EPA 910/9-91-030

United States
Environmental Protection
Agency

Region 10
1200 Sixth Avenue
Seattle WA 98101

Alaska
Idaho
Oregon
Washington

Air & Toxics Division

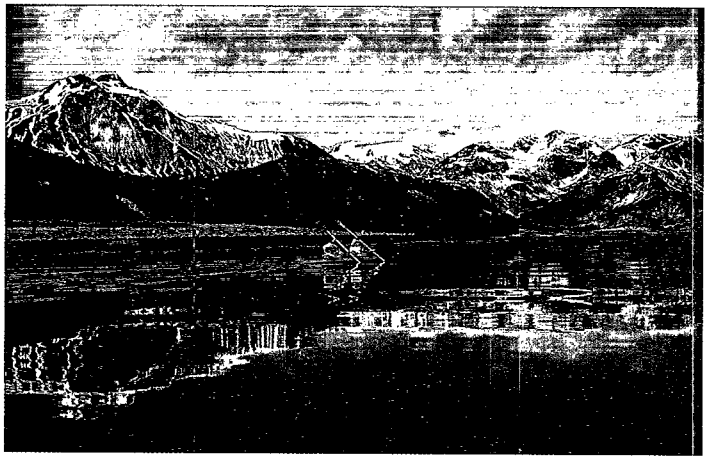
Air Programs Branch

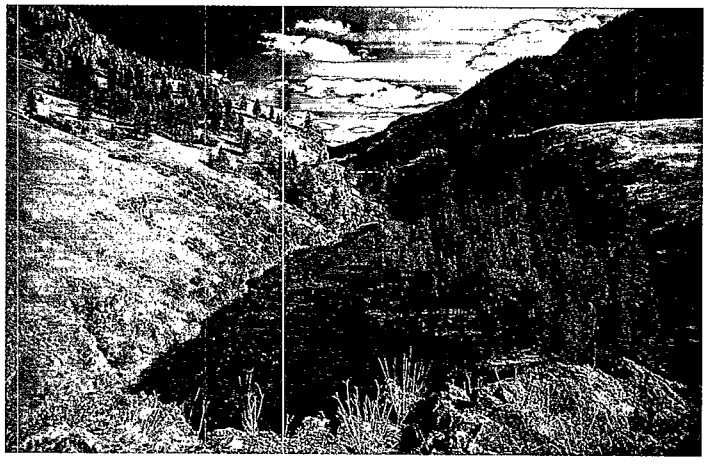
March 1992

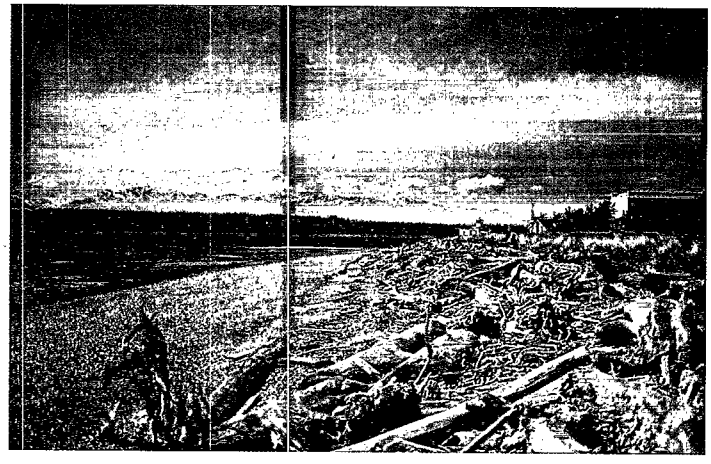
EPA

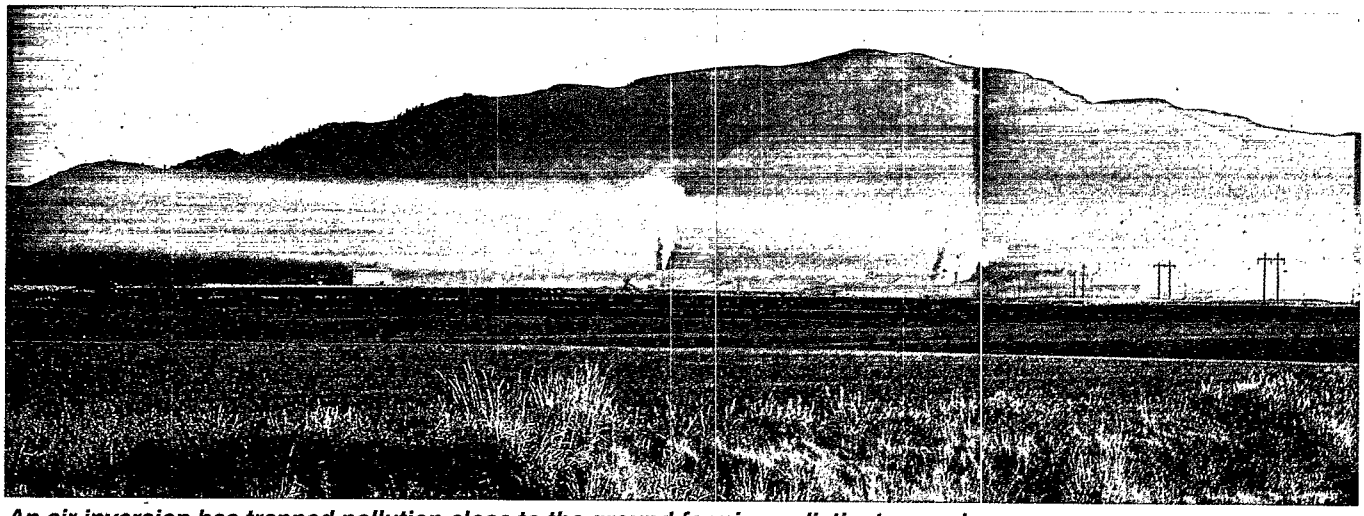
Air Pollution and the New Clean Air Act:

What It Is and How It Affects the Northwest









An air inversion has trapped pollution close to the ground forming a distinct smog layer.

Air Pollution

The American Lung Association estimates that the health costs associated with air pollution are $40 to $50 billion per year.

Particulate pollution, carbon monoxide, and smog are three common types of air pollution in the Northwest. Particulate matter is made up of tiny particles less than 1/100th the width of a human hair. We can breathe particulate matter deeply into our lungs where it may cause difficulty breathing and lung damage. Particulate pollution comes from many sources including some natural causes, industry, and woodstoves.

Carbon monoxide comes mostly from motor vehicles. It is a colorless and odorless gas that impairs the ability of blood to carry oxygen. This can affect the heart, lung, and brain.

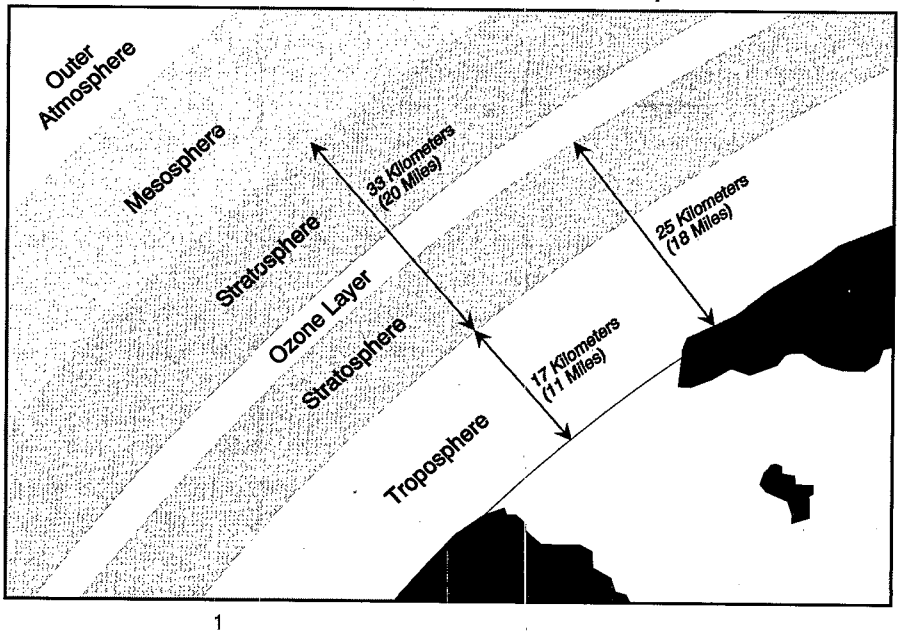
Smog is the brownish haze that appears on sunny days. Its major component is ozone. This harmful ozone near the earth's surface is created by a chemical reaction between sunlight and pollutants in the air, such as auto and industrial emissions. Ozone can cause difficulty breathing and lung damage. It also damages crops and forests. Ozone is beneficial when it occurs high in the atmosphere where it protects us from harmful ultraviolet radiation.

In addition to these three common types of pollution, hundreds of chemicals used daily by our industrial society may cause cancer, birth defects, or other health problems. We are exposed to toxic air pollution from familiar sources, such as our wood stoves and the gasoline that we put into our cars, as well as from exotic chemicals used by industry.

Thinning of the high-altitude protective ozone layer, acid rain, and climate change are global environmental problems. Chlorofluorocarbons or CFCs (used in refrigeration and air conditioning), carbon dioxide, and methane contribute to global climate change. CFCs also destroy the Earth's high-altitude ozone layer which protects us from the sun's ultraviolet rays. These rays can cause skin cancer, cataracts, depress the immune system, and damage plants.

Large amounts of sulfur dioxide in the lower atmosphere cause acid rain that damages forests and lakes. Sulfur dioxide is a by-product of burning fossil fuels like oil and coal.

Weather systems and air pollution occur in the troposphere while high-altitude ozone forms a protective layer within the stratosphere.



Each area of the nation has its own unique air pollution problems but motor vehicles are a major source of pollution in urban areas everywhere. Exhaust from motor vehicles contributes to half of the smog problem, 90% of the carbon monoxide pollution, and over half of the toxic air pollution.

The percentage of air pollution from industry varies greatly from place to place. Averaged nationally, it accounts for about half of all pollution. In Washington, Oregon, Alaska, and Idaho, which comprise EPA's Region 10, industry plays a somewhat smaller role overall but can be a big part of the problem in specific locations.

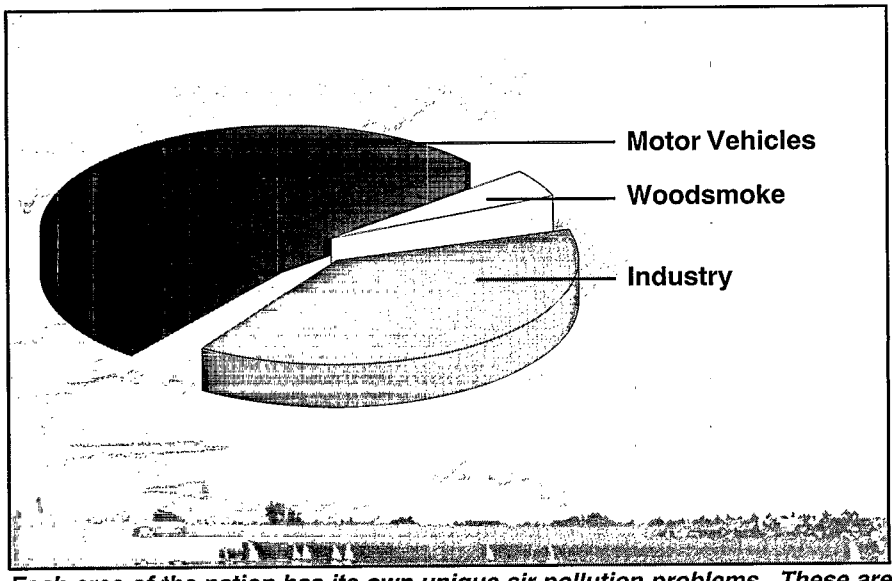
Both nationally and in the Northwest, about half of all industrial pollution comes from small sources like dry cleaners, graphic arts, auto body shops, and gas stations. Each small business may contribute only a small amount of pollution but together their emissions can add up.

Woodstoves and outdoor burning are a much bigger part of the air pollution problem in the Northwest, than they are nationally. Woodstove pollution is an especially serious problem because it occurs in residential areas where more people breathe it for longer periods of time than pollution in industrial areas. A study conducted in the Puget Sound area found that indoor levels of pollution from woodstoves were almost as high as the outdoor levels - even in homes without woodstoves.

Rapid growth in parts of the Northwest has compounded our air pollution problems. Each new person moving into the area represents more miles traveled by car, more wood stoves, and more industries, large and small - all adding pollutants to the air.

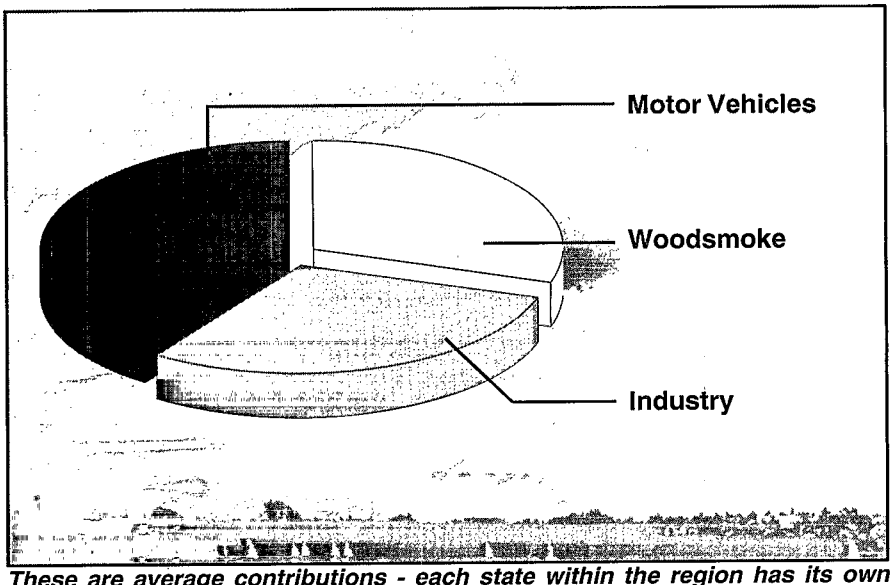
In addition, our special Northwest weather both helps and hurts us. The rains help to cleanse the air of pollution, but mountains and periodic stagnant regional weather patterns block air flow. Pollution becomes trapped near the ground where it can accumulate to unhealthy levels.

National Sources of Air Pollution



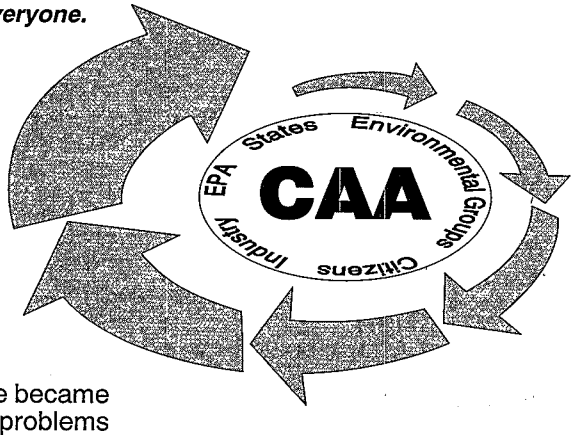
Each area of the nation has its own unique air pollution problems. These are average contributions - specific sources of pollution can significantly vary the percentages at specific locations.

Northwest Sources of Air Pollution



These are average contributions - each state within the region has its own unique mix of air pollution problems. Urban areas often differ from rural areas. Different industries in each state result in different types of emissions.

The Clean Air Act affects everyone.



1970 Clean Air Act

During the 1960's people became aware of the environmental problems caused by industrialization and modernization. Smog hung over major cities. Buildings were blackened by particulate pollution and eroded by acid rain. Rivers, lakes and trees became unhealthy from exposure to pollution.

To address these problems, Congress passed the first comprehensive Clean Air Act in 1970. The law mandated the Environmental Protection Agency (EPA) address air quality problems by setting national health standards for specific air pollutants (such as carbon monoxide, ozone, particulate, sulfur dioxide, and lead). EPA also set emission limits for automobiles and some industries, as well as establishing compliance requirements. A major achievement of this law was the phase-out of lead in gasoline which resulted in a 94% decrease in lead emissions at a cost of less than a penny a gallon.

The law also called for EPA to regulate any air pollutant determined to be hazardous. Controversy and litigation slowed EPA's regulatory efforts; by 1990, only seven hazardous substances were regulated. Congress recognized the need for new ways to reduce air pollution.

The 1990 Clean Air Act Amendments

Many hours of work by Congressional staff, environmental groups, industry representatives, state and local air agencies, and the EPA led to the development and passage of the 1990 Clean Air Act Amendments. The New Clean Air Act (CAA) will require a renewed commitment by individuals, government, and industry to achieve success.

How does the New Clean Air Act work?

Everyone will play a part in making the Clean Air Act successful.

State Governments

The states are partners with the federal government to achieve the goals of the CAA. Most already have strong air pollution control programs. The CAA builds on these existing state programs and on previous CAA requirements. Some important programs that each state must have include:

- control programs and regulations to bring pollution down to below the national standards for carbon monoxide, ozone, and particulate matter;
- a motor vehicle emissions testing program in urban areas where carbon monoxide or ozone are a problem;
- a permit program for businesses and industries;
- a small business assistance program to help smaller companies meet the new requirements of the law;
- an effective enforcement program to assure compliance.

Each state must develop their own laws to address their unique air pollution problems.

Local Governments and Agencies

Each state will develop air quality requirements based on their specific air pollution problems. These programs and requirements may be delegated to local agencies or governments. Larger Indian tribes will also develop their own air pollution programs.

Local transportation planning authorities, economic development councils, and similar agencies may also be a part of regional air quality improvement programs.

Industries and Business

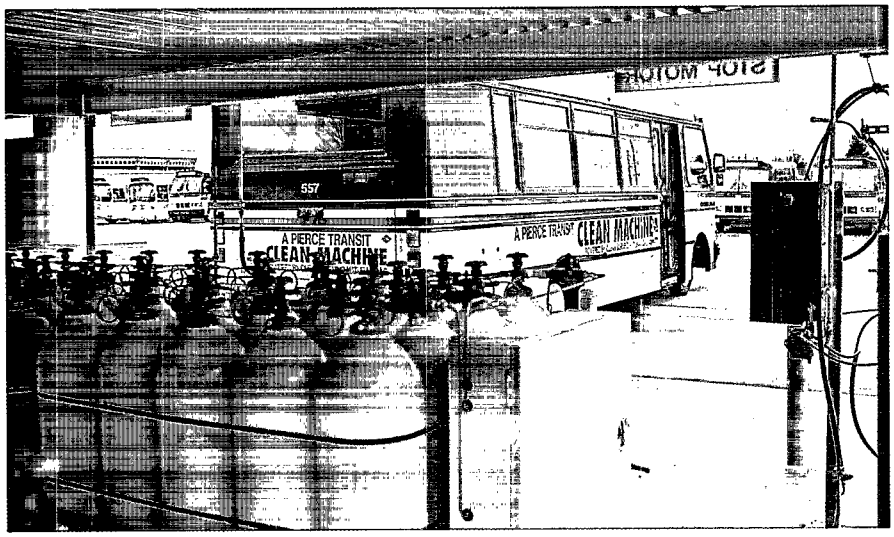
This new law affects businesses and industries, large and small. Any production process which gives off any type of vapor or emission may be regulated and need a permit from the state or local agency. Many smaller companies that have never been regulated before will be affected.

EPA and state agencies have programs to help companies to find ways to reduce pollution and save money. In addition to new regulatory programs, EPA has several voluntary programs to encourage good environmental practices. Call the Region 10 office or your state agency for more information.

For smaller companies, each state and some local agencies are developing small business compliance and technical assistance programs. The Small Business Administration provides special low-interest loans to help companies meet environmental requirements.

Individuals

We often envision smoking industrial stacks when we think of air pollution. Industrial pollution is a major problem, especially in some areas, but wood stoves and automobiles also contribute to air pollution. Woodstoves give off particulate matter which causes short term and chronic respiratory problems. In many areas of the Northwest, temporary burning bans are established when air quality is poor. It is important that these burn bans are obeyed. Individuals may want to consider using less polluting sources of fuel to heat their homes, such as electricity, natural gas, or heating oils.



Pierce County Transit System in Washington has been a national leader in alternative fuels for mass transit systems. Their fleet is the largest natural gas powered system in the nation.

Photo: Courtesy of Washington Natural Gas Company

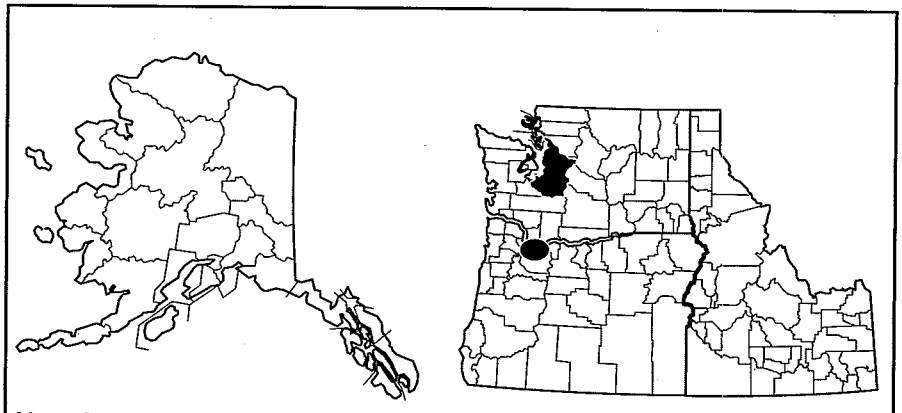
Air emissions from motor vehicles can be reduced by walking, or using mass transit, carpools, or bicycles. Keeping the family car in good working order will also help reduce air emissions and save gas.

The CAA provides several methods for people to become actively involved in their communities. Some individuals may want to participate on workgroups that develop state regulations to control air pollution. Everyone will have the opportunity to comment on these new regulations through the public hearing process. The general public will also have an opportunity to review and comment on air permits before they are issued to local businesses and industry. The CAA also enables citizens to report permit violations or even to sue companies for violations if the state or EPA fails to take action.

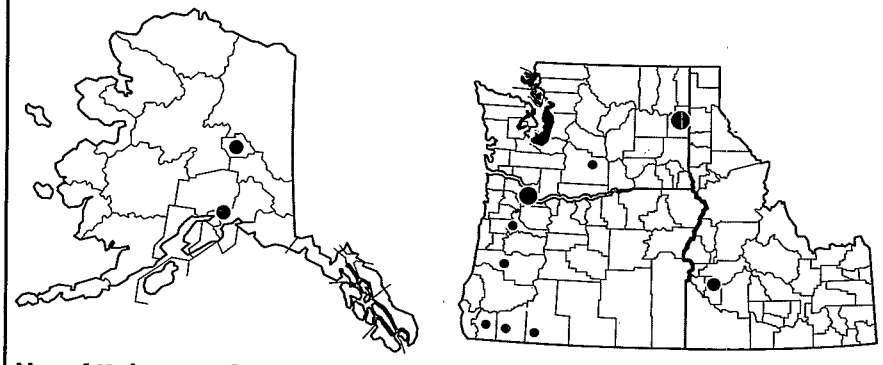
Environmental Protection Agency

Passage of the CAA was only the first step in the regulatory process. EPA is developing over 400 new regulations needed to implement the Act. EPA, environmental groups, and industries are working together to develop these regulations. They will look for technologies that protect the environment while being economically practical.

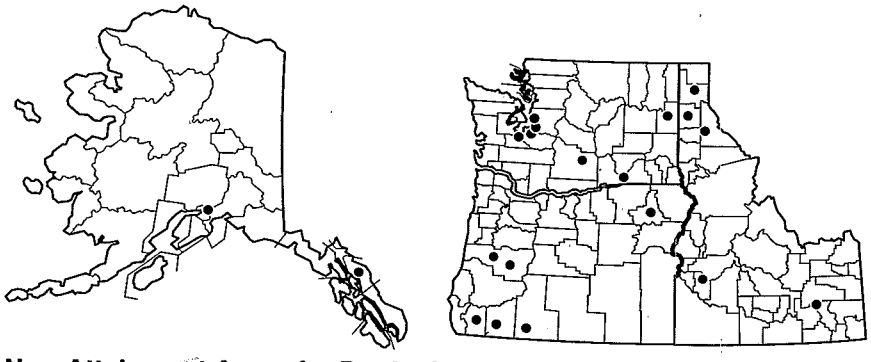
The CAA granted strong new enforcement powers to the states and EPA to assure that these new regulations would be followed. The state air agencies have primary responsibility for compliance monitoring and enforcement. EPA will take enforcement action if the state is unable or if the state requests EPA assistance. The CAA grants EPA civil penalty authority of up to $25,000 per violation per day. New criminal provisions of the CAA will mean jail sentences of from one to fifteen years.



Non-Attainment Areas for Ozone (O_3)



Non-Attainment Areas for Carbon Monoxide (CO)



Non-Attainment Areas for Particulate Matter(PM_{10})

Each state has "pockets" of pollution. These pockets are classified as non-attainment areas. States, local governments, industries, and citizens will work together to achieve reductions in air pollution in these areas. Key: Ozone, Carbon Monoxide and Particulate Matter.

Key elements of the New Clean Air Act

Air Quality Non-Attainment

"Non-attainment" is the word used for *areas where air pollution is above levels safe for public health or the environment.* The CAA establishes new deadlines for states to develop and implement plans to achieve air standards for smog (low-altitude ozone), carbon monoxide, and particulate. The law requires economic sanctions against states that fail to meet the standards by the deadlines or fail to make adequate progress towards meeting the standards.

Hazardous Air Pollutants

The new Clean Air Act requires a *technology-based approach to address toxic emissions at the sources.* All types of industries and businesses, large and small, are covered by this law. The Act allows the industry or business to be innovative in its approach to reducing emissions. Some of the ways to control emissions are by changes in processes, by substituting less toxic materials, or enclosing the systems. This will allow reduction in emissions throughout the process.

Acid Rain

The law will *cut acid rain causing sulfur dioxide emissions* from power plants (the major source of these emissions) in half by the year 2000. Once this level is reached, it is to be permanently maintained, no matter how many more power plants are built. EPA is developing a market-based trading program to assist power plants in making these reductions. Each plant will receive a number of "allowances" based on its past fuel consumption and emission rate. Plants will be able to trade or sell their emission allowances if they reduce emissions beyond the required amount. The state of Alaska is exempt from this portion of the CAA. Although acid rain is not yet a problem in the Northwest, these provisions will help to assure that our fragile alpine ecosystems remain undamaged.

Permits

Many states already have permit programs. Most programs will need some changes, though, to meet all of the requirements of the CAA.

As part of their permit, many companies will be required to maintain recorded data from their monitoring equipment. This data will be reviewed by the state agencies to assure that companies are at all times in compliance with the law. A responsible corporate official will also have to certify annually that his company is meeting the conditions of their permit.

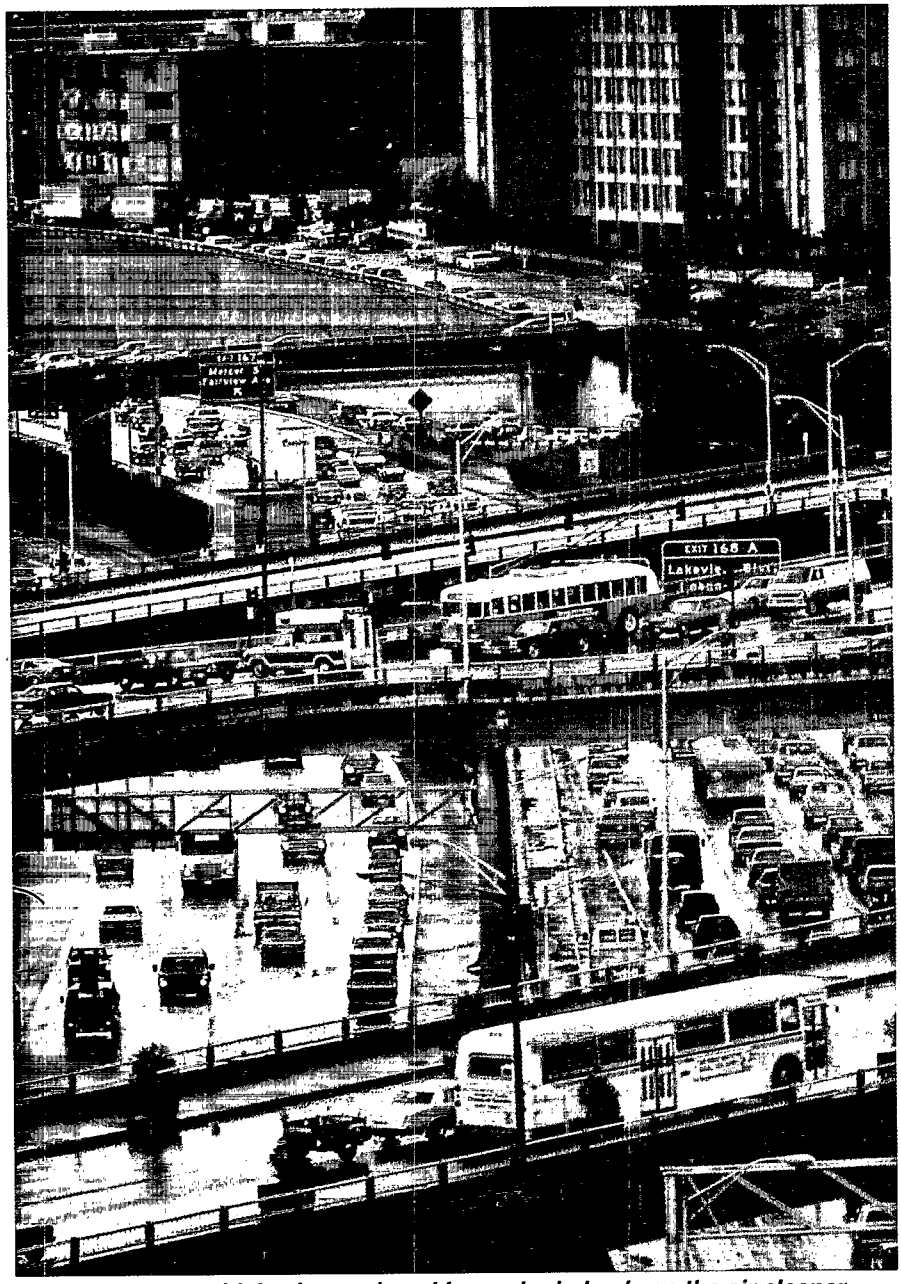
Motor Vehicles

New stringent tailpipe standards for cars, buses and trucks will be developed. In areas within Region 10 with carbon monoxide problems, oxygenated fuels which are cleaner burning will be available. Some areas will institute auto emissions testing programs called Inspection & Maintenance (I/M). Areas with existing programs may improve those programs.

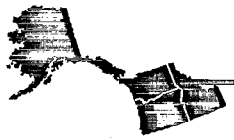
Ozone Depletion

Thinning of the ozone layer is a global problem. Sixty-eight nations from across the world signed an agreement, called the Montreal Protocol, which calls for each nation to reduce the use of CFCs. The new Clean Air Act requires a complete phase-out of CFC production in the United States.

To further control emissions which cause ozone depletion, new regulations on the re-use and recycling of air conditioning units will be implemented. EPA will require special training courses for those who handle CFCs. Industries are developing safer alternatives to the ozone-damaging chemicals in these units. EPA will be reviewing these alternatives to ensure that they are safe for public health and the environment.



Keeping motor vehicles in good working order helps keep the air cleaner.



What You Can Do to Make a Difference

The new Clean Air Act will make a big difference in controlling air pollution. It will achieve significant cuts in emissions from industry, electric power utilities, and car and truck tailpipes. It will create an industrial permit program to focus the many new requirements. It will enable EPA and the states to assure compliance with the new requirements through strong enforcement tools. But regulatory programs alone may not solve our air quality problems.

You can make a difference, too. Sometimes it may seem that our individual actions don't add up to much. As more individuals become concerned about how their actions affect the air we breathe and change their habits, the air quality for everyone will improve. As a bonus, low polluting actions are often more healthy and economical for us.

A lot of information is now available on how individuals can reduce pollution. Most bookstores have good selections. You can also call the agencies listed on this page to receive free information. Here are some ideas to get you started:

Save Energy: Saving energy reduces air pollution and the gases that contribute to global climate change.

- *Use public transportation, carpool, bike, or walk*
- *Drive a fuel efficient car*
- *Keep your car well tuned*
- *Use radial tires and keep them properly inflated*
- *Insulate your home*
- *Insulate your water heater*
- *Turn down the thermostat*
- *Turn off lights*
- *Use energy efficient appliances and heating equipment*
- *Use fluorescent in place of incandescent lightbulbs*

Recycle/Reuse: Recycling and reuse save energy and resources, reduce air pollution and the need for landfills, and reduce the gases that contribute to global climate change.

- *Recycle aluminum, glass, and paper*
- *Compost yard waste (instead of burning or landfilling)*
- *Take your own re-useable grocery bags to the store*
- *Buy products with a minimum of packaging*
- *Buy products with recycled packaging, reusable or recyclable containers.*
- *Buy products made with recycled materials*

Become Involved: If most of us do some of the things listed above, together we will make a big difference. Some people will want to do more. Here are some suggestions on how to get involved:

- *Learn more about environmental issues*
- *Write letters to your legislators (call your local library for names and addresses)*
- *Support the passage of local, state, and federal laws and international treaties that protect the environment*
- *Consider joining and supporting an environmental group*
- *Purchase from environmentally responsible businesses*
- *Start a recycling program at work or in your community*

Who to contact for more information

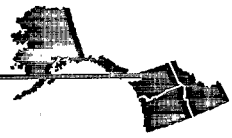
U.S. EPA Region 10
1200 Sixth Avenue
Seattle, Washington 98101
at 1-800-424-4EPA or 206-553-5810.

Washington Department of Ecology
Air Quality Program, PV-11
Olympia, Washington 98504
206-459-6000

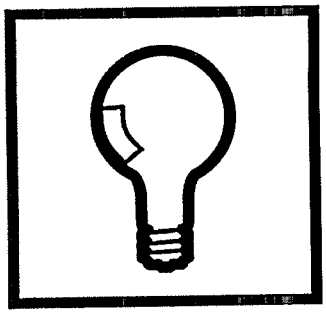
Oregon Dept of Environmental Quality
Air Quality Division
811 S.W. Sixth
Portland, Oregon 97204
503-229-5359

Alaska Department of Environmental Conservation
Air Quality Management Section
410 Willoughby Avenue
Juneau, Alaska 99801-1795
907-465-5100

Idaho Department of Health and Welfare
Division of Environmental Quality
1410 North Hilton, Statehouse Mail
Boise, Idaho 83720-9000
208-334-5860



Facts about the Environment:



The electricity needed for lighting in this country would be cut by 50% if energy efficient lighting were used just where it was profitable.

Replacing a common incandescent light bulb with an energy efficient compact fluorescent saves 300 pounds of carbon dioxide, 1.4 pounds of sulfur dioxide, and 0.8 pounds of nitrogen oxides per year.

It also realizes a 37.5 percent annual return on investment.

More efficient lighting would reduce other forms of pollution, also, such as boiler ash, scrubber waste, acidic mine drainage, natural gas leakage, and the production of greenhouse gases that cause global warming.

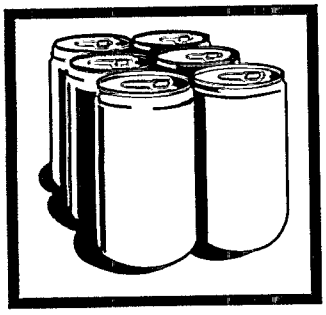
For each ton of paper recycled, nearly 2 tons of lumber and 24,000 gallons of water are saved.

Recycling paper uses 30 to 55% less energy than making paper from trees; and it reduces related air pollution by 95%.

Over a billion trees are used to make disposable diapers each year.

About 50% of paper in the U.S. is used just for packaging.

Most cereal boxes and many cookie and cracker boxes are made from recycled cardboard. It's easy to tell - the boxes are gray on the inside. Paper towels and toilet paper are also often made from recycled paper.



Recycling one aluminum can saves enough energy to run a TV for three hours.

Recycling aluminum uses 90% less energy than refining aluminum from raw materials; and it reduces related air pollution by 95%.

Most aluminum bauxite, the ore from which aluminum is made, is imported.

Every three months, the U.S. throws away enough aluminum to rebuild our commercial airfleet.

A recycled aluminum can is typically re-melted and back in the store within six weeks.

Recent NASA data show that the protective ozone layer over the U.S. is being depleted at double the rate of earlier estimates.

One chlorine atom from a chlorofluorocarbon (CFC) molecule can destroy up to 100,000 molecules of ozone.

CFC use in most aerosol cans was banned by the Federal government in 1978. CFCs are still used in about 10% of aerosols, so read labels carefully.

Even non-CFC aerosol sprays aren't benign: propane and butane, the most common propellants in aerosols today, help create smog.