

AIR QUALITY MONITORING



Common Council Discussion
Jessica Price, PhD and Gregg May
March 17, 2026

What is air quality?

Air quality describes whether the air is clean and healthy to breathe or polluted and harmful.

Air quality is measured by quantifying how much of a pollutant in the air:

- Gasses like ozone and nitrogen dioxide (sometimes invisible)
- Particles like dust, soot, and smoke (visible)

The US Environmental Protection Agency (EPA) sets national limits on six criteria air pollutants:

- Ozone
- Particulate Matter
- Carbon Monoxide
- Lead
- Sulfur Dioxide
- Nitrogen Dioxide

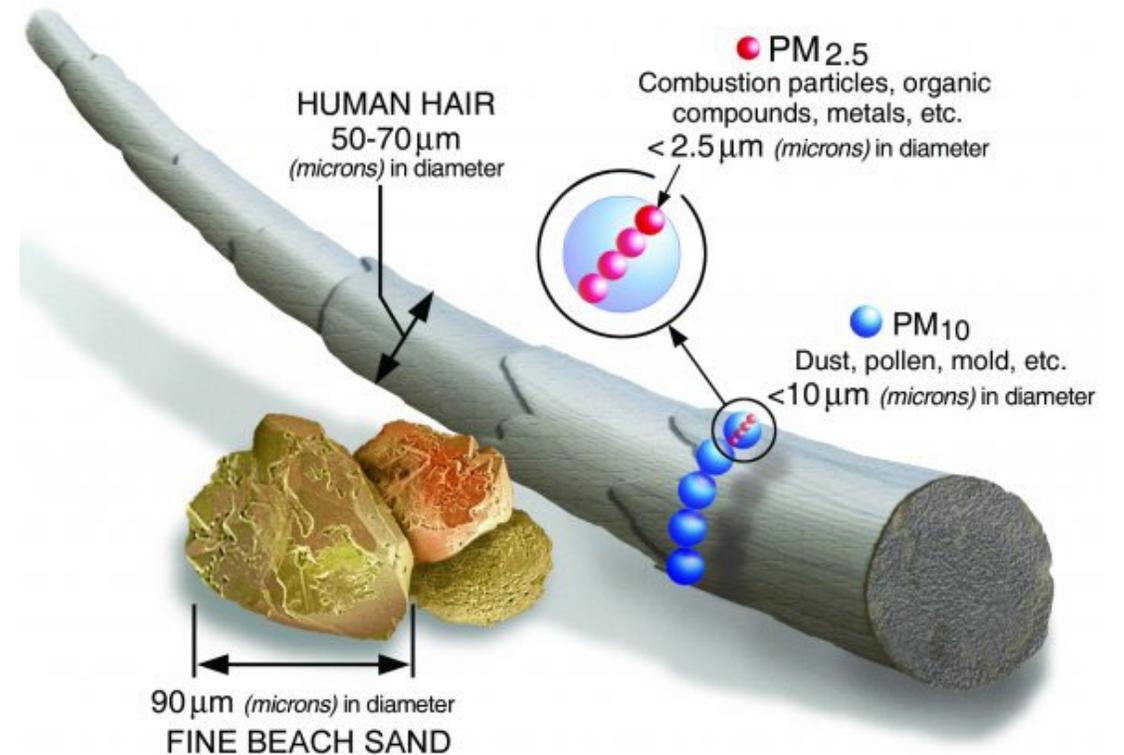


What is Particulate Matter?

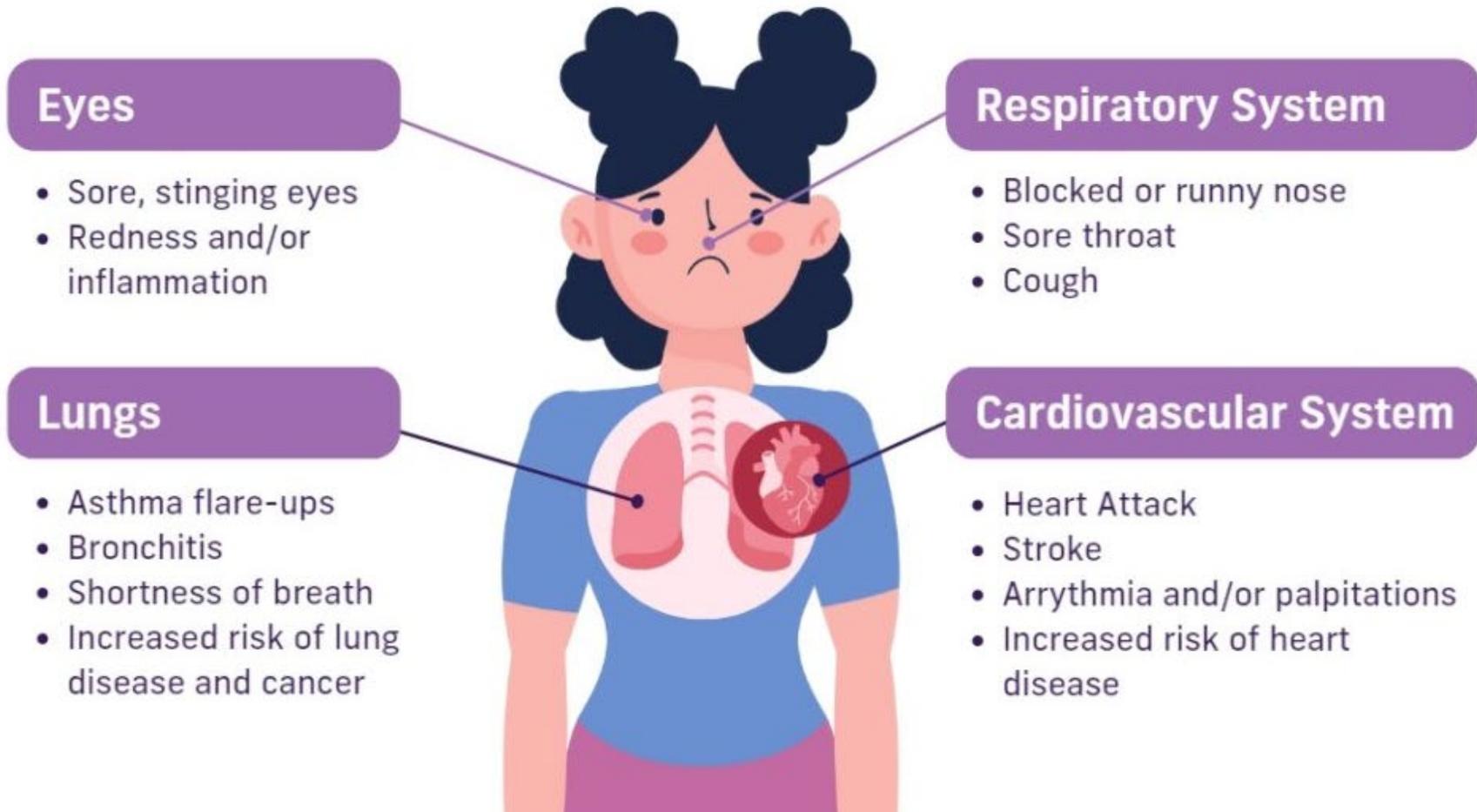
Particulate matter (PM) is tiny pieces of dust, dirt and other materials in the air we breathe.

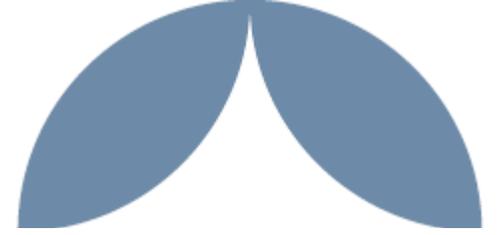
- **PM10** - inhalable particles ~10 micrometers (μm) and smaller
- **PM2.5** - fine **inhalable** particles ~2.5 micrometers and smaller.

These particles are so small that they can enter our lungs and blood stream and affect our health.



Particulate matter is bad for our health!





Where does PM come from?

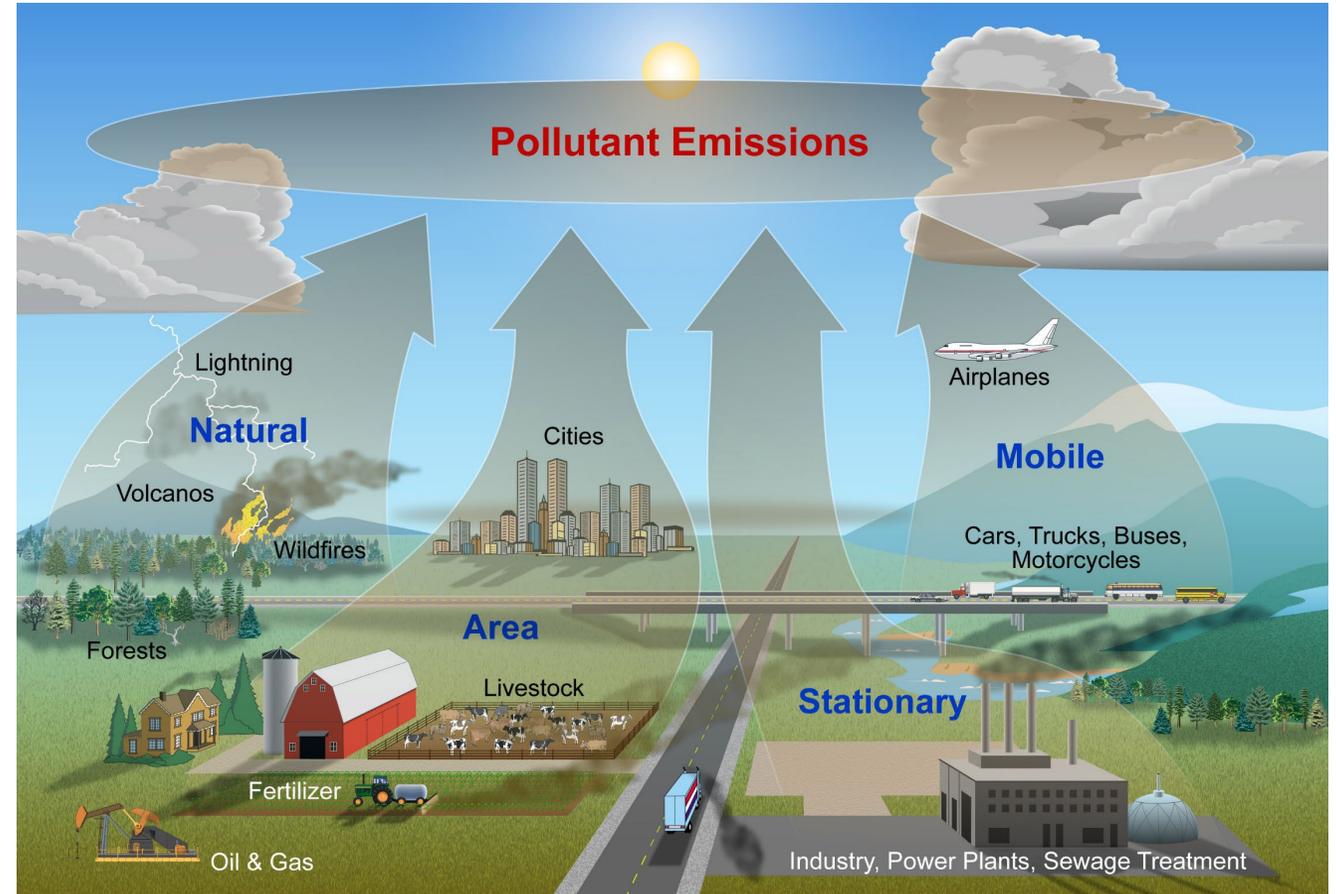
Short answer: Lots of places!

Natural sources

- Dust storms, wildfires, pollen, volcanos

Human-caused sources

- Burning fossil fuels in vehicles power plants and industrial facilities
- Industrial processes like manufacturing and mining
- Construction activities like demolition and excavation
- Agricultural activities like tilling and harvesting crops



Madison's Bad Air Quality Days

Smoke from wildfires in Canada is now impacting air quality Madison each summer.



Air Quality Index

Tells us how clean or polluted the air is.

Visit [AirNow.gov](https://airnow.gov) to see our current AQI.

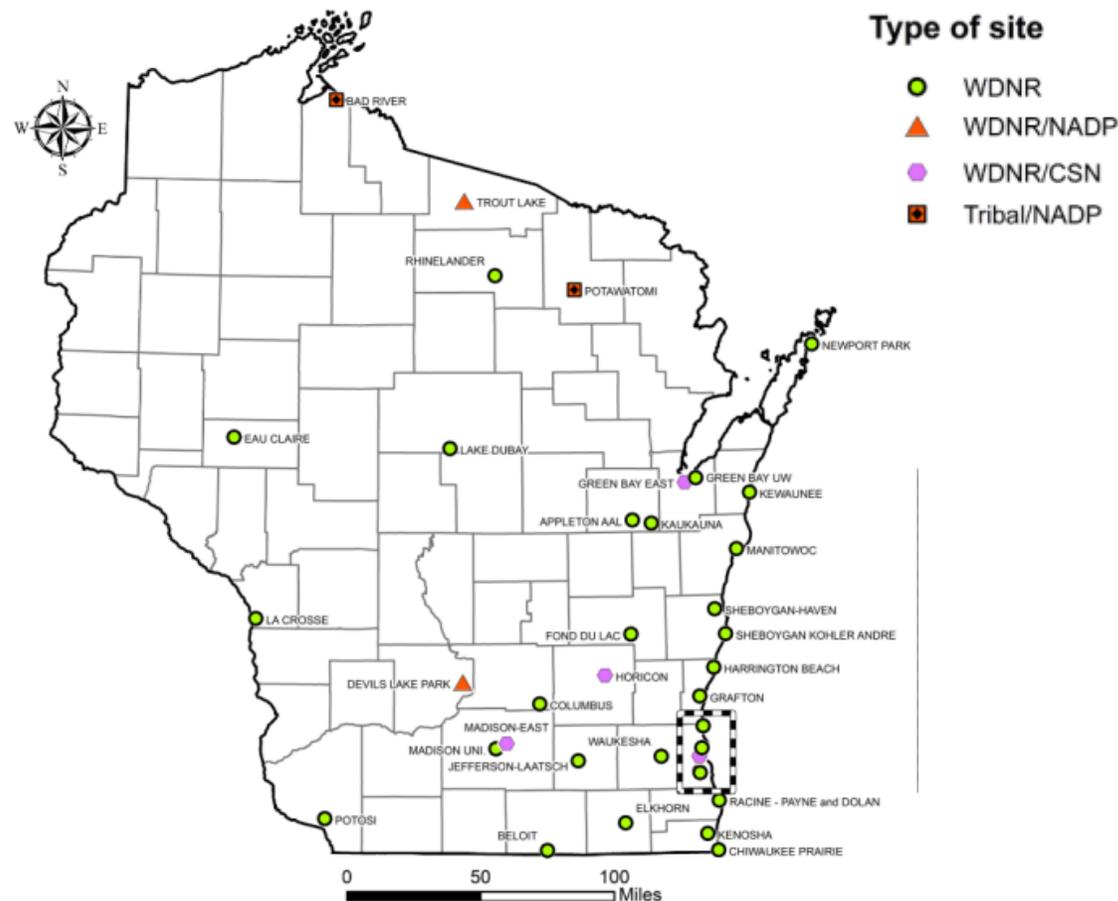




DNR's Sensor Network

The [Wisconsin Department of Natural Resources \(DNR\)](#) is our state's official air regulatory agency.

- 36 regulatory-grade sensors statewide
- Ensures WI meets [National Ambient Air Quality Standards \(NAAQS\)](#)
- Alerts the public when air quality is bad
- Issues permits and monitors industrial operations at emit air pollution
- Collaborates with partners to monitor and improve air quality

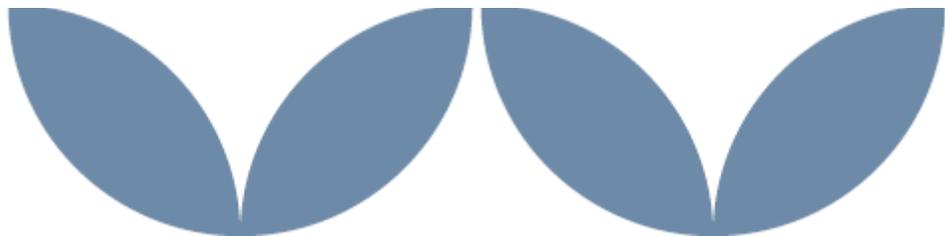


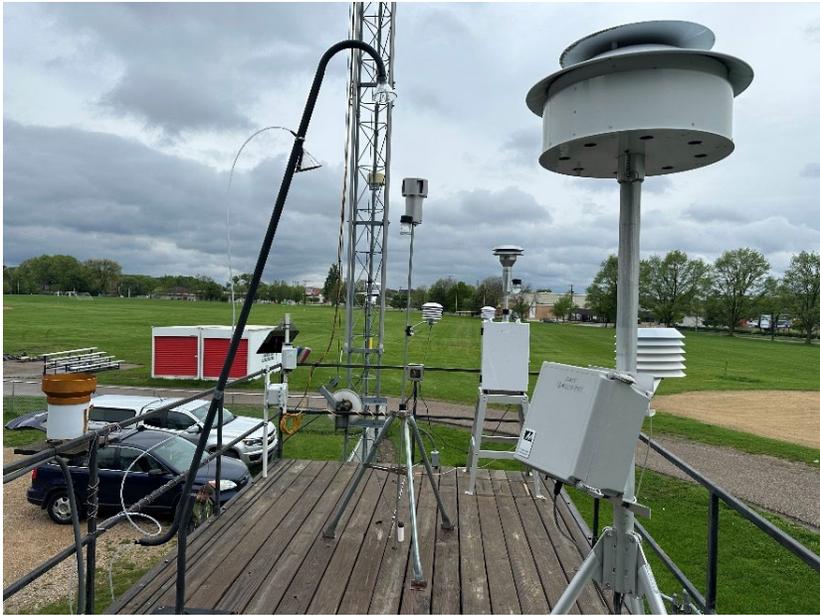
Madison's Sensor Network

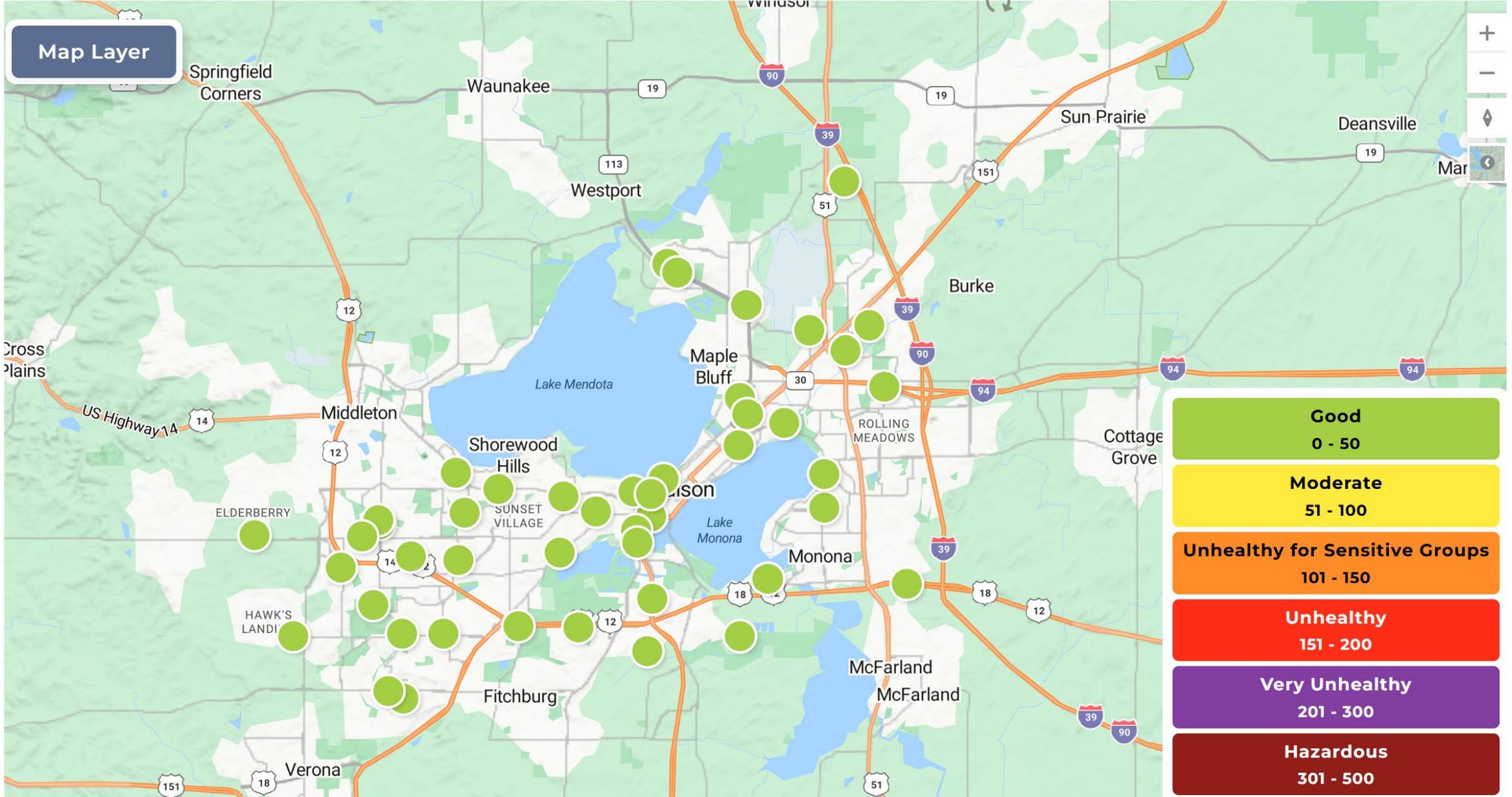
The City has installed a community-wide network of air quality monitors to provide up-to-date and publicly accessible information on PM pollution.

- 65 solar-powered sensors
- Measuring PM1, PM2.5, and PM10
- Data uploaded over the cell network
- Complements and adds to the data we get from the two regulatory sensors

Funded by a grant from the U.S. EPA.









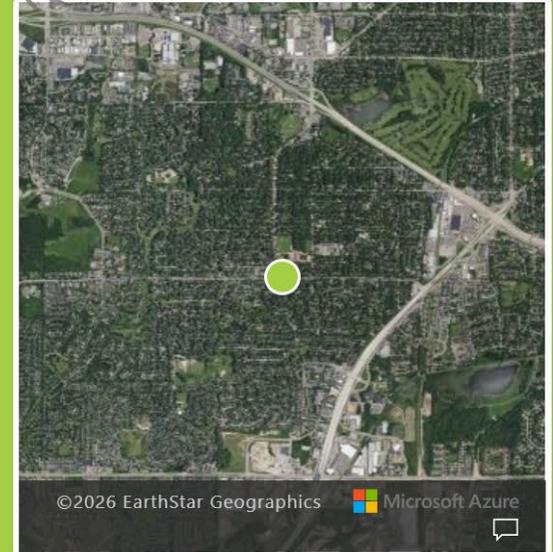
Good



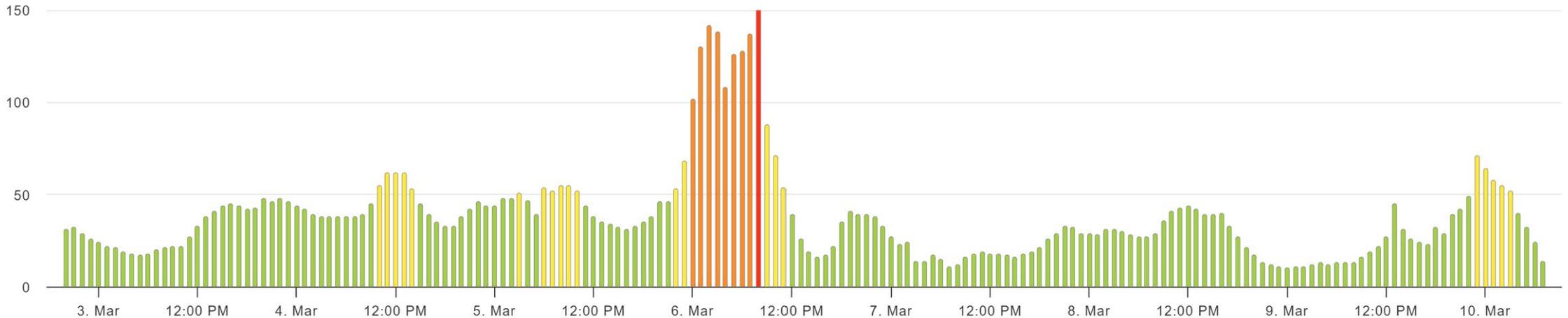
NowCast (3/10/2026, 07:12 AM)

Suggested Action

It's a great day to be active outside.



PM2.5 - Akira Toki Middle School

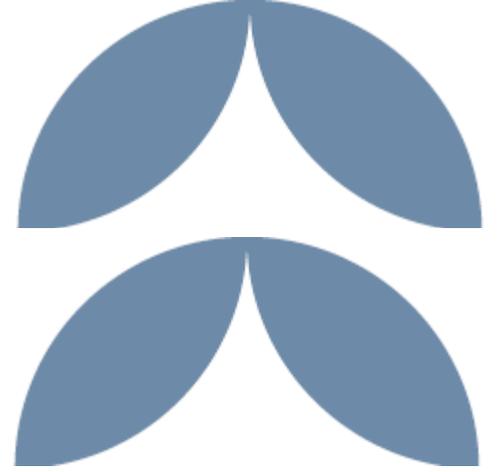


How can we use this network?

- Community health education and resilience building
- Data sharing with regulatory agencies
- Potential to inform decision-making
 - Land Use Planning
 - Transportation Planning
 - Siting green infrastructure
 - Policies to reduce emissions
- Tracking changes over time



Thanks to our partners!



THE FOUNDATION FOR
BLACK WOMEN'S
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 **Public Health**
MADISON & DANE COUNTY



THE HMONING INSTITUTE



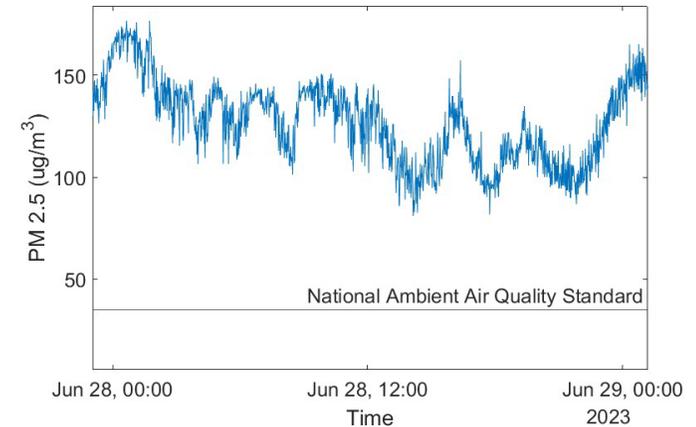
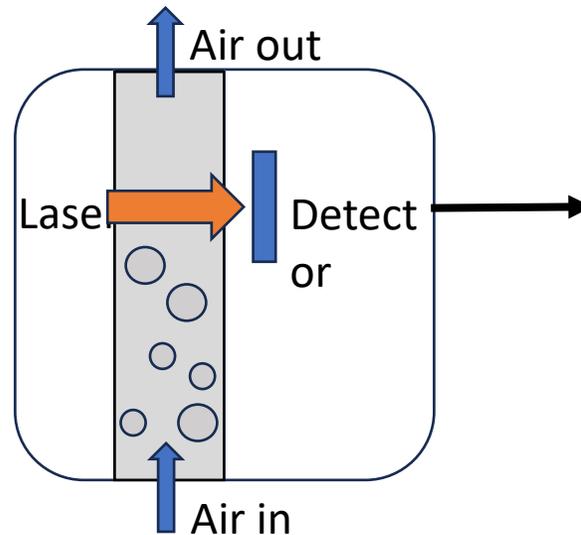
Thank you!

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How do our sensors measure PM?

Particulate matter (PM) concentration in the air is expressed as micrograms per cubic meter of air ($\mu\text{g}/\text{m}^3$).

Measuring is the first step to managing!



How did we decide sensor locations?

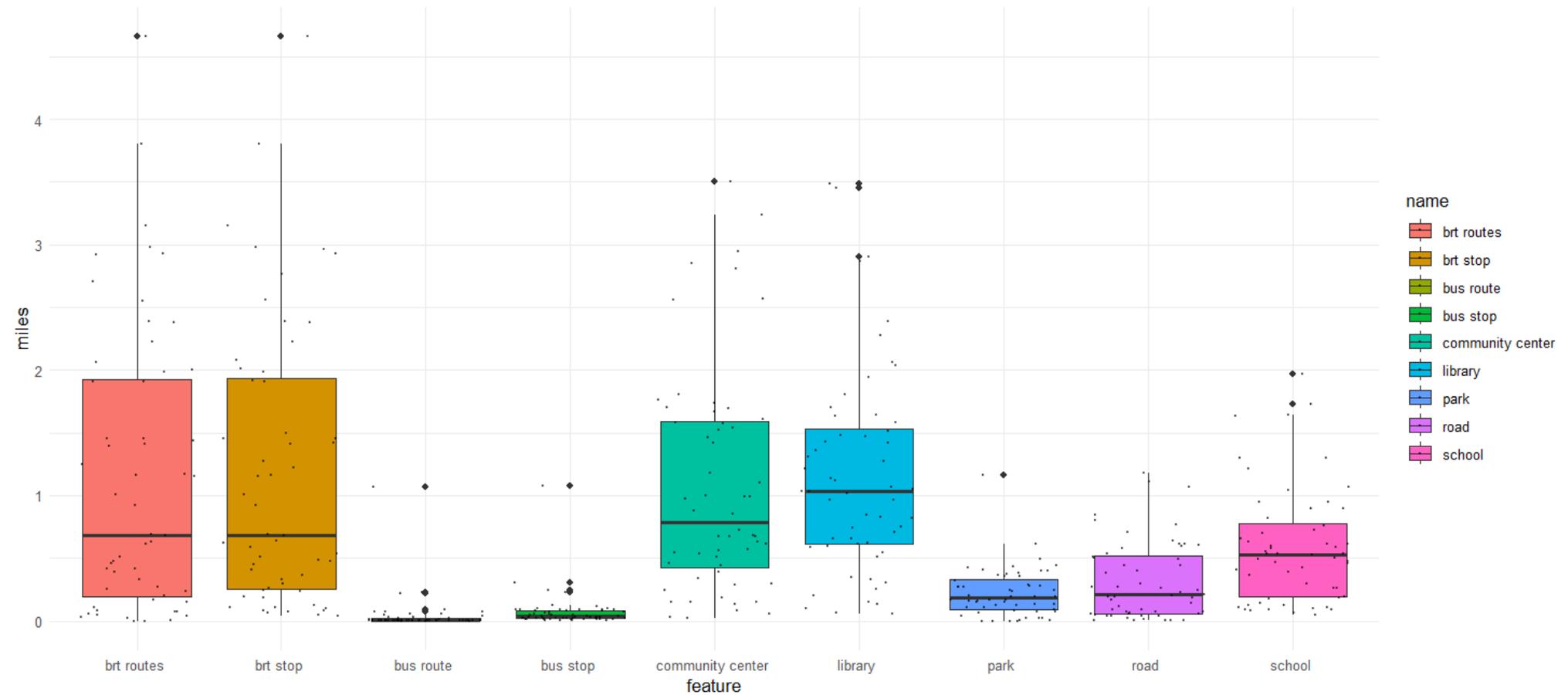
4 Open House events where community members suggested **specific locations and types of locations.**

Used GIS analysis to cross-reference preferences with locations of city-owned light poles.

Used census data to make sure groups weren't being left out.



Nearest Features of Interest



Madison Daily PM2.5 Values 2007-2025

