

What We Know

Air pollution is a mixture of hazardous substances from human-made and natural sources. Air pollution can be split into two classifications: indoor air pollution and outdoor air pollution, also called ambient air pollution.¹

Air pollution affects both air quality and human health. **The World Health Organization (WHO)** identifies air pollution as one of the greatest environmental risks to human health. Current research indicates that poor air quality can result in adverse health effects, particularly cardiovascular and respiratory diseases including asthma. WHO calculates that the effects of air pollutions are associated with an average of 6.7 million premature deaths annually.^{1, 2}

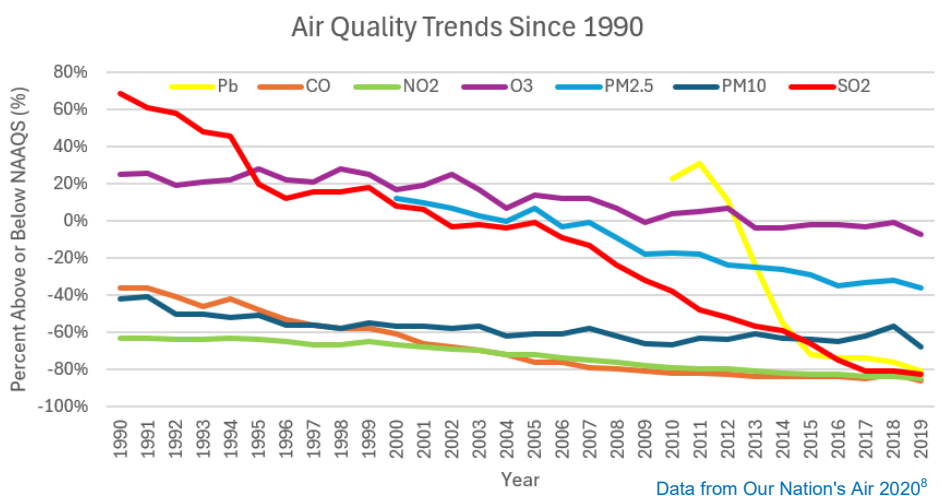
Air quality is monitored by many agencies globally. In the United States (U.S.), air quality standards are set by the **U.S. Environmental Protection Agency (EPA)**. Official readings use a combination of tools to determine accurate Air Quality Index (AQI) by looking at the amount of pollution or tiny particles suspended in the air. The most commonly studied and regulated types of air pollution are ozone (O₃), particulate matter (PM_{2.5} & PM₁₀), nitrogen dioxide (NO₂), sulfur dioxide (SO₂), carbon monoxide (CO), and lead (Pb).^{3, 4, 5}

The AQI is the scale on which air quality is reported. There are six levels:⁶

- 0-50: Good
- 51-100: Moderate
- 101-150: Unhealthy for Sensitive Groups
- 151-200: Unhealthy
- 201-300: Very Unhealthy
- 301 and Above: Hazardous

Leading Types of Air Pollution

Air quality refers to the amount of pollution or tiny particles suspended in the air. **Air pollution** refers to the contaminants present. These contaminants can be gas and solid particles. There are six commonly studied types of air pollution, referred to as **criteria pollutants**. The EPA established criteria pollutants through the **Clean Air Act (CAA)**. The CAA requires EPA to set **National Ambient Air Quality Standards (NAAQS)** for specific pollutants based on scientific evidence to protect against the adverse impacts of air pollution. These pollutants are.^{7, 8}



Ozone (O₃): Tropospheric ozone, more commonly called ground-level ozone, is one of the major contributors of smog. It is formed when sunlight triggers a reaction between **nitrogen oxides (NO_x)** and **volatile organic compounds (VOCs)** released from vehicle exhaust, gasoline vapors, or solvents.^{2, 8, 9}

Particulate Matter (PM_{2.5} & PM₁₀): There are two main categories of PM: PM₁₀ and PM_{2.5}. PM₁₀ are particles with a diameter of less than 10 µm but greater than 2.5 µm; smaller than a grain of sand. PM_{2.5} are particles with a diameter of less than 2.5 µm, a fraction of the width of a human hair. These particles can be generated by dust storms, smoke, fossil fuel combustion, fertilizer use, and gas to particle conversion.^{2, 8, 9}

Nitrogen Dioxide (NO₂): This reactive gas comes from various sources, including vehicle exhaust (cars, buses, planes, and boats), and the burning of fuels like coal and charcoal. It can sometimes give cities a hazy brown cast.^{2, 8, 9}

Sulfur Dioxide (SO₂): This gas forms during the burning of fossil fuels like coal and oil, or during industrial processes.^{2, 8, 9}

Carbon Monoxide (CO): This is a toxic gas that has no color and smell. It is produced when carbon in fuels are not burned completely, called incomplete combustion, such as in vehicle exhaust, gas appliances in the home, or woodburning.^{2, 8, 9, 10}

Lead (Pb): Tiny lead particles can become suspended in the air from various industrial activities, including ore processing, lead smelters, and even some aircrafts using leaded aviation fuel.^{2, 8, 11}

How Air Pollutants Can Affect Your Health

Ozone (O₃): Ground-level ozone harms your lungs, making it harder to breathe and can cause coughing or shortness of breath. It is especially harmful for people with asthma or lung diseases, leading to increased medication use, hospital visits, and emergency room trips. Long-term exposure may increase the risk of death from respiratory problems.^{2,9}

Particulate Matter (PM_{2.5} & PM₁₀): Particle size is directly related to the potential to cause adverse respiratory problems. Larger PM₁₀ particles impact the upper respiratory tract. PM₁₀ can sometimes be dislodged by coughing, yet due to its tiny size, PM_{2.5} can bypass the body's natural defenses, travel deep into the lungs, and enter the bloodstream. This poses a significant health risk as exposure to PM_{2.5} has been linked to a variety of health problems, including heart attacks, strokes, and respiratory issues like asthma attacks. It can also worsen existing lung conditions and contribute to premature death.^{2,8,9}

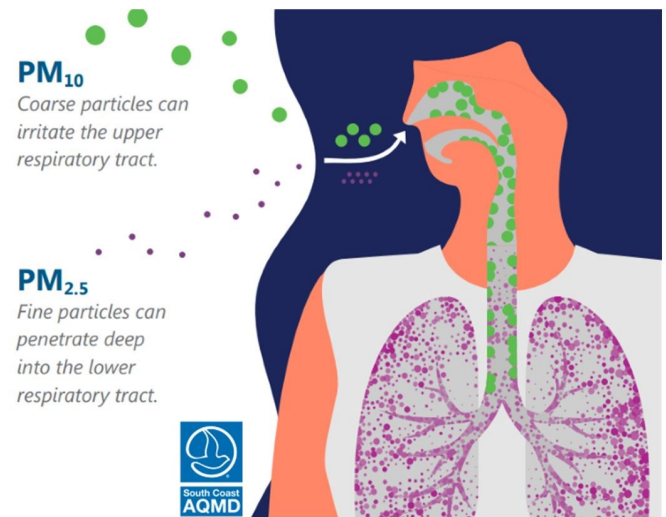
Nitrogen Dioxide (NO₂): NO₂ exposure can irritate the lungs, making it harder to breathe. This is especially true for people with asthma, who may experience more frequent symptoms, hospital visits, and emergency room trips due to NO₂ exposure. Long-term exposure to NO₂ might even contribute to developing asthma and make you more susceptible to respiratory infections.^{2,8}

Sulfur Dioxide (SO₂): SO₂ irritates the lungs, making breathing difficult, especially for people with asthma. Children, older adults, and asthmatics are more susceptible to these effects, which can lead to more frequent hospital visits.^{2,8,9}

Carbon Monoxide (CO): Breathing elevated levels of CO disrupts the body's ability to take oxygen to the organs through the bloods since CO binds to hemoglobin at a higher rate than oxygen. This can cause flu-like symptoms, confusion, seizures, and even death. High exposure can lead to long lasting brain and heart damage.^{2,8,9}

Lead (Pb): Lead exposure, even in small amounts can be harmful, affecting brain and nervous system development in children resulting in lower IQs, learning deficits and behavioral problems. Lead can cause various health problems in adults, including heart disease, high blood pressure, and kidney damage.^{2,8,11}

Overall, air quality affects everyone's health. Long-term exposure to poor air quality may not have an immediate effect, but it can impact a person's quality of life overtime. The primary health concerns of poor air quality are cardiovascular and respiratory complications, though many systems are affected.^{1,9}



Primary Health Concerns

Cardiovascular

Increased risk of overall heart disease, increased blood pressure, and increased risk of coronary artery diseases.^{12, 13}



Heart Disease

Increased risk of heart attack, stroke, and heart failure events, leading to the increase of death caused by cardiovascular diseases.^{12, 13}



Respiratory

Increased risk of asthma, chronic bronchitis, chronic obstructive pulmonary disease (COPD), and Emphysema.^{12, 14, 15}



Asthma

Indoor and outdoor air pollution are major public health threats that can cause and worsen existing asthma.^{12, 14, 15}



Other Health Concerns

Cancer

Leading risk of lung cancer, increased risk of breast cancer in women, exposures to hazardous chemicals like benzene found in gasoline can cause leukemia and is associated with non-Hodgkin Lymphoma.¹²



Neurological

Lead exposure, even in small amounts can be harmful, affecting brain and nervous system development in children resulting in lower IQs, learning deficits and behavioral problems.^{11, 12}



Reproductive

Traffic related air pollution exposure can cause hypertensive disorder among pregnant woman; Hypertensive disorder increases a pregnant woman's risk for dangerous changes in blood pressure.^{1, 12}



Diabetes

Air pollution can increase the risk of developing type II diabetes, especially in individuals already at risk due to factors like obesity or family history.^{1, 13}

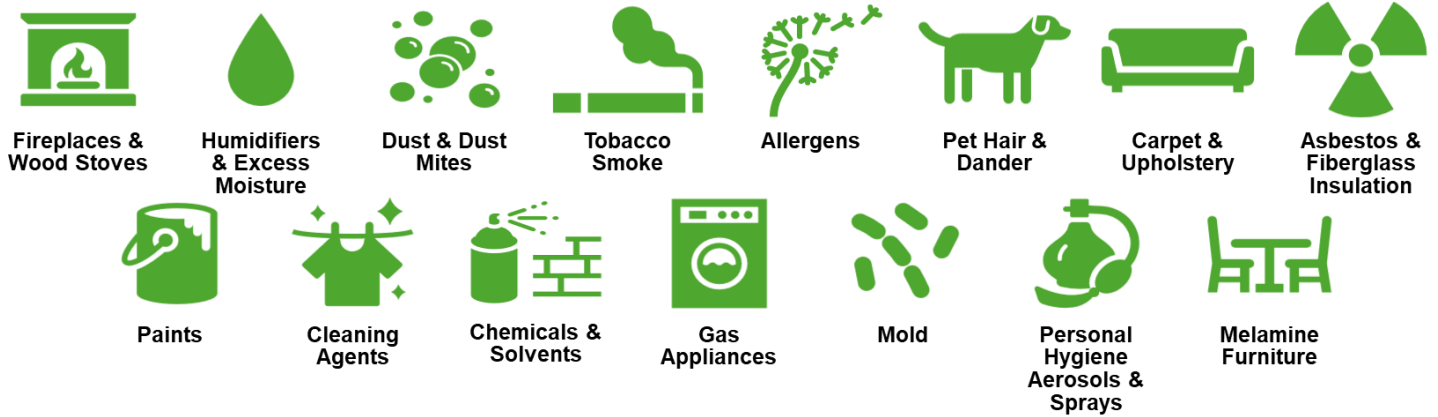


What Causes Air Pollution

Indoor Air Pollution

Indoor air pollution is defined as the existence of pollutants at high concentrations inside of buildings. It is caused by sources that release gases or particles into air, and is affected by poor ventilation and filtration and can lead to an increase in the build up of pollutant levels.^{9,16, 17}

Sources of indoor air pollution include:^{16, 17}



Outdoor Air Pollution

Outdoor air pollution is the presence of pollutants in the air outside buildings from ground level to several miles above the earth's surface. It is also called ambient air pollution, and both human-made and naturally occurring sources cause it. Outdoor air pollution is affected by human activities such as industrial emissions, vehicle emissions, agricultural practices, and deforestation; natural factors like wildfires, dust storms, and volcanic eruptions; and meteorological events such as atmospheric conditions, wind patterns, and sunlight.^{1, 9, 18, 19}

Sources of outdoor air pollution include:^{1, 9, 18, 19}



How to Improve Your Air Quality

You can take steps to improve your air quality both indoors and outdoors using these basic strategies:

Reduce

Source Control

The most effective way to improve air quality is to eliminate pollution sources or to reduce their emissions. There are many ways to reduce sources of both indoor and outdoor air pollution. These can include:

- ◇ Avoid burning from combustion appliances, tobacco products, candles, fireplaces, and grills.
- ◇ Remove or seal dangerous pollutants from building materials such as deteriorated asbestos-containing insulation, lead paint, or off-gassing from new products, such as newly installed flooring, upholstery or carpet, cabinetry, or furniture made of certain pressed wood products.
- ◇ Switch from gas to electric appliances and tools whenever possible.
- ◇ Use environmentally safe products when possible. Products for household cleaning and maintenance, personal care, or hobbies could contain harmful chemicals such as VOCs that can become suspended in the air when used.

Some sources, such as building materials, furnishings, and products like air fresheners, can release pollutants continuously. Other sources related to smoking, cleaning, redecorating, or using gas powered appliances and tools release pollutants intermittently. Pollutant concentrations can remain in the air for long periods after some activities.¹⁷

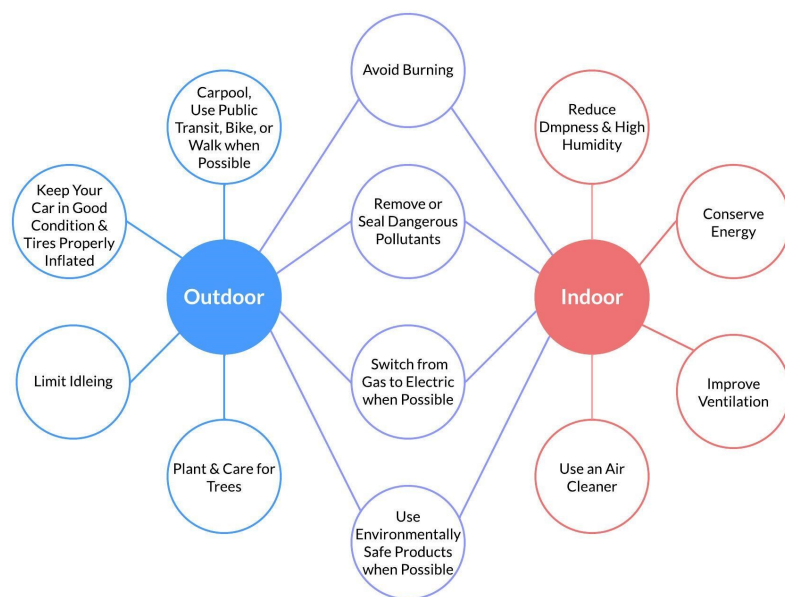
Excess Moisture

Dampness and moisture indoors can lead to mold and poorer respiratory symptoms. Central heating and cooling systems and dehumidification devices can help remove water from the air reducing humidity levels indoors. Using a dehumidifier, turning on a fan or opening a window when showering or cooking can also help eliminate airborne water. Try to eliminate areas of pooling water or moisture in your home.^{17, 20}

Remove

Ventilation Improvements

Since many activities can create air pollution, areas with a buildup of pollutants require proper ventilation. Pollutants can accumulate to levels that can cause health problems when there is little to no ventilation, mostly occurring indoors due to a lack of airflow. However, it is important that buildings have a way to release air pollution so it is not built up. Outdoor air enters and leaves a house through natural ventilation and mechanical ventilation. **Natural ventilation** is when air also flows into the house through openings, joints, cracks in walls, floors, ceilings, and around windows and doors. Several **mechanical ventilation** devices are available to help circulate air within the house and exchange air between outside and inside and are often included in newer homes. These include outdoor-vented fans that remove air from a single room and air handling systems that use fans and ducts to distribute filtered and conditioned air throughout the house. Some of these designs include energy-efficient heat recovery ventilators.^{17, 20}









Air Cleaners

Air filtration can be an excellent way to remove harmful pollutants from the air and improve air quality. Indoor portable air cleaners, also known as air purifiers or air sanitizers, are designed to filter the air in a single room or area. In contrast, central furnaces or HVAC filters are designed to filter air throughout a home. Portable air cleaners and HVAC filters can reduce indoor air pollution; however, they cannot remove all pollutants from the air. Generally, air cleaners are not designed to remove gaseous pollutants but can effectively eliminate PM; that is why filters can remove dust but not smells. The effectiveness of an air cleaner depends on how well it collects pollutants from indoor air and how much air it draws through the air filter. Outdoors, planting trees can help improve air quality as trees help store and break down pollutants and reduce energy costs for cooling from shade. Tiny openings on leaves called stomata take in air, which can include pollutants like ozone, sulfur dioxide, and nitrogen dioxide. These pollutants are absorbed by the tree and broken down.^{17, 20, 21}

Air Quality Measurement

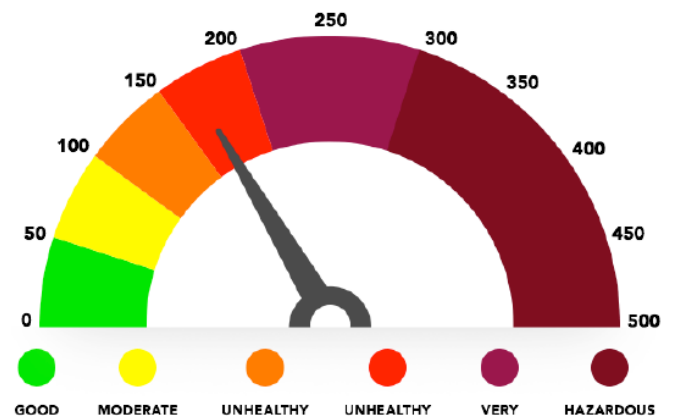
Air Quality Index (AQI)

AQI is an EPA tool that is used to communicate daily air quality. The index is a scale from 0-500 divided into six categories with a higher number meaning of greater concern. Each category has a standardized color and index range to reflect the air quality. Guidance about the level of concern can vary, so it is important to seek out trusted sources.^{5, 6, 7, 22}

	Category	AQI Color	Index	Level of Concern
	Good	Green	0-50	Air quality level indicates clean air with little to no health risks. A great day to be outside.
	Moderate	Yellow	51-100	Air quality is acceptable for most people, but there may be a slight risk for sensitive individuals. Sensitive individuals may consider limiting prolonged outdoor activities.
	Unhealthy for Sensitive Groups	Orange	101-150	Members of sensitive groups, such as people with pre-existing pulmonary or cardiovascular conditions, may experience negative health effects. Sensitive groups should limit prolonged outdoor activities or consider wearing a mask such as an N-95.
	Unhealthy	Red	151-200	Everyone may begin to experience negative health effects. Sensitive groups can expect to experience more serious outcomes. Everyone should limit prolonged outdoor activities or consider wearing a mask such as an N-95.
	Very Unhealthy	Purple	201-300	The air quality is a significant health risk for everyone. All individuals should take precautions such as masking outdoors. Sensitive groups should avoid outdoor activity, everyone should limit outdoor activities.
	Hazardous	Maroon	301-500	This is the most severe air quality level. It poses a serious health threat to everyone. All individuals should take precautions such as masking and avoid all physical activities outdoors.

How AQI is Determined

The AQI is determined using the NAAQS based on the criteria pollutants ozone, PM, carbon monoxide, sulfur dioxide, and nitrogen dioxide. The official AQI is measured at specific EPA sites called **continuous air monitoring stations (CAMS)** around the country, with three sites in the Cincinnati area. Individual monitoring sites may monitor only a single pollutant for research rather than regulation. Each pollutant is measured by concentration, then converted to AQI using a pollutant specific formula. Once converted to AQI, the highest value among the pollutants becomes the overall AQI for that time period and the pollutant of highest value becomes the **primary pollutant**. If only one pollutant is tested then that is labelled as the **pollutant of investigation**.^{5, 7, 23}



AQI scale image from [Cowaymega air quality index blog](#)²⁵

Pollutant	Measurement by Concentration
Ozone	parts per billion (ppb)
PM	micrograms per cubic meter ($\mu\text{g}/\text{m}^3$)
SO ₂	parts per billion (ppb)
NO ₂	parts per billion (ppb)
CO	parts per million (ppm)

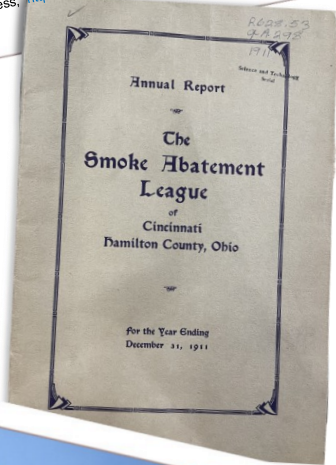
For more information on N95 Respirators, Surgical Masks, Face Masks, and Barrier Face Coverings guidelines please see the FDA guidance here.²⁴



A Brief History of Local Air Quality Monitoring^{3, 4}



Detroit Publishing Co, P. View from Mount Adams, Cincinnati, Ohio. United States Ohio Cincinnati, None. [Between 1900 and 1910] [Photograph] Retrieved from the Library of Congress. <https://www.loc.gov/item/2016810630/>



Indiana Department of Environmental Management, A typical CAMS US Indiana, None. [2016] [Photograph] Retrieved from Indiana Department of Environmental Management

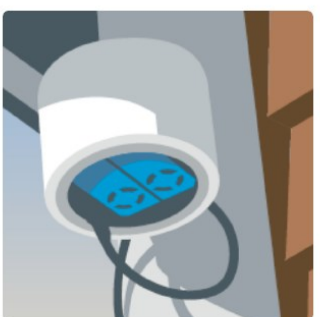


Image from South Coast air Quality Management District Community in Action Guide

- 1880s ○ The City of Cincinnati struggled with air pollution from coal smoke powering the city.
- 1903 ○ A smoke ordinance passed in Cincinnati " ...to regulate the emission of smoke and prevent injury and annoyance" from the burning of coal.
- 1906 ○ Cincinnati Women's Club established the Smoke Abatement League.
- 1907 ○ The Smoke Abatement League successfully pressured the Cincinnati City Council to create the Office of Chief Smoke Inspector to take ambient smoke measurements using an umbrascop and establish penalties for excessive smoke violations.
- 1942 ○ The Office of Chief Smoke Inspector became the Bureau of Smoke Inspection, which conducted the City's first atmospheric pollution survey in 1943 looking at Cincinnati's air quality.
- 1951 ○ Hilton Davis Chemical Company installed four catalytic fume burners to control the smoke at their production plant. This was reported to be the first application of this type of pollution control in the entire country.
- 1955 ○ The Bureau of Smoke Inspection changed to Bureau of Air Pollution Control and Heating Inspection as it became clear that air quality was affected by more than just smoke.
- 1959 ○ The Bureau of Air Pollution Control and Heating Inspection had reduced air pollution 25% from 1954.
- 1963 ○ The US Clean Air Act of 1963 passed and provides funding to state and local agencies for air pollution control and monitoring efforts.
- 1969 ○ Cincinnati established its own ambient air quality standards.
- 1970 ○ The City of Cincinnati restructured and the Bureau of Air Pollution Control and Heating became the Division of Air Pollution Control.
- 1972 ○ Ohio EPA was formed to enforce codes and regulations for local air pollution control agencies that were concerned about air quality issues in large regions. The City of Cincinnati received state funding to set up CAMS that measured air pollution, pressure, wind, and weather. This was the first station of its kind ever set up in the US.
- 1973 ○ The Ohio EPA established a statewide Air Quality Index (AQI).
- 1979 ○ The U.S. EPA established a national Air Quality Index (AQI) to standardized air quality federally.
- 1980 ○ The City of Cincinnati voted to turn the division of Air Pollution Control over to Hamilton County and became the Southwestern Ohio Air Pollution Control Agency (SWOAPCA).
- Today ○ Air quality monitoring, permitting, and enforcement in southwestern Ohio is still performed by Hamilton County's Department of Environmental Services through Ohio EPA programming as **Southwest Ohio Air Quality Agency (SWOQA)**.



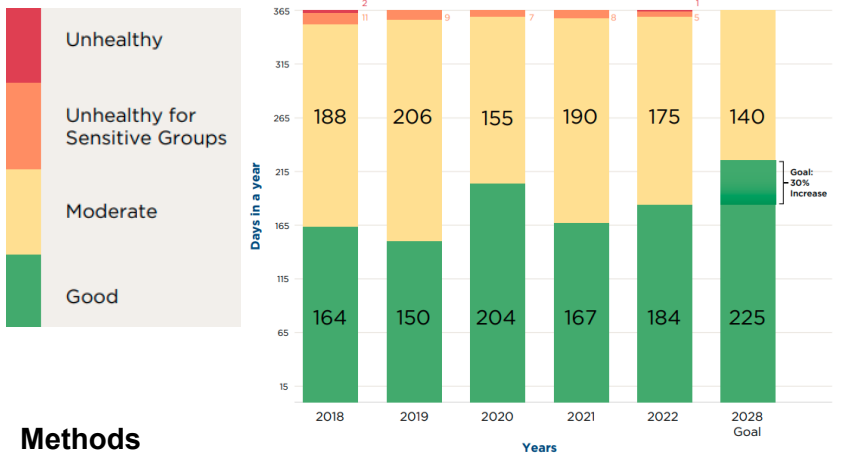
Local Air Monitoring: The Cincy Air Watch Project



Background

In support of the **2023 Green Cincinnati Plan (GCP)** strategy to “*Increase air quality studies, education, and reduce pollution from air emissions,*” the City of Cincinnati **Office of Environment and Sustainability (OES)** in partnership with the **Cincinnati Health Department (CHD)** launched the **Cincy Air Watch Project**.²⁹

Air Quality Index Days Per Year in Cincinnati



Many Cincinnati residents experience poor outdoor air quality which contributes to adverse health conditions, including asthma and lung disease. In 2022, the EPA registered 181 days with “moderate,” “unhealthy for sensitive groups,” or “unhealthy,” AQI ratings in Cincinnati. Ozone and PM_{2.5} were the highest contributors to these low ratings. The 2023 GCP identified a goal of *improving air quality so that AQI healthy days are increased by 30% by 2028*.³⁰

Methods

The GCP outlines four priority actions in regard to air quality:²⁹

- (1) Expand monitoring of air quality and nuisance odors incorporating citizen science in **priority neighborhoods**.
- (2) Provide services, resources, and education for residents in priority neighborhoods on air quality alert system, sources of poor air quality, and air quality regulations.
- (3) Support and fund the development of natural corridors and tree barriers along streams and rivers, interstates and highways.
- (4) Strengthen emissions regulations.

Cincy Air Watch plans to focus initially on the first two actions in hopes of better informing the second two actions in later phases.

In the process of expanding air quality monitoring, the Cincy Air Watch Project has chosen to monitor PM_{2.5} because of its contribution to high AQI days locally and its known link to adverse health effects. This project focuses on priority neighborhoods in Cincinnati with relatively higher rates of asthma as identified in the **2021 Climate Equity Indicators Report**, a study by the City of Cincinnati, University of Cincinnati, and Green Umbrella. These neighborhoods are: Millvale, South Cumminsville, Lower Price Hill, Queensgate, Riverside East, Sedamsville, Villages at Roll Hill, South Fairmont, North Fairmont, English Woods, West End, Winton Hills, and Avondale. These communities are in proximity to highways and industrial development, which are expected to be primary sources of health concern.³¹

These monitors will continuously measure PM_{2.5} levels and share this data publicly on our dashboard at CincyInsights.com. This will help researchers understand the link between air quality and health problems like asthma in these neighborhoods. This project will also help inform the relationship between local air quality and our **built environment**. *If you are interested in contributing to this study you can purchase your own PurpleAir monitor and add it to the map.*^{29, 32}

The Cincy Air Watch Project aims to utilize PurpleAir Flex monitors to measure and communicate real-time outdoor PM_{2.5} data in priority neighborhoods. These small stationary air quality monitors can be easily installed in order to upload data in real-time to a [publicly available map](#) on the PurpleAir website. PurpleAir Flex sensors periodically measure the amount of PM_{2.5} in the air by drawing in a fresh sample of air using a small fan. The sample moves past a laser beam that reflects light from the particulate matter onto a detection plate to determine the size and amount of particles. One limitation is that the sensor cannot determine the composition of the particles (mold, dust, chemical compound, etc.).^{9, 33, 34, 35}

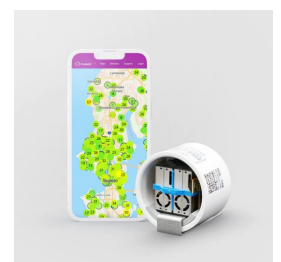


Image from [PurpleAir Flex Air Quality Monitor](#)³²

How to Get Involved

Take Action

Use an Air Quality Monitor at Home



If you want more detailed information about the air quality at your home, you can purchase an air quality monitor. There are low-cost air monitor options available which can help assess air quality in or outside your home. These monitors can measure a number of different factors including PM_{2.5} or PM₁₀, ozone, nitrogen dioxide, and carbon monoxide and come in models for outdoor or indoor use. Potential benefits of using a low-cost air monitor include:

- ◆ **Affordable and Easy to Use:** Low-cost air pollution monitors are much cheaper than CAMS and don't require any special skills to set up.
- ◆ **See What's in Your Air:** They can track the amount of dust or smoke particles that can affect your health.
- ◆ **Early Warning System:** You can detect changes in air quality and can take action to clean indoor air or take precautions to protect against poor outdoor air.
- ◆ **Learn and Improve:** Having a monitor at home can raise awareness about how daily activities can impact air quality and encourage healthier habits.^{9, 33, 34, 35}

Start Your Own Project

If you are interested in starting your own air monitoring study in your neighborhood, the [RISE Communities program](#) aims to empower communities to pursue change through fostering community-academic partnerships through research education, training, and team development. The program is funded by a NIEHS grant and is a partnership between the Cincinnati Children's Hospital Medical Center Division of Biostatistics and Epidemiology and the University of Cincinnati Department of Family and Community Medicine and is open to any team nationwide. This program provides technical training for participants with the application of low-cost PurpleAir sensors for indoor, outdoor, and personal air monitoring in **environmental justice communities**, helping establish a community of practice to build air quality monitoring networks in communities nationwide. Learn more at ejsensors.com.³⁶



Get Involved in Local Projects

If you are interested in getting involved in local air quality studies, the Office of Environment and Sustainability regularly updates a list of Cincinnati area projects on the [Office of Environment and Sustainability Website](#).³⁷

Sign-Up for Air Quality Alerts

AirNow's EnviroFlash sends air quality information for your city to your email or mobile phone. Air quality forecasts and alerts allow you to adjust your plans when necessary on unhealthy air quality days. This can be especially helpful for people who are sensitive to air pollution, such as children, people with asthma, and the elderly. Sign up at enviroflash.info.³⁸

Radon

Radon is a naturally occurring, radioactive gas that can seep through the foundation of your home and accumulate to dangerous levels. It is an indoor air pollutant that is not currently regulated. Nonetheless, it is the leading cause of lung cancer in the U.S. among non-smokers and the EPA recommends testing your home. See the [US EPA's Citizen's Guide to Radon](#) if you are concerned about this particular airborne pollutant.^{9, 39}

Get a Healthy Homes Inspection

Have a Healthy Homes assessment done by a Cincinnati Health Department professional inspector at no cost to you. The assessment may identify potential health risk issues in your home by looking at what may contribute to poor health, may present safety hazards or may cause accidents. Visit the [Cincinnati Health Department website](#) for more information about the [Health Homes Program](#).⁴⁰

Air Quality Complaints

Are you concerned about air emissions? To report an odor, smoke, dust, or other air quality concerns: Call the Air Quality Hotline Line: 513-946-7777 or 1-800-889-0474 or southwestohioair.org/260/Complaints.

Where to Check AQI

RESOURCES



Southwest Ohio Air Quality Agency

The local air quality outpost that monitors and regulates air emissions for Butler, Clermont, Clinton, Hamilton, and Warren counties.



The National Weather Service

Focuses on predicting air quality using atmospheric models to create air quality forecasts twice a day for pollutants like ozone and smoke and issue air quality alerts.



AirNow

The U.S. EPA current air quality information in a user-friendly format, including the AQI, a daily forecast air quality, and an interactive map.



The Weather Channel

Offers current weather forecasts alongside AQI for your location.



Air Data

The U.S. EPA access to raw and historical air quality data. A good resource for detailed air quality research or in-depth analysis. Subscribe to local alerts called EnviroFlash.



Weather Underground

Provides air quality data, weather forecasts for your area, along with details on specific pollutants, pollen counts, and air quality forecasts.



Cincy Air Watch

The City of Cincinnati's current air quality dashboard, including AQI, an interactive map, educational guide, and local climate equity projects.



PurpleAir

A community-based sensor network with a real time PM AQI map, downloadable data, and sensor sales for people who want to contribute to the monitoring network or track their own local air quality.



Definitions:

A

Air Pollution: The presence of substances in the air that interfere with human health, or the environment.

Air Quality: The condition of the air in relation to human health and welfare.

Air Quality Index (AQI): A numerical scale used to communicate the level of air pollution to the public. It ranges from 0 to 500, with higher numbers indicating worse air quality.

B

Built Environment: The physical structures and spaces that make up a community.

C

Carbon Monoxide (CO): A colorless, odorless, and poisonous gas produced by burning fossil fuels.

Cincinnati Health Department (CHD): A city department responsible for public health.

Cincy Air Watch Project: A project to monitor air quality on a neighborhood level in Cincinnati.

Clean Air Act (CAA): A U.S. federal law that regulates air emissions from stationary and mobile sources.

Continuous Air Monitoring Stations (CAMS): Stations that continuously measure air quality.

Criteria Pollutants: Six common air pollutants regulated by the EPA: ozone, particulate matter, nitrogen dioxide, sulfur dioxide, carbon monoxide, and lead. As outlined in the EPA's NAAQS through the CAA.

E

Environmental Justice Communities: Communities that are disproportionately affected by pollution and other environmental hazards.

G

Green Cincinnati Plan (GCP): Cincinnati's Plan to improve the city's sustainability.

I

Indoor Air Pollution: Air pollution within enclosed spaces.

L

Lead (Pb): A heavy metal that can be harmful to human health and the environment.

M

Mechanical Ventilation: The process of replacing indoor air with outdoor air using mechanical equipment.

N

National Ambient Air Quality Standards (NAAQS): The maximum allowable levels for the six criteria pollutants set by the EPA; ozone, particulate matter, nitrogen dioxide, sulfur dioxide, carbon monoxide, and lead.

Natural Ventilation: The process of replacing indoor air with outdoor air through natural openings.

Nitrogen Dioxide (NO₂): A reddish-brown gas formed from burning fossil fuels.

Nitrogen Oxides (NO_x): A group of gases that includes nitric oxide (NO) and nitrogen dioxide (NO₂).

O

Office of Environment and Sustainability (OES): A city department responsible for environmental protection and sustainability.

Outdoor Air Pollution (ambient): Air pollution outside of buildings.

Ozone (O₃): A colorless gas formed by chemical reactions between pollutants in the presence of sunlight.

P

Particulate Matter 10 (PM₁₀): Inhalable particles, with diameters that are generally 10 micrometers and smaller.

Particulate Matter 2.5 (PM_{2.5}): Fine inhalable particles, with diameters that are generally 2.5 micrometers and smaller.

Primary Pollutant: The pollutant of highest AQI over a set timeframe.

Pollutant of Investigation: A pollutant that is being studied for its potential impact on human health or the environment.

Priority Neighborhoods: Neighborhoods of concern based on the research problem, in this case asthma and air quality.

S

Solid Particle Pollution: A mixture of solid particles and liquid droplets suspended in the air.

Source Control: Reducing pollution at the point of emission.

Southwest Ohio Air Quality Agency (SWOQA): A division of Hamilton County Environmental Services, is the local regulatory body for air pollution and monitoring.

Sulfur Dioxide (SO₂): A colorless gas with a strong, irritating odor produced by burning fossil fuels that contain sulfur.

U

U.S. Environmental Protection Agency (EPA): A U.S. government agency responsible for protecting human health and the environment that set federal standards for air quality.

V

Volatile Organic Compounds (VOCs): Organic compounds that easily evaporate into the air and contribute to ozone.

W

World Health Organization (WHO): A United Nations agency responsible for international public health.

This report is intended to provide more information about Air Quality and is not intended to be individual medical advice. If you have questions specific to your situation, contact your healthcare provider.

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This report is intended to provide more information about Air Quality and is not intended to be individual medical advice. If you have questions specific to your situation, contact your healthcare provider.