DETROIT COMMUNITY AIR QUALITY TRAINING

Session 1: Introduction to Air Quality and Monitoring

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Agenda

- Introduction and Icebreaker
- Introduction to Air Quality
- Policy and Clean Air Act
- Introduction to Air Pollutants
- Introduction to Air Monitoring
- Workshop and Q/A
- What's Next?

City of Detroit Enhanced Air Quality Monitoring Program

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Introduction to Green Door Initiative

Our mission is to ensure that everyone is **environmentally literate**, capable of promoting and living out a **sustainable lifestyle** regardless of race, income and zip code.

Air Quality Program Team

Morgan Locke – Program Manager

Justin Littles – Air Quality Technician

Jolani Perez – Engagement and Training Lead

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Introduction to Green Door Initiative

We aim to achieve **environmental and economic justice**, and to ensure that residents and justice involved citizens are empowered and equipped to **live healthy, sustainable lives** fully participating in the **green economy**.

<u>Two Programs</u>

- Workforce Development: environmental career worker training program
- Air Quality Program

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Icebreaker

- What motivated you to come?
- What do you know about air quality in Detroit?
- How did you hear about this training?

What is Air Quality?

Air quality refers to the condition of the air within our environment, influenced by the presence of pollutants and particulate matter, which can significantly affect human health and the ecosystem.

Definition and Importance

- Air quality is a measure of how clean or polluted the air is. According to the World Health Organization (WHO), 99% of the global population breathes air that exceeds their guideline limits for air pollution.[1]
- Good air quality means clear air with minimal pollutants, while poor air quality is often characterized by high levels of harmful substances.

[1]World Health Organization. "Air Pollution." *World Health Organization*, 2024, www.who.int/health-topics/air-pollution#tab=tab_1.

Air Quality Monitoring Part 1b: Looking at Air Quality in Detroit

Presented by: Community Action to Promote Healthy Environments (CAPHE)

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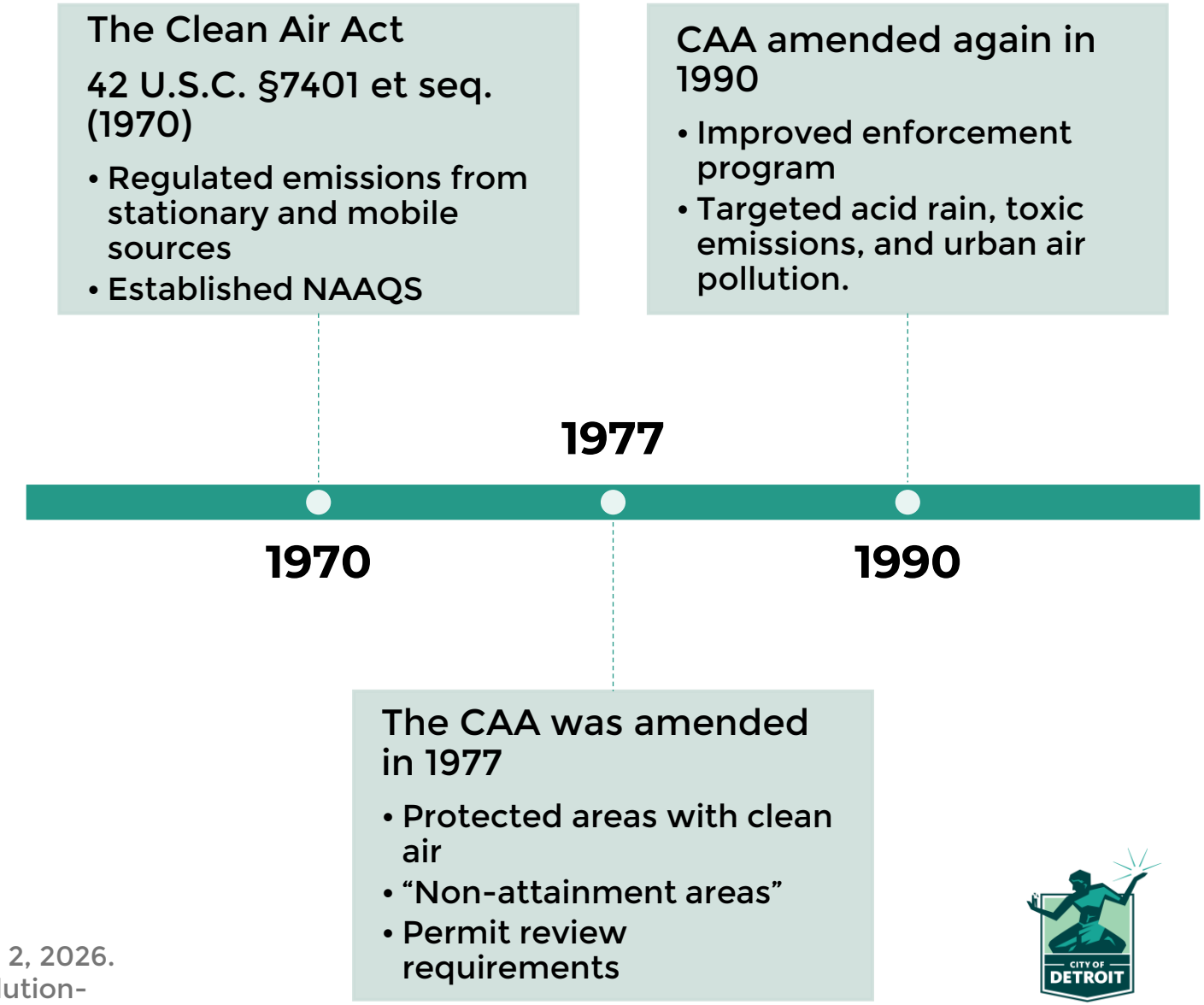
Clean Air Act of 1970

- The Clean Air Act (CAA) was passed in 1970
- Dense visible smog in US cities propelled the newly created EPA to pass legislation to control and prevent air pollution.
- Introduced National Ambient Air Quality Standards (NAAQS).



"Evolution of the Clean Air Act." EPA. Accessed March 2, 2026. https://www.epa.gov/clean-air-act-overview/evolution-clean-air-act.

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Criteria Pollutants Regulated by the EPA

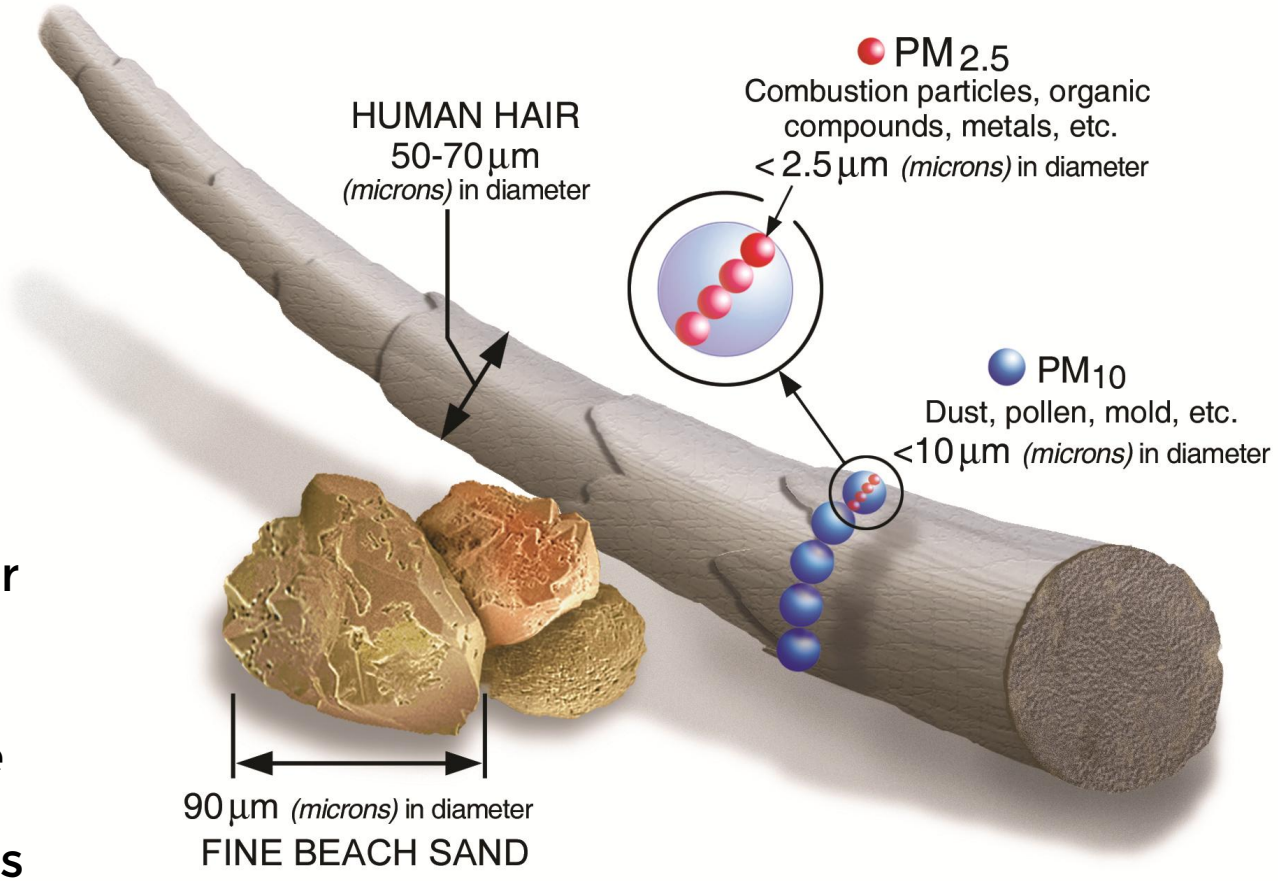
- Particulate matter (PM2.5 and PM10)
- Ground Level Ozone (Smog)
- Nitrogen Dioxide (NO2)
- Sulfur Dioxide (SO2)
- Lead
- Carbon Monoxide

Particulate Matter (PM)

Particulate matter (PM) refers to a **mixture of solid particles and liquid droplets in the air**, which can have **significant health and environmental impacts**

These particles vary in size, composition and origin and are classified based on their aerodynamic diameter

- PM10: Coarse particles with a diameter of 10 micrometers or less
- PM2.5: Fine particles with a diameter of 2.5 micrometers or less, which pose the greater health risks due to their ability to penetrate deep into the lungs and enter the bloodstream



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Particulate Matter (PM2.5 and PM10)

Status: Recommended Nonattainment (PM2.5 2024)

Sources:

- **Natural Sources**: Dust storms, wildfires, and volcanic eruptions
- **Anthropogenic (e.g. human-made) Sources**: Emissions from vehicles, industrial processes, construction activities, combustion of fossil fuels, and agricultural practices.

Effects:

Aggravated asthma, heart attacks, decreased lung function, and premature death in people with heart or lung disease.

"Michigan AQD PM2.5 Designation Recommendation." EGLE. https://www.michigan.gov/egle/about/organization/air-quality/state-implementation-plan

Ground Level Ozone (Smog)

Ozone formed when NO_x + VOCs mix in sunlight.

Status: Moderate Nonattainment

<u>Sources of precursors:</u>

- Vehicle exhaust
- Industrial chemical emissions
- Gasoline vapors, solvents

<u>Effects:</u>

- Lung irritation
- Triggers asthma attacks
- Reduces lung function—especially during hot summer days.

Nitrogen Dioxide (NO2) and Sulfur Dioxide (SO2)

Nitrogen Dioxide

Status: Attainment

Sources:

- Cars and heavy-duty trucks
- Industrial boilers, power generation
- Diesel locomotives and ships

Effects:

- Contributes to ozone and particulate pollution
- Causes respiratory inflammation

Sulfur Dioxide

Status: Partial Nonattainment

Sources:

- Power plants
- Steel and metal processing
- Petroleum refining

Effects:

- Severely irritates airways and aggravates asthma
- Contributes to acid rain and PM formation.

Carbon Monoxide and Lead (Pb)

Carbon Monoxide

Status: Attainment

Sources:

- Vehicles
- Gasoline-powered equipment or appliances
- Gas and wood stoves
- Unvented kerosene or gas heaters
- Leaky furnace or chimney

Effects:

- Reduces oxygen delivery in the body; especially dangerous for people with pre-existing heart and lung conditions

Lead

Status: Attainment

Sources:

- Lead smelters
- Ore and metals processing
- Leaded aviation fuel
- Waste incinerators
- Battery manufacturers

Effects:

- Behavior and learning problems
- Increased blood pressure
- Reproductive problems (in both men and women)

Air Quality Monitors

Air quality monitors are devices that measure pollutants in the air to help people understand the quality of the air.

- Monitors are designed to detect specific pollutants, for instance PM2.5 and PM10, as well as other pollutants.
- Data collected from monitors helps scientists, governments, and communities:
  - **Track pollution levels**
  - **Identify pollution sources**
  - **Respond to potential health risks**
- Poor air quality is linked to serious health issues. By providing real-time data, air quality monitors allow individuals, communities, and health professionals to make informed decisions.

City of Detroit's Air Monitors

Teledyne T640x

Real-time, continuous particulate matter (PM) mass monitor that measures PM 2.5, 10, and coarse PM in the ambient air. These monitors are highly accurate (regulatory grade).

Teledyne T640x

City of Detroit's Air Monitors

TSP Sampler

A total suspended particulate (TSP) sampler is used for the collection of **particulate matter** in ambient air with no preference to size. Particulate filter is then sent to lab to test for metals.

Clarity

Low-cost, solar-powered monitors that measure **PM2.5, and NO2** and are placed in areas where the city needs localized air quality readings.

TSP Sampler

Clarity Monitor

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Air Quality Index (AQI)

Air quality index (AQI) estimates current levels of local air pollution.

- As air pollution levels rise, so does the AQI, along with the associated public health risks.
- The AQI tracks and ranks air pollution levels from 0 to 500, with higher numbers indicating more harmful air.
- Criteria pollutants used to calculate AQI (except Lead)

Name	Index Value	Advisory
Good	0 to 50	None
Moderate	51 to 100	Usually sensitive individuals should consider limiting prolonged outdoor exertion.
Unhealthy for Sensitive Groups	101 to 150	Children, active adults, and people with respiratory disease, such as asthma, should limit prolonged outdoor exertion.
Unhealthy	151 to 200	Children, active adults, and people with respiratory disease, such as asthma, should avoid outdoor exertion; everyone else should limit prolonged outdoor exertion.
Very Unhealthy	201 to 300	Children, active adults, and people with respiratory disease, such as asthma, should avoid outdoor exertion; everyone else should limit outdoor exertion.
Hazardous	301 to 500	Everyone should avoid all physical activity outdoors.

Tools You Can Use

EPA AirNow

- Airnow.gov

JustAir

- justair.app

Weather app

PurpleAir and Clarity mobile dashboards

Detroit Air Quality Website

- Detroitmi.gov/AirQuality
- Air Quality Resources
- Dashboard

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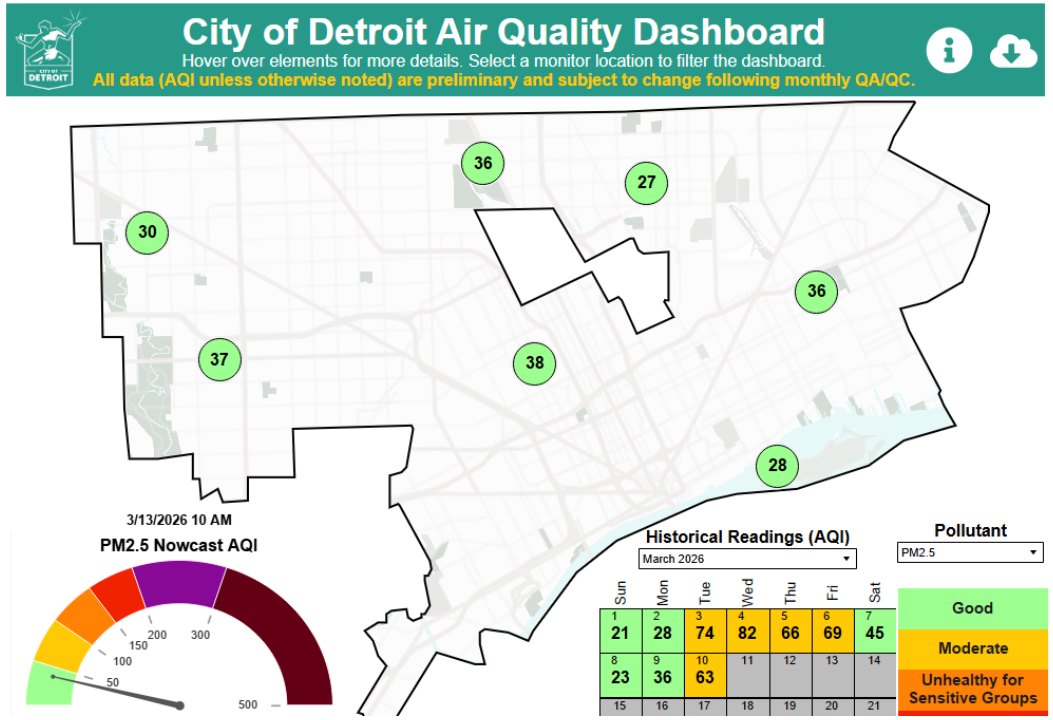
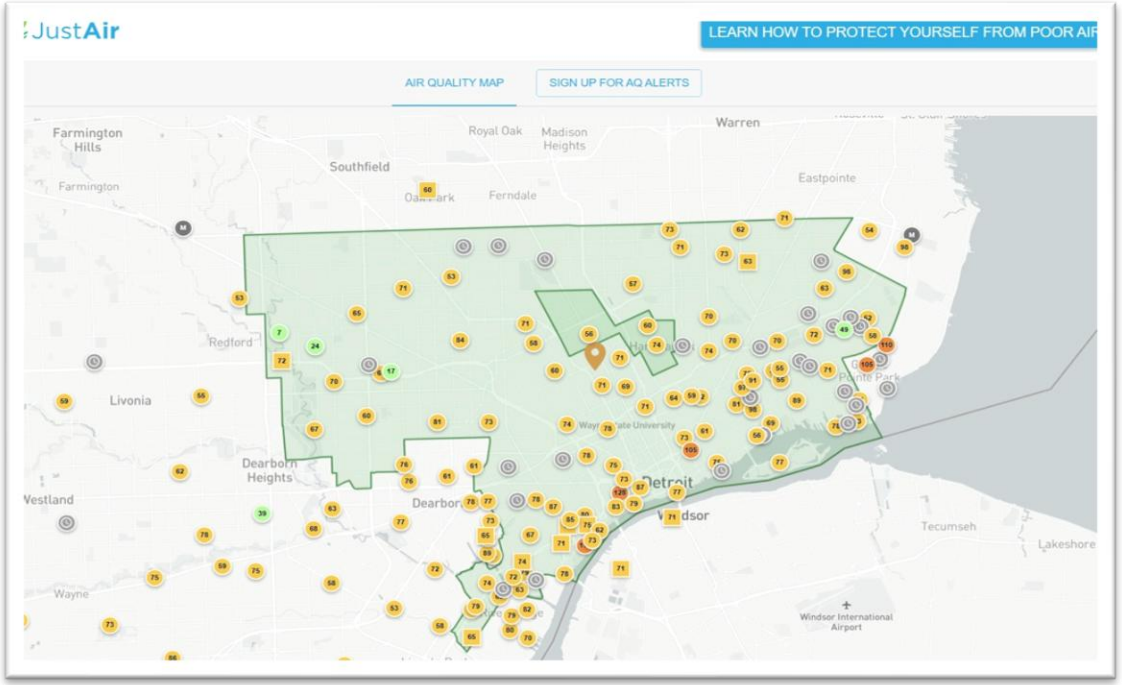
Air Quality Dashboards

Detroit Air Quality Dashboard

JustAir Dashboard





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Report Fugitive Dust

Call: 313-628-9994

Email: Dust@detroitmi.gov

Improve Detroit

https://detroitmi.gov/webapp/improve-detroit-report-issue-online

What to include in Complaint/Report

Most helpful to include:

- Photos and/or videos
- Location, cross streets or address
- Date and time of observation
- Typical date/time when BSEED could observe firsthand ongoing issue
- Description of complaint(s)

"Complaints help inform inspectors to substantiate the report"

Workshop

How does air quality affect you on a day-to-day basis?

For example:

- Children's health
- Medical issues
- Does the air affect your ability to breathe outside in your community?

What did you learn today or find most interesting?

What will you take away or put into practice?

What questions did you have on this first training?

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What's Next

Training 2 (June)- Learn about various sources and types of air pollution, and health effects. Introduce methods and monitors used to measure air pollution levels and existing notification and interactive tools.

Training 3 (September)- Learn about organizing for change strategies, how to advocate for healthy air in your community and develop skills for participating in public hearings and making public comments.

Training 4 (November)- Targeted information to engage local officials and support policies for clean air.

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THANK YOU

Questions, comments or looking to connect?

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