

Improving Air Quality

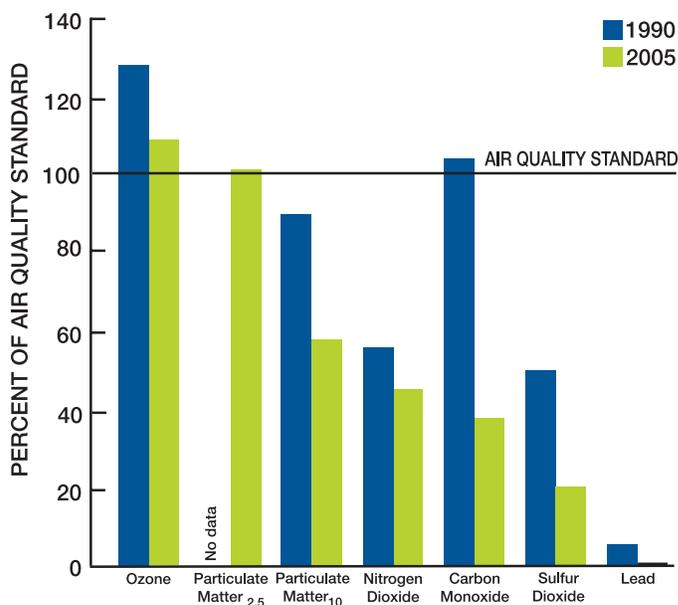
in the Metropolitan Washington Region

THE CLEAN AIR ACT, FIRST PASSED IN 1970 AND AMENDED IN 1990, ESTABLISHED A FRAMEWORK THAT FORMS THE BASIS FOR IMPROVING AIR QUALITY AND FOR AIR QUALITY PLANNING THROUGHOUT MOST OF THE UNITED STATES.

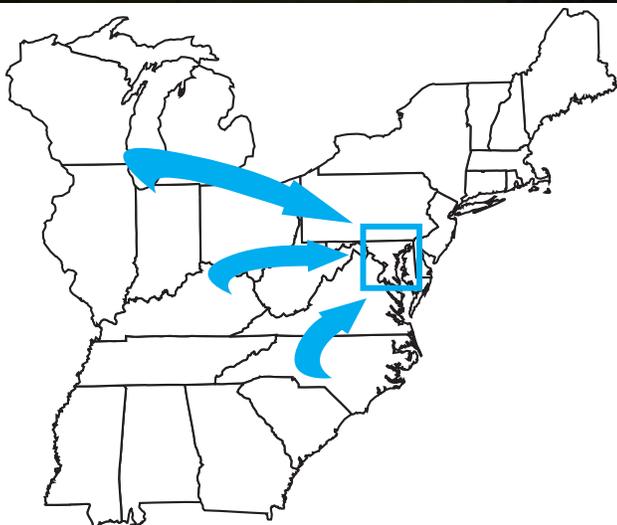
Federal Clean Air Standards

The Clean Air Act requires the U.S. Environmental Protection Agency (EPA) to set national air quality standards to reduce pollutants that can harm our health and environment. These national standards limit the concentrations of six pollutants that are often found in the air we breathe: carbon monoxide, lead, nitrogen dioxide, ground-level ozone, particulate matter, and sulfur dioxide.

Air quality in the Washington region has markedly improved since 1990. However, pollutant levels of ozone and particles are still above the national health standards. As a result, our region does not meet the eight-hour ozone standard and the particulate matter_{2.5} standard, and is classified as a nonattainment area for these two pollutants.



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Pollution transported to the Washington region from other regions comprises 40–70 percent of regional ozone on the worst air quality days.

Sources of Air Pollution in the Washington Region

Ozone and particle pollution are the major air pollutants in our region.

Ozone

In the upper atmosphere, ozone (O_3) is helpful. It is a gas that protects the Earth from harmful ultraviolet rays. But closer to the ground, ozone is a harmful pollutant. On hot summer days nitrogen oxides (NO_x) and volatile organic compounds (VOCs) undergo chemical reactions in high heat and strong sunlight to form ground-level ozone. Called ozone precursors, these compounds are released in our region through numerous activities that are part of everyday life, such as driving a car, painting a house, or mowing the lawn. Unhealthy levels of ground-level ozone occur during the warmer months, typically from May through September.

Particle Pollution

Unlike ground-level ozone, particles are not a seasonal pollutant. High levels of particles can occur any time of the year. The term particle, or particulate matter (PM), is used to describe the mixture of solid particles and liquid droplets in the air. Particle pollution is made up of a number of components, including nitrates, sulfates, ammonia, and direct particle emissions (e.g., soil and dust). Fine particles are invisible to the naked eye and can only be seen using powerful microscopes. $PM_{2.5}$ consists of fine particles whose diameter is 2.5 micrometers or less.

Pollutant Transport

Ozone precursors and particulate matter are transported into the Washington region. Winds coming from the south and west can carry NO_x and VOC emissions, smoke, and other pollutants into our air from hundreds of miles away.



Health Effects of Ozone and Particle Pollution

In the upper atmosphere, the ozone layer forms a shield that protects the Earth from the sun's harmful ultraviolet rays. But ozone produced in the Earth's lower atmosphere poses serious health and environmental threats.

Too much ozone in the air we breathe affects people who exercise regularly outdoors and who have respiratory problems. Children are at high risk for ozone-related problems because their lungs are still developing, they breathe faster than adults, and they tend to spend more time outdoors, especially in the summer, when ground-level ozone levels are highest. Ground-level ozone can irritate and inflame the respiratory system, lowering resistance to colds and pneumonia, intensifying heart and lung disease, and causing coughing, throat irritation, and uncomfortable sensations in the chest. Over time, lung tissue may become permanently scarred, resulting in reduced lung function. Compounds that form ozone also contribute significantly to Chesapeake Bay pollution.

The size of particulate matter is directly linked to the amount of damage this kind of pollution can cause. The smaller the particles, the greater the potential damage. Fine particles are especially dangerous because they can penetrate deep into the lungs and even into the bloodstream, potentially causing serious health problems. Sensitive groups for particle pollution include people with heart or lung disease, older adults (who may have undiagnosed heart or lung ailments), and children. Particle pollution can lead to increased hospital and emergency room visits, and even death.



Chesapeake Bay bridge.

Sample Sources of Ozone and Particulate Matter

Many activities that are part of everyday life are the source of ozone and particle pollution.

Ozone	Particulate Matter
Power plants and factories	Power plants and factories
Cars, trucks, locomotives, aircraft, recreational watercraft	Cars, trucks, locomotives, aircraft, recreational watercraft
Construction machinery, lawn and garden equipment	Construction machinery, lawn and garden equipment
Bakeries and dry cleaners	Dust from roadways and construction equipment
Alcohol- or petroleum-based consumer products	Forest fires and agricultural burning



Metropolitan Washington Region Air Quality Monitors



The metropolitan Washington region consists of the District of Columbia, five counties in Maryland, and four counties in Virginia. State and local officials from these jurisdictions are working together through the Metropolitan Washington Air Quality Committee (MWAQC) to develop new air quality plans to bring the region into compliance with the federal standards.

Monitoring Air Quality

To determine whether the region's air attains the federal standards for ozone and fine particles, air quality monitors located throughout the Washington region measure pollutant concentrations hundreds of times a day. Local air quality has improved dramatically since the Washington region began monitoring air quality 40–50 years ago. Levels of all six regulated pollutants have dropped significantly. Through 2005, the region continued to make good progress toward reducing levels of ozone and particulate matter. The current air pollution episodes are shorter in duration and affect a smaller area than in previous years, and maximum pollutant levels are lower. Within the next few years the region expects to see large drops in these pollutants, as a result of new federal and state controls on power plant and vehicle emissions. Nevertheless, additional effort will be required to ensure that the Washington region will attain both the eight-hour ozone and PM_{2.5} standards by the required deadline of 2010.

For further information about air quality and air quality planning in the Washington region, please visit: www.mwcog.org/environment/air where you can access current air quality conditions and daily air quality forecasts and read our region's air quality plan. To learn about actions citizens can take to clear the air, please visit: www.cleanairpartners.net and www.commuterconnections.com

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