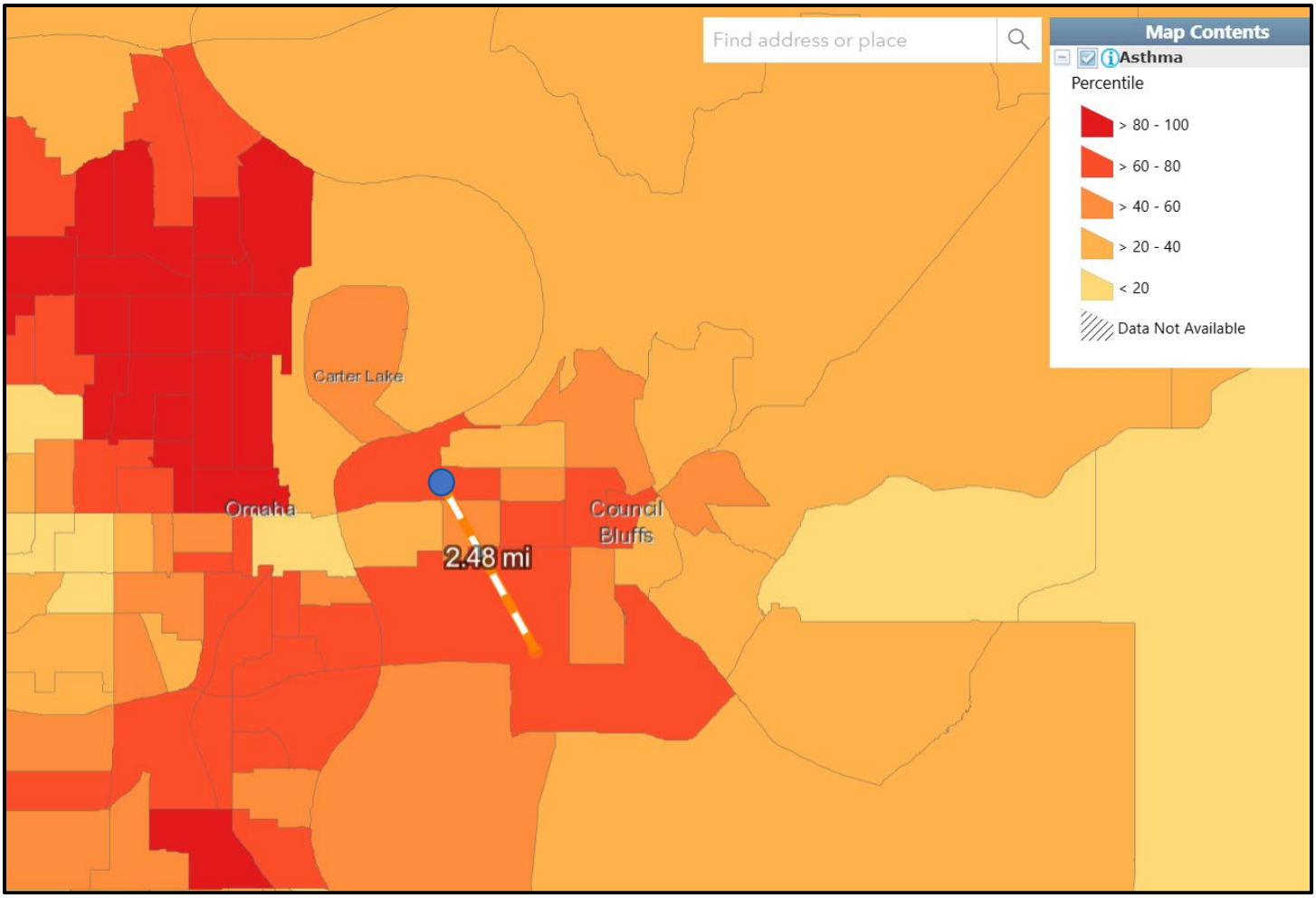
City	Site	Address	County	PM 2.5 Monitor	PM 2.5 Monitor in >80%
Cedar Rapids	Public Health	500 11th St. NW	Linn	Yes	No
Council Bluffs	Franklin School	3130 C Ave.	Pottawattamie	Yes	No
Davenport	Hayes School	622 South Concord St	Scott	Yes	No
Des Moines	Health Dept.	1907 Carpenter	Polk	Yes	No
Des Moines	Public Works	5885 NE 14th	Polk	Yes	No
Iowa City	Hoover School	2200 East Court	Johnson	Yes	No
Sioux City	Irving School	901 Floyd Blvd.	Woodbury	Yes	No

The following screen shots for these seven PM2.5 sites demonstrate that their 4 km scale generally extends into areas that the EJ map identifies as having the highest incidence of asthma. (Since the measuring tool on the EJ map only allows measurements in miles, the conversion to km is shown below each image.) The monitors location is represented by a blue dot.



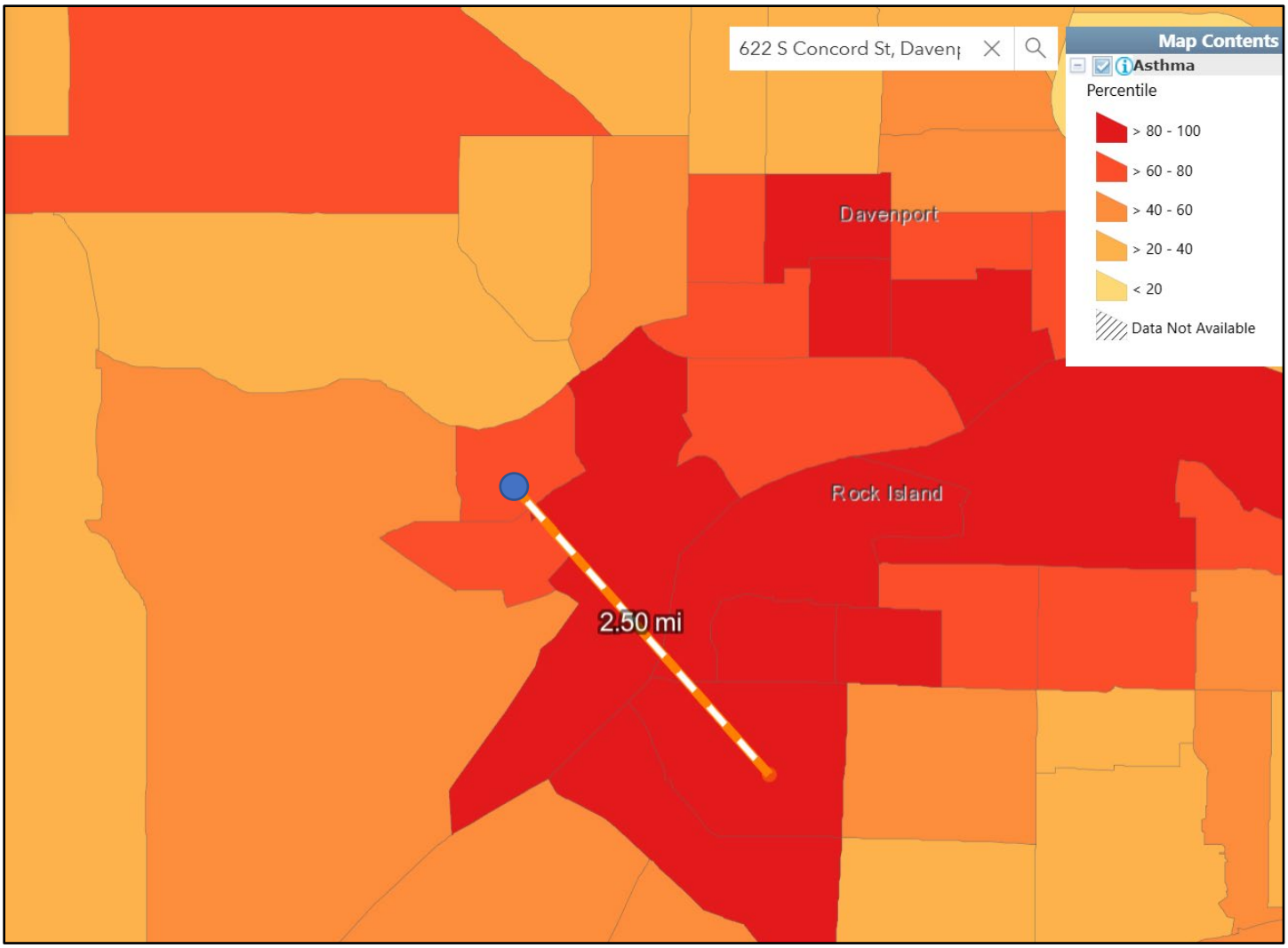
Cedar Rapids, Public Health site at 500 11th St. NW

2.13 miles = 3.43 km



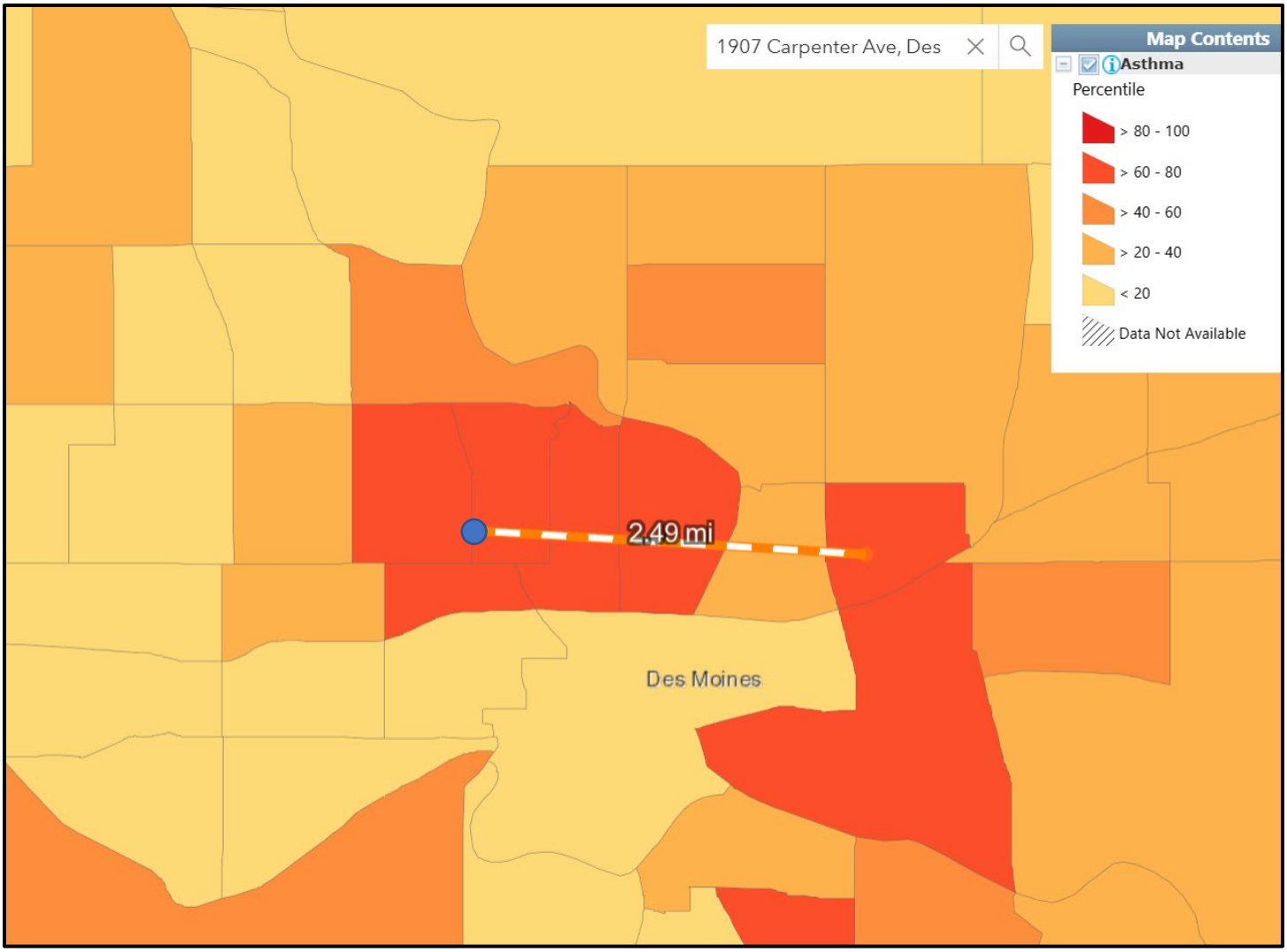
Council Bluffs, Franklin School site at 3130 C Ave.

2.48 miles = 3.99 km
In addition, four SLAMS PM2.5 monitoring sites (not shown) are operated by Nebraska in the Omaha-Council Bluffs MSA.



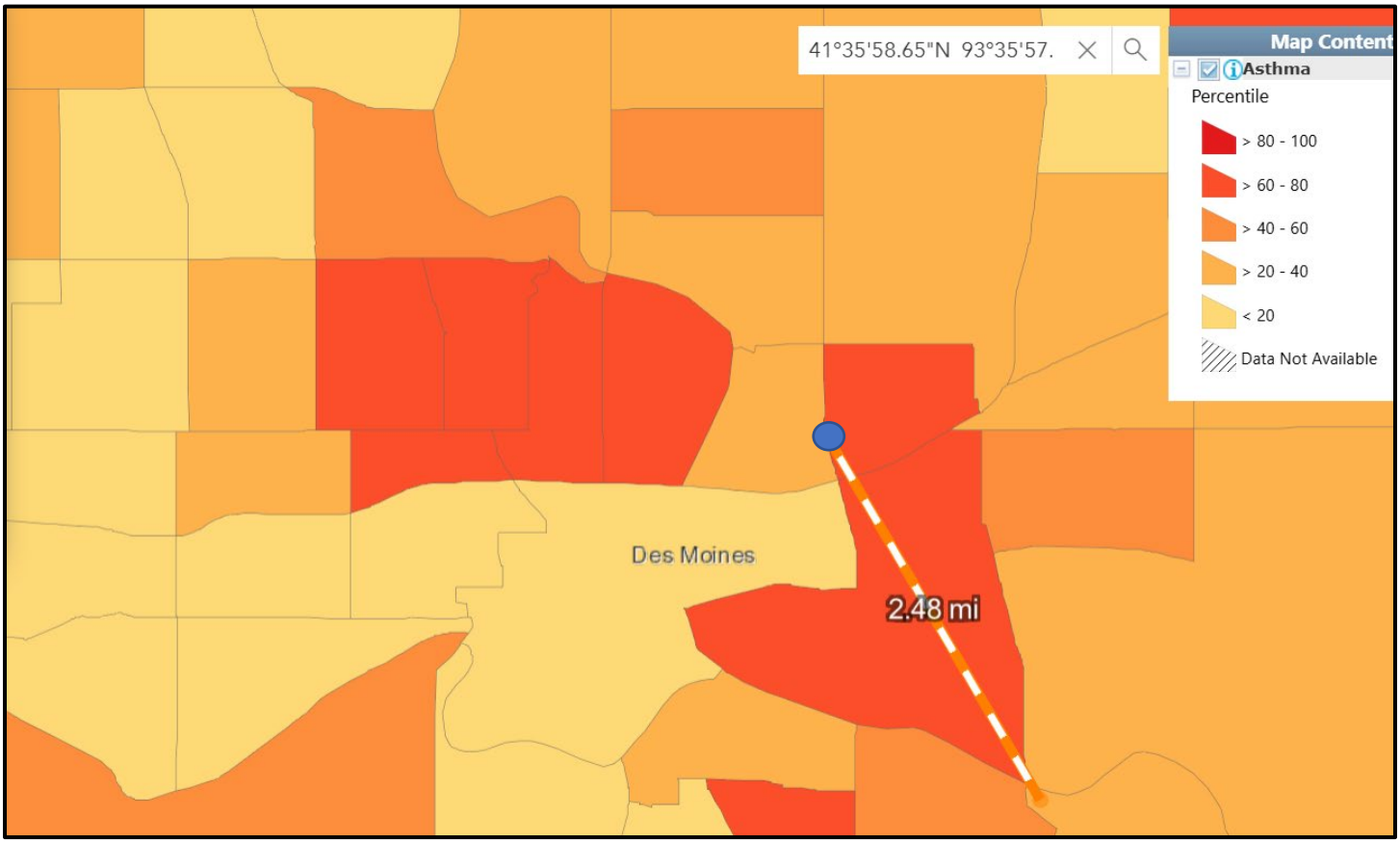
Davenport, Hayes School site at 622 South Concord St.

2.50 miles = 4.02 km; Note that the scale of the monitor extends well into Illinois.
In addition, a SLAMS PM2.5 monitoring site (not shown) is operated in Rock Island by the state of Illinois.



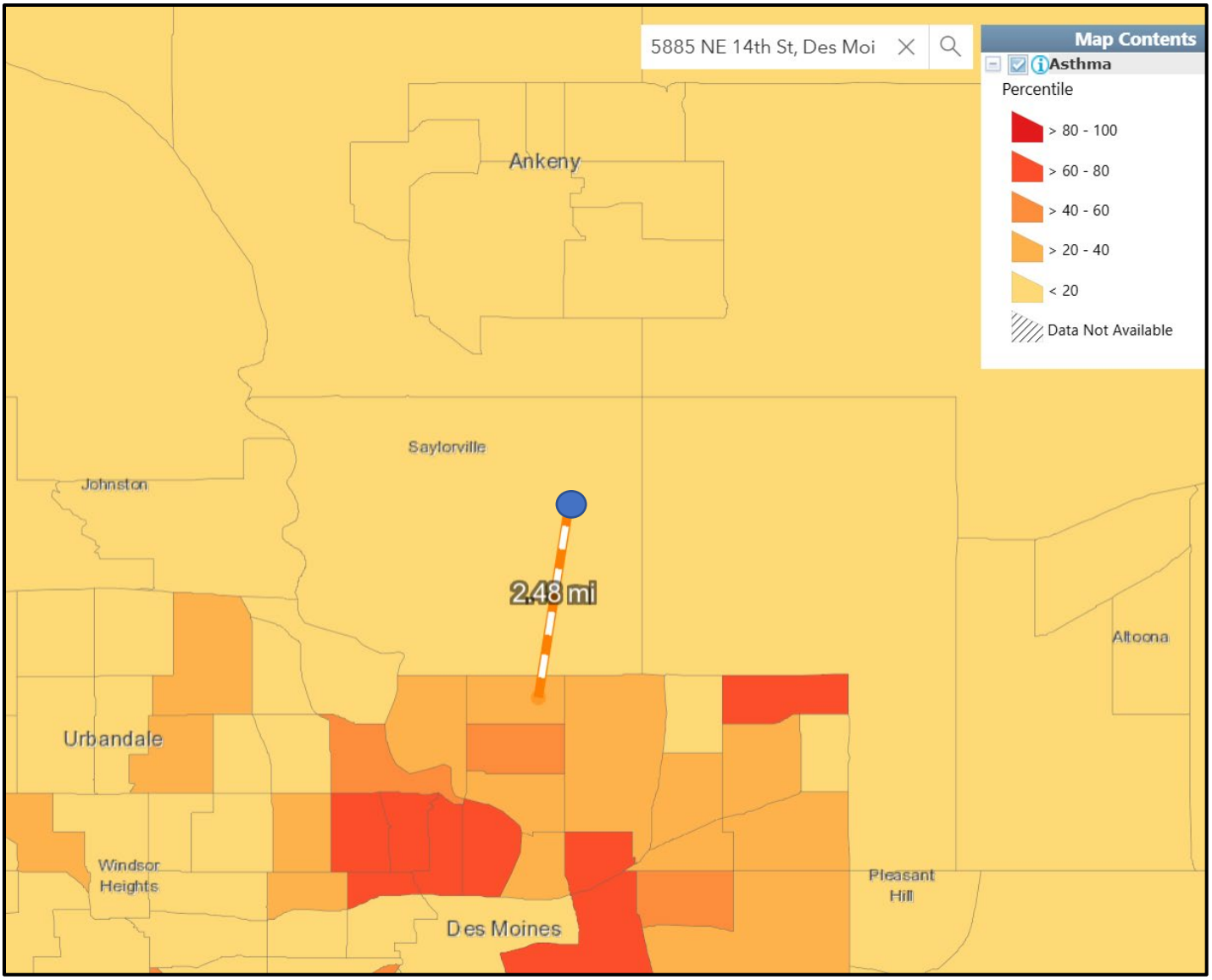
Des Moines, Health Dept. site at 1907 Carpenter

2.49 miles = 4.01 km
In the above image color shading indicates that at the monitor location, the asthma rate is the same in the census tracts on both sides of Martin Luther King Blvd (i.e. the two upper leftmost red census tracts). The color shading in the image in the comment shows different asthma rates for these same two census tracts.



IRA Grant Funded Des Moines, East High School Site

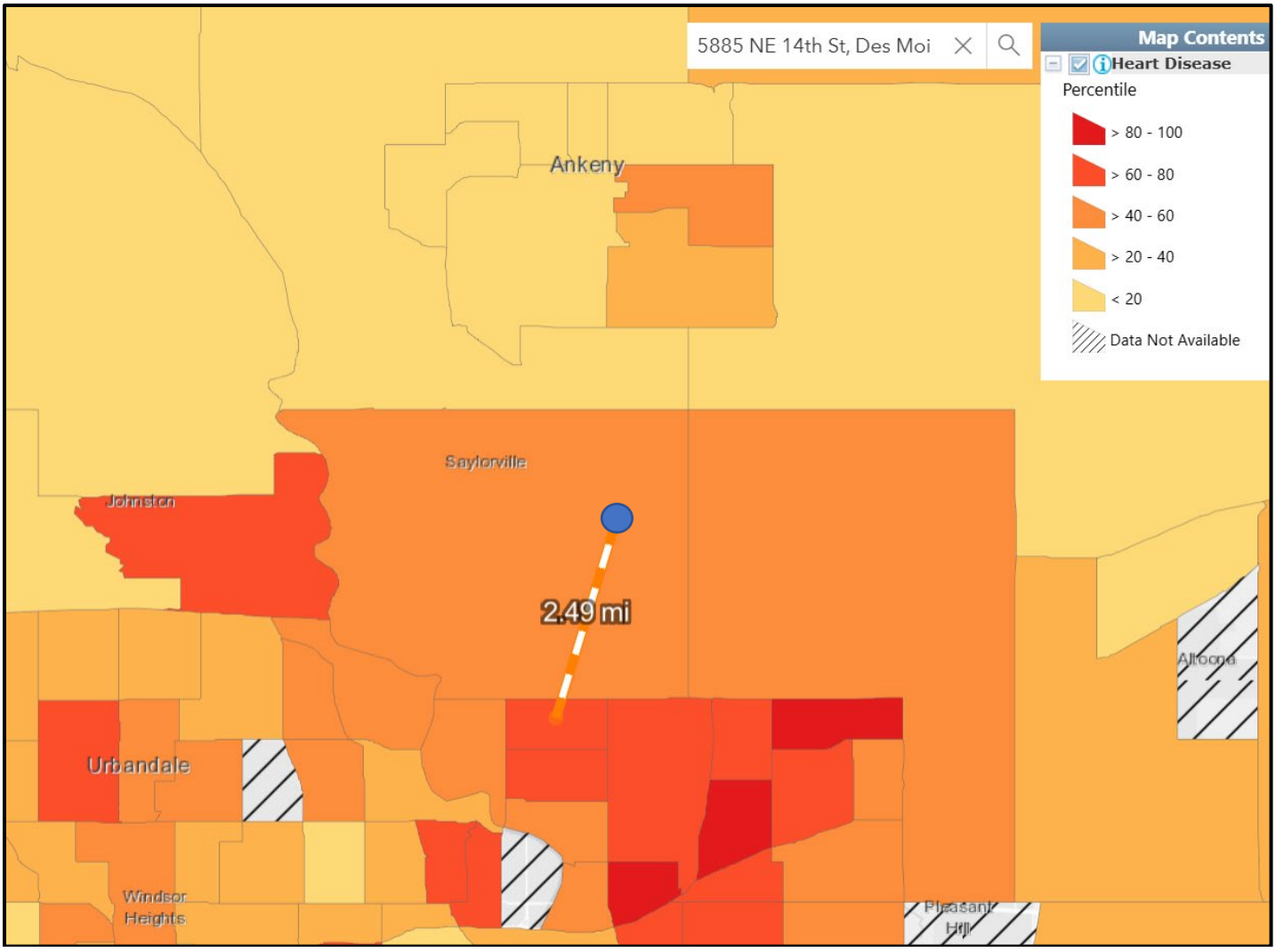
2.48 miles = 3.99 km



Des Moines, Public Works site at 5885 NE 14th Street

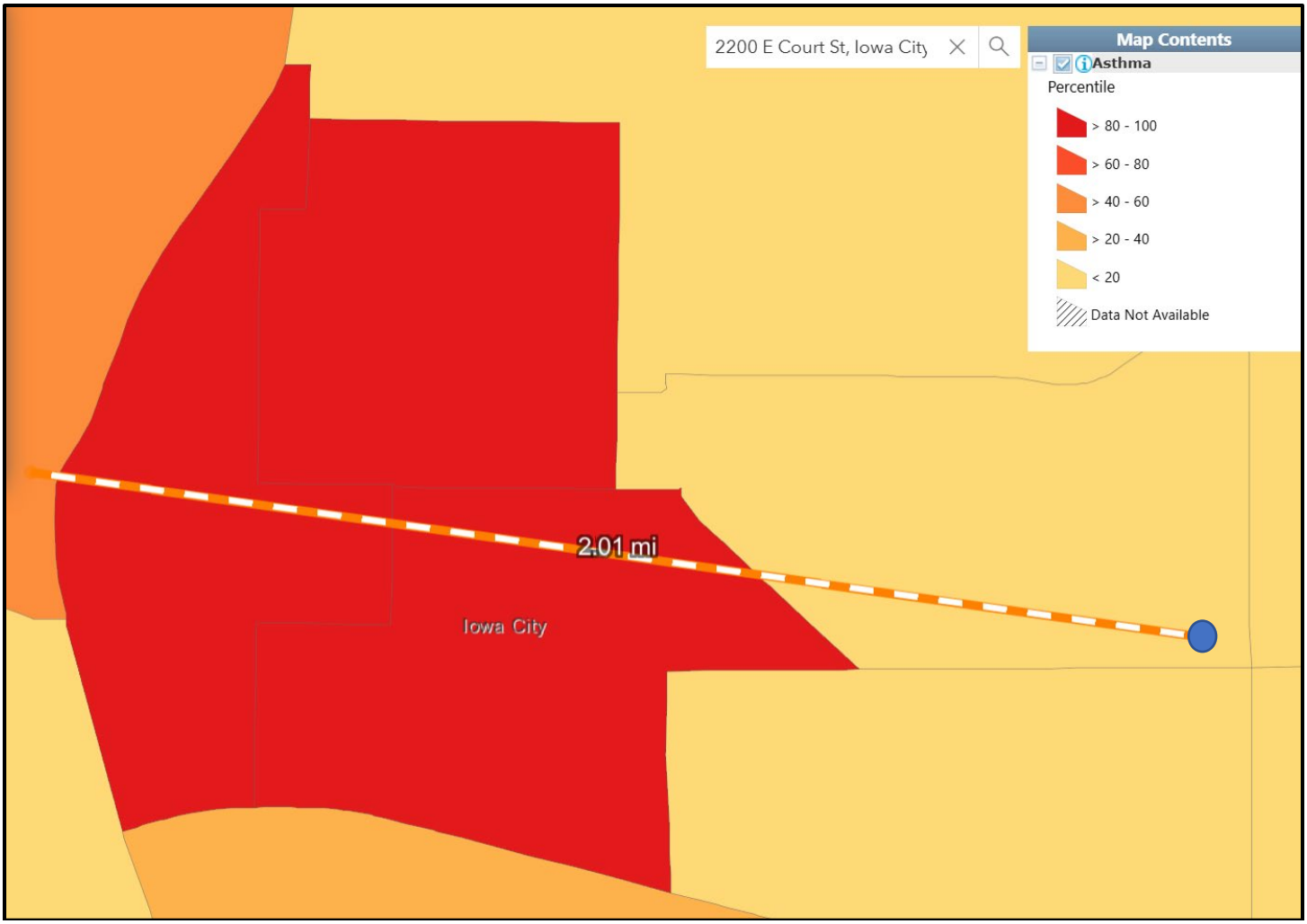
2.48 miles = 3.99 km

Note that while the 4 km scale does not extend into the darkest red areas associated with asthma, the potential for the neighborhood scale to overlap the urban scale (reaching out to 50 km) would certainly cover the deepest red census blocks. Moreover, the lower right dark red area is already covered by the other monitor at the Health Dept. site at 1907 Carpenter. As shown in the second image above, the lower right region with dark red highlight is addressed by a soon to be established site at Des Moines East High School. Prior to deciding to change the status of this monitor from SPM to SLAMs, IDNR established that it's four km neighborhood scale reached into the area South of the "I-35 beltway" (i.e. Tract Number: 19153000400). The next image shows this same monitors location in relation to the heart disease categories identified by the EJ map.



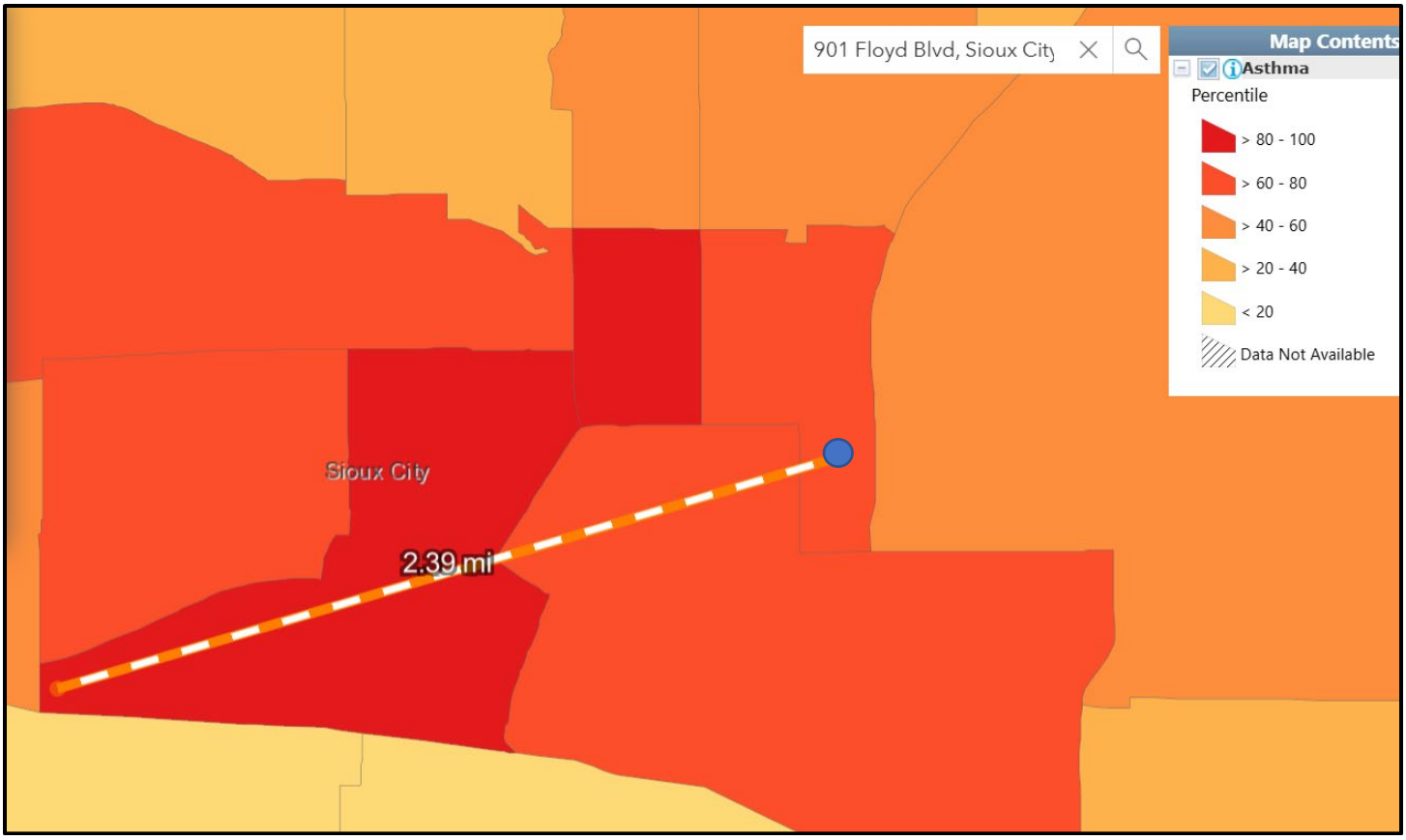
Des Moines, Public Works site at 5885 NE 14th Street (this time in relation to heart disease).

2.49 miles = 4.01 km



Iowa City, Hoover School site at 2200 East Court

2.01 miles = 3.23 km
When the above image is compared to the analogous image in the comment, color shading indicates different asthma rates for the upper right census tract (shown in red above, but orange in the comment).



Sioux City, Irving School site at 901 Floyd Blvd.

2.39 miles = 3.85 km