

The federal Environmental Protection Agency (EPA) sets air quality standards to protect health. EPA has set standards for seven air pollutants: fine particulate matter (PM_{2.5}), larger particulate matter (PM₁₀), carbon monoxide, nitrogen oxides, sulfur dioxide, lead, and ozone. The standards define how much air pollution is safe in the outdoor air.

This focus sheet describes particulate matter and explains its health effects, sources, standards, and controls.

Particulate Matter

Particulate matter is particles of soot, dust, and unburned fuel suspended in the air. PM_{2.5} is particles 2.5 micrometers in size and smaller. PM₁₀ is particles larger than 2.5 micrometers and smaller than 10 micrometers in size.

Health Effects

The smaller the particles, the more likely they are to cause serious health problems. The smallest particles can travel deep into the lungs and stay there, causing structural and chemical changes. Research shows that particulate matter is associated with premature death and serious health effects, including:

- Risk of heart attack and stroke
- Lung inflammation
- Reduced lung function
- Asthma-like symptoms
- Asthma attacks
- Cancer

Those most at risk for health effects are the most vulnerable members of the population: children, the elderly, and people with lung or heart disease. Even people who are healthy may have temporary symptoms such as irritation of the eyes, nose, and throat; coughing; phlegm; chest tightness; and shortness of breath.

Sources

Particulate matter can come directly from sources such as forest fires, or can form when gases emitted from power plants, industries and automobiles react in the air.

Why it Matters

Particulate matter causes serious health problems. Death rates in U.S. and European cities have increased when there are high levels of particulate matter in the air. Local studies have also shown high levels of particulate matter are related to decreased lung capacity and hospitalization of children with asthma.

For more information about air pollution standards and how they are set, see EPA's web site at:

<http://www.epa.gov/air/criteria.html>

For more information about health studies on particulate matter, see the American Lung Association's web site at:

<http://www.lungusa.org/site/pp.aspx?c=dvLUK900E&b=35356>

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PM_{2.5} comes mainly from smoke. In winter, more than half (56 percent) of Washington's estimated statewide PM_{2.5} comes from wood stoves and fireplaces. Other sources of PM_{2.5} are outdoor burning, industrial wood waste boilers, slash fires, land clearing fires, and agricultural burning.

PM₁₀ comes mainly from windblown dust. Sources include soil erosion, road dust, and dusty industries.

A New PM_{2.5} Standard

In response to overwhelming evidence that PM_{2.5} causes serious health effects, EPA lowered the PM_{2.5} air quality standard in December 2006 to better protect health. The old standard was 65 micrograms per cubic meter of air. The new standard is 35 micrograms per cubic meter of air.

Before EPA lowered the standard, all of Washington met the PM_{2.5} standard. With the new standard, several areas of the state are close to exceeding the standard, and one area is not meeting it. Air monitoring data shows that the Wapato Hills-Puyallup River Valley area persistently exceeded the standard during 2004 -2006. Ecology has recommended to EPA that the Wapato Hills -Puyallup River Valley area be designated "nonattainment" for the new national air quality standard for PM_{2.5}. Strict air pollution controls are required in nonattainment areas.

Although EPA's changes lowered the standard by 46 percent, the standard is still not as low as the medical and public health community recommends. Scientific evidence shows there are serious health effects at levels even lower than the revised standard allows.

Controlling Particulate Matter

Washington controls particulate matter through:

- Strict wood stove regulations
- Restrictions on outdoor and agricultural burning
- A permit program for industrial facilities
- Best management practices for preventing soil erosion
- Controls on street cleaning machines in bad areas

You can help reduce particulate matter air pollution by composting yard waste instead of burning it; using a form of heat other than wood heat, or making sure your wood stove is certified and that you use clean burning practices; obeying burn bans; and using your car less.

