

US EPA ARCHIVE DOCUMENT



THE U.S. EPA'S 25TH ANNIVERSARY REPORT: 1970-1995



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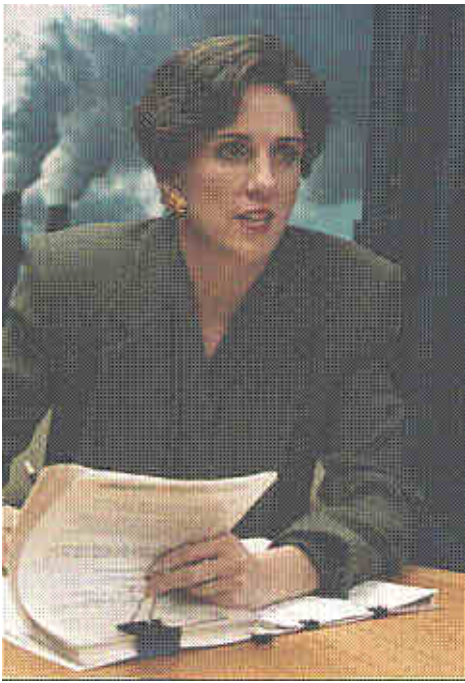


[Acknowledgements](#)



URL=<http://www.epa.gov/25year/>

For Questions or Comments, please send electronic mail to: hilton.patricia@epamail.epa.gov



Letter from the Administrator

S.C.Delaney/U.S.EPA

Dear Reader:

In December of 1970, the United States Environmental Protection Agency (EPA) was created to solve the nation's urgent environmental problems and to protect the public health. In those days, our pollution problems were obvious. A dark veil of air pollution hung over our cities. Rivers and lakes could not sustain life and even caught on fire. The bald eagle, our national bird, was threatened with extinction by unmonitored pesticide use.

For the past 25 years, the nation has made steady progress on the environment. The EPA -- working closely with state, local and tribal governments -- established a system of public health and environmental protection second to none in the world. Our efforts produced impressive, measurable improvements in the environment that have enhanced the quality of life for every American.

Yet, to report on the nation's environmental accomplishments of the past quarter century is not to say we can't do better.

Many environmental challenges lie ahead. Some of the problems from 1970 have proven to be difficult to solve. Also, by learning more about the environment, we have discovered new problems that must be addressed in new ways. As a nation, our work on the environment must continue. We at EPA enter our second quarter-century committed to providing a cleaner environment, at cheaper cost to the American economy, using smarter strategies of environmental protection.

In the future, we will work to improve monitoring of environmental quality by ensuring that our actions are more cost-effective and based on common sense. We will actively seek the opinions of citizens and state and local officials to be sure that our efforts are meeting real needs.

This report chronicles our environmental progress of the past quarter century and looks towards the challenges ahead. It is dedicated to the thousands of EPA employees, both past and present, who have devoted their careers to preserving the nation's environment.



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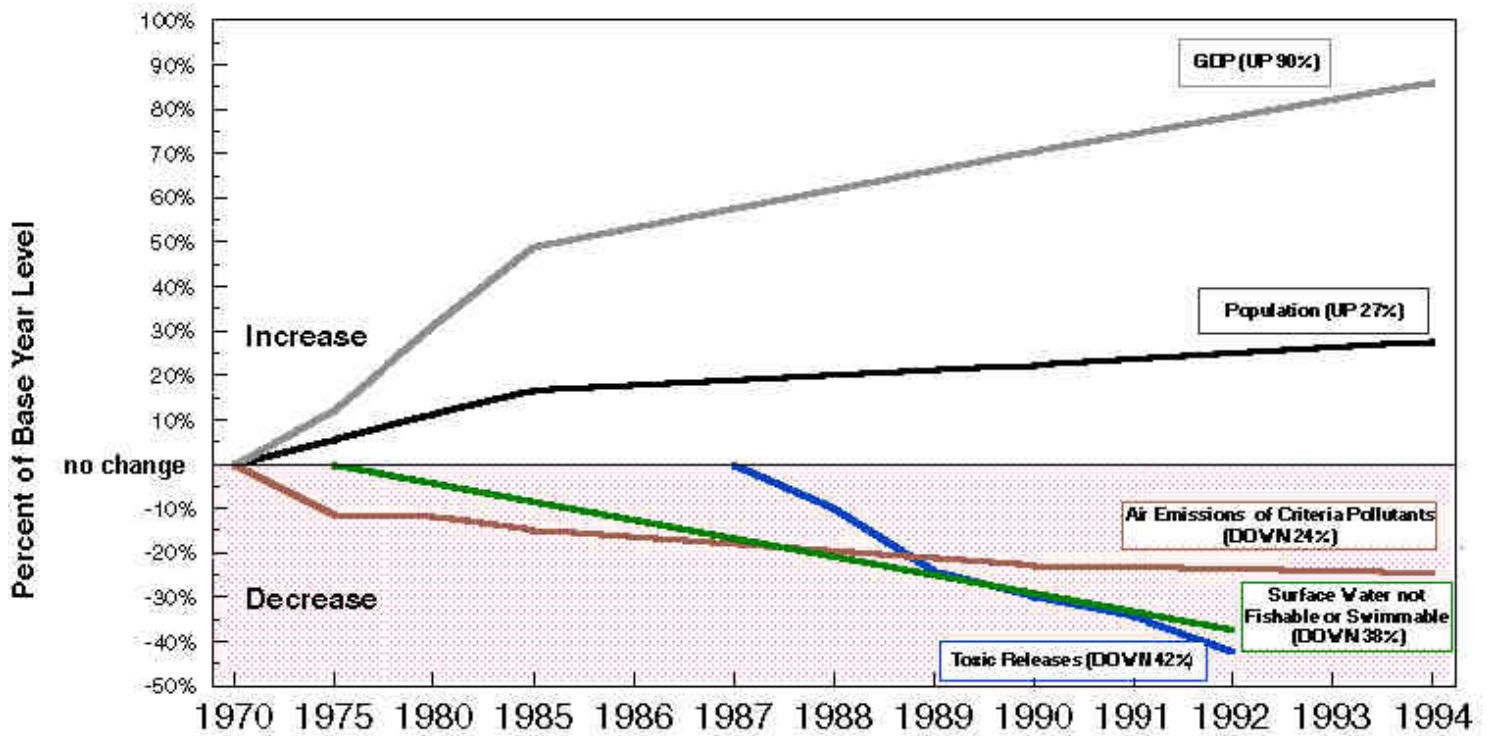
INTRODUCTION

TWENTY-FIVE YEARS OF ENVIRONMENTAL PROGRESS AT A GLANCE

This report celebrates EPA's twenty-fifth anniversary by chronicling the nation's progress in protecting public health and the quality of the natural environment. The data presented in the report show that citizens across the nation are breathing cleaner air, are drinking cleaner water, and have less exposure to dangerous toxic compounds than they did 25 years ago. The report explores these achievements using environmental trends and community profiles from around the country, and then underscores many of the challenges that continue to face the country.

The following graph shows how key environmental trends have improved over the past 25 years along with considerable growth in the U.S. Population and Gross Domestic Product (GDP). Many key facts, trends and challenges are summarized below as an introduction to the remainder of the report.

Environmental Improvements/Economic and Population Growth



[Air Quality Improvements and Other Signs of Progress](#)

- Since 1990, the number of metropolitan areas not meeting air quality standards has dropped by more than half, from 199 cities to fewer than 70. Just since 1990, an additional 50 million Americans now live in areas where smog no longer exceeds health-based standards.
- Between 1985 and 1994, combined 90 of the nation's largest cities (excluding Los Angeles) saw a 72 percent reduction in the number of days where the air was considered unhealthy due to problems with ozone and carbon monoxide. During the same period, the 10 million citizens living and working in Los Angeles experienced one-third fewer days of unhealthy air.
- Since 1970, total emissions of six common air pollutants have decreased by an average of 24 percent.
- Since 1970, emissions of particulate matter decreased by 78 percent.
- Since 1988, airborne concentrations of fine particulate matter have dropped 20 percent.
- Since 1970, emissions of lead have declined by 98 percent, primarily by eliminating lead from gasoline and placing controls on specific industrial sources of lead.
- Since 1978, average blood-lead levels in children have declined by nearly 75 percent.
- Between 1987 and 1993, U.S. production of ozone-depleting chlorofluorocarbons fell by more than 60 percent.
- Annual sulfur dioxide emissions from electric power plants will be reduced to half of 1980 levels under the EPA's flexible, market-based program. This innovative approach will achieve these reductions while saving electric utilities and their customers approximately \$3 billion per year over more traditional command-and-control regulations.
- The percentage of U.S. households that have tested their homes for radon has increased from 3.6 percent in 1990 to 10.2 percent in 1994.
- These improvements have been realized even as the economy grew by 90 percent, the population rose by 27 percent, and the number of motor vehicle miles driven increased by 111 percent.

[Air Quality Challenges](#)

- Sixty-two million Americans live in approximately 60 to 70 metropolitan areas that fail to meet air quality standards for one or more pollutants.
- Total emissions of nitrogen oxides (NOx), primarily due to automobile activity and coal-fired power plants, have increased by 14 percent since 1970. NOx contributes to ground-level ozone (smog) and other environmental problems.
- Indoor air pollutants such as lead, environmental tobacco smoke and radon pose significant human health risks.
- Continuing global challenges include the threats posed by chemicals that deplete the earth's protective ozone layer or impact global climate. Since 1972, for example, world-wide levels of carbon dioxide, a common "greenhouse gas," have increased by eight percent, contributing to potentially increases in global temperatures.

[Water Quality Improvements & Other Signs of Progress](#)

- About 60 percent of the Nation's surveyed rivers, lakes, and estuaries are clean enough to meet basic uses such as fishing and swimming.
- The volume of oil spilled in U.S. waters has declined significantly, from 15 million gallons per year in the mid 1970s to 2 million gallons in 1992, a decrease of 86 percent.

- Ocean dumping of sewage sludge, industrial waste, plastic debris, and medical waste has been banned.
- More than 1 billion pounds of toxic pollution have been prevented from entering our nation's waters each year due to wastewater standards put in place over the last twenty-five years.
- Wastewater standards have been developed for over 50 different industries and more than 57,000 industrial facilities now operate under a pollution control permit.
- More than 30,000 major industrial dischargers are covered by standards that require pretreatment of waste before it enters local sewers. This program has reduced toxic discharges entering public sewers (e.g., heavy metals or PCBs) by an estimated 75 percent.
- Seventy-three million more people, in thousands of communities across the nation, have upgraded sewage treatment, compared to 25 years ago. This added treatment has reduced discharges of harmful oxygen consuming wastes to our waters by 36 percent (from 6,700 metric tons a day in 1970 to 4,300 metric tons a day in 1992).
- Between 200,000 and 470,000 cases of gastrointestinal illnesses each year have been prevented by adherence to drinking water safety standards.
- About 4,000 communities have adopted special programs to protect ground water supplies from contamination.

Water Quality Challenges

- About 40 percent of the Nation's surveyed rivers, lakes, and estuaries are not clean enough to meet basic uses such as fishing and swimming.
- Although wetlands destruction is declining, the United States continues to lose nearly 70,000-90,000 acres of wetlands each year.
- Nonpoint source pollution such as pesticide runoff is now the leading cause of water pollution in our nation.
- Localized cases of waterborne diseases continue to threaten drinking water safety. In 1993, the parasite, cryptosporidium, was linked to over 400,000 illnesses and 100 deaths in Milwaukee.

Waste, Toxics, and Pesticides Management

- Overall, the volume of Toxic Release Inventory chemicals released into the environment was reduced by 43 percent between 1988 and 1993. Between 1988 and 1994, releases of 17 specific high priority toxic chemicals fell by more than 46 percent. Reductions in toxic releases to different areas of the environment can be summarized as follows:
 - Toxic air emissions fell by 39 percent;
 - Toxics discharged to surface waters decreased by 13 percent;
 - Disposal of toxic substances into deep wells fell by 57 percent while landfilling and other releases to land decreased by 44 percent.
- Since the early 1970s, EPA has worked to reduce the harmful effects of pesticides by:
 - Banning or eliminating the use of over 230 pesticides and 20,000 pesticide products, such as DDT.
 - Promoting programs that reduce the amount of pesticides applied to crops.

- Increasing the safety of those pesticides that are applied.
- Bringing safer pesticides to market.
- Establishing basic workplace protections for almost four million agricultural workers.
- Through recycling and composting, domestic waste recovery for other uses has increased from 7 percent by weight in 1970 to 24 percent in 1994.
- More than 141,000 clean-ups of underground storage tanks have been completed since 1990.
- Of the 1,300 Superfund sites considered to pose the highest risk to human health, EPA has implemented clean-up activities at 95 percent and completed clean up construction at 349 of these sites.

Waste, Toxics, and Pesticides Challenges

- From 1970 to 1994, U.S. solid waste production increased by one-third, from 123 million tons annually, or 3.3 pounds per person per day, to 209 million tons or 4.4 pounds per person per day.
-

New Directions

To meet the nation's future environmental challenges, the EPA is reinventing the way it provides environmental protection and exploring new directions to implement its programs fairer, faster and more cost-effectively. Reinvention at EPA means focusing on results and providing flexibility and incentives to encourage innovative solutions. It means forming partnerships with states and tribes as co-regulators, with stakeholders to support local efforts to forge sustainable futures, and with regulated entities to find leaner, cheaper solutions. It means empowering the public to take action by increasing access to information about pollutants in their communities and making more data available through programs such as the Toxics Release Inventory (TRI) program. It means finding ways to break down the legal barriers that currently make it difficult to implement integrated approaches for managing environmental quality at the facility-, industry-, and community-wide levels. Building on past successes, EPA is adopting a more comprehensive approach that develops integrated solutions for entire communities and ecosystems.



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AIR QUALITY

In 1970, the nation passed the Clean Air Act in response to the growing recognition that our air was potentially unhealthy. The Clean Air Act quickly eliminated the most egregious sources of air pollution. In addition, the law put in place health-based standards to protect our right to breathe clean air. All across the country, improvement in air quality is regarded as one of the most important environmental achievements of the last quarter century.

In achieving this progress, EPA has traditionally employed a command-and-control approach, setting and enforcing strict standards for six common, high risk pollutants. Looking ahead, the strong enforcement that yielded these gains will continue. In the future, however, traditional methods will be supported by new, more flexible ways of doing business.

To begin, EPA will be expanding the roles of state and local governments, industry, environmental groups and other stakeholders in the standard setting and implementation processes. In addition, EPA will rely increasingly on innovative, market-based, economic incentive approaches to encourage more cost-effective and efficient compliance. EPA also anticipates that education and information transfer will be important tools, especially in helping to address problems posed by indoor air pollution.

CLEARING THE AIR: THE SUCCESS OF STRONG ENFORCEMENT

The Six Common Air Pollutants

Under the Clean Air Act, EPA established national standards for six common air pollutants. These common air pollutants, designated "criteria pollutants," are lead, nitrogen dioxide, sulfur dioxide, carbon monoxide, particulate matter (PM10) and ground-level ozone, which causes smog. These six pollutants are found throughout the nation and can pose serious threats to human health, ecosystems, visibility, crops and buildings (see Air-1). Consequently, reducing these pollutants has been one of the primary focuses of air pollution programs.

Air-1

IMPACTS OF SIX COMMON POLLUTANTS

Pollutant	Major Impact	Change from 1970 to 1994
Lead	Infant Mortality, Reduced Birth Weight and Childhood IQ loss	- 98%

Ozone	Respiratory Illness and Lung Damage, Crop and Forest Damage, Buildings and Materials Damage and Visibility Problems	- 23%
Sulfur Dioxide	Respiratory Illness, especially in Asthmatics, Visibility Problems, and Precursor to Acid Rain	- 32%
Carbon Monoxide	Circulation Problems and Lung Damage	- 23%
Nitrogen Dioxide	Lung tissue Damage and Increased Respiratory Illness	+ 14%
Particulate Matter	Premature Deaths and Increased Lung Damage	- 78%

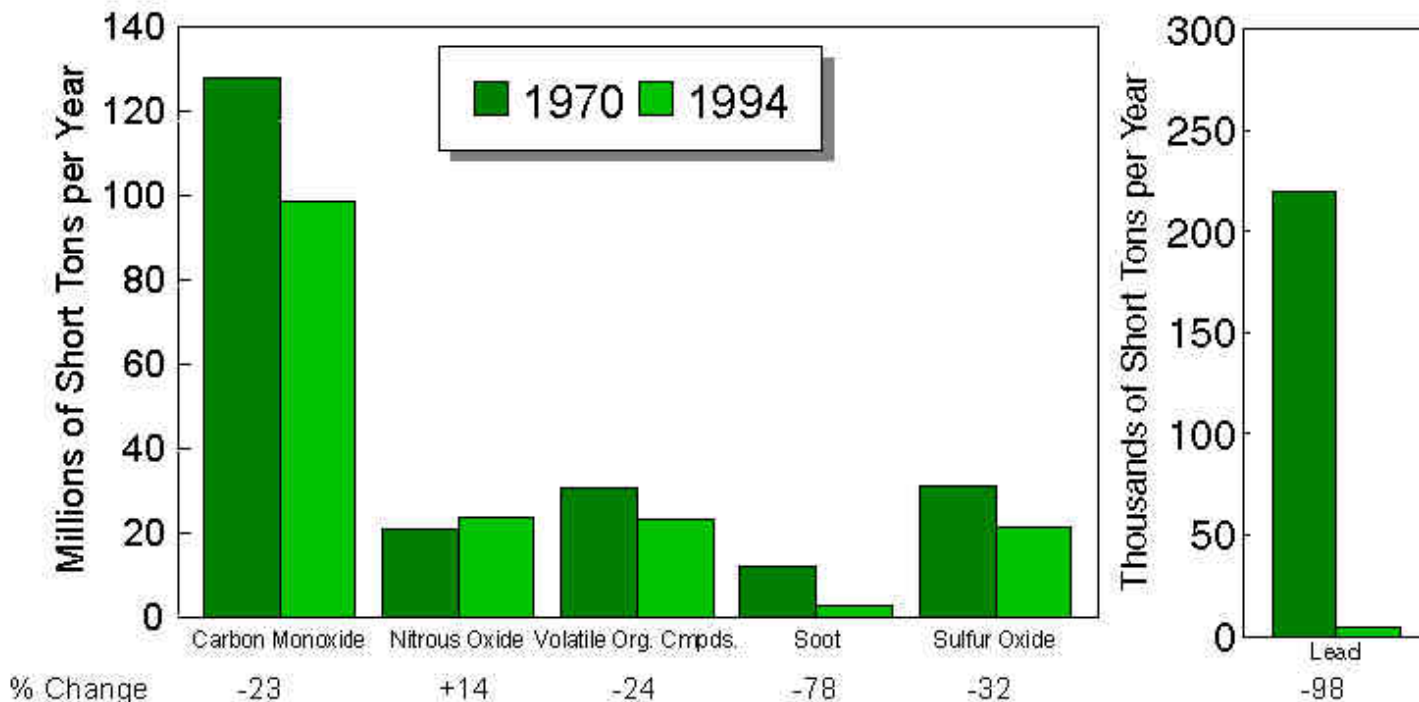


Cleaning the Winter Air in Southern Oregon

Since 1970, total emissions for all six pollutants are down by 24 percent. The air program has realized great success with reductions in all pollutants except nitrogen oxides (see Air-2). Increased coal burning at power plants has increased nitrogen oxide emissions despite a decline in emissions from motor vehicles.

Air - 2

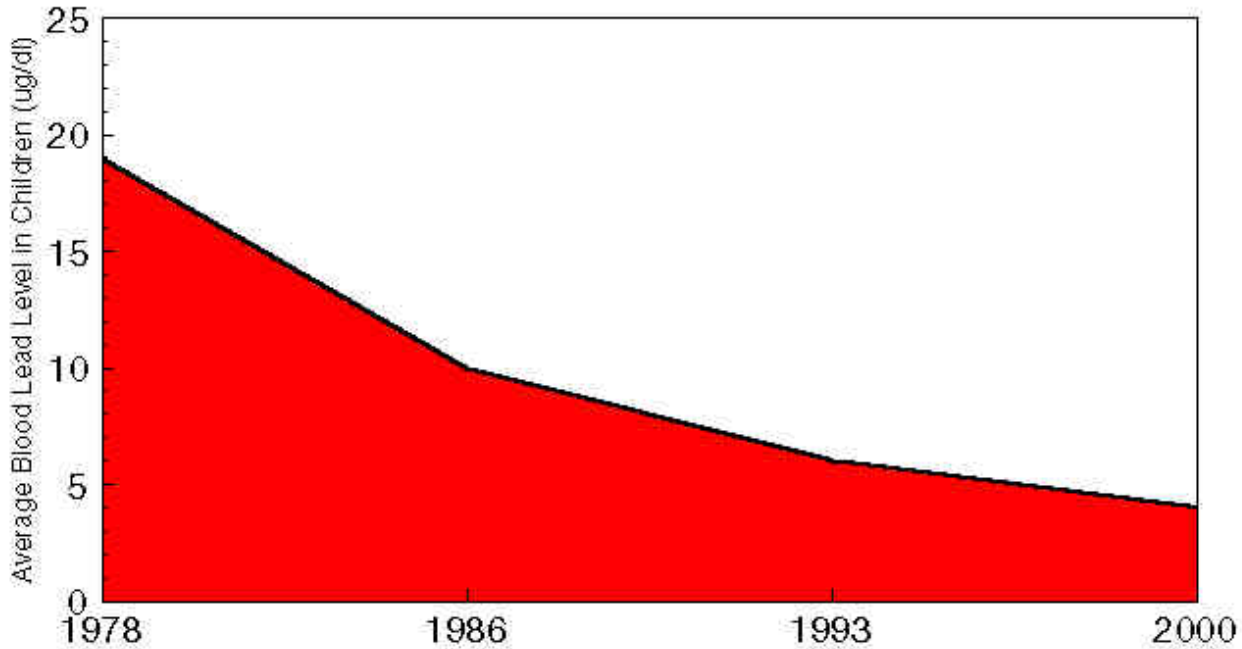
SOURCES OF POLLUTION ARE INCREASING; EMISSIONS OF MANY AIR POLLUTANTS ARE DECREASING



The most significant reductions have occurred in emissions of lead, down by 98 percent. This success is due primarily to the EPA efforts to remove lead from gasoline and to place controls on specific industrial sources of lead. Significantly, blood lead levels in children have been reduced by nearly 75 percent since 1978 (see Air-3).

Air - 3

BLOOD LEAD LEVELS IN CHILDREN ARE DOWN BY 75 PERCENT



Source: Center for Disease Control, 1993, as reported in Proposed Office of Water Environmental Indicators, December 1994.

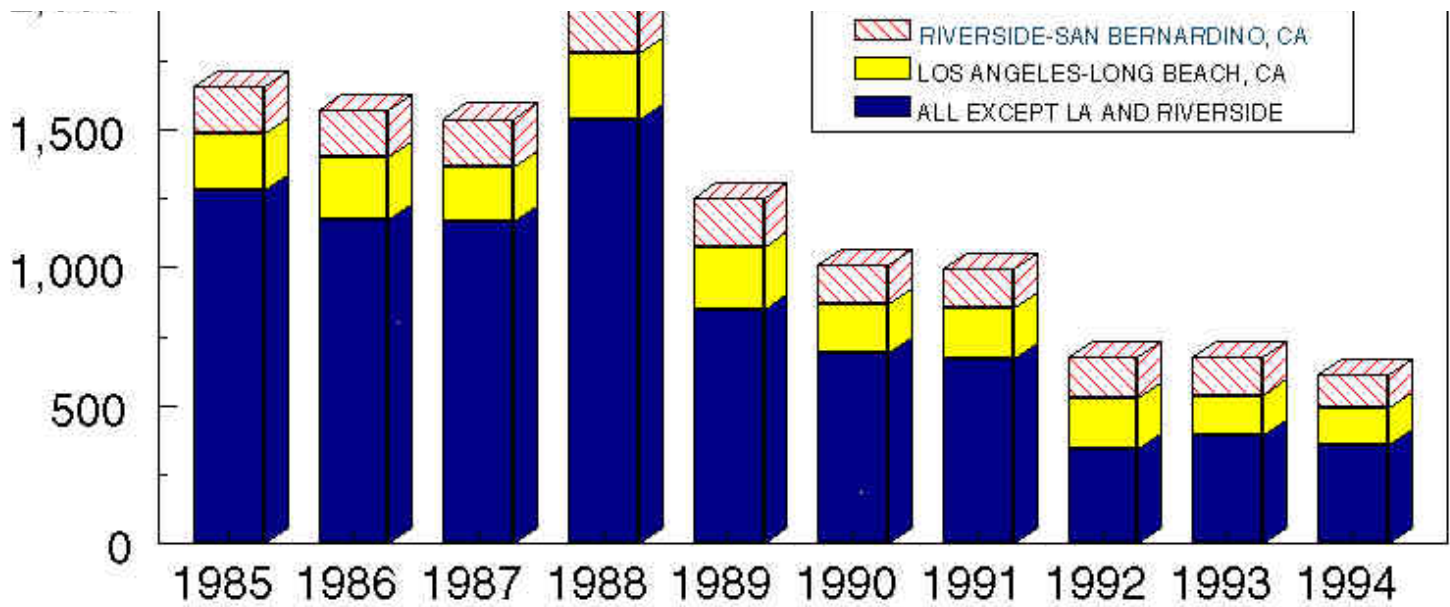
In addition to its success with regard to lead, the EPA actions over the past 25 years have resulted in a 70 to 80 percent reduction in emissions of other pollutants from a typical car. U.S. cars are running more efficiently as well as more cleanly. Cars are now 90 percent cleaner than in 1970. Over the same period, miles per gallon delivered by a typical car has almost doubled.

EPA measures air quality in major urban areas using the Pollution Standard Index (PSI). When the index exceeds 100, the air is considered unhealthy. The majority of PSI days greater than 100 are the result of carbon monoxide and ozone problems. From 1985 to 1994, there has been a downward trend in the number of PSI days greater than 100 in 90 major urban areas (see Air-4). Since Los Angeles and Riverside, California generally account for many of the unhealthy days, their indices are shown separately. During the same timeframe, in Los Angeles, the number of unhealthy PSI days has decreased by 35 percent. Riverside has experienced a 27 percent decline. For the remaining urban areas, PSI days exceeding 100 have fallen by more than 70 percent.

Air - 4

Total Number of PSI Days Greater than 100 in the 90 Largest Cities





Source: U.S. EPA 1994 National Air Quality and Emissions Trend Report



[Progress in Addressing Ozone Pollution \(Smog\)](#)

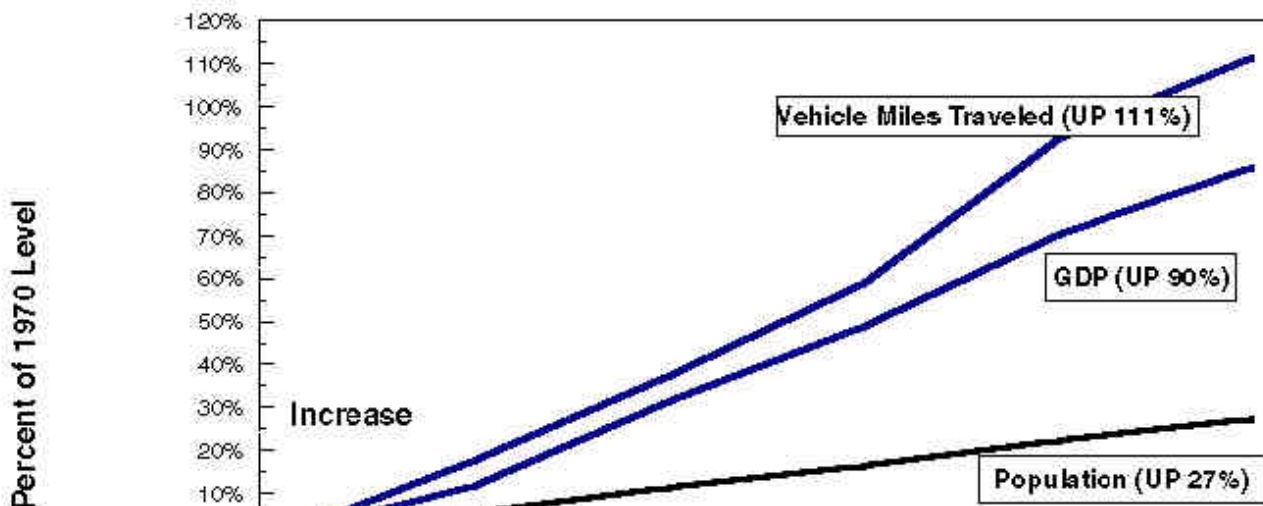
Since 1990, the number of metropolitan areas not meeting air quality standards has dropped from 199 cities to fewer than 70. Moreover, EPA Administrator Carol Browner recently reported that 50 million Americans are breathing far healthier air, freer from harmful levels of smog, than in 1990.

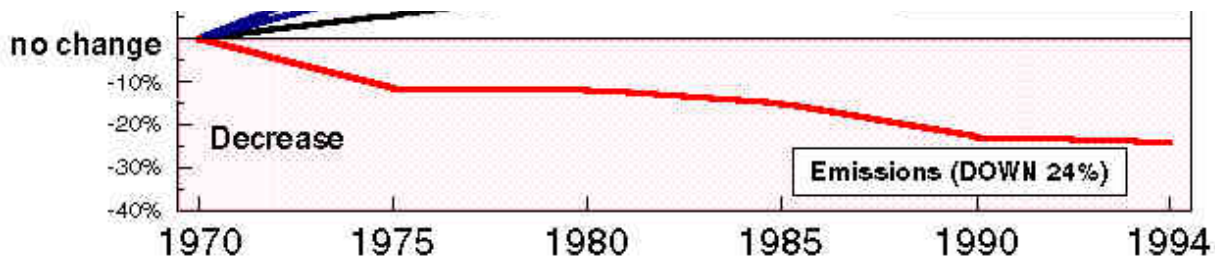
The success in reducing pollutant emissions is even more impressive when one realizes that from 1970 through 1994, the U.S. population increased by 27 percent, the domestic economy grew by 90 percent, and the number of motor vehicle miles driven increased by 111 percent (see Air-5).

EPA works in coordination with states, industry and public interest groups to reduce ozone pollution, in the form of cleaner cars, cleaner fuels, and more stringent controls on industrial pollution.

AIR - 5

Emissions Reductions/Economic and Population Growth





Vehicle Miles and Emissions data are from: 'National Air Pollutant Emission Trends, 1900-1994,' October 1995, EPA-454/R-95-011.
 Gross Domestic Product and Population data are from: Statistical Abstract of the United States, 1995, U.S. Department of Commerce, Bureau of the Census.

Protecting the Ozone Layer

The ozone layer protects life on earth from exposure to harmful ultraviolet rays. A small number of industrial chemicals, however, are destroying the earth's stratospheric ozone. As the ozone layer is depleted, the levels of ultraviolet radiation reaching the planet's surface increase, creating significant health implications for all humans. The most immediate dangers include skin cancer, cataracts, and immune system impairment. Crop yields and ocean productivity may be also adversely impacted by ozone depletion.

Of the ozone-depleting chemicals, some of the most harmful are chlorofluorocarbons (CFCs), which are widely used as coolants in refrigerators and air conditioners. EPA directed the phaseout of CFC production as mandated by the Clean Air Act and in compliance with the international Montreal Protocol. By the end of 1995, CFC production for domestic use was eliminated in the U.S. most recently through a flexible, market-based approach where a limited number of permits to produce CFCs were allocated. If all nations abide by the agreement and it is fully implemented, the ozone layer should recover by the middle of the next century.

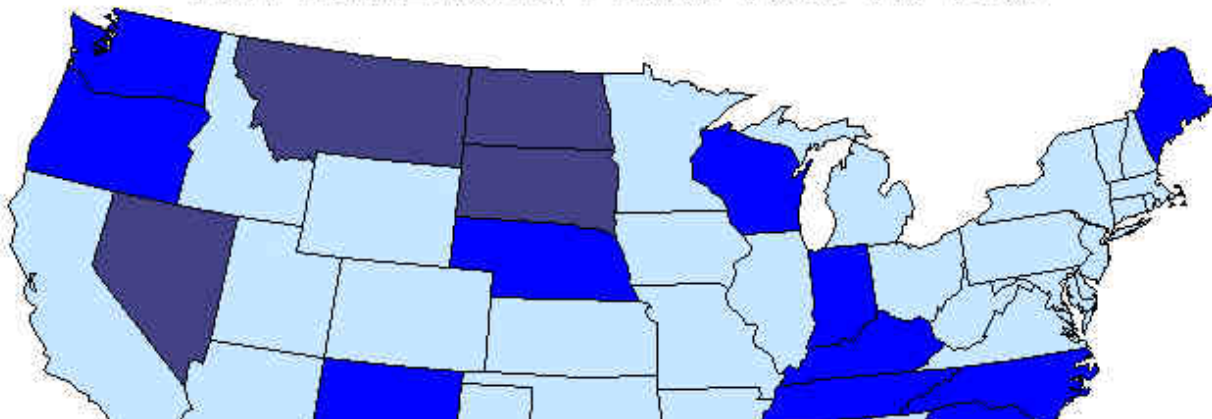
Air Toxics

Under the Clean Air Act, EPA also sets national pollution emission standards for toxic pollutants. Exposure to these hazardous compounds can result in severe damage to human health, including cancer and other chronic and acute illnesses. Many of these contaminants create significant risks when deposited on the land or in the water because they can accumulate to dangerous levels in humans and animals.

The volume of toxic air pollutants released to the air is decreasing. The EPA's Toxics Release Inventory, an annual accounting of toxics reaching the environment, shows that total emissions of hazardous air pollutants were reduced by 31 percent between 1988 and 1992 (see Air-6).

Air - 6

PERCENT CHANGE IN TOXIC AIR POLLUTANT AIR RELEASES FROM 1988 TO 1992





Source: U.S. EPA, 1993 National Air Quality and Emissions Trends Report

■ Increase	(5)
■ Up to 25% decrease	(15)
■ Greater than 25% decrease	(30)



[Improving Our Ability to Assess Risks](#)

In 1990 Congress directed the EPA to set, under a very ambitious time schedule, standards requiring maximum controls for 189 toxic compounds. As a result, the Agency has issued standards for hazardous air emissions from 18 industries. These standards reduce toxic air emissions by 900,000 tons annually.

Controlling Acid Rain

Acid rain is caused when sulfur dioxide and nitrogen oxides -- pollutants released primarily from the burning of coal, oil and other fossil fuels by electric utility power plants and automobiles -- chemically react with other substances in the atmosphere to form acidic compounds. When these acids are carried down from the atmosphere in rain, fog or snow, they can harm fish, damage high altitude forests and contribute to the deterioration of buildings and historical monuments. The pollutants that cause acid deposition have also been known to worsen asthma and other lung ailments and to impair visibility in many regions of the nation, including the scenic vistas of our national parks.



[Cleaner Air in New England](#)

To reduce the harmful impacts of acid rain, the EPA is using an innovative, market-based approach to controlling sulfur dioxide (SO₂) emissions at electric utility power plants. The Clean Air Act permanently limits annual SO₂ emissions from electric power plants to half their 1980 levels resulting in a 10 million ton reduction. Among the innovative features of this program are the cap on total emissions, great compliance flexibility and heavy reliance upon economic incentives, not government proscription. Units affected by the program are free to choose how they meet their emission limits. For example, compliance options might include switching to cleaner fuels, installing pollution controls or reducing user demand for electricity. In addition, under the Acid Rain Program, companies that reduce their SO₂ emissions below their reduced emission limit can sell that extra emission reduction to other companies that wish to apply them to meeting their current or future emissions requirements. This market-based approach to reducing sulfur dioxide emissions will save utilities and their customers approximately \$3 billion per year over the more traditional command and control approach. When fully implemented, this program will result in fewer acidic lakes and streams, reduced damage to buildings and monuments, measurable health benefits of between \$12 and \$40 billion per year and visibility improvements of \$3.5 billion per year.

INDOOR AIR: PROGRESS THROUGH EDUCATION

Most people spend up to 90 percent of their time indoors, but many are not aware of the potential risk to their health posed by pollution inside their homes, schools, factories and offices. Common pollutants found in indoor environments include lead, radon (a naturally-occurring gas that is the country's second leading cause of lung cancer), household pesticides and solvents. Recent scientific evidence indicates indoor air can be more seriously polluted than outdoor air, even in large industrial cities. More importantly, those exposed to indoor air pollution are often the elderly, young and others most susceptible to ill effects.

Fortunately, many indoor air quality problems can be easily managed using readily available technology. Through its efforts to reduce lead in dust from peeling paint and to educate the public about the risks posed by environmental tobacco smoke and radon, EPA is taking steps to reduce these risks.

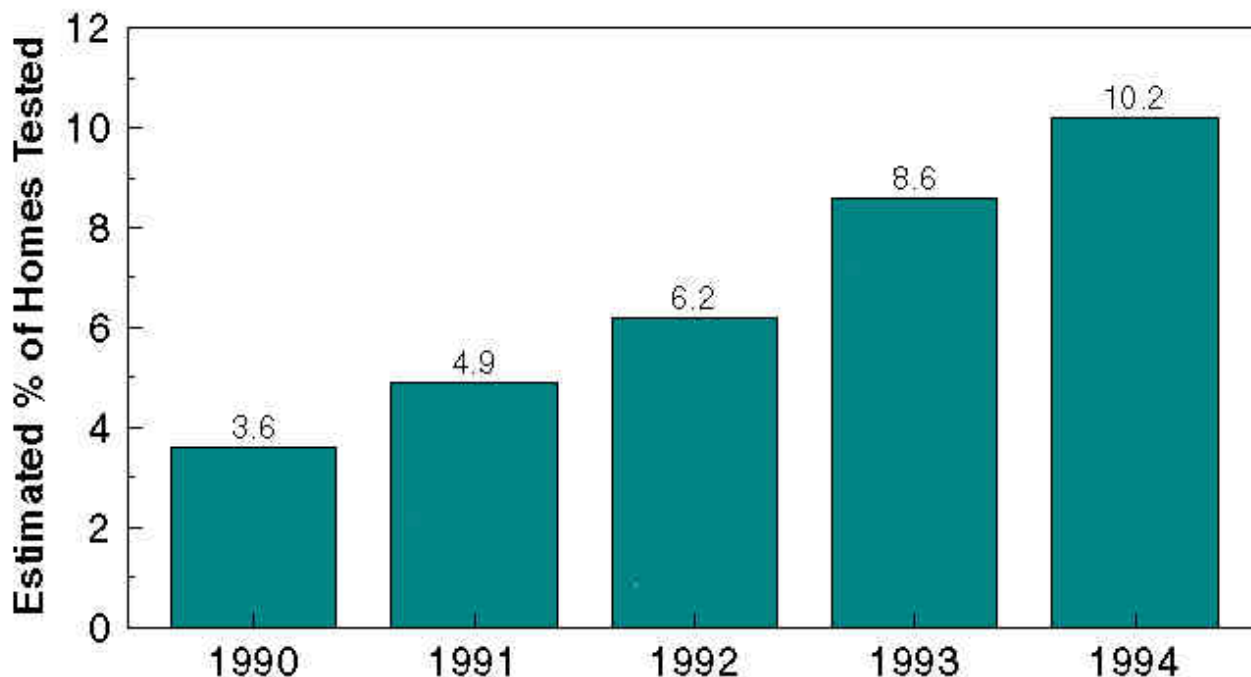


Attacking Indoor Lead Poisoning

These efforts are beginning to show impressive results. Spurred on by EPA's radon education program, the percentage of U.S. households that have tested their homes for radon has increased significantly over the past five years (see Air-7). This number is likely to continue to grow as more states require that radon testing be part of any real estate transaction. In addition, more than 500,000 new homes have been built with radon-resistant features.

Air - 7

MORE HOMES ARE BEING TESTED FOR RADON



Source: EPA Office of Air and Radiation, 1994.



Reducing the Risk of Radon

AIR QUALITY CHALLENGES AHEAD

EPA and the states have made great strides in responding to threats to human health and the environment posed by air pollutants. Yet much work remains to be done. Sixty-two million Americans live in approximately 60 to 70 metropolitan areas that fail to meet air quality standards for one or more pollutants. As EPA turns to the future it will concentrate on many significant challenges, including:

Ground-Level Ozone: Ground-level ozone is a dangerous pollutant that commonly appears as smog. In 1994, approximately 93 million people lived in areas that did not meet the ozone standard. The EPA is currently reviewing the ozone standard as well as a related standard for particulate matter to ensure they protect human health. The EPA is also working to ensure that states have sufficient flexibility to manage their ozone problems and achieve the health-based standards.

Pollutants from Mobile Sources: Nitrogen oxides (NO_x) are key contributors to acid rain, ground-level ozone, inhalable fine particles and particulate matter. A large proportion of this pollution comes from our automobiles -- our trips to the store and to work, as well as our cross-country travels. Technological advances in reducing vehicle pollution have helped reduce NO_x from mobile sources. Unfortunately, our ever-increasing reliance on automobiles has made it difficult to effectively control NO_x emissions. Americans today drive more than 2 trillion miles per year, more than twice the number in 1970. Consequently, over the last 25 years emissions of nitrogen oxides, unlike all other criteria pollutants, have increased.

EPA is working to reduce nitrogen oxide pollution. Part of this effort includes providing incentives to develop more energy efficient modes of travel, including cleaner cars, trucks, buses and gasoline.

Indoor Air Pollutants: Lead, radon, household pesticides and solvents are common indoor air pollutants that pose significant health risks. EPA will continue to investigate and employ non-regulatory approaches, especially education, so consumers take these risks more seriously and take actions to prevent unnecessary exposure.

Global Issues: EPA will need to address a number of global challenges that require cooperation with other U.S. agencies as well as with other countries. Continued diligence is required to further reduce chemicals that harm the ozone layer. Moreover, EPA will need to take steps to help control the production of carbon dioxide, a common gas that accumulates in the atmosphere and contribute to global warming. Carbon dioxide and other compounds are often referred to as "greenhouse gases" because they trap heat, causing the Earth to warm. Since 1972, worldwide levels of carbon dioxide have increased by eight percent, contributing to increases in global temperatures.



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CLEANING THE WINTER AIR IN SOUTHERN OREGON

Residential wood stoves and fireplaces can be major sources of particulate matter (PM-10) pollution. Increased concentrations of PM-10 can affect breathing and respiratory system functioning, especially for the elderly, children, and persons suffering from chronic lung disease or heart problems. The problem becomes particularly bad when winter weather conditions, known as air inversions, cause the pollutants in the air to become trapped, allowing them to build to unhealthy levels.

In Klamath Falls, Oregon, extensive use of wood stoves and fireplaces had led to local concentrations of PM-10 that were among the highest recorded in the country. Alarmingly, in January 1988 Klamath Falls recorded levels five times greater than the national health standard. In 1990, during the times when concentrations of PM-10 were at their highest, school children showed significant declines in breathing and lung capabilities.

In response to this serious problem, EPA and the state of Oregon worked closely with the local community to develop public awareness and voluntary programs for restricting wood burning. From 1991 through 1993, funding from oil surplus funds, community block grants and local government sources helped residents purchase over 700 alternative heating devices that replaced poorly functioning wood stoves. In addition, the community adopted restrictions on the use of wood stoves during times of air inversions.

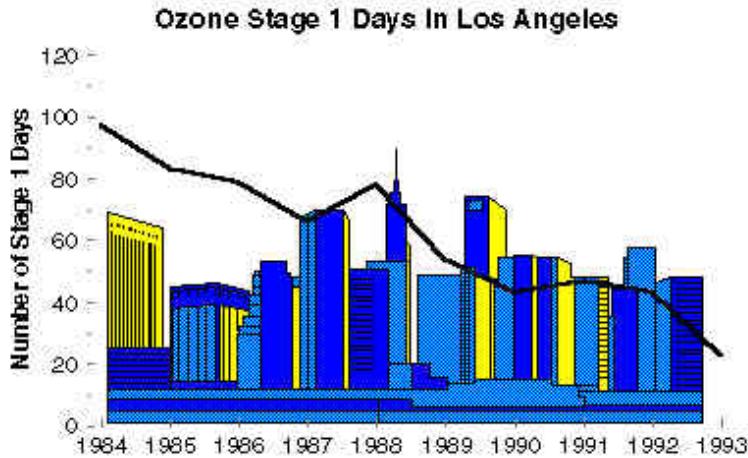
These actions, along with continued community education, have led to dramatic improvements in the local air quality. National health standards for PM-10 have not been exceeded since before the 1991-1992 heating season, and the prospects for continued air-quality improvement at Klamath Falls are bright.

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PROGRESS IN ADDRESSING OZONE POLLUTION (SMOG)

Ground level ozone pollution remains a pervasive problem in the United States. Ozone is not emitted directly into the air but is formed through chemical reactions of nitrogen oxides and volatile organic compounds with sunlight. Since ozone is not a localized hot-spot problem, effective control programs must take a broad view of the problem and involve a lot of stakeholders.

Los Angeles, California is the only area in the country classified under the Clean Air Act Amendments as "extreme" for ozone and it has by far the highest ozone concentrations nationwide. The large number of motor vehicles and the frequent occurrence of air inversions that trap pollutants contribute to this problem.



Los Angeles has, however, realized significant gains in its efforts to reduce ozone pollution. High levels of ozone, the major component of smog, can be evaluated by the number of days that the concentration exceeds 200 parts per billion. These are referred to as stage-one days. In the decade between 1984 and 1993, the number of stage-one days was reduced from a high of 97 in 1984 to 23 days in 1993.

To meet these continuing challenges, EPA worked with the local government agencies, activists, industry and the public to develop a Federal Implementation Plan to clean up the air in Los Angeles and its surrounding communities. EPA's approach encouraged the use of innovative strategies sensitive to the needs of individual communities to address continuing air pollution problems. Most important, EPA's extensive public involvement helped to inspire widespread public support for and participation in the state and local air quality planning process, which culminated in the development of state implementation plans by state and local agencies. These plans reaffirmed the communities' leadership in solving local air quality problems.

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IMPROVING OUR ABILITY TO ASSESS RISKS

EPA is continually seeking to improve our ability to evaluate the risks posed to different population groups by exposure to specific toxic compounds. Children, the elderly, those with illnesses and other groups may be more or less sensitive to a particular chemical than the typical individual evaluated in a risk assessment. The scientists who evaluate the toxicity and hazards of chemicals to certain people are known as "risk assessors".

As part of this effort, risk assessors in EPA's regional office in San Francisco, California have determined that vinyl chloride, a known human carcinogen, is especially potent in infants. Young children living near landfills or hazardous waste sites may be exposed to vinyl chloride in their homes. The regional risk assessors, working with the Office of Research and Development, at the EPA Headquarter, and Cal/EPA, a California state agency, developed a risk assessment that enabled the following steps to be taken by EPA: 1) set action levels that would protect children in their homes; 2) determine remediation alternatives for vinyl chloride in hundreds of homes; and 3) identify unacceptable risks for young children living near hazardous waste sites containing vinyl chloride.

This innovative approach to assessing risks helps promote the Agency's stated goal to identify and address risks to children from sources of pollution.

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CLEANER AIR IN NEW ENGLAND

The national success in reducing the emissions of most criteria pollutants has led to dramatically cleaner air in New England, and has helped reduce the risk posed by acid rain.

Between 1974 and 1993, the number of days when air pollution in New England exceeded air quality standards was drastically reduced. Again, it is noteworthy that this decline has occurred while the economy has grown, the population has increased and the number of motor vehicles in use has grown substantially.

Since 1970, national efforts have reduced emissions of sulfur dioxide by 10 percent. Over the same period, the amount of sulfite (which contributes to the production of acid rain) deposited in rain and snow in New England has declined by 10 to 15 percent. More importantly, the observed impacts of increased acidity on New England's lakes have also been reduced. In 1985, 12 percent of New England's lakes were unable to support healthy systems due to increased acidity. Today, only eight percent of the region's public lakes show the deleterious effects of increased acidity. Still, acid rain remains a significant problem in New England.

While this progress in reducing the production of acid rain is heartening, additional controls on sulfur dioxide and nitrogen dioxide emissions will be needed to achieve further improvement in the health of the region's lakes and forests.

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ATTACKING INDOOR LEAD POISONING

EPA has achieved remarkable success in reducing the levels of lead in outdoor air by implementing the national phaseout of lead in motor gasoline and by taking corrective actions at individual stationary sources. Lead, however, still remains a public health concern and continues to threaten children exposed primarily from indoor sources such as paint and dust.

There have been significant reductions in the blood lead levels in children from the late 1970's to today. The reductions can be attributed to removing lead from gasoline and banning lead-soldered food cans. In addition, lead was removed from house paint in 1978.

In 1992 Congress enacted the Residential Lead-Based Paint Hazard Reduction Act known as Title X which provides for a comprehensive national approach to dealing with lead-based paint in the nation's homes. The law also calls on the EPA to provide basic information on lead to the American public. Under the 1018 Lead Disclosure Rule, potential home buyers and renters are assured of their right to know about lead hazards before buying or renting a home or apartment.

In addition, EPA is working with states and private industry to ensure that the public is informed of lead-based paint hazards and how to deal with these hazards.

EPA has worked with The National Safety Council to establish a National Lead Information Center Hotline and Clearinghouse. The Hotline (1-800-LEAD-FYI) is an automated recording in either English or Spanish that requests callers, addresses and sends out a package of information on lead poisoning prevention. The Clearinghouse (1-800-424-LEAD) is staffed by trained lead specialists who provide in-depth technical information on a range of lead-related issues to general public and professional audiences in both English and Spanish.

In Baltimore, the city is distributing more than 2,500 cleaning kits to educate residents about the problems posed by lead dust and to provide them with the means to reduce the risk they face. Distribution of the cleaning kits also gives health providers the opportunity to talk to residents about where to clean and why it is imperative to keep the dust down; the importance of diet, hand washing and continued testing of blood lead levels are also stressed. One community health nurse praised the program, noting that the hands-on education really makes a difference in the resident's understanding of the cleaning process. In some instances, the cleaning kits along with education and other interventions have been credited with reducing blood lead levels.

The success of this program highlights the importance of involving people in activities that affect their lives and the great benefits that can accrue from even modest expenditures. EPA will continue to pursue opportunities to use education and training to help reduce risks, especially those related to indoor air pollution.

[Return to Air Quality](#)

REDUCING THE RISK OF RADON

The EPA estimates that radon gas is the second leading cause of lung cancer in the United States, resulting in approximately 14,000 deaths per year. Radon emitted from certain geologic formations enters homes primarily through cracks in the foundation; if not properly vented, it can accumulate to dangerous levels. Fortunately, radon is relatively easy and inexpensive to remove.

The EPA's Radon program emphasizes education and public outreach to inform homeowners about the dangers of radon, how to test for it and how to get rid of it. The program has had some notable successes. It is estimated that 900 lung cancer deaths have been averted in the areas comprising New Jersey, New York, Puerto Rico and the U.S. Virgin Islands as a result of over 20,000 residential radon mitigations. In addition, as a result of the statewide building code, 23,500 new homes in the highest risk areas in New Jersey have been built with radon-resistant construction.

New Mexico offers a closeup of one successful ongoing effort. EPA and state officials are working closely with the All Indian Pueblo Council (AIPC), which is a consortium of 19 Federally-recognized Indian Tribes who live in areas with potentially high levels of radon. EPA's regional office in Dallas, TX has worked cooperatively with the AIPC, sharing information and inviting them to participate in educational programs such as those that take place at the All States Annual Radon Conference. Cooperation efforts continue to reduce the risk of radon.

Efforts are now underway to include radon testing and mitigation activities as part of the ongoing State Weatherization program. Through these and other programs, the state and EPA are committed to helping the tribes in New Mexico identify and address the health risks posed by unhealthy levels of radon.

[Return to Air Quality](#)



Water Quality

S.C.Delaney/U.S.EPA

Each day, Americans enjoy the benefits of clean water. Whether it's a day at the beach, an ice-cold glass of water or a plate of fresh shellfish, this valuable resource sustains our lives and enriches our nation. We rely on water for drinking, food production and recreation. It is also essential for manufacturing, transportation and power generation. Twenty-five years ago, however, our nation's water resources were in serious jeopardy. Threatened by industrial pollution and inadequate sewage treatment, our rivers, lakes and harbors were overwhelmed by the uncontrolled waste of a growing nation.

To combat this degradation, the nation embarked on a long journey to restore the integrity of our waters and make them fishable and swimmable once again. In doing so, the American public committed substantial financial resources to clean and protect the 3.5 million miles of rivers, 41 million acres of lakes, 277 million acres of wetlands and 34,400 square miles of estuaries that make up the nation's vast water network. A quarter century later, our efforts have produced real environmental improvements. In communities across the nation, surface and drinking-water resources are now safer, cleaner and better protected.



[Shad Return to the Delaware](#)

CLEANER, HEALTHIER WATER

The cleaner water we enjoy today is the result of a long-running restoration process that began in 1972 with the passage of the Clean Water Act (CWA). Before the CWA, many portions of our national waters were highly polluted, as thousands of factories, cities and towns dumped industrial wastes and sewage into near-by waters. As the nation's population and industrial base grew, these practices often inflicted serious environmental harm.



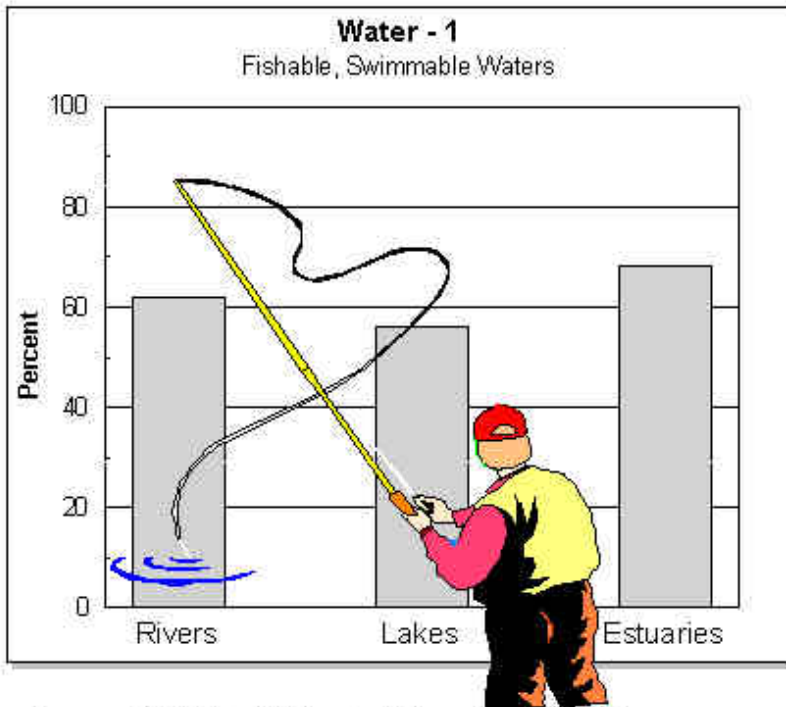
S.C.Delaney/U.S.EPA



The Cleanup of Boston Harbor

Today, our water is cleaner and healthier than at any point in the last quarter century. Fish have returned to waters that were uninhabitable for decades, communities are investing in waterfront revitalization projects and people are building homes and raising families near waters that were once too polluted for safe contact.

In 1974, the EPA conducted general surveys of the nation's largest rivers, and found that only about 40% were safe enough for fishing and swimming. Today, about 60% of the Nation's surveyed rivers, lakes and estuaries are clean enough to meet basic uses such as fishing or swimming. (See Water-1).

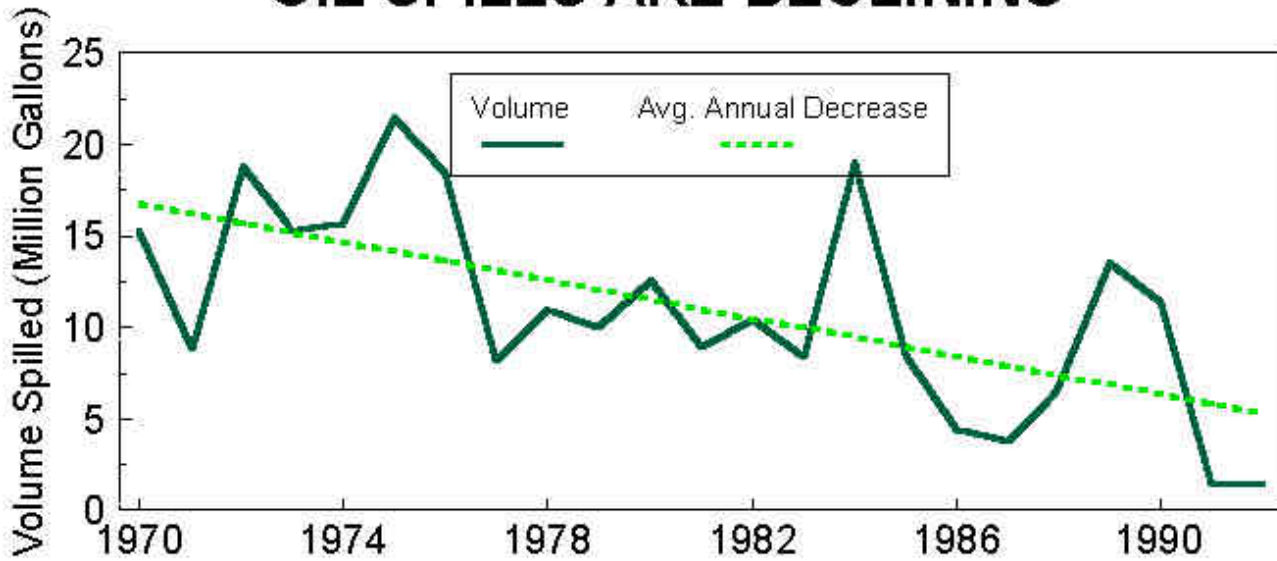


Source: 1994 National Water Quality Inventory, U.S. EPA.

Our waters are cleaner because action has been taken to ensure protection against senseless pollution and unnecessary destruction. Ocean disposal of sewage sludge, industrial waste, plastic debris and medical waste has been banned. Environmental safeguards have been put in place to guard against oil spills (see Water-2). Wetlands and other aquatic habitat are being better protected as recognition about their vital functions and values increase. Perhaps our biggest gains are attributable to better control of the most obvious sources of water pollution -- wastewater discharges from industry and municipal sewage treatment plants.

Water - 2

OIL SPILLS ARE DECLINING



Source: Department of Transportation/U.S. Coast Guard, "Pollution Incidents in and Around U.S. Waters, 1986" and unpublished data.

Reduced Industrial Pollution

Prior to 1970, wastewater discharges from industry went largely unchecked. The CWA, however, made it illegal for any industry to discharge pollutants directly to national waters without a permit specifying appropriate pollution limits. The EPA developed standards for more than 50 different industries and currently oversees more than 57,000 industrial water pollution permits. Currently, these permits prevent over one billion pounds of toxic pollution from entering our nation's waters each year.



Mississippi River Quality

A related water pollution control program focuses on companies that dump liquid wastes down their drains into the public sewer system. The CWA contains special provisions that require these dischargers to "pretreat" their waste before it enters the sewer. Currently, more than 30,000 major industrial dischargers are covered by pretreatment standards. As one of EPA's most successful programs, pretreatment standards have reduced toxic discharges to public sewers by an estimated 75 percent.

Better Sewage Treatment

In the past, raw or inadequately treated sewage was routinely released into our nation's waters. As sewage decomposed, these wastes consumed large amounts of oxygen from the water. Over time, continuing releases of sewage consumed so much oxygen that many waterbodies could no longer sustain aquatic life.



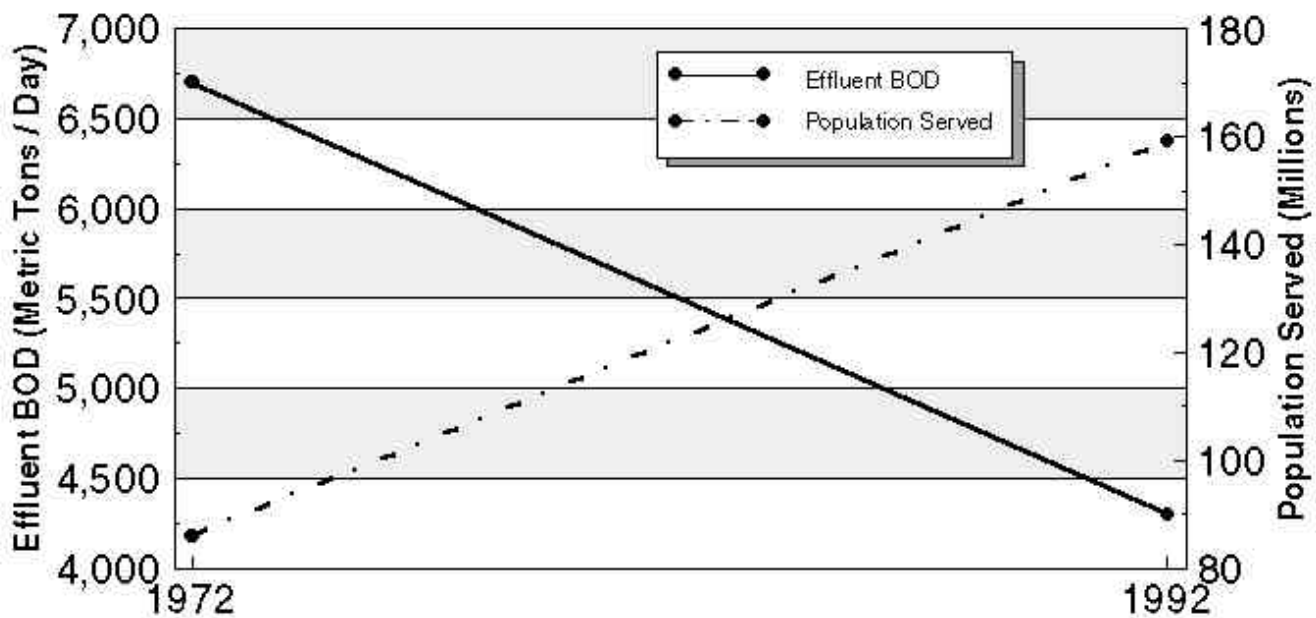
Toxics Management in the Niagara River

To reverse this degradation, EPA developed a major sewage treatment program designed to eliminate the harmful effects of human wastes on aquatic ecosystems. In addition to providing major funding for the construction of new wastewater treatment plants, EPA implemented important new standards requiring wastewater plants to treat and remove oxygen consuming wastes.

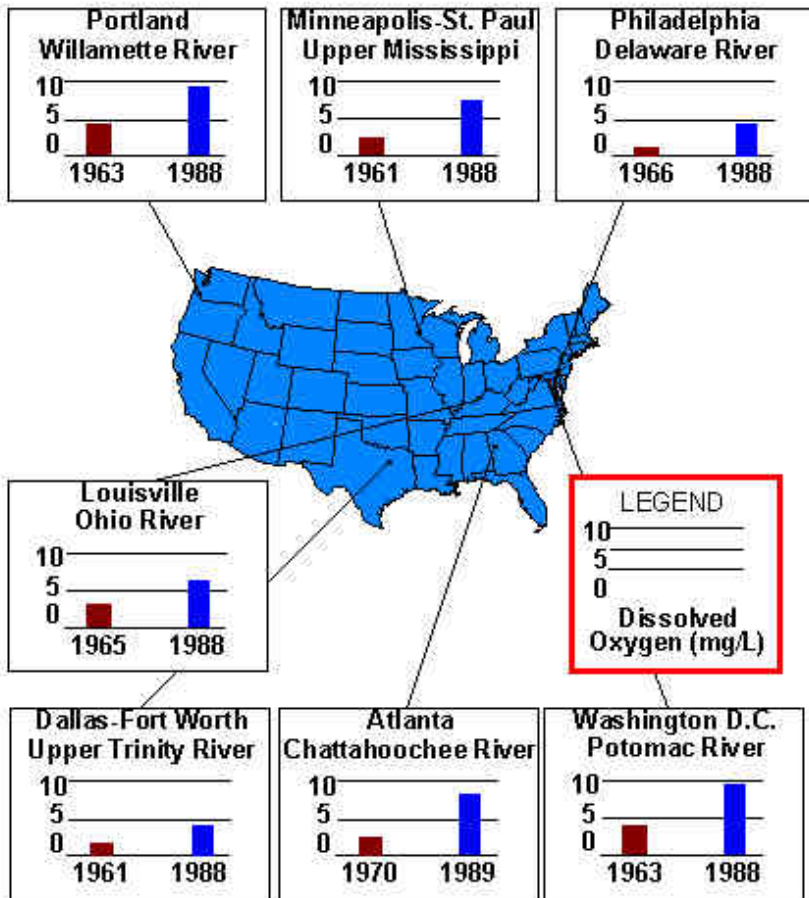
Seventy-three million more people, in thousands of communities across the nation, have upgraded sewage treatment, compared to 25 years ago. The water quality improvements associated with these efforts are impressive. Releases of oxygen consuming wastes have declined by 36 percent (from 6,700 metric tons a day in 1970 to 4,300 metric tons a day in 1992) even though the amount of sewage being treated has increased by 28 percent (see Water-3). Even more importantly, levels of life-giving dissolved oxygen have increased in regularly monitored waters across the country (see Water-4).

Water - 3

Environmental Results: Increasing Secondary and Advanced Sewage Treatment -- Decreasing Biological Oxygen Demand (BOD)



WATER - 4
OXYGEN LEVELS BEFORE AND AFTER THE
IMPLEMENTATION OF THE CLEAN WATER ACT



Passage of the Clean Water Act has resulted in significant gains in water quality nationwide. That is, as discharges of oxygen-depleting biodegradable organic wastes have decreased through secondary and, in many cases, advanced treatment of wastewater, levels of life-giving dissolved oxygen have increased.

Safer Drinking Water

Most people in the United States simply turn on the kitchen tap to pour a clean, safe glass of drinking water. It's probably even fair to say that most Americans assume that the 34 billion gallons of tap water we use each day will always be pure and close at hand. To ensure that this would always be true, Congress enacted the Safe Drinking Water Act in 1974.

Since that time, preserving the safety of our nation's public drinking water supply has been, and continues to be, one of the EPA's top priorities. In fact, over the last 20 years EPA has issued numerous drinking water standards to protect the public from the effects of harmful chemicals and microbial pollutants. In addition, the EPA and states monitor the quality of drinking water supplies and develop strategies to prevent contamination of our drinking water reserves. Together these efforts constitute a comprehensive program that provides the American public with a safe and reliable water supply.

Currently, the U.S. has about 7,000 community water systems that provide drinking water for over 240 million people. About one out of five of these systems uses surface waters, such as lakes or rivers, for their water source. These surface water systems serve almost two-thirds of the population. The remainder of the population is served by a system that pumps its water from the ground."

The EPA has developed safety standards for 84 specific pollutants and established programs that ensure that the nation's public water supplies remains safe for human consumption. Systems that draw their water from surface waters, for example, must meet filtration and disinfection standards to remove bacteria and parasites. The EPA estimates that these requirements have helped prevent 200,000 to 470,000 cases of gastrointestinal illnesses each year.

The EPA is also working with the states and other stakeholders to develop long-term protection programs to ensure that drinking water sources do not become contaminated in the first place. Special protection programs have been put into place in about 4,000 communities across the country.

CHALLENGES AHEAD

The EPA's 25th anniversary provides a timely opportunity to reflect on the progress the nation has made in restoring and protecting our aquatic resources. It is also an opportune time to look to the future and take stock of the continuing challenges that lay ahead.



[Protecting the San Francisco Bay](#)

Three of these challenges -- wetland protection, nonpoint source pollution, and the threat of micro-organisms in our drinking water supplies--will take center stage. The EPA hopes new programs that emphasize education, coordination, and innovation will provide timely and effective solutions for these difficult problems.

Wetland Protection: In their natural state, wetlands help regulate and maintain the health of rivers, lakes, streams and estuaries. They provide ground water recharge, filter out pollutants, and reduce flooding and erosion. Wetlands are important habitats for fish and wildlife, including large numbers of migratory birds and a number of threatened or endangered species. Each year, wetlands-dependent enterprises, such as commercial fishing, recreation and timber management, contribute billions of dollars to the U.S. economy.

Before the substantial benefits of wetlands protection were recognized, about 100 million acres of wetlands were lost over the last two centuries, more than half of the wetlands in the continental United States. Through private and public wetland acquisition efforts and state and federal environmental programs, the rate of wetland loss has been reduced from 460,000 acres per year several decades ago to between 70,000-90,000 acres per year now. Although this progress is encouraging, meeting the interim national goal of "no overall net loss of wetlands" will require maintaining existing protections while increasing education, incentive programs for restoration and protection and voluntary land stewardship efforts.

The National Biological Survey, under the Department of Interior, recently identified 51 types of wetland systems as threatened or endangered. Protecting these remaining systems is one of EPA's most important goals. To this end, the EPA and other agencies have reformed federal wetlands programs to focus on common sense solutions, and hope to achieve the no net loss goal by the year 2005. In addition, the EPA is working with States to protect the wetlands that remain from harmful pollutants, hydrological disturbance and invasive biological species, and to restore wetlands so that the long-term goal of "increasing the quality and quantity of America's wetlands" can be achieved.



[Preserving and Restoring Louisiana Wetlands](#)



[Harbor Herons Wildlife Refuge](#)



Alligators Rebound in the Southeastern U.S.

Nonpoint Sources of Pollution: Nonpoint source pollution is now the leading cause of water pollution in this country. Unlike discharges from industrial and municipal facilities, often referred to as point source discharges, nonpoint sources are more difficult to identify and control. Typical sources of nonpoint pollution include drainage from our streets and parking lots, runoff from agricultural land and deposition of pollutants from the air.

Nonpoint pollution is a serious environmental threat that damages our aquatic ecosystems in three ways.

- **Chemical contamination.** Pesticides, trace metal and used oil are regularly detected in agricultural and urban runoff. Even in very low concentrations, these compounds can contaminate the aquatic habitat, poisoning wildlife populations in and around the waterbody, including the fish we eat.
- **Biological constituents.** Nonpoint source pollution contributes vast amounts of nutrients from fertilizers and animal wastes to our nation's waters. These contaminants produce unsightly algae blooms and reduce oxygen in receiving waters. If these conditions persist, the waterbody's oxygen supply can become so scarce that fish and other aquatic organisms can no longer survive.
- **Physical degradation.** Nonpoint runoff frequently contains large amounts of sediment and silt. When deposited in the waterbody, these sediments reduce the clarity and visual appeal of lakes and rivers and increase the cost of drinking water treatment. Sediment and silt are also major causes of aquatic habitat degradation because they eliminate the sunlight needed by plants growing below the water's surface and can inhibit the spawning of valuable fish like salmon. Habitat destruction, both on stream banks and within streams, also reduces survival chances for aquatic life.

Beginning in 1987, the EPA initiated a major program to assess the nation's nonpoint problem. The initiative seeks to identify geographic areas with high-risk nonpoint source problems and to develop plans to protect waters of ecological significance. As of 1994, the EPA had approved 51 state nonpoint source management plans, most focusing on pollution prevention and interagency coordination.

Similarly, in 1989, the EPA developed the Nonpoint Source Agenda for the Future. This Agenda seeks to build on current programs by developing practical solutions to the nonpoint source pollution problem. In particular, education and financial incentives are being targeted as alternatives to traditional regulatory controls. With the help of states, tribes, local governments, community groups and the private sector, the EPA hopes to reduce the nonpoint source pollution problem and make more water swimmable, fishable and drinkable in the near future.



The Challenge of the Chesapeake

Drinking Water: If undetected micro-organisms or chemical contaminants make their way into a public water system, thousands of people can become ill. Because of the serious consequences of even one lapse, the EPA strives to ensure that all Americans receive safe drinking water at all times.



Drinking Water Protection in New York and Puerto Rico

To fulfill this goal, the EPA requires public water systems to meet rigorous safety standards. Despite these efforts, there

have been localized cases where water has been rendered unsafe to drink. In 1993, for example, a waterborne parasite called cryptosporidium was linked to over 400,000 illnesses and 100 deaths in Milwaukee. As the worst waterborne disease outbreak in decades, this incident highlights the potential vulnerability of all drinking water systems.

While our water supplies are generally considered safe, the EPA is committed to addressing the threats to our drinking water. As part of this commitment, the EPA continues to develop new standards based on the highest priority health risks. In addition, the EPA will provide technical assistance to smaller communities that may not have the expertise to fully manage their drinking water systems. Other programs will support the design and use of methods that reduce the cost and improve the reliability of drinking water treatment. Finally, the EPA will continue to emphasize protection of water sources throughout the nation so that our drinking water supplies remain free of harmful contamination.

Watershed Protection: To address these and other challenges, the EPA is placing an increased emphasis on watershed or community-based environmental protection. Rather than focusing on single pollution sources or problems, a watershed approach provides for a more comprehensive, holistic view that takes into account multiple conditions, stressors and problems in need of attention. When fully developed and implemented, a watershed approach might address protection for drinking water sources and wetlands areas, air deposition of toxic chemicals, polluted runoff from urban areas, as well as the more traditional industrial and municipal wastewater discharges.

A watershed approach also focuses on achieving better coordination among various government and nongovernment agencies that have watershed management responsibilities and increasing participation by the many stakeholders that have an interest in their watershed's conditions. Whether the issue is defining priorities, scheduling cleanup actions, or restoring critical wetland areas, much more can be accomplished when multiple stakeholders unite to leverage their resources, time and attention for the benefit of the watershed and community as a whole.



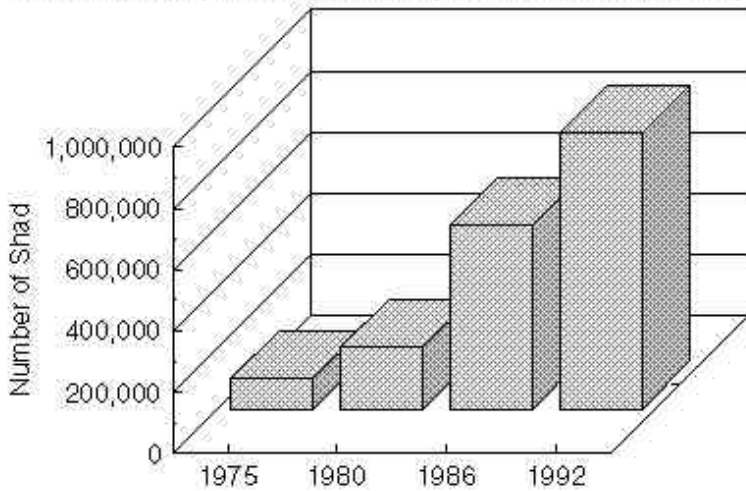
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Shad Return to the Delaware

At the turn of the century, the Delaware River supported the eastern seaboard's most abundant population of American shad. Years of over-fishing and pollution, however, decimated the shad population. In fact, by the 1930s, the river's oxygen supply was so low that the shad could not reach their spawning grounds north of Philadelphia.

The EPA played an important role in the state and federal partnership that took steps to restore this highly valued fishery. A shad management plan was developed that addressed the issues of poor water quality, physical obstructions and water use. As part of this initiative, sewage treatment plants were built to improve oxygen levels, and fish ladders were constructed to assist the shad in negotiating man-made obstacles.

Rebounding Shad Populations in the Delaware River



Although challenges still exist, the American Shad is now on its way to recovery. Prized for its natural resource and economic value, the shad population is now over 900,000 strong -- up from 100,000 in 1971. With the resurgence of the fishery, people are re-discovering the Delaware's rewarding recreational opportunities. In 1986, the river supported over 65,000 recreational fishing trips valued at more than 3 million dollars.

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THE CLEANUP OF BOSTON HARBOR



Photo Courtesy of the Rotarian, 1969



"BEFORE"

Once called the dirtiest harbor in America, Boston Harbor is well on the road to complete recovery.

Until the 1950s, millions of gallons of untreated sewage were discharged into Boston harbor every day, contaminating the water, sediments and fish. Although construction of two primary wastewater treatment plants in 1952 and 1968 improved effluent quality somewhat, these plants proved inadequate to protect the beaches and fisheries of the Harbor. In 1985, the EPA sued the state in federal court to force the construction of a modern wastewater treatment system.

The court ordered the Massachusetts Water Resources Authority (MWRA) to build a multi-billion dollar, state-of-the-art treatment facility for sewage from Boston and 42 surrounding communities. Portions of that facility are now complete. For example, sewage sludge -- which used to be dumped directly into the Harbor -- is now pelletized and used as fertilizer. The old sludge discharge site, once devoid of life, has been recolonized by marine species and the water is noticeably clearer. Better industrial pretreatment has greatly reduced the discharge of toxics into the harbor. Sewer overflows have dropped as the MWRA has upgraded its pumping facilities. Beach closings have been dramatically reduced, and porpoises have returned to the harbor.



"Boston Harbor today"

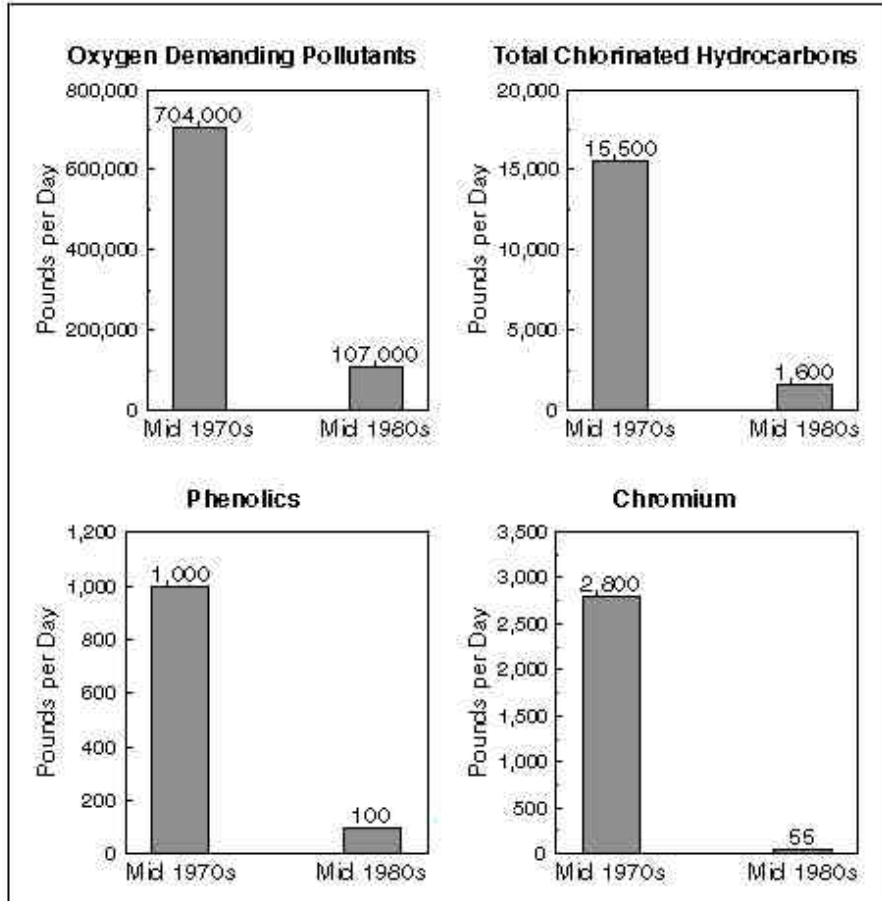
Further progress is in sight. The remaining portions of the MWRA treatment plant will be completed in 1999. Additional facilities to reduce sewer overflows are in the works. EPA continues to oversee compliance with the court order, to ensure that this historic harbor will once again be a source of pride, rather than shame.

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MISSISSIPPI RIVER QUALITY

Mississippi River Quality

Water quality in the highly industrialized lower Mississippi between Baton Rouge and New Orleans has improved dramatically from a combination of permitting and environmental enforcement.



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TOXICS MANAGEMENT IN THE NIAGARA RIVER

Mention the Niagara River, and most people have visions of water thundering over the famous falls that border the United States and Canada. Few people realize, however, that until recently the Niagara River also carried the burden of toxic pollution. Dangerous compounds such as mercury, PCBs and pesticides were regularly detected at high concentrations in river waters and Lake Ontario fish. Alarmed by the high levels of pollution, the United States and Canada developed a cooperative transboundary management plan in 1987 to reduce inputs of toxic chemicals to the river.

Efforts to clean up the river have reduced toxic pollution and improved the appearance and safety of the water. Since 1981, for example, the EPA and the State of New York have attacked toxic discharges. Their aggressive control program has reduced point source inputs of toxics by 80 percent. Much of this reduction can be attributed to improved wastewater treatment by the city of Niagara Falls. Environmental clean-up efforts have also focused on the numerous hazardous waste sites along the banks of the river and its tributaries, including Love Canal. To date, clean-ups at these locations have reduced potential toxic inputs by 25 percent. Within the next year, additional actions should reduce these inputs by a total of 80 percent. Clean-up in tributaries of the Niagara River have also produced important environmental benefits through reductions of dioxin and PCBs.



Niagara Falls Park Commission

Because the United States and Canada are actively managing the Niagara's toxic inputs, the river is well on its way to recovery. The Lake Sturgeon is just one of the many examples of this progress. For the first time in decades, the species, which is native to the area, has returned to the upper reaches of the Niagara. Continued management of the Niagara's toxic pollution will further improve the aquatic ecosystem and restore the natural beauty of one of the nation's most treasured rivers.

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PROTECTING SAN FRANCISCO BAY

The San Francisco Bay and Delta constitute the largest estuary on the West Coast of the United States. Comprising more than 1,650 square miles, the bay and delta provide 20 million people with drinking water, irrigate approximately 4.5 million acres of farmland and drain nearly 40 percent of California's land area. Over the last 100 years, the estuary has undergone extensive modifications to hydrology, landscape and water quality. Major initiatives involving citizens of the region are currently underway to protect and restore this unique resource.

The Bay/Delta Accord is one such effort. Led by EPA, the State of California, and the U.S. Department of Interior, the Bay/Delta Accord which was reached in 1994 relies on scientific analysis and negotiation to build consensus between environmental organizations, business groups and water supply agencies. Together, these groups have defined common goals and are looking for mutually acceptable solutions that address the area's water supply concerns while promoting environmental protection.

The North Bay Initiative is another effort that focuses on preserving the habitat in and around San Francisco Bay. A coalition including EPA and 12 other federal, state and local government agencies is using outreach and education to promote common sense land-use. Combined with agricultural incentive programs, EPA believes that the delta protection strategy will reduce water pollution, preserve valuable habitat and protect the area's threatened and endangered species.

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PRESERVING AND RESTORING LOUISIANA WETLANDS

The EPA's efforts to protect coastal wetlands in Louisiana are an example of cooperative environmental management in action. Currently, experts estimate that 25 square miles of wetland are lost each year to erosion and loss of sediment. This trend threatens the economic and cultural structure of the area, where commercial and recreational hunting and fishing are a way of life.

The EPA is part of a federal and state partnership that is working on addressing, developing and implementing projects for the coastal erosion problem. It has taken the lead in forging this partnership, encouraging input from the public and the scientific community. As a first step, the Agency is directing an effort to reconstruct the Barrier Islands that serve as a buffer to hurricanes and other storm surges. The EPA is also promoting demonstration projects that seek to construct marsh areas through careful use of dredged sediment and composted vegetation. The EPA will continue to forge new partnerships to pursue the vision of a restored coastal Louisiana.

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HARBOR HERONS WILDLIFE REFUGE

S.C.Delaney/U.S.EPA

In the heart of New York City lies an environmental treasure partially created out of the provisions of the Clean Water Act and EPA enforcement. This "diamond-in-the-rough" is Harbor Herons Wildlife Refuge near Staten Island. Once a highly polluted area, the 278-acre refuge is now home to some 1,200 nesting pairs of herons, egrets and ibises. In fact, it is home to the largest colony of herons in New York State. During the spring and winter migrations, the refuge also serves as an important resting point along the Atlantic Flyway.

The area now comprising the refuge is situated in the Arthur Kill, an ocean waterway separating Staten Island from New Jersey. In the 1970s, the Arthur Kill was plagued with high levels of industrial pollution. Decades of misuse had degraded the Kill's tidal wetlands and driven waterfowl away. Beginning in the mid-1970s, however, permits issued under the Clean Water Act severely restricted discharges in the New York Harbor area. Over the next decade, water quality improved, the wetland ecosystem recovered and waterfowl populations returned and began to flourish.

In 1990, an untimely event stopped the area's recovery short. An underwater pipeline owned by Exxon ruptured in the Arthur Kill. Over 560,000 gallons of oil spilled from the ruptured pipe, damaging marsh grasses and ruining much of the area's habitat and food sources.

The EPA, along with other federal agencies, the State of New York, and local governments initiated a lawsuit to recover the damages caused by the spill. In the ensuing case, Exxon was required to pay a substantial fine and to establish a trust fund dedicated to restoring the natural resources damaged by the oil. Soon thereafter, land was purchased using the newly established fund, and was officially designated Harbor Herons Wildlife Refuge. The fund also acquired other wetlands in and around the New York Harbor area, and set these aside as public parks and conservation preserves.

From a troubled environmental past, the Arthur Kill and Harbor Herons Wildlife Refuge have emerged as examples of the benefits of environmental protection. Using creative enforcement practices such as trust funds and well-established environmental laws, the EPA and its partners have proven that sensitive ecosystems and wildlife can prosper in areas of high population and intense industrial development.



S.C.Delaney/U.S.EPA

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ALLIGATORS REBOUND IN THE SOUTHEASTERN U.S.

Until recently, the American alligator was threatened with extinction by a powerful adversary: the world economy. The lucrative hide trade provided a major financial incentive to scour the nation's swamps and bayous for the legendary alligator and its valuable skin. Land-use policies, water pollution and the demand for agricultural products also adversely affected the sensitive wetland habitats the alligator relies upon for food and shelter.

Federal protection and state management have afforded the alligator a second chance. Hunting regulations constitute one factor in the alligator's recovery. Even more importantly, the alligator's economic value -- the very trait that made it susceptible to over-hunting -- has become an ally to its restoration. State officials forged this relationship by allowing landowners to harvest a percentage of the alligators on their property. This innovative program creates an incentive to increase alligator populations through habitat restoration and protection. Landowners have enthusiastically endorsed this approach, protecting more than 500,000 acres of wetlands for alligator production.

Using a combination of traditional and innovative regulatory programs, federal and state officials have succeeded in saving this unique species, and in 1987 the American alligator was removed from the endangered species list.

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THE CHALLENGE OF THE CHESAPEAKE

S.C.Delaney/U.S.EPA

The Chesapeake Bay is the largest and most productive estuary in America, and the first targeted for restoration and protection. The Bay is especially hard hit by nonpoint sources of pollution, with urban sprawl, residential development and agricultural production contributing massive quantities of the nutrients nitrogen and phosphorus to the Bay and its tributaries.

In 1983, the EPA, in partnership with the states of Maryland, Virginia and Pennsylvania, the District of Columbia and the Chesapeake Bay Commission, a tri-state legislative body, formed the Chesapeake Bay Program to lead the restoration of the Bay and its entire watershed. The Bay Program has identified the problem areas for the Bay, and has set specific goals to overcome those problems, such as reducing nutrients entering the Bay by 40% by the year 2000. The Bay Program has used sophisticated computer modelling and Bay-wide monitoring, as well as extensive volunteer citizen monitoring to measure success. This non-regulatory approach has been working very well.



S.C.Delaney/U.S.EPA

The Bay Program has had a number of successes: toxic discharges have been cut in half in the Bay watershed, striped bass have come back, underwater grasses have returned and fish passages have reopened hundreds of miles of stream spawning areas for migratory fish. There is, however, still a lot of work to do to fully restore the Bay. Algae and low dissolved oxygen, in particular, continue to plague extensive areas of the Chesapeake. EPA is committed to continued source management over the next decade in order to resolve the biggest of the Bay's water quality problems.



S.C.Delaney/U.S.EPA

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DRINKING WATER PROTECTION IN NEW YORK AND PUERTO RICO

S.C.Delaney/U.S.EPA

Few things have as direct an impact on your health as the water you drink. For this reason, drinking water safety continues to be one of the EPA's top priorities. As part of the continuing effort to maintain clean drinking water, the EPA spot checks public water systems for purity. During the summer of 1995, the EPA and its state partners undertook such a study, examining surface waters in the State of New York and the Commonwealth of Puerto Rico for cryptosporidium and giardia. These two biological agents are among the most common causes of water system infection.

The audit results indicated that more rigorous protection is needed. In New York State, for example, 43 percent of treated water contained detectable levels of cryptosporidium and giardia. In Puerto Rico, 14 percent of the principal water supplier's product contained at least one of these biological agents. At low levels, these contaminants do not pose problems for healthy individuals; however, sensitive populations such as infants and the elderly, may have more difficulty fighting off even small amounts of these agents. Because even one illness is too many, the EPA continues to strive toward national drinking water solutions.

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WASTE, TOXICS, AND PESTICIDES MANAGEMENT

Americans enjoy an exceptionally high standard of living. From ice cream to computers, from fast food to cars, we produce and rapidly consume an enormous diversity of goods. A hidden cost of this abundance is the management of its by-products -- the complex soup of hazardous chemicals generated by heavy industry, as well as the more benign leftovers in our household trash. If we are to protect human health and the environment, we must manage these wastes wisely.

By any measure, the amount of waste generated in the U.S. is staggering. From 1970 to 1994 U.S. solid waste production increased by one-third from 123 million tons annually or 3.3 pounds per person per day to 209 million tons or 4.4 pounds per person per day. In 1993, industry managed 258 million tons of hazardous waste and over 7 billion tons of non-hazardous waste. The EPA has identified over 650 chemicals and chemical categories that pose the greatest challenge to the protection of air, water, and land; EPA's efforts to track releases indicate that industry released over 1.6 million tons of these substances in 1992. The magnitude of these figures, however, can mask the progress that EPA has made in managing waste.

THE WASTE MANAGEMENT HIERARCHY

The EPA and state regulators have introduced and begun to implement a philosophy of waste management that emphasizes prevention over disposal. Specifically, the EPA has promoted a "hierarchy" of waste management:

- **Prevention:** Industry and households should adopt measures that reduce the amount of waste generated. This is often referred to as source reduction or waste minimization.
- **Recycling:** Pollution that cannot be prevented should be recovered and recycled.
- **Treatment:** Pollution that cannot be prevented or recycled should be subjected to treatment procedures that render the waste harmless.
- **Disposal:** Disposal or release into the environment (e.g., landfilling) should be used only when other options are not feasible; disposal methods should be environmentally sound.

Through policy and regulatory enforcement, the EPA seeks to promote approaches higher in this hierarchy. First, the EPA has made progress in reducing waste generation and toxic releases. For wastes that are generated, the EPA has helped promote recycling and improved handling. Finally, the EPA is steadily addressing the expensive and complex task of cleaning up after historical contamination -- the legacy of past waste management practices that predated the hierarchy of reduced generation, recycling and safe disposal.

Pollution Prevention First

Putting prevention first has required a revolution in the way that industry thinks about production and waste management and in the way that EPA regulates. Eliminating waste or toxics releases requires that industry abandon the "end-of-pipe" environmental management approach; instead, industry must redesign production processes from the ground up. For its part, EPA has recognized that it must forsake regulatory approaches that force industry into one-size-fits-all solutions and instead allow room for innovation.

Promoting Safer Chemicals, Processes, and Technologies

The EPA recognizes its role in pushing for the use of safer chemicals and processes in the basic operations of the industrial sector. A new EPA chemicals program plays a major role in preventing chemicals that will pose significant risks from entering the marketplace. For chemicals already in commerce, the EPA is beginning to examine clusters of related chemicals, rather than single chemicals, in evaluating alternative products and processes. Industries are encouraged to shift to products and processes that are safer and more effective.



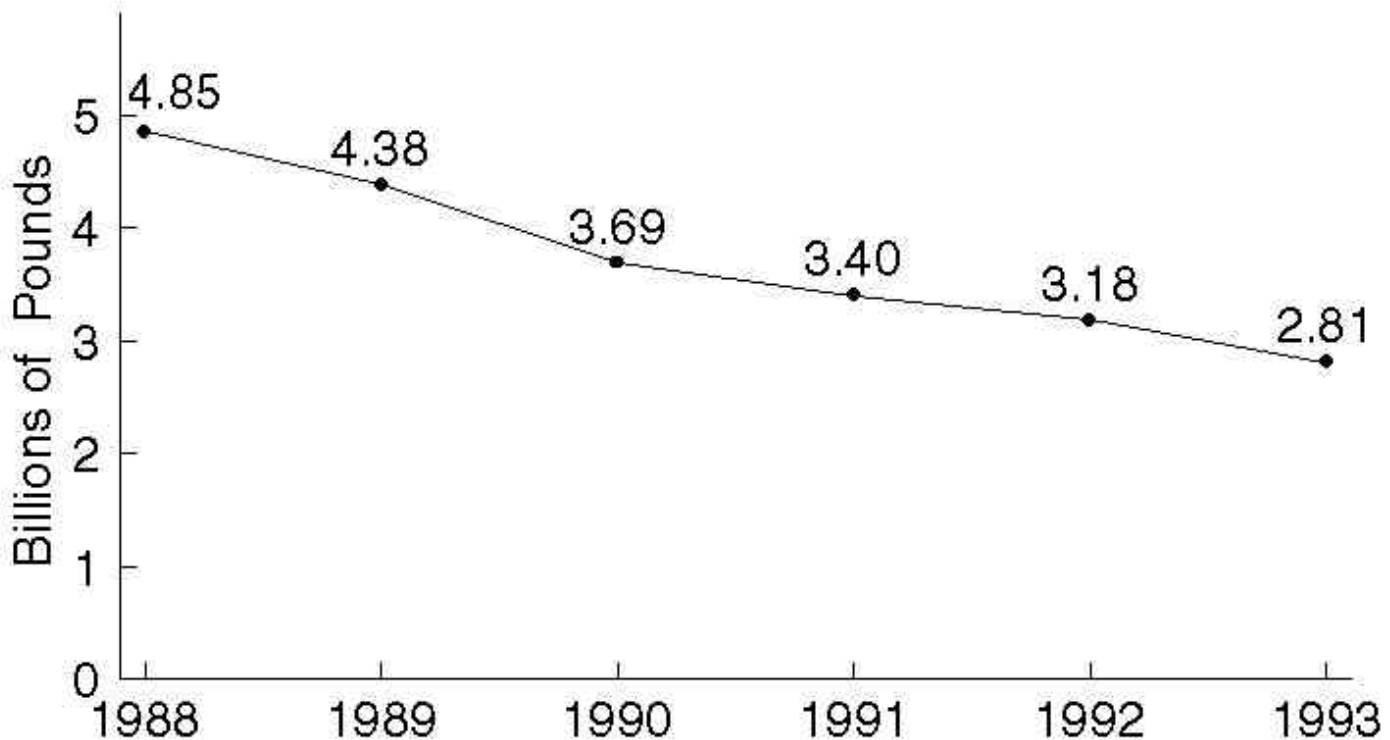
Economic Gain Through Waste Minimization

Let's look at some data that illustrate progress already made.

The 1986 Emergency Planning and Community Right-to-Know Act established the Toxic Release Inventory (TRI), a database on releases, off-site transfers and generation of over 650 chemicals and chemical categories from large manufacturing facilities. The TRI data suggest that overall releases of toxic chemicals to the environment were reduced by 43 percent between 1988 and 1993 (see Waste-1). Most of this reduction is attributable to air emissions (see Waste-2). However, toxic releases via two other media have also been reduced significantly. Chemical releases through underground injection, the forcing of liquid wastes into deep wells, have been reduced by 57 percent, while other releases to land (e.g., landfilling) have decreased by 44 percent.

Waste - 1

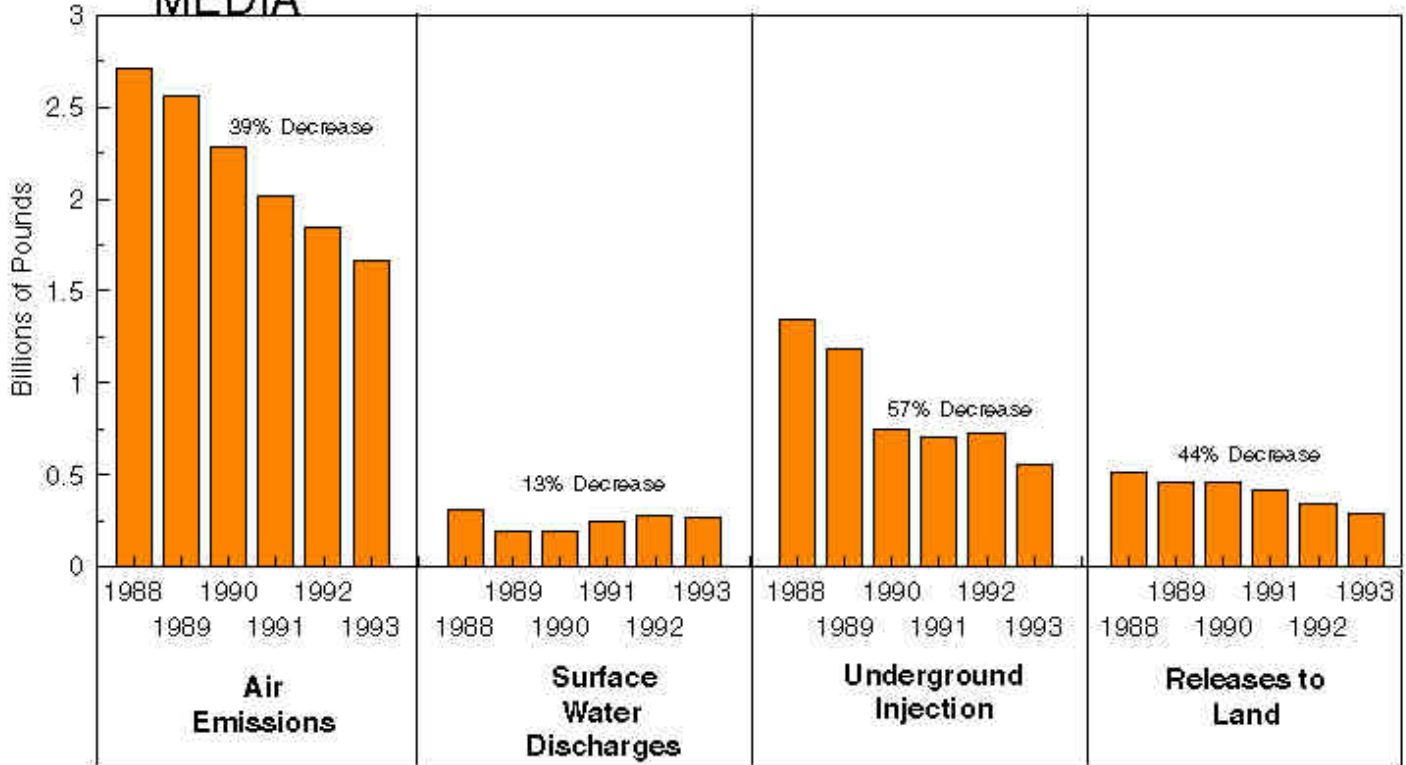
RELEASES OF TOXIC POLLUTANTS HAVE DECREASED



Source: U.S. EPA, *Toxics Release Inventory, 1993 as reported in Proposed Environmental Goals for America*.

Waste - 2

RELEASES OF TOXIC POLLUTANTS FOR ALL MEDIA

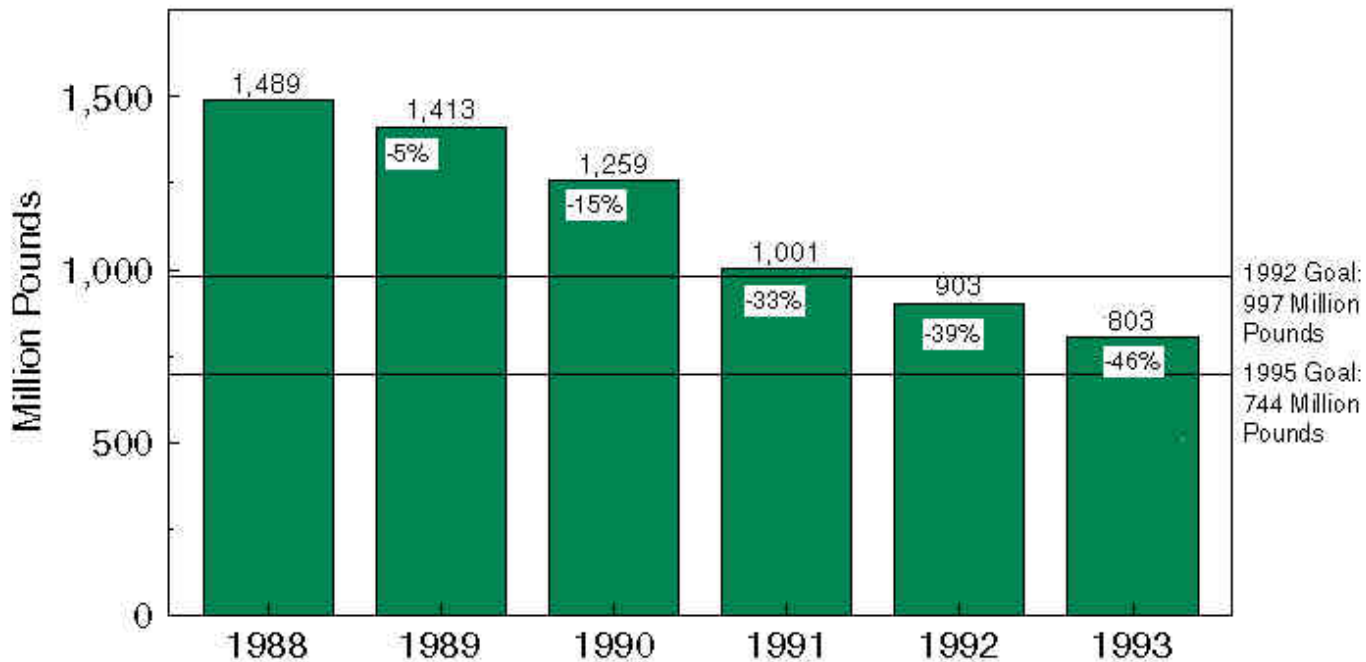


Source: U.S. EPA, Toxics Release Inventory, 1993.

Further evidence of pollution prevention is seen from EPA's 33/50 Program, a voluntary initiative that seeks to reduce generation and releases of 17 priority TRI chemicals selected on the basis of toxicity and opportunity for achieving pollution prevention. Releases of these priority chemicals declined by more than 46 percent between 1988 and 1994 (see Waste-3).

Waste - 3

RELEASES OF THE 33/50 PROGRAM PRIORITY CHEMICALS HAVE DECLINED



Source: U.S. EPA, Toxics Release Inventory, 1993.



Community Based Environmental Protection

Frequently, the most effective way to reduce risk from pesticides is to substitute a less harmful one for a more harmful one, to reduce the use of a pesticide, or to eliminate the use of the pesticide. EPA's program for reducing pesticide risks is a good example of pollution prevention through substitution of safer pesticides and through use reduction. Since the early 1970s, the Agency has banned or eliminated use of over 230 pesticides and 20,000 pesticide products. Through the Pesticide Environmental Stewardship Program, EPA, in conjunction with USDA and FDA, is working with pesticide users to reduce pesticide risk and use in both agricultural and non-agricultural settings. Through voluntary public-private partnerships, both private sector partners and the federal government are making commitments to adopt techniques that enhance pest management and reduce pesticide risk of exposure and use. To date, 37 Partners have signed up, including the Department of Defense, which has committed to reduce its pesticide use by 50 percent by the end of FY 2000.



Reducing Ecological Threats Through Pesticide Control



Pollution Prevention Through Pesticide Management

The EPA has made significant progress in the reevaluation of older pesticides, many of which were first registered many years ago, before today's more rigorous health and environmental standards. Thousands of scientific studies have been evaluated, often resulting in new requirements and restrictions to reduce pesticide risks. Yet, nearly half of these older pesticides remain to be reviewed.

Protecting Agricultural Workers

Another significant effort aimed at reducing risk from pesticide poisonings is EPA's Worker Protection Standard program. The implementation of this Standard represents a major strengthening of national efforts to safeguard almost four million agricultural workers and pesticide handlers. It requires agricultural employers to ensure that employees receive basic training in pesticide safety and to notify workers when pesticides are applied. Employers must also provide washing facilities and supplies if workers are likely to come into contact with pesticides, and provide and maintain protective equipment to reduce potential health risks due to pesticide exposure in agriculture.

Protecting Children from Pesticide Hazards

EPA is committed to ensuring that potential health risks to infants and children are consistently and explicitly evaluated in all its programs. Through the use of modern computer systems, EPA performs dietary risk assessments specifically for various age groups of children, including infants, based on age-specific food consumption survey data collected by the U.S. Department of Agriculture.

Through an extensive outreach program, and through EPA's participation in the Poison Prevention Week Council's widespread network and annual press events, EPA's fact sheets on "Pesticides and Child Safety" and "Using Insect Repellents Safely" in both English and Spanish are distributed to thousands of hospitals, clinics, pharmacies and the general public every year.

Public Access to Pesticides Information

The National Pesticide Telecommunications Network (NPTN) (800) 858-7378 has been instrumental in preventing potentially dangerous situations involving pesticides for both people and their pets. The service provides impartial factual information about pesticides including information on pesticide products, their health and environmental effects, as well as referrals for investigation of pesticide incidents and emergency treatment. NPTN will soon be available on the Internet. On average, NPTN responds to about 25,000 calls annually.

Pollution Prevention Through Emergency Planning and Community Right-to-Know

Finally, prevention of toxic chemical spills and other accidents is a priority for the Agency. The Emergency Planning and Community Right-to-Know Act of 1986 requires states to establish state and local planning groups to develop emergency response plans for each community. To date, states have established over 3,400 Local Emergency Planning Committees (LEPCs). Facilities are required to make information available to the public through LEPCs on the hazardous chemicals present on site. A 1994 nationwide survey indicated that 79 percent of the LEPCs are functioning and most of these have completed emergency response plans and exercised them within their communities. Anecdotal information suggested that these preparedness efforts have contributed to reduced chemical inventories and improved communities' ability to respond to chemical emergencies.

While emergency planning is critical, preventing accidents is the ultimate goal. Through the Accidental Release Information Program and the Chemical Safety Audit Program, EPA has begun collecting data on the causes of accidents, steps facilities can take to prevent recurrences, and successful practices companies use to mitigate and prevent accidents.

RESPONSIBLE WASTE MANAGEMENT

While prevention stands as the first priority today, EPA's efforts in the past focused primarily on the other three levels of the hierarchy -- recycling, treatment and proper disposal of waste. Some historical perspective can help us assess progress

in these areas.

In 1976, Congress passed the Resource Conservation and Recovery Act (RCRA), which in 1984 was significantly amended through the Hazardous and Solid Waste Amendments (HSWA). RCRA and HSWA divided the universe of waste and hazardous materials into specific categories and established programs to address each.

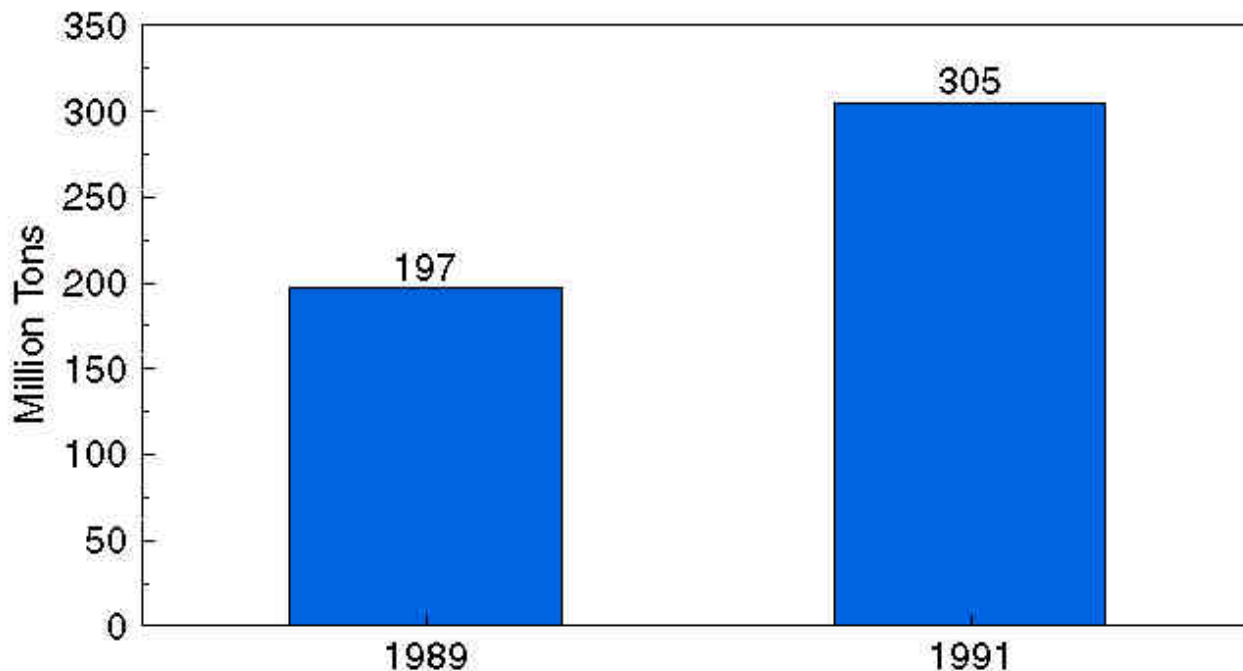
A key RCRA objective was to identify those industrial wastes with characteristics that make them of special environmental concern (e.g., explosiveness, toxicity). These wastes are defined as "hazardous" under Subtitle C of RCRA and are subject to special regulations designed to track their generation and transport and to ensure their safe treatment and disposal. In addition, facilities that treat, store or dispose of hazardous wastes must meet rigorous state and federal permit requirements. Wastes posing lesser risks are governed by state authorities; these wastes include non-hazardous industrial waste and municipal solid waste (household trash). Other RCRA programs focus on particular categories of hazardous materials management: most notably, EPA and the states implement regulations requiring that underground storage tanks used for petroleum and other dangerous substances meet strict design specifications to minimize the risk of leaks.

EPA's progress in these waste management areas (hazardous waste, non-hazardous waste and underground tanks) is demonstrated by the data.

Hazardous waste: Over the years, EPA has made steady progress in identifying those wastes considered to be "hazardous," and therefore subject to more protective management standards (see Waste-4). Between 1989 and 1991, the quantity of generated waste defined as hazardous increased by over 100 million tons, due largely to the 1990 introduction of the Toxicity Characteristic Rule, which identified wastes considered to be hazardous due to their toxic characteristics.

Waste - 4

INCREASING WASTE QUANTITIES SUBJECT TO HAZARDOUS WASTE MANAGEMENT STANDARDS

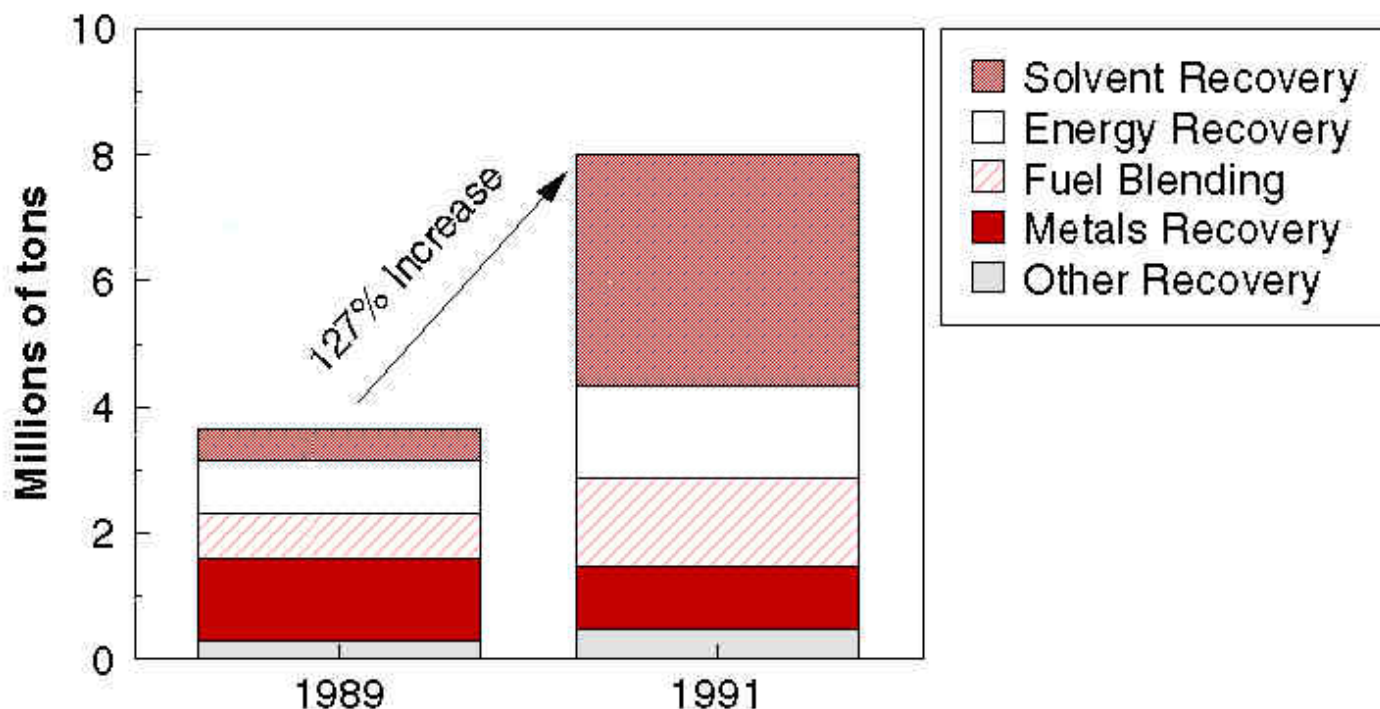


Source: *The Biennial RCRA Hazardous Waste Report, U.S. EPA, 1994.*

Adherence to the waste management hierarchy is apparent in recent hazardous waste trends. There has been an increase in hazardous waste recycling and recovery between 1989 and 1991 (see Waste-5). Overall, waste going to recovery processes more than doubled (by weight), with the greatest changes coming from recovery of solvents, highly toxic (often carcinogenic) chemicals commonly linked to past pollution of surface water and ground remove space water.

Waste - 5

RECYCLING OF HAZARDOUS WASTE HAS INCREASED



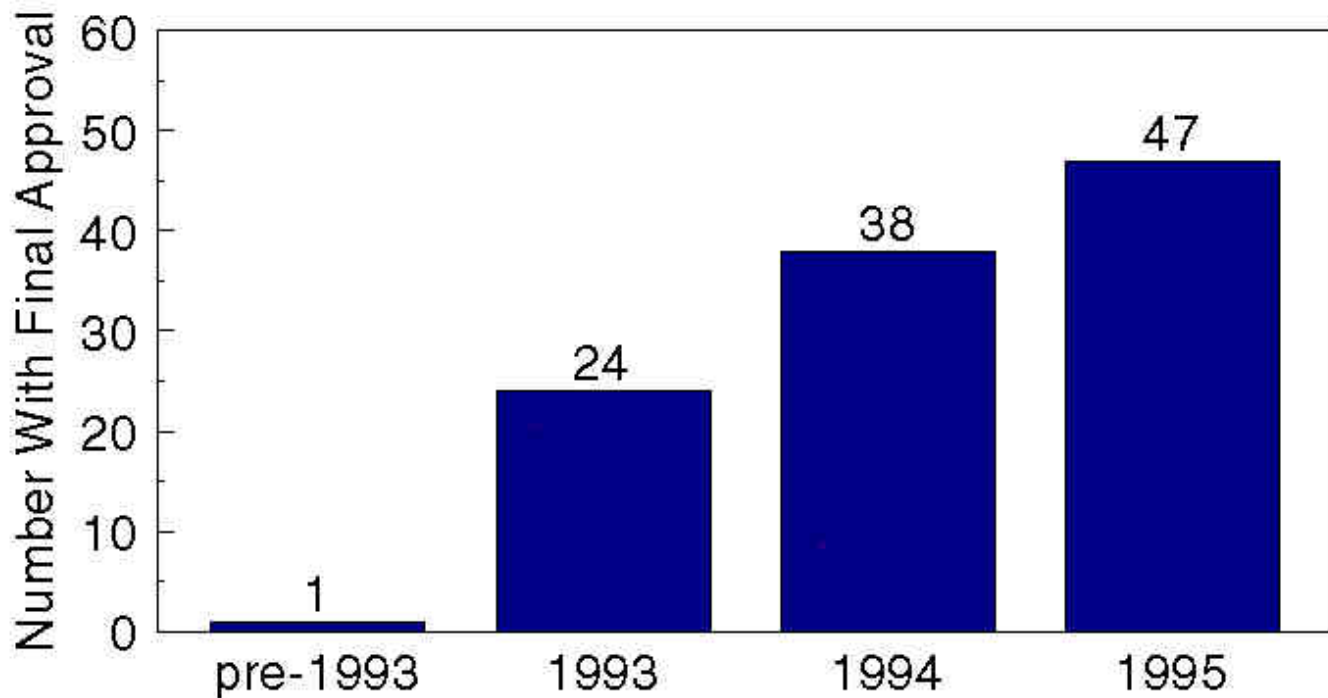
Source: 1989 and 1991 Biennial RCRA Hazardous Waste Reports as reported in *EI Digest*, March 1995; Another Look at the EPA's 1991 Biennial Report.

Land disposal of hazardous waste has become much less prevalent, partly as a result of land disposal restrictions (LDRs) instituted by EPA beginning in 1986. These rules require treatment of many wastestreams prior to disposal in a landfill or other land-based disposal unit. Landfill disposal decreased by about 25 percent between 1989 and 1991. In the same period, underground injection decreased by 20 percent. Between 1991 and 1993, landfill disposal increased by about 15% and underground injection by about 5%, but these trends should be considered in light of the additional 100 million tons of waste brought under hazardous waste management regulations by the Toxicity Characteristic Rule in 1990.

Non-hazardous waste: EPA efforts have also improved the management of non-hazardous waste, particularly household trash. From an administrative standpoint, there has been an increase in the number and quality of state programs created to manage trash. For example, the number of states, territories and tribes with final EPA approval of municipal solid waste landfill programs increased from one in 1993 to 47 in 1995 (see Waste-6). Through curbside and drop-off recycling programs, households have increased recycling of materials such as paper, glass, steel and plastic; households have also increased composting of yard waste. As a result, the U.S. has moved from an overall recovery rate of 7 percent in 1970 to 24 percent in 1994. Recycling and the growth of trash combustion have contributed to a decrease in the share of trash going to landfills from a high of 82 percent in 1980 to only 61 percent in 1994 (see Waste-7).

Waste - 6

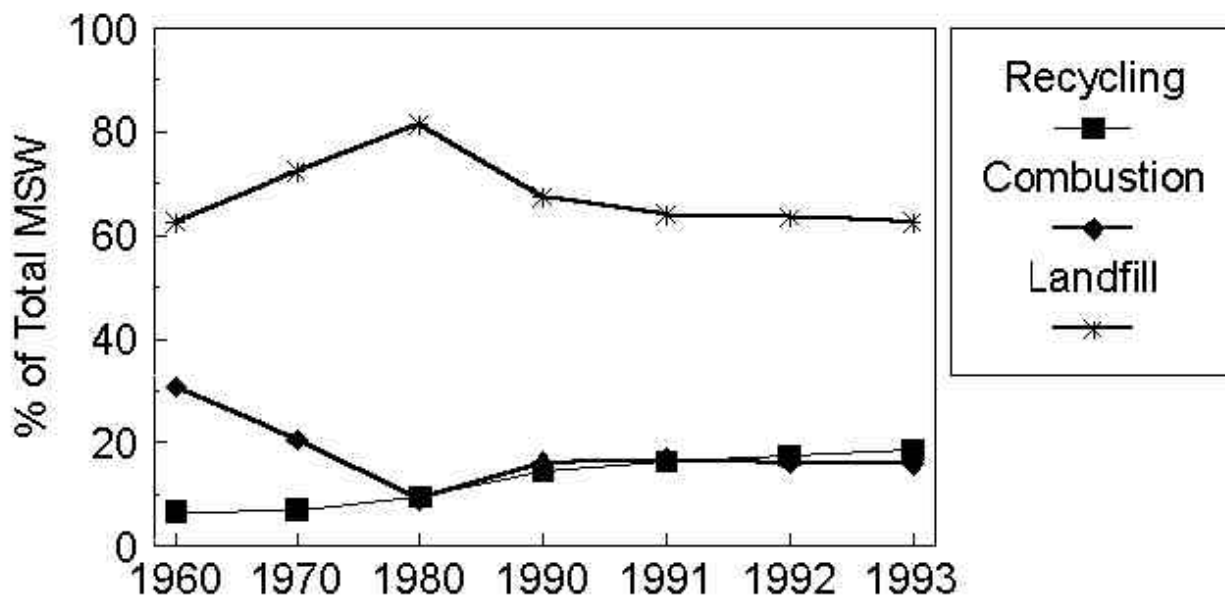
MORE STATES/TRIBES HAVE EPA-APPROVED MUNICIPAL SOLID WASTE LANDFILL PERMIT PROGRAMS



Source: U.S. EPA, *Municipal Solid Waste Landfill Permit Program Approval Status Report, 1995*

Waste - 7

WE RECYCLE MORE TRASH AND LANDFILL LESS



Source: *Characterization of Municipal Solid Waste in the United States: U.S. EPA 1994 Update.*



S.C.Delaney/U.S.EPA

Underground tanks: Underground tanks used to store petroleum or certain hazardous substances are a major concern because of their potential to leak and contaminate ground water, the source of drinking water for nearly half of all Americans. A leaking underground storage tank (UST) can also pose a risk of fire or explosion. The EPA has developed regulations requiring tank owners to prevent and detect leaks from USTs and to clean up contaminated sites. By December, 1998, all USTs must be either replaced with new tanks that meet certain standards, older tanks that have been upgraded with corrosion and spill prevention equipment, or properly closed. UST cleanups are also well underway. Since 1990, the EPA and states have overseen or completed over 141,000 cleanups. The EPA continues to promote approaches that make cleanups faster, more effective and more economical.

CLEAN UP

Reducing waste generation and managing waste safely are relatively new practices in the context of our country's economic and industrial history. For decades, industry disposed of waste either without regard to environmental impacts, or in ways that appeared safe at the time, but were, in fact, environmentally unsound.

Beginning in the 1970s, Americans began to take note of the legacy of this past behavior. Well publicized incidents such as the discovery of extensive contamination at Love Canal, New York spurred lawmakers to action. The Congress passed the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) in 1980. This law, more commonly known as "Superfund," created a program to clean up abandoned hazardous waste sites across the country. Funded by the responsible companies as well as by taxes on chemical and petroleum production, the EPA manages clean ups at Superfund sites. The Resources Conservation and Recovery Act (RCRA) assures proper closure and clean up of environmental releases by owners and operators of waste storage, treatment, and disposal facilities, thereby preventing future Superfund sites.



[Disaster Averted: Love Canal on the Road to Recovery](#)

While clean ups are complex and often require long-term remedial measures (e.g., treatment of contaminated ground water), the EPA has made significant progress. The EPA ranks Superfund sites according to the risk posed to human health and the environment and places the worst sites on the National Priorities List (NPL). Of the roughly 1,300 sites on this list, 95 percent have clean up operations underway and 349 (26 percent) have clean-up completed. Superfund cleanup is a long complex process, and more cleanups have been completed in the last two years of the program than in its first decade.

Throughout the nation thousands of abandoned and potentially contaminated industrial properties lie unused and undeveloped. Known as "Brownfields", these properties possess many good development prospects such as access to transportation and labor. Furthermore, many of these sites are located in depressed areas that would benefit greatly from re-development. The potential for contamination, however, presents a major barrier. Current environmental laws generally

hold existing landowners responsible for clean-up costs -- even if they did not contaminate the land. Banks are also hesitant to provide development loans for fear that they might become owners of the property if developers default.

The Brownfields initiative removes many of these barriers and seeks to link environmental health to economic development. One way this is done is by reducing the stringency of clean-up to levels that are considered safe in an industrial setting. The EPA and the states are also providing Brownfield developers with financial assistance as well as guarantees that additional clean-up will not be required after the site is in use. Now, just over a year into the program EPA is exploring ways to expand the role of the Brownfields approach in other areas of environmental protection.



[Reclaiming Contaminated Land](#)

MORE CHALLENGES AHEAD

Even as we make progress in managing waste and toxics, additional challenges become clear. Two challenges are most pressing: (1) **further reduction and recycling of waste**; and (2) **introduction of waste management programs that reduce regulatory burdens and encourage economic development**.



[Reduction of Medical Waste: Hospitals Save Money Under EPA Initiative](#)

Reduced Generation and Increased Recycling: The EPA has continued to emphasize its commitment to pollution prevention. In November 1994, the Agency announced the final Waste Minimization National Plan, a blueprint for reducing the generation and release of toxic pollutants. The Plan has a goal of reducing the presence of the most harmful constituents in waste by 25 percent by the year 2000, and 50 percent by the year 2005. To help achieve these goals, the EPA is working to encourage pollution prevention through a variety of innovative programs and policies. These include the following: 1) outreach tools which will help waste generators select priority wastes to target for reduction, 2) opportunities to reduce the amounts of wastes being burned and 3) outreach electronic bulletin boards designed to inform companies of pollution prevention alternatives.

Likewise, the Agency is working to encourage reduced use of toxic chemicals such as pesticides. For example, integrated pest management encourages more controlled application techniques, improved timing of planting and other natural pest control approaches.

In addition to waste prevention, the EPA is also looking for ways to enhance waste recycling. One set of efforts involves removing legal obstacles to environmentally sound recycling of hazardous waste. For example, EPA's Universal Waste Rule streamlines the requirements for nickel-cadmium batteries and other materials which will serve to promote increased recycling. Furthermore, the EPA is currently working on a major new initiative that would revise the definition of solid waste under RCRA and streamline and simplify the stringent hazardous waste rules for environmentally sound recycling of hazardous waste.

Reducing Economic Burdens: A second major challenge is to pursue waste management and clean up while limiting the economic burden placed on businesses, cities and households. The EPA's strategy is to use regulatory resources to target the most toxic wastes and contaminated sites, while providing more flexibility in managing less toxic wastes and sites. For example, observers have noted that fear of Superfund liability may discourage development of older industrial areas. In response, the EPA has introduced the Brownfields initiative, a program designed to encourage redevelopment of areas that pose little or no risk to health and ecosystems. The Agency is working with state and local officials to identify these low-risk sites, clarify the liability of municipalities and other government entities and develop guidance on simplified

cleanup requirements.

Over the years, the EPA has engaged in several rounds of Superfund reforms, in an effort to make waste site cleanups faster, fairer and more efficient. The most recent round of Superfund improvements aim to control costs while protecting public health by assuring more cleanup consistency, streamlining processes to save time and money, creating new choices for cost-effective cleanup options and encouraging economic redevelopment. Other reforms aim to decrease litigation and reduce both costs and clean-up delays by increasing fairness in the enforcement process. A third set of reforms aims to provide more and better information, along with opportunities for involvement in cleanup decisions, to citizens, state and local governments, and industry, to encourage responsible cleanup choices that reflect local needs and preferences.

The EPA is seeking greater economic efficiency in the RCRA hazardous waste management programs as well. For example, the Agency recently proposed the Hazardous Waste Identification Rule (HWIR). The objective of HWIR is to exempt from the stringent hazardous waste rules of industrial wastestreams that have relatively low concentrations of hazardous chemicals and, therefore, pose little risk to health and the environment. The recently enacted Land Disposal Program Flexibility Act eliminates stringent and costly treatment requirements for certain low risk wastes that are regulated under other laws. This RCRA "fix" will eliminate an unnecessary and duplicative layer of costly regulation, yielding tens of millions of dollars in savings to private industry. Likewise, the EPA is currently working to reduce the paperwork associated with the "manifest" by which shipments of hazardous waste are tracked.



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ECONOMIC GAIN THROUGH WASTE MINIMIZATION

One of the most attractive features of pollution prevention is the potential for "win-win" outcomes -- those where a facility can reduce pollution and simultaneously lower its own costs. This happened as a result of a lawsuit filed by EPA against the DuPont company's Chambers Works chemical plant in Deepwater, New Jersey -- one of the largest chemical manufacturing facilities in the United States.

As part of the 1991 settlement between DuPont and EPA, in addition to paying a substantial penalty for past RCRA violations, DuPont agreed to conduct an internal audit of their waste-generating activities and evaluate pollution prevention opportunities at the facility. In consultation with EPA, company officials identified 15 manufacturing processes with pollution prevention potential. The individual projects focused on reducing solvent wastes, tar wastes and other chemical wastes. One project even reduced packaging waste by introducing reusable chemical containers in place of disposable 55-gallon drums.

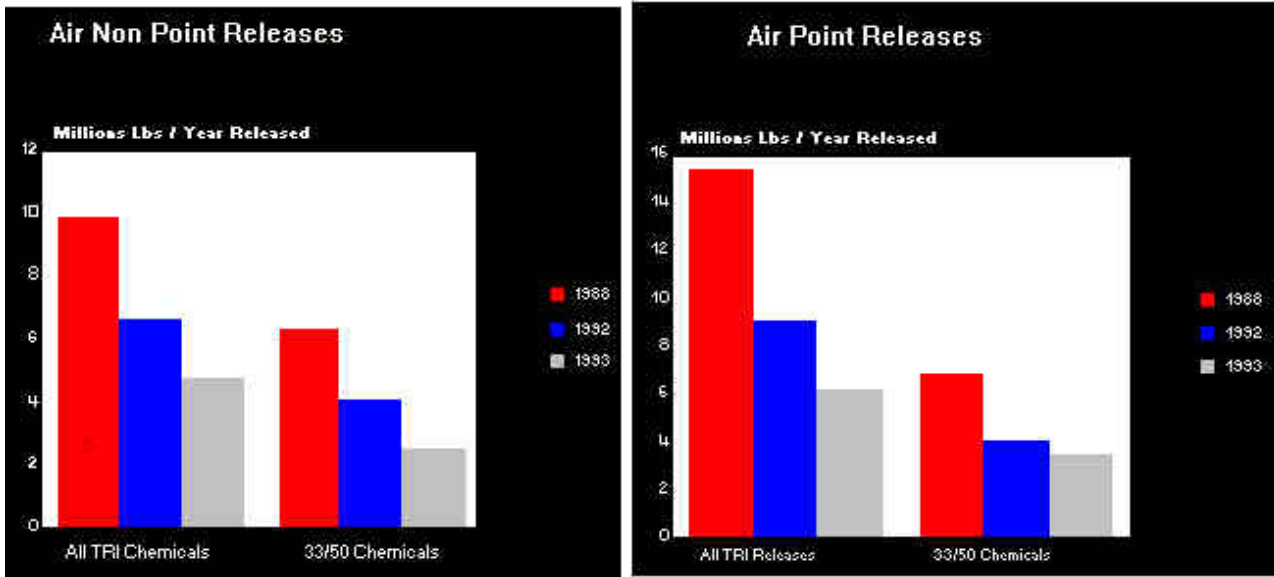
"The tremendous result of this study demonstrates the value of partnerships between industry and government", said Paul Tebo, Vice President, Safety, Health and the Environment, DuPont. "As we face a more competitive global market, we must work together to solve environmental challenges."

The outcome of the EPA/DuPont efforts is striking. By late 1993, seven of the 15 projects were implemented. DuPont has reduced wastes from the affected processes by 73 percent. Once all projects are in place, DuPont expects that wastes from all 15 processes will be cut roughly in half. More importantly, this waste reduction will yield benefits to the company as a result of reduced waste disposal and other regulatory costs. The total up-front investment for all 15 projects is expected to be about \$6 million, while DuPont anticipates annual savings of about \$15 million. Finally, the success realized at the Chambers Works facility may be relevant at other locations; therefore, DuPont is making the study publicly available as an example of how technological advances can be shared to further waste minimization progress.

[Return to Waste, Toxics and Pesticides Management](#)

COMMUNITY BASED ENVIRONMENTAL PROTECTION

The Gateway Initiative in greater East St. Louis, Illinois exemplifies how EPA can achieve environmental improvements through direct involvement with communities. East St. Louis is a highly industrialized area that has historically suffered from poor air quality and a variety of public works problems (e.g., broken sewer mains). Under the Gateway Initiative, EPA has coordinated the efforts of a variety of stakeholders to address these problems; key stakeholders include the Illinois EPA, the University of Illinois, the Illinois Department of Public Health and community groups. These organizations have worked together to inform the community of ongoing environmental initiatives and progress and to solicit input on future initiatives. For example, the program has employed "good neighbor dialogues" to inform residents of progress in reducing releases of TRI chemicals. These chemicals have shown a marked decrease between 1988 and 1993. The effect of these reductions can be seen on a grassroots level: local hospital staff contend that the elimination of chemical spills at Monsanto and other industrial facilities has resulted in hundreds fewer emergency room admissions.



[Return to Waste, Toxics and Pesticides Management](#)



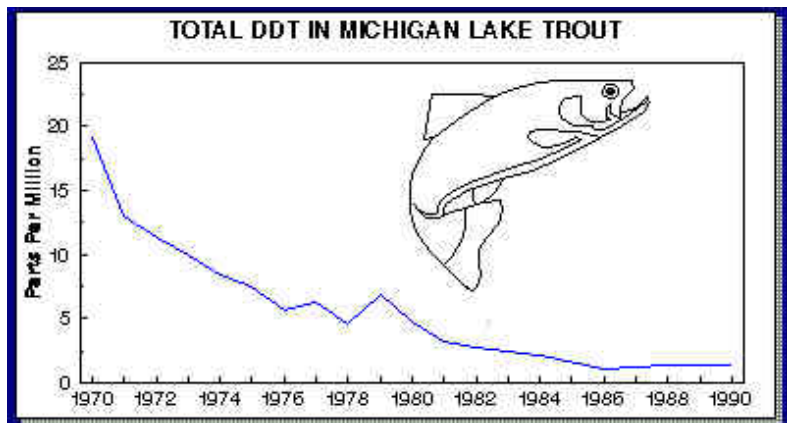
REDUCING ECOLOGICAL THREATS THROUGH PESTICIDE CONTROL

S.C.Delaney/U.S.EPA

EPA's pesticide regulatory programs have played a key role in helping restore some of the nation's most precious wildlife. A prominent example involves the Agency's 1972 ban of DDT, a common pesticide known to build up in the ecological food chain and reduce the ability of both birds and fish to reproduce. While a variety of factors (e.g., habitat loss) played a role in the decline of these species, the recovery in the wake of the DDT ban clearly demonstrates the importance of pesticide control.

Perhaps the best example of how the DDT ban helped a species rebound is that of the American bald eagle -- our national symbol. The bald eagle was removed from the endangered species list in July 1995 after nearly disappearing 25 years ago. Bald eagle populations across the country have risen. For example, the number of successful nestings around Lake Ontario has increased from none in 1979 to six in 1994; over 60 eaglets were raised in these nests.

The DDT ban has also brought about the recovery of a variety of other species. Federal officials are currently in the process of removing several bird species, including the peregrine falcon and the bald pelican, from the endangered/threatened list. The ecological effects of eliminating DDT use are also evident in Great Lakes fish. For example, average DDT concentrations in Lake Michigan lake trout declined from 19.19 parts per million in 1970 to 1.39 parts per million in 1990.



While banning DDT may be the most dramatic and well-known example, EPA's work to protect endangered species and other wildlife has continued and grown increasingly more sophisticated. Before a pesticide can be registered or reregistered, EPA requires data and information on its environmental fate and potential effect on birds, fish and other organisms.

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POLLUTION PREVENTION THROUGH PESTICIDE MANAGEMENT

Pesticide use is one of the few ways that we intentionally introduce toxic pollutants into the environment. Therefore, EPA has been at the forefront of efforts to reduce pesticide use, not only through regulatory mandates, but also through innovative cooperative agreements. Two on-going programs illustrate the Agency's commitment to pesticide use reduction through cooperative projects: the Biologically Integrated Orchard Systems (BIOS) Project, and the Urban Pesticide Initiative.

The BIOS Project is designed to help almond growers in California's Central Valley reduce their use of chemical pesticides and fertilizers. With funding from EPA, the BIOS project has provided 28 farms with technical support and financial incentives to adopt biological farming methods. For example, growers are encouraged to plant vegetative cover under trees that builds the soil and provides habitat for beneficial insects that prey on the unwanted pests. When asked about the project's effectiveness, a local organizer stated that "BIOS is working right now for farmers who are enrolled." The success of the BIOS project has led EPA to expand the program model to other crops in California, building new partnerships with the agricultural community.

The Urban Pesticide Initiative (UPI) is another cooperative program that relies on outreach and education to promote pesticide use reduction. A joint effort between EPA's regional office in Seattle, Washington, several Washington State agencies, and the cooperative extension community, UPI focuses on reducing unnecessary and illegal uses of pesticides in cities and towns. Through coordination with stakeholder groups and educational outreach, UPI promotes integrated pest management through a variety of geographic initiatives.

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DISASTER AVERTED: LOVE CANAL ON THE ROAD TO RECOVERY

The discovery of contamination at Love Canal in Niagara Falls, New York may be the single most publicized environmental incident in U.S. history. Love Canal became synonymous with the nation's fear of hazardous waste and was a catalyst for establishing the Superfund program. The on-going efforts of the EPA and other groups, however, have averted disaster at Love Canal and have restored much of the area to an environmentally safe condition.

From 1942 to 1952, Hooker Chemicals and Plastics (now Occidental Chemical Corporation) used Love Canal as a dump for over 21,000 tons of mixed chemical wastes. In the ensuing years, homes and even an elementary school were built in the area above and around the covered landfill. Over time, contaminated groundwater migrated to sewers, creeks, and ultimately the nearby Niagara River. In the late 1970s, the area was declared an environmental emergency and 950 families were evacuated.

Clean-up of Love Canal has been complex but successful. Clean-up operations have included containment of the leaking landfill, removal and disposal of sediments from sewers and creeks, removal and cleaning of soils near the school, destruction and removal of homes surrounding the canal, and buyout of properties in the area. In 1988, EPA issued the Love Canal Habitability Study. The Agency concluded that several portions of the outer area surrounding the site and rings of homes that were torn down were again clean enough for people to move back to the neighborhood; other areas, while not suitable for homes, were sufficiently clean for commercial or industrial use. Today, revitalization of the area continues. Nearly 200 homes have been sold, 60 others are undergoing renovation, and new residential developments are being built.

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RECLAIMING CONTAMINATED LAND

Cooperation between EPA, local governments and real estate developers is revolutionizing the way that cities convert contaminated industrial areas to useful purposes. The case of Elitch Gardens in Denver, Colorado is an example of innovative public/private partnership, a concept that EPA is now promoting more formally under the Brownfields Initiative.

In 1992, the City of Denver and private developers approached EPA with a proposal to build an amusement park on land in Denver's Central Platte Valley. The land was contaminated from previous use as a gas plant and rail yard facility. EPA worked with the stakeholders involved in the project, and eventually the parties jointly developed an acceptable cleanup strategy. As a result, environmental cleanup and land use objectives were both achieved, as envisioned under the Brownfields Initiative. This simple but groundbreaking agreement removed a critical obstacle and allowed Denver to convert a blighted area into one that the public can enjoy safely.

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REDUCTION OF MEDICAL WASTE: HOSPITALS SAVE MONEY UNDER EPA INITIATIVE

EPA's waste minimization initiatives extend beyond industrial waste and municipal solid waste to other categories of regulated waste. In conjunction with the Iowa Department of Natural Resources, the Agency has recently implemented a program to reduce hazardous waste generated at hospitals.

The Iowa Hospital project began with a workshop entitled "Statewide Pollution Prevention for Healthcare Facilities," demonstrating ways that hospitals could reduce waste generation. The program also includes on-site technical assistance and job training activities. EPA estimates that the five pilot hospitals involved in the program will save a total of \$500,000 each year in waste management and energy costs as a result of the initiative.

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NEW DIRECTIONS

More than three decades ago, the American public began demanding a higher standard of environmental accountability from industry. After more than a century of neglect, our ecosystems were showing the harmful effects of economic prosperity and population growth. Safer air, cleaner water and uncontaminated land came to the forefront of the American agenda. In 1970 EPA was established, formalizing the American sentiment. Summarized in a single, unyielding mission, EPA pledged to protect human health and the environment.

Throughout this document, we have shown how EPA has worked to improve the quality of our lives and the environment. Focusing on air, water, and land, EPA has developed specific programs to clean-up past mistakes and prevent future pollution. On a national scale, these targeted efforts have resulted in vast improvements in environmental quality. At the same time, hundreds of communities across the nation can relate individual success stories about changes for the better.

Today, EPA's mission of protecting human health and the environment continues to be the foundation of all of our programs and efforts. As EPA has grown, however, we have discovered more effective and less costly means of preventing pollution and addressing environmental challenges.

We envision a 21st century America in which economic incentives, environmental incentives, and technological innovation are aligned so that economic growth improves -- rather than diminishes -- environmental quality.

In the next century, environmental protection must be driven by clear and measurable national goals. Economic, environmental and social goals must be integrated so policies are mutually supportive, not conflicting. Performance will be measured by achieving real results in the real world, not simply by adhering to procedures.

Our new way of thinking is more comprehensive -- instead of focusing on specific media such as air or water, EPA now looks at entire ecological systems and develops integrated environmental solutions. Some key aspects of this "community-based" approach include:

- Developing consensus-based solutions. EPA is bringing industry representatives, environmental groups, concerned citizens and local governments to the negotiating table. With EPA as moderator, these groups are working to resolve their differences and agree on mutually acceptable environmental solutions.
- Empowering the public with information. By providing information, EPA is able to form partnerships, increase public awareness and improve data quality and access. These initiatives encourage public involvement in decision making as together we strive to reduce the risks associated with environmental pollutants.
- Practicing multi-media environmental protection. Increasingly, EPA is developing solutions to environmental problems that consider water, air, and land management within a coordinated system. When effectively managed, this comprehensive approach helps EPA address all of the environmental dilemmas within an ecosystem.
- Building partnerships with regulated communities. Highly-regulated industries are being encouraged to exchange information and data with the EPA. By learning more about the industries we regulate -- their internal processes, profitability, and competition -- we can develop more informed and more effective pollution control programs.
- Increasing the use of promising new technologies. Older regulatory programs sometimes inhibit innovations in

pollution control technology. The EPA is now supporting pilot programs where companies can test promising new ideas under less rigid regulatory frameworks.

- Using more market-based incentives. The EPA is increasingly looking to the free-market as an effective means of pollution control. The tradeable air emissions permit system is one program that is already in place. Over time, the EPA hopes to increase the use of other market-based programs such as deposit-refund systems, recyclable markets and rebates on environmentally benign products.

EPA has already started to use these approaches in a number of program areas. Some of these efforts are described below.

Common Sense Initiative

The Common Sense Initiative (CSI) forges a collaborative working relationship between EPA, the states and industry. In the past, industry kept most of their engineering and cost data secret, hoping to win concessions from the EPA. The CSI removes this veil, bringing these groups together to share information about environmental goals and industrial processes. As allies, the EPA and the six pilot industries are finding that open and honest discussions promote "cleaner, cheaper, and smarter" systems of environmental protection. Through added flexibility, lower costs and more effective pollution control, both the EPA and industry are realizing the advantages of this common-sense approach.

Project XL

Project XL is an innovative program that encourages industry groups, government agencies, or even individuals to test new pollution prevention and control technologies. Under this program, EPA provides real-world testing opportunities for program participants. EPA also removes many of the regulatory burdens that often impede the development of new environmental technologies. Already, the program's impact is being felt. EPA's project participants are currently testing a number of innovative ideas, including a unique process for treating contaminated soil without removing it from the ground.

Design for the Environment

The Design for the Environment Program (DfE) is a voluntary program which aims to help businesses incorporate environmental considerations into the design and redesign of products, processes and technical and management systems. Through the DfE program, the EPA creates voluntary partnerships with industry, professional organizations, state and local governments, other federal agencies and the public to promote safer substitutes, technologies and chemical processes.



[*The Greener Cleaner*](#)

Green Chemistry Challenge Program

The Green Chemistry Challenge Program will recognize accomplishments in chemistry that have been used to achieve pollution prevention goals. It will also promote further basic research through targeted EPA grants and encourage industrial and university collaboration to develop innovative approaches to achieve pollution prevention.

TRI Expansion Initiatives

The Toxics Release Inventory (TRI) offers the public toxic chemical data from more than 23,000 manufacturing facilities and certain federal facilities across the country. The Agency intends to expand the types of industries that report to TRI and to explore collecting chemical use information, also known as materials accounting data.



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The Greener Cleaner

Noam Frankel, a Chicago businessman, was looking for a new business to invest in. His interest was piqued by an alternative to dry cleaning that the Center for Neighborhood Technology (CNT) was promoting. Encouraged by European successes with this technology, the CNT had joined the EPA's Design for the Environment Dry Cleaning project which aimed to find and test alternatives to dry cleaning with toxic chemicals. Not only was this new technology, wet-cleaning, an environmentally safer way to clean clothes, but to Frankel it seemed like it was a good investment from a cost perspective as well. Frankel opened his shop, *The Greener Cleaner*, in Chicago last year.

With funding from the EPA and a willing business partner in Frankel, CNT is now evaluating the commercial viability of wet-cleaning using business information from *The Greener Cleaner*. CNT's interim report shows that the wet-cleaning does appear to be comparable in cost and performance to dry cleaning. This may not be new news to *The Greener Cleaner*, or to much of the dry cleaning industry. This past year saw a tremendous jump in the number of dry cleaners now using wetcleaning techniques. A few years ago, wet-cleaning was an untested, and untrusted, idea. Today, there are 100 wet-cleaners in North America and the number seems to be growing daily.

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2. U.S. EPA Regional Offices:

Frank McIntyre, Region I
Chris Jendras, Region I
Robie Keiber, Region II
Barbara Pastalove, Region II
Larry Brown, Region III
Reginald Harris, Region III
Peter Marx, Chesapeake Bay Program Office
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3. Others:

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