

Washington's Environmental Health 1997

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Introduction

The quality of Washington' water, air and land provide the basic foundation for a healthy economy, quality-of-life and rich populations of plants, fish and wildlife. Given Washington's projected population growth, that foundation is at risk.

This report gives a snapshot of Washington's environmental health. The Department of Ecology invites you to help in our effort to enhance, restore and protect Washington's beautiful environment.

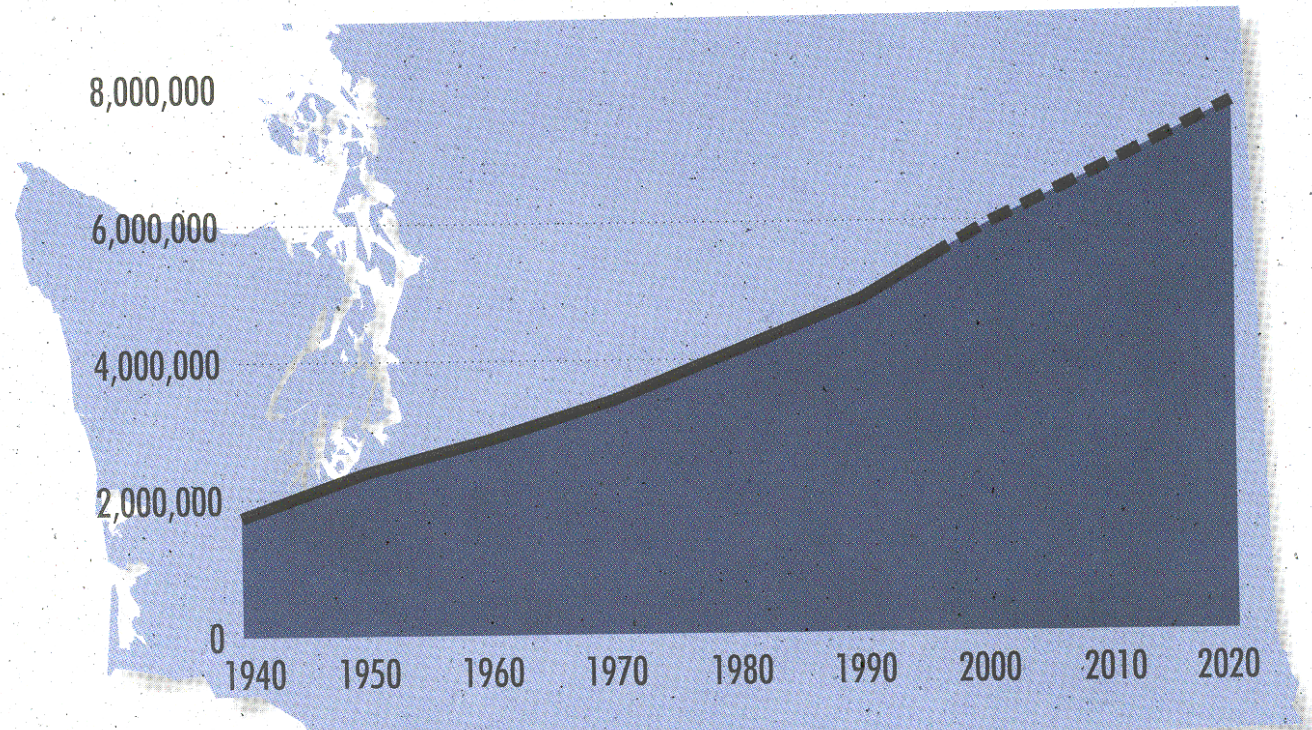
Throughout this document you will find ways to join with us as partners to:

- Prevent pollution
- Clean up pollution
- Support sustainable communities and natural resources

"The environment is the center of our life quality – it must be guarded with great passion."

Tom
Fitzsimmons,
Director
Department of
Ecology

Figure 1: Projected population growth for Washington State.



Source: Office of Financial Management

Improving the Health of Washington's Environment

Pollution of our environment is characterized in two basic ways, point and nonpoint. Point source pollution is *directly* discharged or emitted from pipes and smokestacks.

Nonpoint source pollution comes from many small sources or is *indirectly* released into the environment. Examples of nonpoint pollution sources are cars, on-site septic systems and pesticides and fertilizers carried by rainwater runoff from farms and agricultural lands, urban development, lawns and golf courses.

Pollution controls placed on point sources have been mostly successful. Pollution discharges from factory smokestacks and pipes have been reduced to protect air and water quality. Improved hazardous and solid waste management practices have resulted in a reduction of chemicals being released to the water, air and land. Ten years ago this could not have been said.

Despite these successes, we are approaching the 21st century facing a tremendous environmental challenge: the cumulative impact of many small sources of pollution to air and ground and surface waters. Washington's projected population growth will increase pollution from these sources unless action is taken. Together we need to decrease the number of cars on the road, improve land use decisions to protect our water and reduce the tons of waste generated.

Ground and surface waters are at the greatest risk of increased environmental degradation. There is a very strong perception that we live in a state rich in clean, abundant water. This perception is simply not accurate. In many parts of our state:

■ The demand for surface and ground water to drink, irrigate farms, water lawns and protect fish far exceeds what is available.

■ The quality of water is degraded by pollutants such as fecal coliform bacteria, nitrates, pesticides and chemicals.

Washington State is in a gridlock over issues surrounding the availability and quality of water. The location and extent of water availability and quality problems are directly related to the way we use the land. In 1990, when the State Legislature adopted the Growth Management Act, it found that uncoordinated and unplanned growth posed a threat to the environment, sustainable economic development and the health, safety and high quality of life enjoyed by the residents of the state.

Since that time, 150 communities have adopted growth management plans. That foundation must now be broadened to include the context in which these communities exist – the watershed.

A watershed is defined as all of the land and ground water which drains into a river or body of water. Within the watershed a variety of different elements (such as people, plants, animals, air, water and land) function as a whole; each affects, and is affected by, all of the other elements. How we use and take care of the land has a profound and lasting impact on the quality of life for ourselves and future generations.

The environmental problems facing a community, in particular, the water availability and quality problems, can be solved. It will be a challenge. A critical component of the solution includes an informed and active citizenry.

Citizens can learn about the environmental issues facing their community by contacting Ecology (refer to back cover) for more in-depth information. City and county planning departments can be contacted for information about local growth management planning.

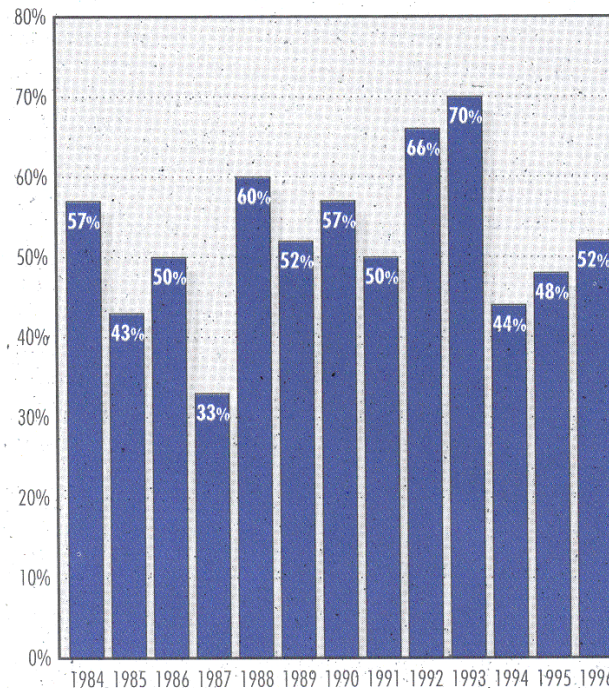
Ground and surface waters are at the greatest risk of increased environmental degradation.

Bacteria in Surface Water

Why This Is Important

Rivers and streams contaminated by human and animal fecal wastes can pose a significant health risk to people and animals. Fecal waste carries with it bacteria and viruses that can cause stomach ailments and diseases such as hepatitis, salmonella, cholera and typhoid. People swimming, fishing or drinking water from contaminated rivers and streams are at an increased risk of becoming ill. Rivers and streams also carry coliform bacteria into marine waters where shellfish can become contaminated. In turn, people eating contaminated shellfish can become ill.

Figure 2: Percent of monitored rivers and streams exceeding water quality standards for fecal coliform.



Source: Department of Ecology

Current Trends

Over half of the rivers and streams monitored on a long-term basis for fecal coliform bacteria, an indicator of the presence of fecal waste, have exceeded state water quality standards. A twelve-year analysis of selected rivers and streams, 1984-1996, indicates that fecal coliform bacteria contamination is not improving (figure 2).

Causes of the Problem

Human and animal fecal waste enters surface waters from failing septic systems and poorly managed animal operations, such as dairies and “hobby” farms. Raw sewage from failing septic systems seeps through the ground or is carried by rainwater to nearby surface waters. Allowing farm animals to graze in or next to streams is another source of contamination.

What Can Be Done

Everyone can help keep human and animal fecal waste out of Washington’s waters.

- Septic systems need to be inspected and pumped regularly.
- Use fencing to control the access of farm animals to rivers and streams.
- Properly store and manage manure.

Nitrates in Ground Water

Why This Is Important

Nitrates break down in the human body and can interfere with the natural transfer of oxygen to the blood stream. Children under the age of one year and pregnant or nursing women are at the greatest risk to what is known as methemoglobinemia, or “blue baby syndrome.” Based upon this risk, more than 10 milligrams per liter of nitrate-nitrogen in drinking water is unsafe. Nitrate-nitrogen levels between 5 and 10 milligrams per liter serve as a clear indication that ground water quality is at risk (figure 3).

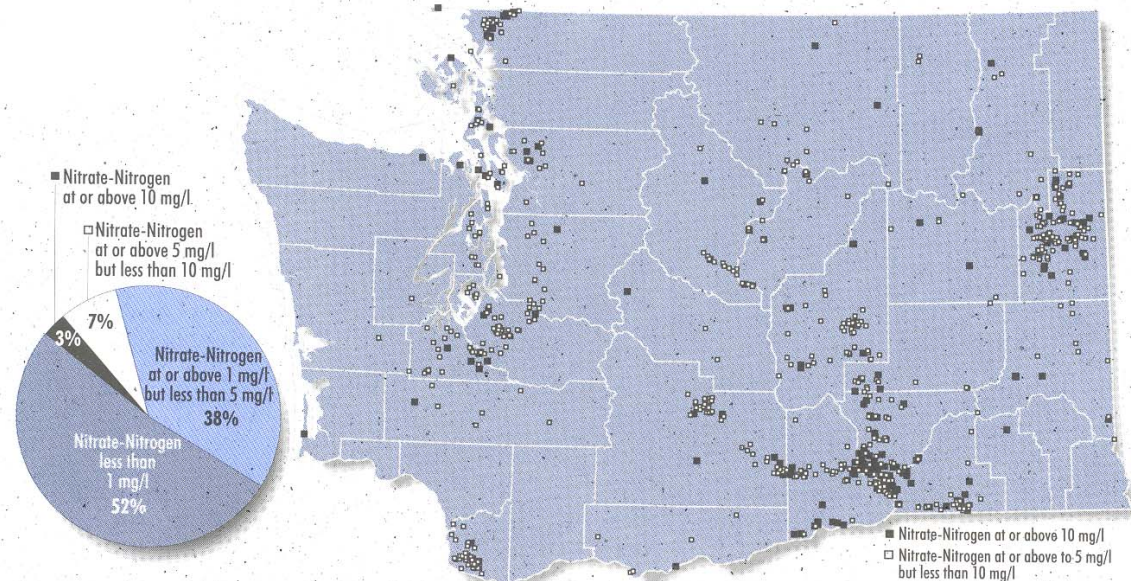
Causes of the Problem

Excessive use or over application of agricultural chemicals and lawn fertilizers, poorly managed farm operations and failing septic systems are the primary cause of nitrates in ground water. The nitrates in fertilizers and human and animal fecal waste seep through soil with either irrigation or rain water and enter ground water.

What Can Be Done

- Use fertilizers sparingly and apply at the recommended rates.
- Contact your local extension service for advice on alternative lawn care options.
- Use fencing to control the access of farm animals to rivers and streams.
- Regularly inspect and pump on-site septic systems.
- Seek advice from local conservation districts on proper manure storage and fencing options.

Figure 3: Percent and location of tested public water supply wells where nitrate-nitrogen levels are above 5 milligrams/liter.



Source: Department of Health

Water

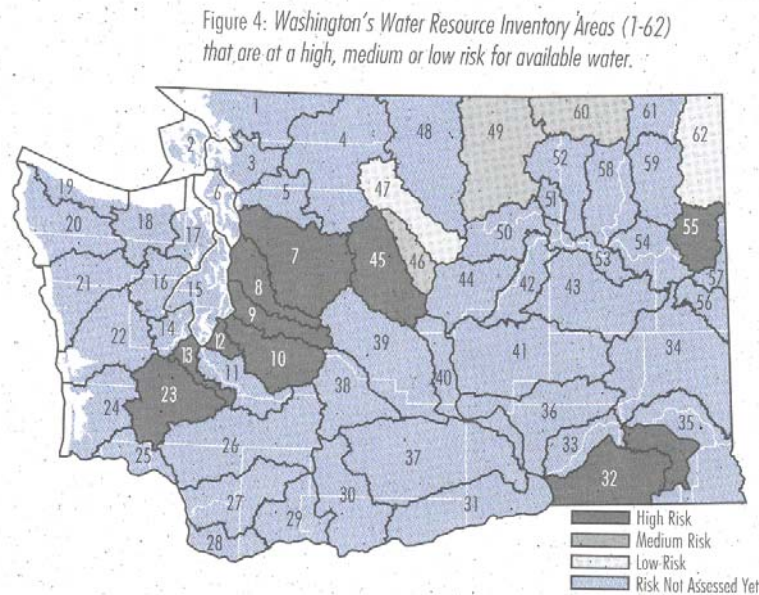
Water Availability

Why This Is Important

With our multitude of lakes, streams and rivers, Washington seems to have an abundance of water. However, the demand for water has steadily increased each year, while the amount available will always be the same, or in some cases, less. The challenge is to balance Washington's available water supply between the needs of people and habitat protection for the plants and animals vital to the environmental and economic health of our state.

Current Trends

Increasing amounts of ground and surface water are being diverted for irrigation, municipal and industrial use (figure 5). This has caused some areas of the state to be at risk for available water (figure 4).



Source: Department of Ecology

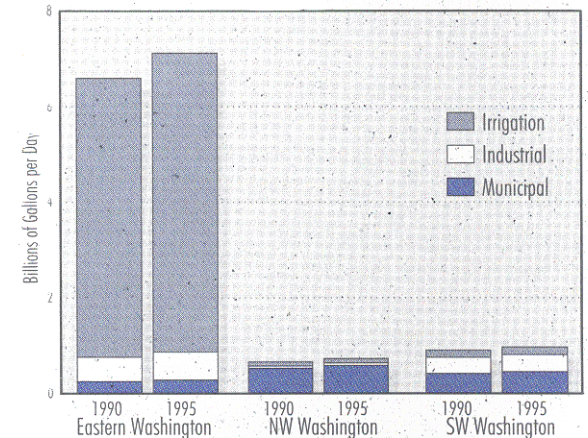
Causes of the Problem

Water and land use practices significantly affect water availability. The paving of roads, parking lots and other large surface areas causes rainwater to flow into storm drains to rivers or streams. This does not allow for the recharge of ground water, our natural "reservoir" for future availability. In addition, wasteful water use impacts current and future needs.

What Can Be Done

- Make land use decisions that protect surface and ground waters.
- Landscape with plants that are native to your area, they require less water.
- Practice water conservation on irrigated agricultural lands and in the home and office.

Figure 5: Water use in Washington.



Source: U.S. Geological Survey

Commercial Shellfish Beds

Why This Is Important

Many Washingtonians rely on healthy populations of shellfish for personal consumption or commercial use. Shellfish living in polluted sediments, or the marine “floor,” can accumulate bacteria and other toxins in their tissue making them unfit to eat. Once contaminated, it is very expensive and time-consuming to clean up marine sediments.

Current Trends

The overall trend for North and South Puget Sound prior to 1993 was a decrease in the percentage of shellfish beds approved for harvest. In 1994 some beds were reclassified as approved. Conditions in Hood Canal have remained relatively stable. Information for the Southwest Coast has not been collected long enough to determine a trend at this time (figure 6).

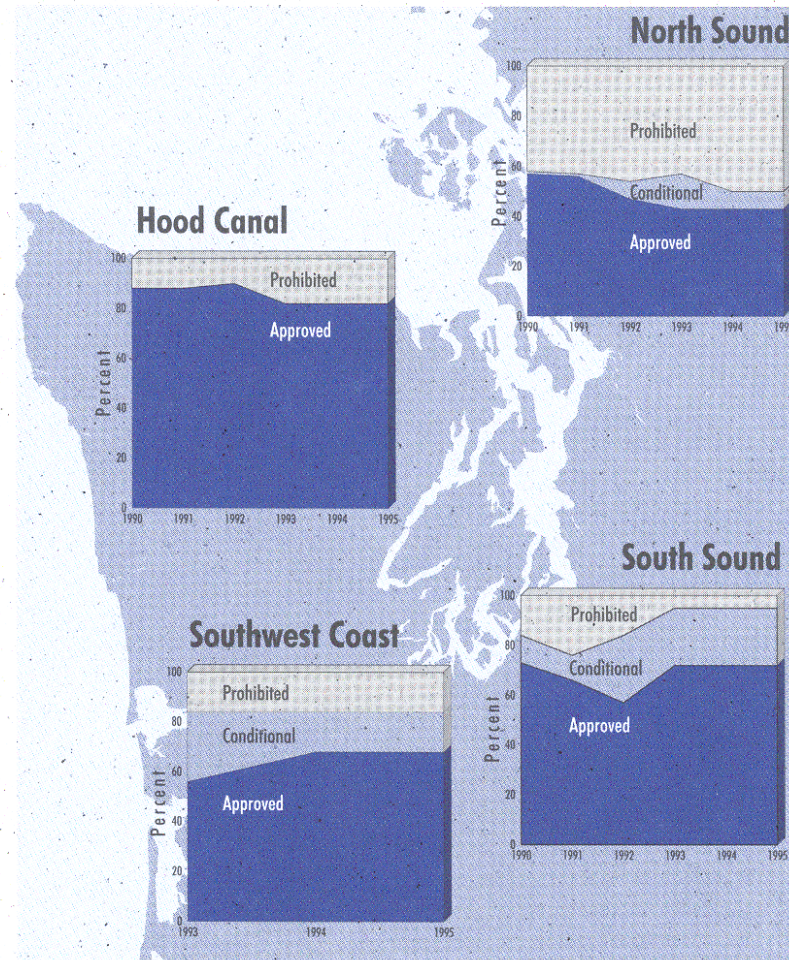
Causes of the Problem

The leading cause of shellfish contamination is non-point pollution such as stormwater runoff from residential areas, hobby farms and dairy farms. Failing septic systems are also a major problem. Other causes include marinas, boating wastes and sewage treatment plants.

What Can Be Done

- Regularly inspect and pump septic systems.
- Seek advice from local conservation districts in developing the best approach for handling animal fecal waste.
- Recycle or properly dispose of household chemicals, do not dump them down storm drains.

Figure 6: Percent of commercial shellfish beds that are approved, conditionally approved or prohibited for harvest.



Source: Department of Health

Prohibited/Restricted: No commercial shellfish harvest allowed or the growing area has limited pollution where the shellfish can be harvested, moved to a clean area and allowed to “cleanse” before direct marketing for consumption.

Conditionally Approved: An approved growing area subject to predictable, but not constant, pollution (runoff from heavy rainfall).

Approved: Growing and harvesting shellfish for direct marketing is approved.

Air Quality

Why This Is Important

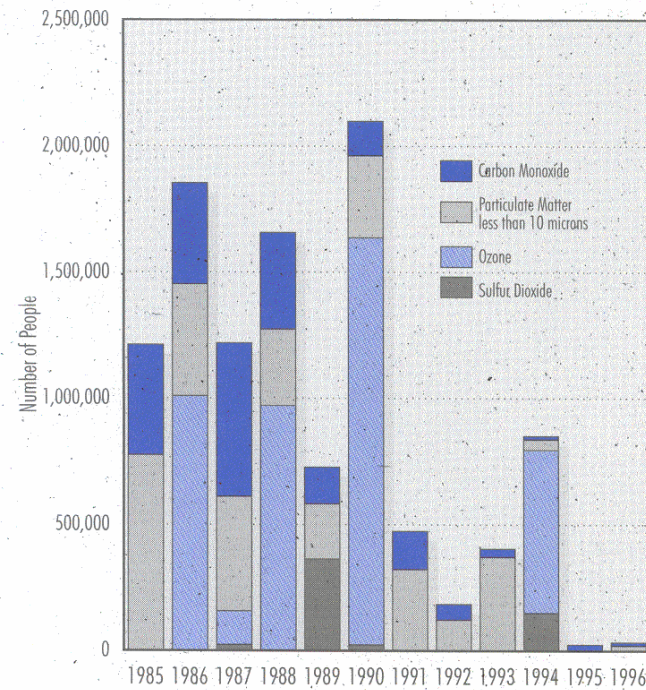
Polluted air can cause or worsen lung-related diseases, such as emphysema, chronic bronchitis and asthma; and can cause breathing difficulty and even death. Easily inhaled small particles, called particulate matter, are perhaps the most significant health concern related to poor air quality.

Polluted air can contribute to water pollution. It can also damage building materials, cloth and metals and lead to decreased visibility and damage trees, agricultural crops and other living organisms.

Current Trends

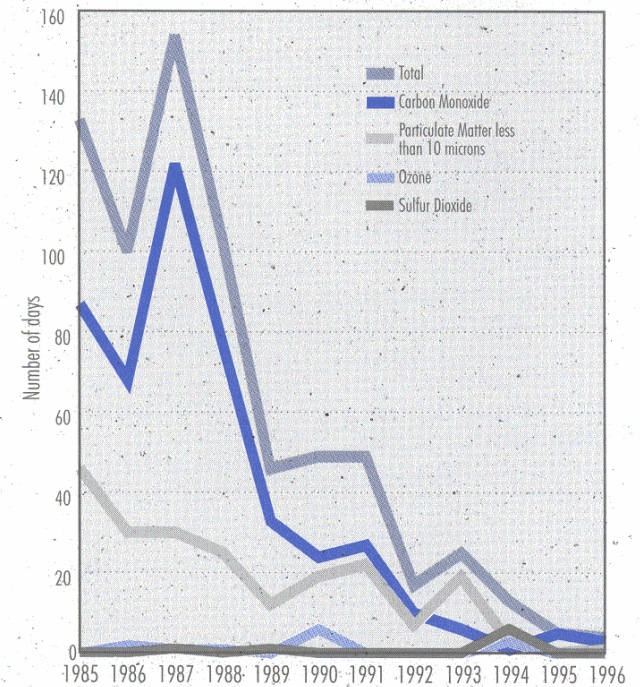
Air quality in Washington is considered moderate to good. In 1995, thirteen areas in the state were identified as being in “non-attainment” (not meeting federal health-based standards) for one or more of four air pollutants: ground-level ozone, small particulate matter, carbon monoxide and sulfur dioxide (figures 7 and 8). Ten of those areas now measure air quality clean enough to meet federal standards (figure 10).

Figure 7: Number of people potentially exposed to unhealthy air.



Source: Department of Ecology

Figure 8: Number of days air quality did not meet health standards for carbon monoxide, particulate matter, ground-level ozone and sulfur dioxide.



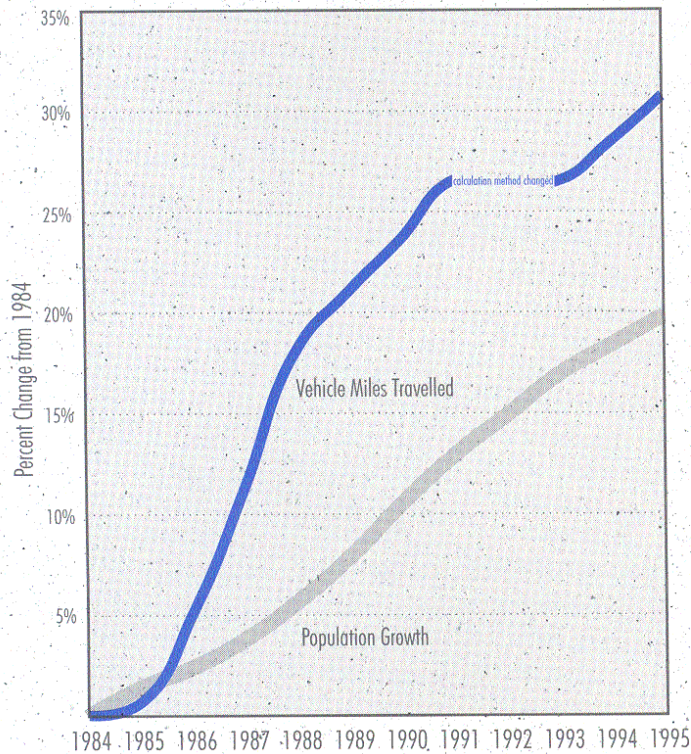
Source: Department of Ecology

Causes of the Problem

The primary cause of poor air quality in Washington is motor vehicle exhaust (figures 9 and 11). Exhaust from motor vehicles contains many toxic pollutants, including carbon monoxide. Motor vehicles are also a source of particulate matter and ground level ozone.

In addition, high levels of particulate matter are caused by tiny particles of soot, dust and unburned fuel from woodstoves, fireplaces, backyard burning, agricultural burning and industry.

Figure 9: Percent change from 1984 in Washington State vehicle miles traveled per year and population growth.



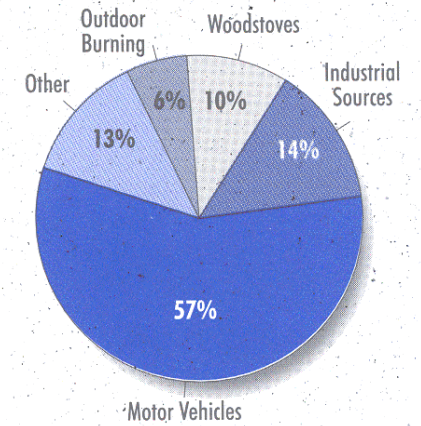
Source: Office of Financial Management

What Can Be Done

No action that we take on a daily basis carries more environmental impact than the use and maintenance of our cars.

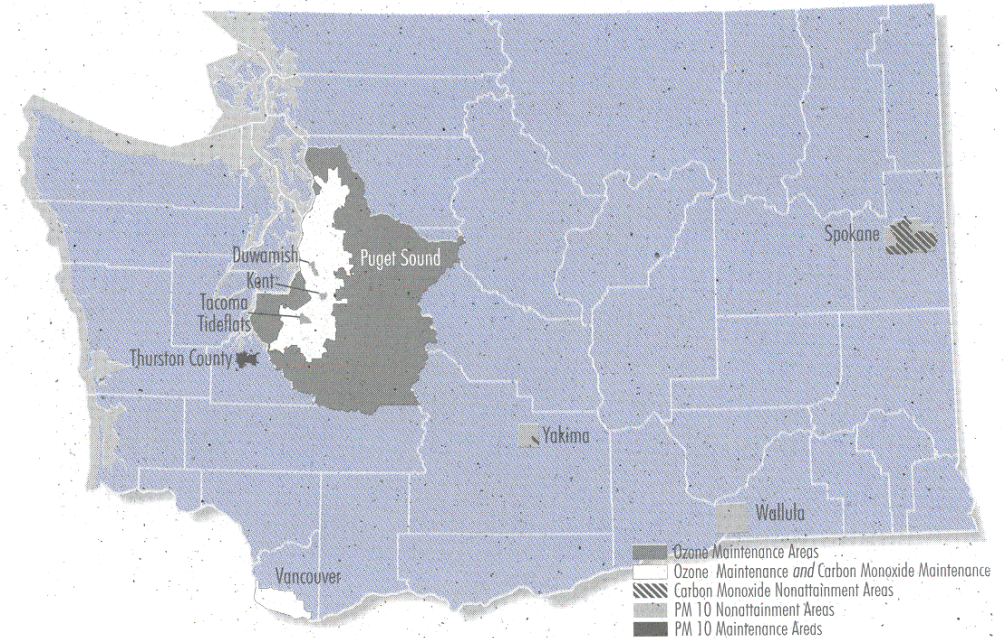
- Routinely maintain your car to reduce the amount of pollutants from the exhaust.
- Drive less: carpool, bike, walk or take the bus.
- Reduce wood-burning indoors and out.
- Compost or chip yard waste instead of burning.
- Use less polluting lawn and garden tools, such as electric or manual lawn mowers.

Figure 11: Air pollution sources in Washington State (1996).



Source: Department of Ecology

Figure 10: Nonattainment (degraded) and maintenance (improved) areas for air quality.



Source: Department of Ecology

Waste

Toxic Chemical Releases

Why This Is Important

Toxic chemicals released from manufacturing facilities to air, water and land can threaten human health and the environment. Ground water that is contaminated by toxic chemicals is a serious health problem when drinking water sources are threatened. Toxic chemicals that enter into rivers and streams can harm fish, wildlife and plants.

Toxic chemicals released to the air can pose a threat to human health. Releases to the air can also end up in soil or water, potentially harming fish and other animal life.

Figure 12: Primary sources of Toxic Chemical Releases.

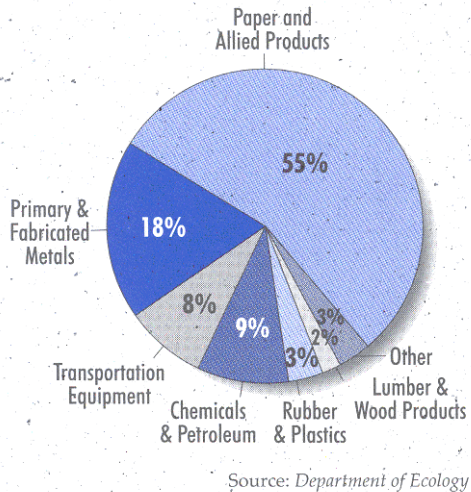
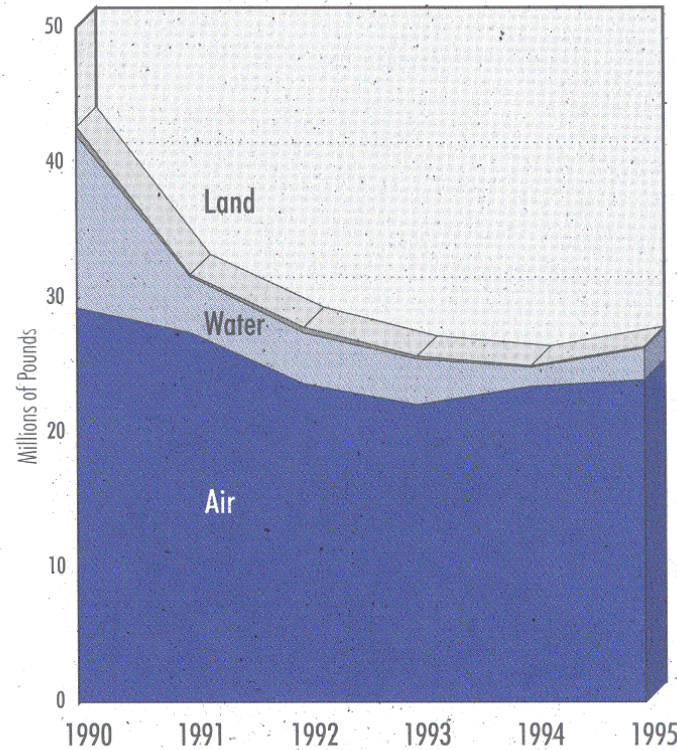


Figure 13: Millions of Pounds of toxic chemicals released to air, land and water.



Source: Department of Ecology

Current Trends

The trend from 1990 to 1994 indicates releases of toxic chemicals went down; however, total toxic releases to the air continues to be a concern. Recent increases in releases to air and water may be due, in part, to changes in reporting requirements (figure 13).

Causes of the Problem

Toxic chemicals are released to the air, land or water through industrial manufacturing processes (figure 12). At the present time, few standards exist for most toxic air pollutants. Some are formed in association with regulated air pollutants; carbon monoxide, particulate matter, ground-level ozone and sulfur dioxide. When these air pollutants are controlled (page 8) so are some toxic chemicals. For new or modified facilities, standards require that toxic air pollutants be reduced to the maximum extent possible.

What Can Be Done

The information in figure 13 is from the State Toxics Release Inventory.

Individuals can use the Toxics Release Inventory information to learn about chemicals that have been released to the air, land and water in their community (on Ecology's home page at <http://www.ecy.wa.gov/>)

Manufacturing facilities use the information to guide development of less toxic manufacturing processes.

Hazardous Waste Generation

Why This Is Important

Improper handling and disposal of hazardous waste can result in contaminated air, water and land and threaten human health. Hazardous waste reduction is very important in the prevention of future environmental and human health risk due to hazardous chemicals. Equally important is the safe management of the hazardous waste that ends up in the environment may require an expensive clean up action.

Current Trends

The amount of hazardous waste generated each year has been decreasing since 1992 (figure 14). This decrease can be attributed to efforts by industry to prevent or reduce the amount of hazardous waste generated. Continued efforts in pollution prevention, reducing the use of hazardous chemicals, will be critical to achieving further decreases in the amount of hazardous waste generated.

Causes of the Problem

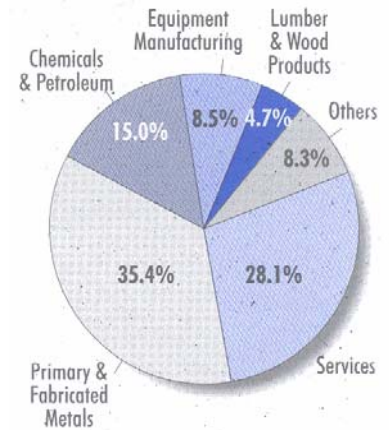
Most of the hazardous waste generated in Washington is produced by large industries (figure 15). Many of these industries are taking positive steps toward reducing the amount of hazardous waste they generate. Of increasing concern are the numerous smaller businesses, such as dry cleaners, printers and auto repair shops, that can potentially pollute soil and ground water if their hazardous waste is not handled properly.

What Can Be Done

Although most hazardous waste is generated by industry, there is much an individual can do:

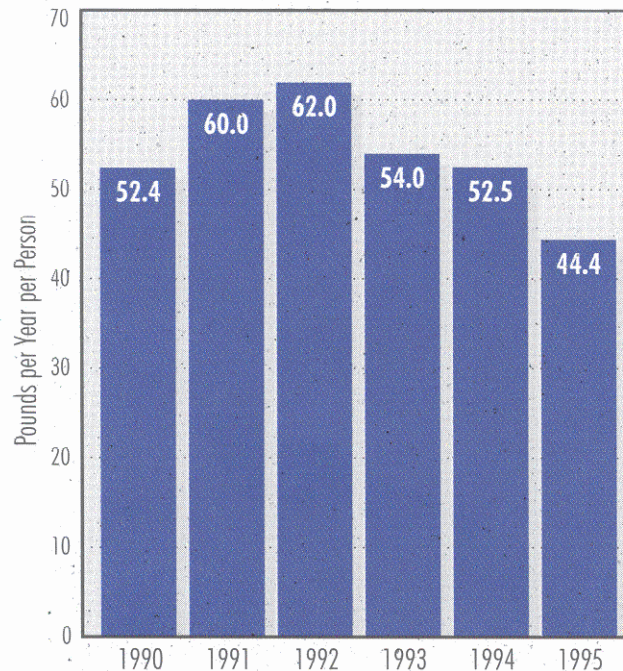
- Use less-toxic products at home, school and work.
- Dispose of unused paint, motor oil and antifreeze at household collection sites (call your local garbage collection service).
- Ask your dry cleaner, printer or auto mechanic how they dispose of used chemicals.

Figure 15: Hazardous waste generation in Washington State.



Source: Department of Ecology

Figure 14: Pounds of hazardous waste generated each year per person.



Source: Department of Ecology

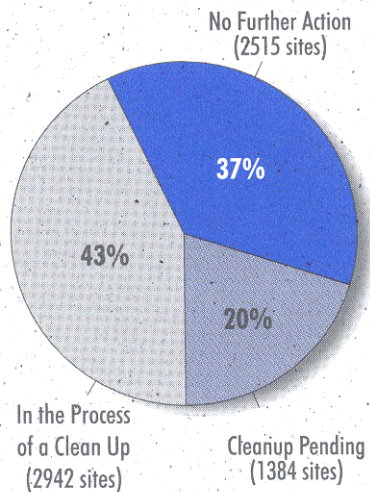
Nuclear and Toxic Site Cleanups

Why This Is Important

More than 6,800 sites in Washington are suspected or confirmed of being contaminated with toxic chemicals. Each contaminated site poses a different type and level of risk to people's health and the environment. For example, contamination of ground water can affect drinking water and expose families to harmful chemicals.

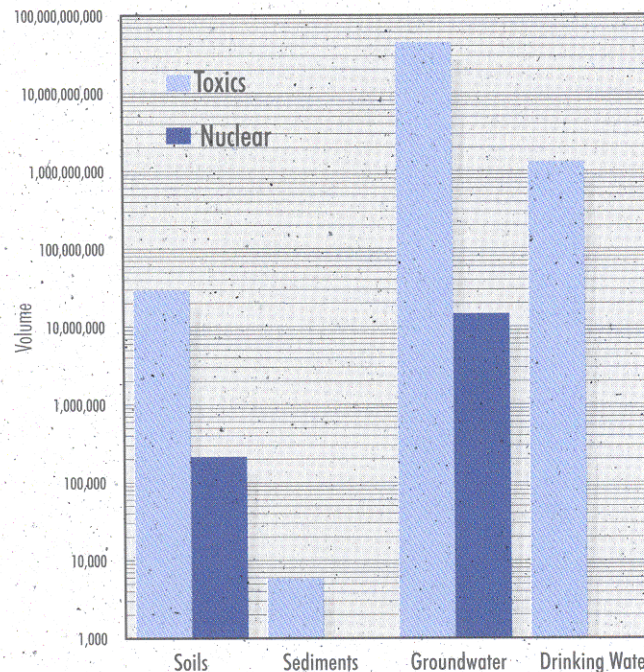
An additional 1,500 contaminated places are located on the Hanford Nuclear Reservation where radioactive and chemical waste were disposed to the soil. At least 230 square miles of ground water under Hanford is contaminated, some of which has migrated to the Columbia River.

Figure 16: Known contaminated toxic sites in 1997.



Source: Department of Ecology

Figure 17: Volume of land and water treated in 1995.



Source: Department of Ecology

Current Trends

Of the more than 6,800 sites, excluding Hanford, a third require no further action, almost half are in the stages of a clean up process and twenty percent are pending a clean up action (figures 16 and 17). In 1995, 2,333,305,700 pounds of toxic contaminants were removed or treated at clean up sites. This is enough to fill more than 4,600 railroad box cars. In addition, at the Hanford Site, 1,900 pounds of toxic contaminants were removed or treated in 1995.

Causes of the Problem

Sites have been contaminated by accidental spills, or releases, illegal dumping and hazardous or solid waste handling practices that historically were thought to be safe.

At the Hanford Site, plutonium and uranium were produced for the United States weapons program between the 1940s and 1980s. Millions of gallons of chemical and nuclear waste have been stored or buried at the site.

What Can Be Done

Cleaning up contaminated sites that pose the highest risk to human health and the environment is a priority. The public is encouraged to take part in the decisions involved in cleaning up a site. Information is available through local libraries, at public meetings and by calling Ecology or visiting our Internet Homepage at <http://www.ecy.wa.gov/>

Solid Waste Disposal

Why This Is Important

The amount of garbage currently generated each day is significant. In 1995 the total amount was 42 million pounds. About two-thirds of that amount was disposed of in environmentally sound landfills, the rest was recycled. An additional 4 million pounds of household hazardous waste and 9.8 million pounds of used oil was collected. This amount will continue to increase with Washington's growing population.

Current Trends

Increased participation by citizens in reducing and recycling waste appears to be having a positive impact on the amount of solid waste going to landfills. In addition, the growth in permanent facilities and community events to collect household hazardous waste and used oil provides increased opportunities to citizens to properly dispose of potentially harmful materials. However, a significant amount of solid waste that is disposed could be recycled (*figure 18*).

Causes of the Problem

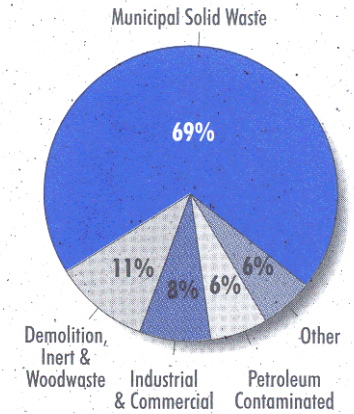
We all make garbage; at home, school and work (*figure 19*). Much of what is produced and used in our society is disposable or has a short product life. Even with success in waste reduction and recycling, Washington's projected population growth will cause an increase in waste generation unless efforts are made to reduce the amount and toxicity generated in the first place.

What Can Be Done

Households have been the major factor in waste reduction and recycling. You can help.

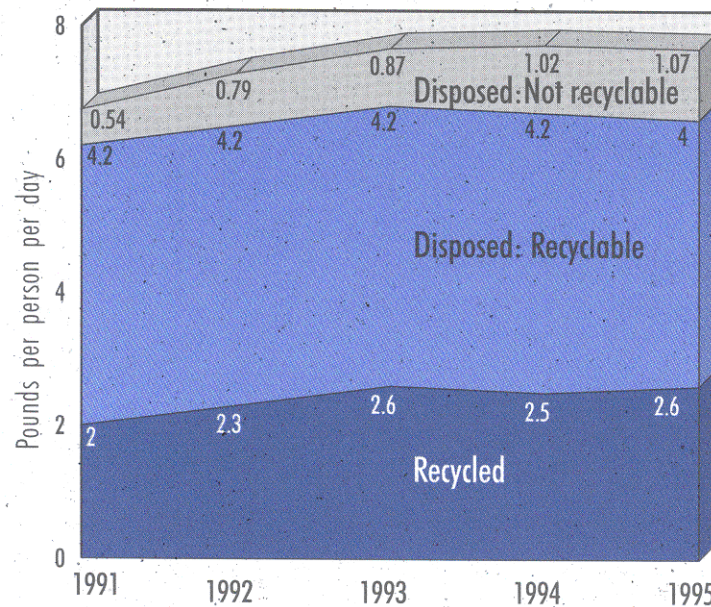
- Request and purchase recycled products from your grocer.
- Avoid buying products that are "over" packaged by purchasing in bulk or economy sizes.
- Avoid disposal products by choosing reusable.
- Compost yard and food waste.
- Take used oil to a collection center.
- Buy less toxic household products and dispose of toxic household chemicals at collection centers.

Figure 19: Types of solid waste disposed in 1995.



Source: Department of Ecology

Figure 18: Pounds of solid waste generated per person each day.



Source: Department of Ecology

Oil Spills

Oil Spill Prevention

Why This Is Important

Washington is one of the nation's primary petroleum refining centers. Crude oil is shipped, trucked and piped into Washington at the rate of approximately 26 million gallons a day. In addition, another 13 million gallons a day of refined product are transported out of Washington.

Major oil spills can have serious impacts on the diverse and abundant fish and wildlife populations that are critical to the recreational, ecological and economic well-being of the state. Given the amount of oil transported throughout the state and the inevitable damage which results from major spills, prevention is a high priority.

Current Trends

The data in figure 21 displays the annual amount of oil spilled in Washington State from spills larger than 10,000 gallons. The amount of oil spilled per year appears to have declined since the implementation of the state's spill prevention and response programs (1991). Although this data relates to volume, other information suggests that the frequency of large spills is also declining.

Causes of the Problem

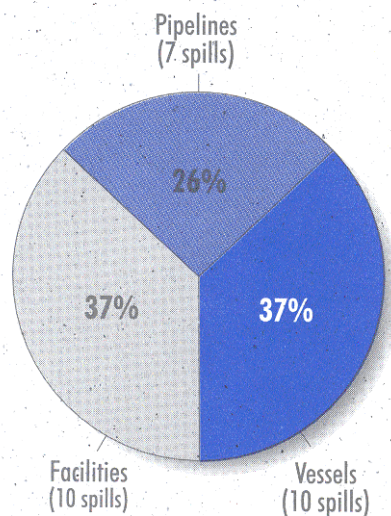
The majority of the large oil spills occur on or immediately adjacent to Washington's waterways. Most major spills are caused by some form of human error and therefore are preventable (figure 20).

What Can Be Done

Everyone can help reduce the impact of a spill by reporting it immediately to the state Emergency Management Office at 1-800-258-5990 or 1-800-OILS-911. In addition, a number of measures have been put into place to prevent major oil spills since 1991:

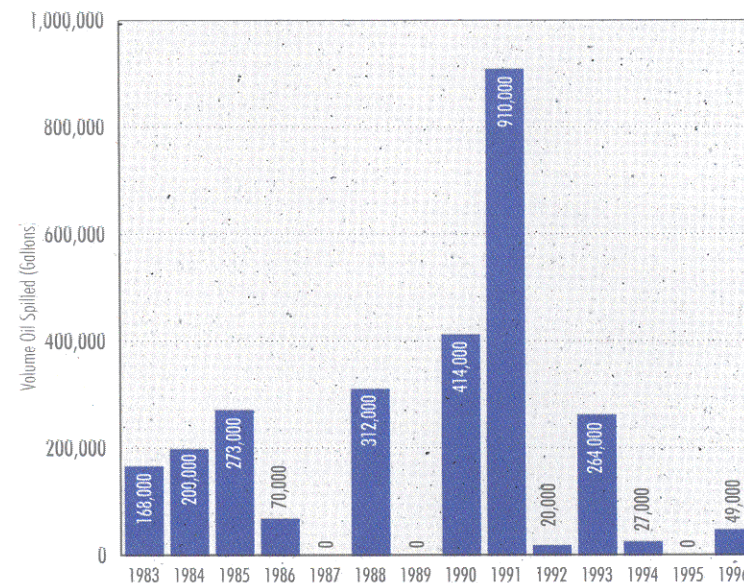
- Improved worker training in spill prevention.
- Investments in new equipment for spill prevention and response.
- Increased effort by local government, tribes and public interest groups to keep oil related businesses focused on spill prevention.

Figure 20: Major oil spills over 10,000 gallons; number of spills by source.



Source: Department of Ecology

Figure 21: Volume of spills per year in gallons from oil spills larger than 10,000 gallons.



Source: Department of Ecology

Compliance with Environmental Laws

Why This Is Important

Environmental laws are passed to:

- Protect people from being exposed to toxic substances,
- Protect natural resources, plants and animals from environmental damage,
- Prevent pollution from occurring, or
- Clean up existing pollution problems.

Complying with, or obeying, existing environmental protection laws is critical to the health and well-being of Washington's citizens and environment.

Current Trends

The recent trend has been to focus on bringing industrial facilities into voluntary compliance with environmental laws (figure 22). This requires an increased effort in providing technical assistance to help industry understand the connection between their actions and the environment. This approach has resulted in a reduction of permit violations.

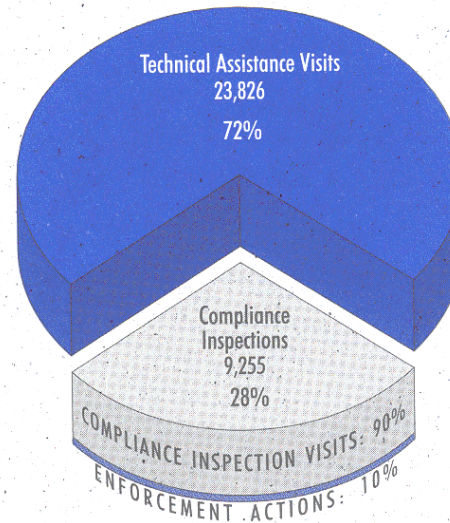
Although Ecology's preferred approach is voluntary compliance, formal enforcement is used in situations that create an imminent threat to human health or the environment and for serious situations of repeated noncompliance.

What Can Be Done

Four basic "tools" are used by Ecology to ensure compliance with environmental laws; 1) permit approval, 2) compliance inspections, 3) technical assistance, and 4) enforcement order and penalty.

Compliance inspections are conducted in response to a citizen complaint or to ensure compliance with an environmental permit. Technical assistance visits are done when a business requests or accepts help in complying with an environmental law. Enforcement is used to require a business to take corrective steps to protect human health and the environment.

Figure 22: Total number of Ecology site visits to businesses between July 1, 1993 and June 30, 1996.

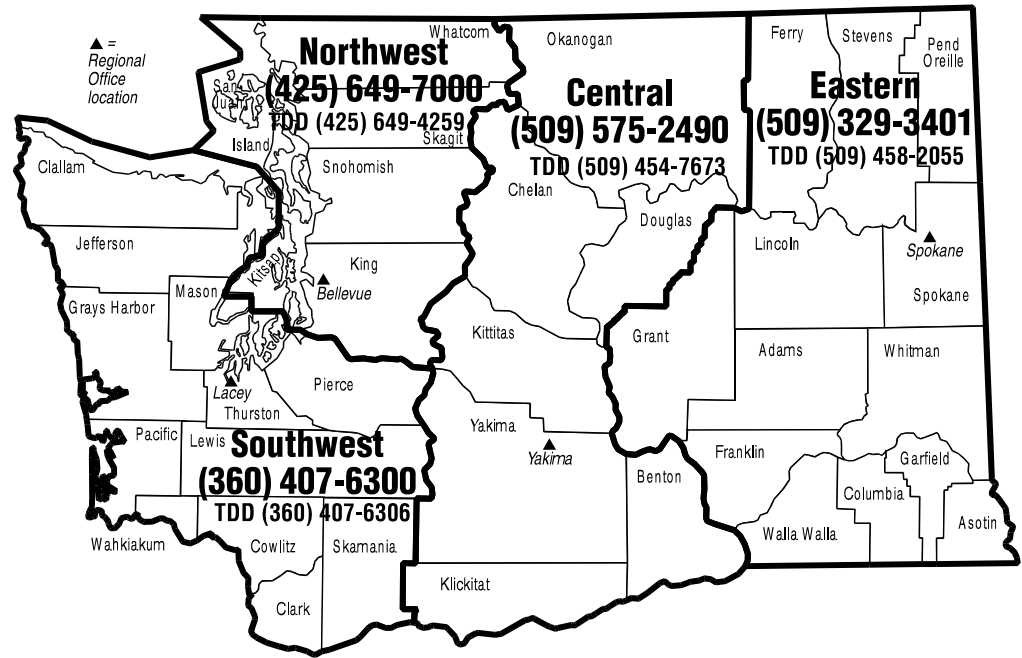


Source: Department of Ecology

It is up to all Washingtonians to make sure future generations have the same or better quality of life as we have today. Throughout this report are tips on how to make informed choices about protecting the environment in your everyday lives. If you need more information, call the Ecology office closest to you or one of the toll-free information lines.

To report a suspected environmental hazard or a spill, call the Ecology regional office closest to you 24 hours a day.

- *Eastern Regional Office, Spokane, (509) 329-3400*
- *Central Regional Office, Yakima, (509) 575-2490*
- *Southwest Regional Office, Lacey, (360) 407-6300*
- *Northwest Regional Office, Bellevue, (206) 649-7000*
- *Hazardous Substance Information, 1-800-633-7585*
- *Hanford Nuclear Reservation Information, 1-800-321-2008*
- *Toxics Cleanup Sites and Underground Storage Tanks, 1-800-826-7716*
- *Motor Vehicle Emission Testing, 1-800-453-4951*
- *Recycling Information, 1-800-RECYCLE*
- *Woodsmoke/Outdoor Burning Information, 1-800-523-4636*



Ecology is an equal opportunity agency. If you have special accommodation needs, contact Felecia Phillips-Curtis at (360) 407-6199 (voice) or 711 or 1-800-833-6388 (TTY)

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