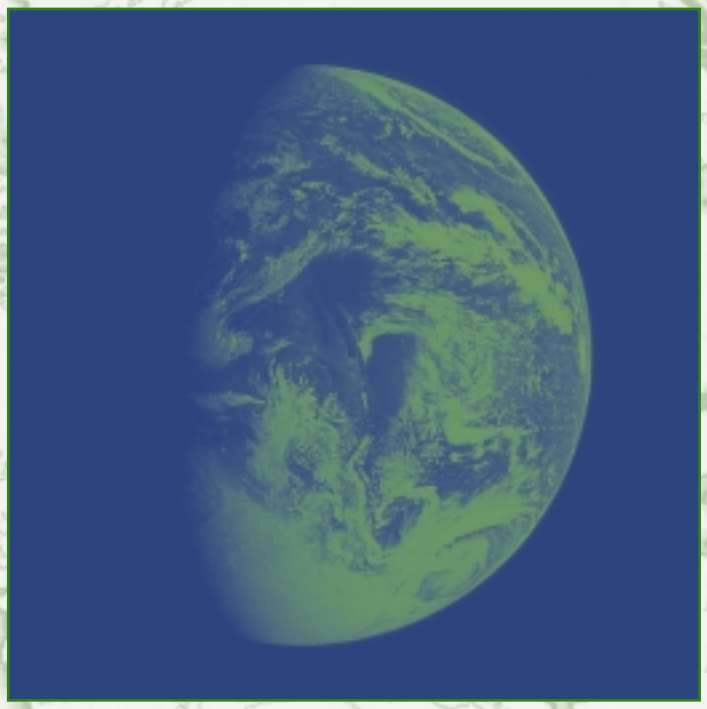
REMEMBER THE PAST



PROTECT THE FUTURE

U.S. Environmental Protection Agency
Region 5/Great Lakes Region
EPA-905-R-00-002

ILLINOIS | INDIANA | MICHIGAN | MINNESOTA | OHIO | WISCONSIN

EPA was born 30 years ago at a time when rivers caught fire and cities were hidden under dense clouds of smoke. We've made remarkable progress since then. But we can't rest on our success.

Our mission to protect the environment, and to protect public health, is a mission without end. New challenges loom over the horizon as surely as the new day.

We must continue our work to ensure that with each new dawn, the sun shines through clear skies and upon clean waters – and all our families enjoy the blessings of good health.

Carol M. Browner, EPA Administrator

Map on cover, inside and back covers, page 1, and page 29: Mr. Bellin Ingenieur du Roy Et de la Marine, "Partie Occidentiale de la Novelle France ou du Canada," 1755. Courtesy Chicago Historical Society.

We are pleased to present the following report on 30 years of environmental progress to the communities, industries, environmental groups, partner agencies, and tribal governments that we work with on a daily basis.

This report highlights the issues in which Region 5, the Great Lakes Region, has an active role. Over the past three decades, the role of the States and Tribes has grown and evolved. EPA still maintains the primary responsibility for enforcing the laws and ensuring that the six-State area meets designated health standards.

Today, EPA Region 5's priorities reflect some familiar and some emerging issues:

- *Reducing toxic chemicals, especially mercury and PCB's*
- *Promoting sustainable urban environments and ensuring that future development proceeds in an environmentally sound manner*
- *Protecting people at risk, especially children, and taking steps to ensure that no community bears more than its fair share of the pollution burden*
- *Continuing cleanup of contaminated sediments, which lie at the bottom of hundreds of rivers, streams, and lakes*
- *Protecting and restoring critical ecosystems, especially within the Region's remaining undeveloped areas*

With a strong enforcement foundation in the new millennium, the Great Lakes Region will continue to work in partnership with our stakeholders to seek sensible solutions to environmental challenges, both old and new.

Francis X. Lyons, Administrator, EPA Region 5

Regional Administrators

Francis X. Lyons
1999-Present

David A. Ullrich (Acting)
1997-99

Valdas V. Adamkus
1981-97

John C. McGuire
1978-81

George R. Alexander, Jr.
1976-78

Francis T. Mayo
1971-76

1970 First Earth Day ... National Environmental Policy Act requires environmental impact statements for

CLEAN AIR

Air quality problems and the industrial Midwest have always been closely linked. Before 1970, steel mills, auto plants, and other large facilities faced few controls when it came to the smoke that poured from their stacks or the chemicals released from their processes. The 1970 Clean Air Act, amended in 1977 and 1990, introduced tougher standards.

Today, air quality is much improved in most Region 5 communities and the tools are in place to lower emissions even further. At the same time, industry and growth have charged ahead. Nationally, between 1970 and 1997, the U.S. population grew by 31 percent, the Gross Domestic Product rose by 114 percent, and the total vehicle miles traveled jumped by 127 percent.

Principal Pollutants

Air pollution contributes to heart and lung disease, and increases cancer risks. It also reduces visibility and damages soil, lakes, streams, and the food web that sustains all life. EPA's efforts to reduce emissions begin with six major pollutants: ozone, nitrogen dioxide, particulate matter, sulfur dioxide, carbon monoxide, and lead. For each, EPA sets health standards that local areas must take steps to reach. Both nationally and within the Great Lakes Region, emissions for all but nitrogen dioxide dropped between 1970 and 1997.

Nitrogen dioxide (NO_2)

Though emissions increased by 11 percent nationally between 1970 and 1997, today all of Region 5 meets the air quality standard for the lung irritant NO_2. Nitric oxide and NO_2 together are known as NO_x, which is a major contributor to ozone. NO_x is also a factor in acid rain.

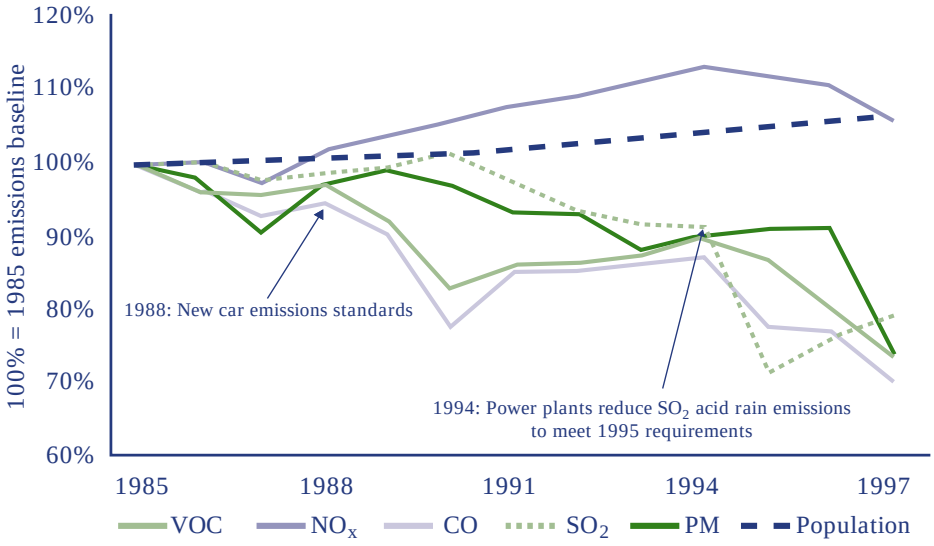
Ozone (O_3)

Also known as smog, ozone is a lung irritant formed by the blending of volatile organic compounds (VOC's) and NO_x on hot, sunny days. Emissions of VOC's – which come from factories, consumer products, and motor vehicles – dropped by 38 percent nationally between 1970 and 1997. Although VOC's have dropped significantly and many areas now meet the O_3 standard, ground-level ozone continues to be a problem in a few cities, including Chicago, East St. Louis, and Milwaukee.

Particulate matter (PM)

PM is the dirt, smoke, and soot in air, most of which comes from diesel engines and industrial sources. PM emissions dropped by 75 percent nationally between 1970 and 1997. Fine particulates, which impair visibility and cause health problems when inhaled deeply, are an emerging area of concern.

Air Emission Trends for Region 5 1985-1997



Air emissions data in Region 5 between 1985 and 1997 show decreases for five of the six principal pollutants. During this period, CO emissions decreased by 30 percent, both VOC's and PM decreased by 26 percent, and SO_2 dropped by 21 percent. (Due to the introduction of unleaded gasoline, lead emissions were virtually eliminated by 1980.) NO_x emissions increased by 5 percent during this period. Population in the Region 5 States increased by 5 percent between 1985 and 1997.

Sulfur dioxide (SO_2)

SO_2, a major contributor to acid rain, is formed primarily by the burning of sulfur-containing fuels, such as coal and oil, and during metal smelting. Emissions of SO_2 dropped by 35 percent nationally between 1970 and 1997, with much of the progress due to new controls on coal-fired power plants, required in 1995. The requirements feature an innovative, flexible approach: emissions trading through the Chicago Board of Trade, which allows companies with stringent SO_2 controls to sell credits to companies with less effective emission controls.

Carbon monoxide (CO)

Emissions of CO, an invisible, odorless gas that comes primarily from vehicle exhaust, decreased by 32 percent nationally between 1970 and 1997. In 1978, 19 urban areas in Region 5 were above the health standard for CO. By 1999, all had made significant improvements and were meeting the standard. Helping improve the situation: tougher State-managed vehicle inspection programs, increased use of cleaner-burning fuels, and pollution control equipment on new cars.

Lead (Pb)

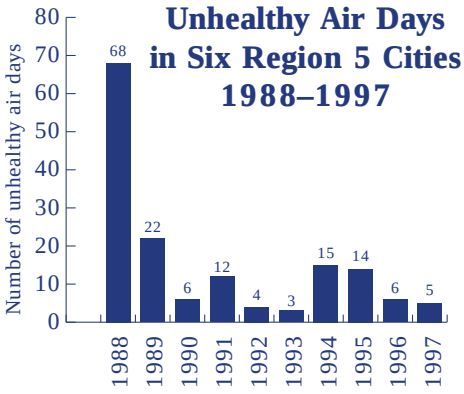
Unleaded gasoline, introduced in 1975, accounts for much of the nationwide 98 percent reduction in Pb emissions between 1970 and 1997. Today, in the Great Lakes Region, the primary sources of airborne lead are metal smelters and battery manufacturers.

Toxics

When Congress amended the Clean Air Act in 1990, it told EPA to take further steps to reduce air pollution. Much of this effort focused on a vast group of 188 additional toxics – pollutants that contribute to cancer, birth defects, neurological disorders, and other health problems. For some of the worst toxics, such as mercury and benzene, controls had been previously established. But for most, EPA had to develop emissions standards keyed to specific industries. Currently, EPA has issued 44 new emissions standards, regulating 79 source categories, such as steel mills, paint factories, and dry cleaners. Dozens more are on the way.

Atmospheric Deposition

Atmospheric deposition occurs when airborne pollutants settle on land or water, often in contaminated rain or snow. Despite improvements in air pollution control, deposition remains a problem in the Great Lakes Region. EPA is especially concerned about toxics, such as mercury, PCB's, and dioxins, which tend to bioaccumulate in plants, fish, and wildlife, potentially



Total days that air quality was rated unhealthy or worse in Chicago, Cincinnati, Detroit, Gary, Milwaukee, and Minneapolis.

AQI: Measuring Unhealthy Air Days

Since 1988, EPA has published a daily index that grades air quality in urban areas. Each day, the Air Quality Index (AQI) measures the levels of five key pollutants – carbon monoxide, nitrogen dioxide, particulate matter, sulfur dioxide, and ozone – rating the air quality on that day on a scale from good to hazardous.

By this yardstick, air quality in most Region 5 cities has improved significantly over the past decade. However, the AQI provides just a snapshot. The index is based only on air conditions for a 24-hour period that can produce acute effects, such as shortness of breath, or trigger chronic conditions, such as an asthma attack. Seasonal conditions can also affect the AQI. For example, carbon monoxide emissions are usually worse during the winter, with ozone more severe in the summer.

wreaking a host of health and food-web problems.

With Environment Canada, EPA maintains a network of 19 shore-based monitoring stations that measure concentrations of toxic pollutants in the air. Using these concentrations, annual average pollutant loadings into the Great Lakes are calculated. Data collected since 1990 indicate that levels of PCB's and the pesticide DDT – banned in 1972, but still present in the environment – are decreasing.

Enforcement

With Region 5's large industrial base, EPA and its partners actively enforce the clean air regulations. In 1998, settlements led to nearly 16,000 fewer tons of pollutants emitted and $11 million in penalties. Between 1988 and 1998, an average of 91 companies per year were charged with clean air violations. Because some industries generate more air pollution than others, Region 5 strategically targets its enforcement efforts at key industrial sectors and geographic areas.

On the Horizon

• New outreach and regulatory efforts targeting smaller sources, such as dry cleaners, machine shops, and hospitals, which cumulatively are major contributors to urban air pollution

Andersen Corporation

June 1999. Region 5 Administrator Francis X. Lyons (left) tours Andersen Corporation's Bayport, MN, window manufacturing facility with regulatory compliance engineer Dale Olson. EPA, Minnesota Pollution Control Agency, Washington County, and Andersen have entered into a unique air emissions agreement that allows the company to expand its environmentally sensitive production processes, while discouraging traditional high-emissions solvent-based processes.

• More protective tailpipe emissions standards for all passenger vehicles, including sport utility vehicles, minivans, and pickup trucks

• Expansion of EPA's Sunwise program, which raises children's awareness of stratospheric ozone depletion, the dangers of ultraviolet radiation, and simple sun safety procedures

Endangered Species Act ... Leaded gas phase-out begins ... Energy crisis turns attention to solar power ...

First global environmental conference, in Stockholm, Sweden ... 1974 Safe Drinking Water Act ... 1976

CLEAN WATER

Clean water is essential for a healthy environment. When EPA was formed in 1970, the organizational backbone came from the old Federal Water Pollution Control Agency. And once EPA was up and running, many of the early headlines came from enforcement of the 1972 Clean Water Act.

The Great Lakes comprise the largest system of fresh surface water on the planet and provide over 10,000 miles of shoreline. Along with the great rivers – from the Ohio to the Upper Mississippi – they distinguish the Region's geography. We depend on them for drinking water, agriculture, recreation, and commerce. In Region 5, EPA's protection of clean water takes many forms and involves many partners, including Environment Canada, our counterpart agency across the border.

Surface Water

The Clean Water Act, last amended in 1987, has two fundamental goals: eliminate pollutant discharges into the Nation's lakes, rivers, and streams and make those waters safe for fishing and recreation.

Efforts to reach those goals began with financial support to build or improve municipal sewage treatment plants. Since 1972, EPA has awarded more than $11.5 billion to Region 5 communities, giving local officials the tools to safely manage their wastewater. The result: In 1976, 2,065 communities in the Great Lakes Region did not provide required secondary treatment; today, that number is down to 3. Together with the States, EPA enforces permit requirements on these facilities to ensure that both municipal and industrial wastewater plants work effectively.

Under the Clean Water Act, States monitor the quality and safety of their lakes and rivers for designated uses, such as drinking water, recreation, or supporting aquatic life. Each State develops its own water standards and monitoring program, and reports its findings to EPA every 2 years. These reports have shown major improvements over the years. However, about 2,700 of Region 5's waterbodies remain impaired, largely as a result of urban and agricultural runoff.

EPA and the States coordinate their water quality programs within geographic watersheds, using total maximum daily loadings (TMDL's) as a tool to address impaired waterbodies. TMDL's are calculations that establish the maximum amount of a pollutant that a waterbody can receive and still meet water quality standards. TMDL calculations are then used to allocate clean-up responsibilities among the various pollution sources within the watershed.

Agricultural Runoff

Chemical runoff from our farmlands has far-reaching impacts. Excessive pesticide use can contaminate drinking water supplies. And cumulative runoff of nutrients can lead to harmful overenrichment. EPA's nonpoint source grant program promotes best management practices that reduce nutrient-contaminated runoff. Addressing pollution from large-scale livestock operations is also a concern. To address these facilities, known as confined animal feeding operations, Region 5 is working closely with the States and the U.S. Department of Agriculture to apply a mix of new voluntary and regulatory controls.

Beach Closings

Since 1980, EPA has tracked beach closings for U.S. shores of the Great Lakes. Despite some dramatic cleanups, closings still occur too often. The past few years have seen well-publicized incidents in Chicago, Northwest Indiana, and Lake St. Clair, MI. In 1996, the most recent comprehensive reporting year, of the 555 Great Lakes beaches, 69 were closed or restricted at least once for environmental problems. Of these, 11 were restricted for more than 2 weeks.

Most closings are due to contamination from untreated or partially treated sewage. This often happens during heavy rains, when combined

Hammond, IN, 1971. Beach closings are less common today, occurring most often after heavy storms.

storm and sanitary sewers overload and discharge into lakeshore areas. Swimming in these contaminated waters can lead to illness or infection. In 1997, EPA launched a new beaches-focused program to strengthen water quality standards, improve access to beach information, and develop better prediction tools for contamination.

Sediments

Dealing with polluted sediments in lake beds and river bottoms continues to be a Region 5 priority. While the volume of chemicals from runoff or discharges into lakes, streams, and tributaries has been reduced since the 1970's, persistent concentrations of toxic chemicals still pose risks to people, aquatic systems, and wildlife.

Contaminated sediments can also clog shipping routes and threaten commercial fishing.

Since the early 1980's, Region 5 has developed partnerships and enforcement strategies to achieve cleanups at dozens of rivers and harbors. Some notable projects:

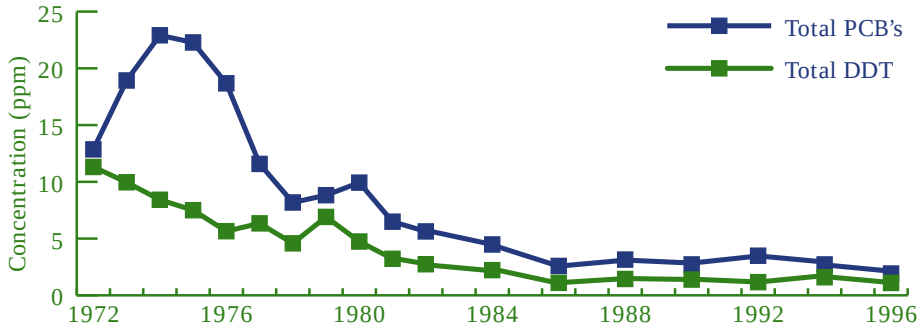
• At the Outboard Marine Superfund site, Waukegan, IL, the removal of over 300,000 lb of PCB's from Waukegan Harbor was completed in 1993.

• In Northwest Indiana, as a result of a 1998 Federal consent agreement, USX will dredge 700,000 cubic yards of contaminated sediments from the East Branch of the Grand Calumet River, near its Gary Steel Works. Work is set to begin in 2002.

Fish Contamination

Fish that live in waters with polluted sediments also risk contamination. For this reason, since the mid-1970's, States have issued fish consumption advisories for the Great Lakes, their tributaries, and many other lakes and rivers in Region 5. Virtually all of the fish data collected have shown improvement, although a few problems remain. PCB levels in lake trout, for example, are down nearly 90 percent, with continuing advisories due to tightened criteria. Mercury residue levels in fish also remain high in hundreds of inland lakes. EPA is studying the link between atmospheric deposition and water pollution in a pilot project at Devil's

PCB's and DDT in Lake Michigan Lake Trout



Following bans on DDT (1972) and PCB's (1976), long-term monitoring data for lake trout in Lake Michigan show dramatic decreases for both contaminants. Despite this trend, fish consumption is still restricted in all five Great Lakes.

Lake, WI, with an eye toward new strategies to control mercury emissions.

Drinking Water

Ninety-five percent of the people in the Great Lakes Region who get their drinking water from community water systems have water that meets all of EPA's health-based standards. To maintain quality, each year the States require 7,800 local water supplies to test for more than 80 pollutants on a regular basis. EPA and the States also actively support the Wellhead Protection Program. Since 1991, 778 community water systems have taken new steps and implemented management activities to safeguard the areas surrounding local ground-water wells.

Indian Country

Among the 35 Indian Tribes in Region 5, water quality has come a long way. In 1972, just six Tribes had offices dedicated to their drinking water systems. Today, 29 have a formal utility or environmental department. Since 1990, 24 new or expanded sewage treatment facilities have been built to serve tribal communities. Many of these replaced failing septic systems that threatened public health and safe drinking water. More recently, in 1997 and 1998, Region 5 worked with the Tribes and the Indian Health Service to close 19 waste injection wells and 40 abandoned drinking water wells that posed a threat to drinking water supplies.

On the Horizon

- Greater attention to monitoring and assessing water quality trends in lakes and rivers

- Expansion of EPA's stormwater runoff permit program to most urbanized areas and construction sites of 1 to 5 acres

Ohio Environmental Protection Agency

Cuyahoga River: Back and Better

In Region 5, the clean water story flows directly to the Cuyahoga River's Cleveland shoreline. On June 22, 1969, the oil and garbage-infested river caught fire, galvanizing the American environmental movement. A generation later, fish populations have recovered and exceedances of ammonia, heavy metals, and fecal coliform bacteria standards have dropped dramatically.

Ohio Environmental Protection Agency

power plant, Harrisburg, Pennsylvania ... 1980 Comprehensive Environmental Response, Compensation,

Renatta Bobcock

and Liability Act (Superfund) ... 1984 Union Carbide methyl isocyanate release in Bhopal, India, kills

CLEAN LAND

America's status as a world leader owes much to its productive land and vast natural resources. But the land has not always been treated well. As cities grew and industry expanded, poorly managed waste – some of it hazardous – had unpleasant side effects.

In many parts of the United States, we are only now becoming better caretakers. Since the late 1980's, for example, the Nation's overall recycling rate has jumped from 11 percent to 27 percent, with a goal of 35 percent by 2005. That's big progress, but there's room to do even better. As for managing the more hazardous materials, the 1976 Resource Conservation and Recovery Act (RCRA) and the 1980 Superfund statute have led the way. Both were later amended, RCRA in 1984, and Superfund in 1986.

RCRA

RCRA authorizes EPA and its State partners to control hazardous waste from "cradle to grave." That is, from production to final safe disposal. RCRA defines hazardous waste, sets standards, and regulates how to manage and transport it. RCRA also outlines permit requirements for waste treatment, storage, and disposal.

Permitted facilities

In 1980, about 1,700 Great Lakes Region facilities notified EPA that they dealt with hazardous waste and were subject to the permit standards. Over the years, many of them have closed or stopped handling hazardous waste. By June 1999, just 679 RCRA-permitted facilities were in operation. In 1984, a corrective action process was added, which requires companies to clean up the areas they used for hazardous waste storage or disposal before 1980.

Underground storage tanks

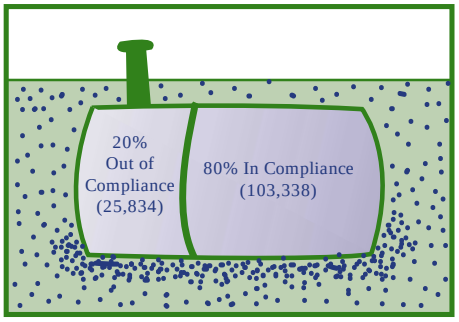
Most petroleum-contaminated ground-water cases point to an underground storage tank (UST) problem. In 1988, EPA established a 1998 deadline for facilities, such as gas stations, to upgrade, replace, or remove their tanks. During that decade, 264,496 UST's in Region 5 were closed, 88,612 leaking tanks were discovered, and 50,778 sites were cleaned up. Work is under way at nearly all of the others. To keep costs down and new technologies evolving, EPA encourages UST owners to use emerging clean-up approaches, such as enhanced soil-vapor extraction and a range of ground-water treatment technologies.

Superfund

Where RCRA governs operating facilities, Superfund cleans up abandoned hazardous waste sites. Sites that require long-term, often expensive cleanups are known as remedial sites. These include the almost 1,300 sites currently on the National Priorities List (NPL), 270 of which are in Region 5. Of these, 13 are Federal facilities, typically former military installations or nuclear research labs.

2,000 people ... 1985 British scientists report hole in ozone layer over Antarctica ... First segment of

Active Underground Storage Tanks Region 5 - October 1999



Between 1988 and 1998, 264,496 leaking or substandard UST's were permanently closed.

Removal sites are usually smaller than NPL cleanups, requiring anywhere from a few months to a few years to complete.

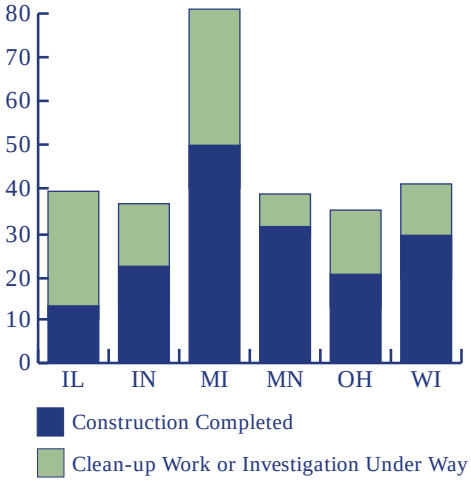
Remedial sites

When Congress told EPA to create the NPL in the wake of the 1978 evacuation of the Niagara Falls, NY, Love Canal neighborhood, it anticipated the whole Superfund program would encompass a few hundred sites at the most. It also assumed the parties that contributed to the contamination, would, in turn, pay their share of the clean-up costs.

Reality was more complicated. Most NPL sites required extensive engineering and scientific studies before cleanup could begin. And many of the clean-up technologies that are standard today were developed as Superfund gained experience. Also, not all the parties EPA and the States identified as responsible were willing, or able, to assume the costs.

In response, Superfund has been fine-tuned many times. In 1986, Congress expanded EPA's enforcement and clean-up authority. In 1989, the pace of many cleanups was accelerated, and in the 1990's, three rounds of administrative reforms led to a faster, fairer, and more efficient program. By December 1999, 169 of 270 sites in the Great Lakes Region had reached construction completion status, meaning only long-term operations, such as ground-water pumping or monitoring remained. Region 5 expects to have completed 250 sites by late 2003.

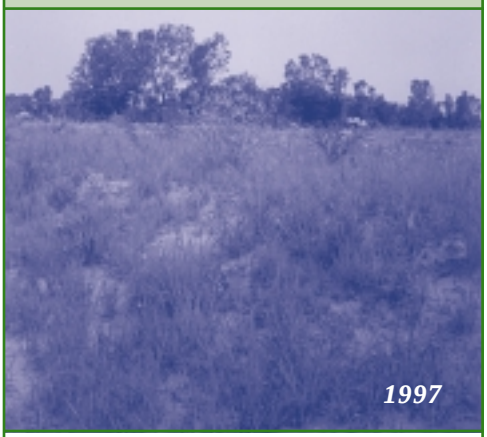
NPL Completions Region 5 - December 1999



Removal sites

The Superfund removal program has enjoyed strong support over the years. Where the remedial program usually

Gary Lagoons. Since the 1950's, illegal dumpers had used this Northwest Indiana site near the Gary Airport to unload construction debris, garbage, and waste oil. A 1996-97 $4.1 million Superfund removal disposed of 9,000 gallons of PCB-waste oil, 10,250 tons of contaminated soil, and 340 tons of scrap. With help from the Indiana Department of Natural Resources, the Indiana Department of Environmental Management, and the U.S. Fish and Wildlife Service, natural dune and swale and native vegetation were restored.



Chicago-area Deep Tunnel completed to help reduce flooding ... 1986 Emergency Planning and

addresses abandoned landfills and major contamination sites, removals are typically shorter-term and smaller-scale. Common removal sites: abandoned plating shops, cleanups after floods and chemical fires, and containment of emergency chemical releases.

Region 5 initiates about 50 removals annually. Often, EPA will manage a situation until the worst hazards are under control, then turn it over to a State or local agency for the final steps. When possible, we try to return these sites to municipalities or local businesses that can redevelop them. Since 1991, Region 5 has approved more than 20 of these prospective purchaser agreements, which give the buyer certain protections from liability for known or potential past contamination.

On the Horizon

• Under the Base Realignment and Closure Act, Region 5 is assisting with the cleanup and redevelopment of 14 former military bases.

• A new Superfund Redevelopment Initiative was announced in July 1999. The program awards $100,000 grants to help communities determine future uses of former Superfund sites. Tar Lake, Mancelona, MI, was one of the first 10 sites selected nationally. Four additional sites are expected to be added in 2000.

Region 5: Looking Back

"In 1973, when I joined EPA, the Region 5 office was small, with maybe 300 people. But there was real intensity and a sense of purpose in the air.

"An early priority was issuing permits under the Clean Water Act. On some of the permits, there were public hearings which drew a lot of attention. Establishing EPA's credibility in the eyes of the public, industry, and the State agencies was a challenge. EPA was the new kid on the block and still sorting out the Federal role.

"In 1978, the Great Lakes National Program Office was created to monitor and work with our partners, particularly Environment Canada, on protecting the Lakes. The office is unique – though based in Region 5, it is an independent, national program. Valdas Adamkus was instrumental in making the Lakes a priority in all we do. Val, as he is known, was our first Deputy Regional Administrator and was the Regional Administrator from 1981 to 1997. After retiring, he was elected President of his native Lithuania.

"In the early 1980's, EPA lost momentum when enforcement was de-emphasized. It was a period of great discouragement. By the late 1980's, Superfund and RCRA were in full swing, and work at many of the worst sites was well under way. About this time, the Region also began to move more toward a partnership approach to solving environmental problems.

"The 1990's brought many new ideas as part of re-inventing government, and a broader approach to environmental protection. Rather than the narrow focus on smokestacks and discharge pipes, today EPA looks closely at issues such as Brownfields, children's health, and environmental justice. EPA recognizes much better how these are all related to the quality of people's lives. People not only in the Great Lakes area, but across the country and the world, want clean air and water, and a safe place to be with their friends and families."

David Ullrich joined Region 5 in 1973, and has served as Deputy Regional Administrator since 1992.

1988. Staff meeting to discuss clean-up agreement for Waukegan Harbor (IL) Superfund site. Right: Valdas Adamkus. Second from left: David Ullrich.

Community Right-to-Know Act ... Region 5 establishes Indian environmental liaisons to work directly with

tribal governments ... Nuclear plant accident at Chernobyl, Ukraine ... 1987 Montreal Protocol to phase

HEALTHY COMMUNITIES

Sometimes environmental progress is best measured at the community level. EPA's regulations and technical criteria help solve the problems, but at their core, most environmental issues are about quality of life.

From the beginning, the Great Lakes Region has devoted tremendous resources to communities with key environmental issues. EPA has consistently asked for public input on difficult decisions, helped local officials as they grappled with issues such as illegal dumping and removal of lead paint, and asked stakeholders to tell us how to do our jobs better.

Clean Air at Home

In the early 1970's, confronting air pollution meant going after belching smokestacks. Today, preserving public health also encompasses less obvious threats.

Indoor air quality

In the Great Lakes Region, where the winters can be long and cold, people spend much of the time indoors. Unfortunately, recent studies indicate some indoor pollutants pose health risks that rival the outdoor ones. Some of these hazards are well known, like secondhand tobacco smoke, radon gas, asbestos-containing building materials, and lead-based paint. Some are less obvious, like formaldehyde-treated drapes and poor ventilation around space heaters or cleaning supplies. Over the past decade, EPA has worked to reduce indoor air hazards in homes, schools, and commercial buildings with a series of outreach campaigns to raise awareness of these issues.

Asthma

Anyone who is, or lives with, an asthmatic knows how scary it is to literally have your breath taken away. Nationally, the asthma rate among children ages 5 to 14 rose 74 percent between 1980 and 1994. In 1998, more than 2.9 million people in the Great Lakes Region were reported to suffer from asthma, with especially high rates among low-income and minority children. In fact, between 1990 and 1995, Illinois had the highest mortality rate in the United States for asthma among African-Americans. In 1998, EPA and the U.S. Department of Health and Human Services developed a joint strategy to gather new data and develop new tools to reduce exposures to air pollutants that exacerbate asthma and other respiratory illnesses.

Environmental Justice

Environmental justice (EJ) means no community should bear an unfair share of pollution or

out CFC's signed by 24 nations ... 1988 Non-native zebra mussels found in Lake St. Clair, Michigan ...

hazardous waste due to a lack of political or economic power. An Executive Order signed by President Clinton in 1994 requires Federal agencies to take environmental fairness into consideration in any decision-making.

EJ played a significant role in a 1997 settlement with Sherwin-Williams on Chicago's southeast side. Under the settlement, the paint company is spending $950,000 to help the City of Chicago clean up contaminated sites in the Victory Gardens neighborhood. An additional $150,000 will go to the nonprofit Open Lands Project, to develop wetlands and restore habitat.

Lead in Children

Before 1978, lead-based paint was commonly used in homes and apartment buildings. Although cases of childhood lead poisoning are on the decline nationally, tens of thousands of children in Region 5 under age six have elevated levels of blood-lead, placing them at risk for a range of health problems, including impaired mental and physical development. EPA and the States are working to address this through a series of new outreach efforts to homeowners, landlords, and remodelers; through training and certification of people working in the lead-abatement field; and with targeted enforcement in areas known to have children with high levels of blood-lead.

Brownfields

Brownfields are abandoned or underused properties where real or perceived environmental contamination has slowed redevelopment. Across the Region, there are thousands of these sites, from abandoned factories to shuttered gas stations to aging railyards. Since 1995, Region 5 has provided up to $200,000 in seed funding to more than 60 States, cities, towns, counties, Tribes, and development groups to expedite cleanup or assessment of local sites. Typically, EPA's funds are used as a lever to get a site over the initial hurdles that block redevelopment, such as paying for a consultant to get a true measure of the contamination.

Butters/Fetting site, Milwaukee. Once an abandoned tannery site, a Superfund removal, followed by a 1996-98 public/private Brownfield redevelopment effort among EPA, Wisconsin Department of Natural Resources, and local officials helped convert the 1.3-acre property to a new home for a growing mechanical contracting business.

Wisconsin Department of Natural Resources

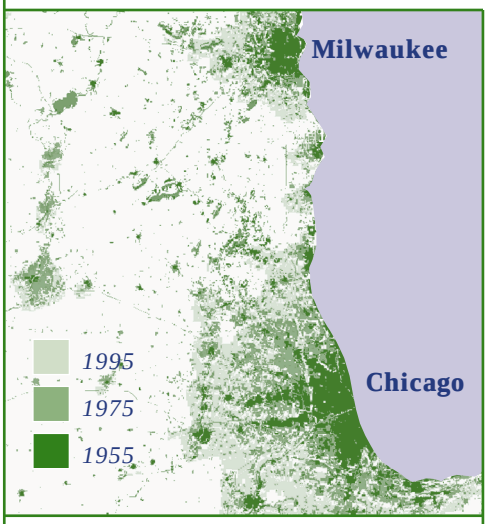
Urban Sprawl

Managing urban sprawl is a challenge for every metropolitan area in the Region, from Cincinnati to Minneapolis to Detroit to Indianapolis. Smaller cities, too, are beginning to suffer the trauma and planning challenges of endless traffic congestion, declining open space, and overtaxed infrastructure.

While EPA does not regulate land use, the Agency is uniquely positioned to advance the analysis of the many environmental issues associated with sprawl. Since 1998, Region 5 has co-sponsored a series of meetings for government agencies and local organizations to share tools and promote smart growth. The Region also created and widely distributed *Environmental Quality and Community Growth*, a guidance document for local officials and interested citizens.

U.S. Surgeon General urges homeowners to test for radon gas ... Region 5 files first administrative

U.S. Geological Survey



Urban Growth, Chicago-Milwaukee. Since 1955, the Chicago and Milwaukee areas have grown closer together, accelerating the loss of farmland and areas that once absorbed stormwater. The story is the same elsewhere: In Northeast Ohio, the metro population fell 11 percent between 1970 and 1990, while urbanization increased by 33 percent.

Illegal Dumping

Illegal dumping has long been a problem in the Region's urban centers. Often, sites aren't hazardous enough to warrant Superfund involvement, but they still reinforce depressed conditions and scare away redevelopment. Since 1995, Region 5 has provided support to more than 20 locally managed projects – from community-sponsored cleanups to establishing site watchdog groups to training local police on how to catch and prosecute dumpers.

In Detroit, since 1997, these efforts have led to 254 citations, 170 arrests, and 89 impounded vehicles. In East St. Louis, community groups have demolished 30 abandoned properties previously used as dump sites. And working with the Bureau of Indian Affairs, EPA helped a group of seven Michigan, Minnesota, and Wisconsin Tribes with clean-up plans for their illegal dump sites.

On the Horizon

• Now in development through Purdue University, free Internet-based software that lets users analyze the impacts of different development scenarios on local water quality

• Through the RCRA Corrective Action program, an aggressive new initiative that will address human health, ground-water, and ecological concerns at about 1,900 sites in the Great Lakes Region

Detroit's Del Ray neighborhood, 1995. EPA teamed up with community groups to create a Midnight Dumping Task Force.

Chicago, 1997. An EPA emergency response team cleans up illegal pesticide contamination.

Pesticide misuse forces relocations

Over the past few years, the misuse of the outdoor pesticide methyl parathion by unlicensed applicators has led to temporary relocations of hundreds of families in the Great Lakes Region. In Lorain County, OH, (1994-95), and in Chicago (1997-98), EPA, in partnership with numerous State and local agencies, spent more than $30 million to clean up homes and small businesses contaminated by the chemical. Methyl parathion was intended for use in cotton fields. Unfortunately, local exterminators, who acquired the chemical illegally, used it to kill household pests. The poison did the job and much more, requiring extensive cleanups in many households to make them safe. A smaller-scale methyl parathion cleanup occurred in Detroit (1997). Region 5 emergency response teams have also assisted with EPA cleanups in Louisiana, Mississippi, and Tennessee.

Bill MacDowell

Pollution Prevention Act encourages public-private partnerships ... 1991 Great Lakes National Program

HEALTHY ECOSYSTEMS

Ecosystems are the plant and animal communities living together in a given area. In the Great Lakes Region, major ecosystem types include forests, savannas, prairies, wetlands, dunes, and open water. Each supports an intricate mix of plants, animals, and micro-organisms. Since pre-settlement times (c. 1830-1850), major portions of each of these regional ecosystem types have been lost to industrial and population growth, agricultural uses, and introduction of non-native species.

Region 5 works to preserve ecological diversity on many fronts, typically in close coordination with the States and other Federal agencies, such as the Fish and Wildlife Service and the Army Corps of Engineers.

Unique Resources

In Region 5, two ecosystem types are showcases for uniquely Midwestern conditions. The sand dunes that dot Great Lakes shorelines comprise one of the largest freshwater dune systems in the world. Unique species include the dune thistle, Houghton's goldenrod, the Lake Huron locust, and the piping plover.

Rare freshwater coastal wetlands also play a vital role. They protect near-shore ecosystems from erosion by storing flood waters and settling waves. They also improve water clarity through sediment control and enhance water quality through a mix of natural processes. In addition to providing nesting and spawning grounds for birds, small animals, and aquatic life, coastal wetlands sustain about 90 percent of the 200 fish species in the Great Lakes.

Measuring ecosystem health is not an easy task. When an ecosystem is in good shape, it doesn't announce itself. Flood waters are absorbed, the consequences of droughts are reduced, and vegetation quietly purifies air and water. Both of these unique regional ecosystem types show signs of decline. Because sand is inexpensive and can be used for manufacturing processes and construction materials, the dunes have been mined continually since the early 1900's. The coastal wetlands are disappearing, too, with tens of thousands of acres drained, filled, and dredged with each succeeding decade.

Species Watch

In the Great Lakes Region, two groups of biologically significant species – the endangered and the non-native – are closely monitored as gauges of ecosystem health.

Office launches Research Vessel *Lake Guardian* ... Environmental Justice Summit of grassroots groups held

Endangered species

As the health of ecosystems declines, entire populations of plants and animals die out. When flora and fauna become nearly extinct throughout their natural ranges, government agencies classify them as endangered.

In Region 5, 31 species are currently on the Fish and Wildlife Service's Endangered Species List. On the bright side, since the late 1970's, a few prominent species have shown signs of improvement. The bald eagle, for example, has been moved to the status of "threatened." And the peregrine falcon has been de-listed completely.

Another endangered species, the eastern prairie fringed orchid also recently bounced back from the brink of extinction. Before 1997, about 100 remained, primarily in Minnesota and Wisconsin.

James Zimmerman, University of Wisconsin Arboretum

The eastern prairie fringed orchid has made a comeback in the past

Following a coordinated effort among government, nonprofit, and volunteer organizations to protect its natural habitat, the flower has reappeared in a number of locations. In 1999, nearly 1,000 were observed in Wisconsin alone.

Elsewhere, along the Upper Mississippi River, some other important species are not faring as well. According to a U.S. Geological Survey report, great blue heron and great egret populations have slipped since the late 1970's. The report suggests that possible causes include "poor water quality, loss of nesting trees and foraging areas, and toxic contaminants."

Non-native species

Non-native, or exotic, species continue to pose serious threats to ecosystems. Among aquatic exotics, most of these species find their way here in the ballast water of international freighters. Because they arrive without natural predators, exotics can spread quickly, taking habitat and food from native species.

Since the late 19th century, over 140 new species have established themselves in the Great Lakes Basin. The sea lamprey nearly wiped out lake trout, whitefish, and chub populations in the 1950's. Another, zebra mussels, discovered in the Great Lakes in 1988 and now showing up in the Mississippi River and inland lakes, are known for clogging water supply intakes and disrupting aquatic food webs.

Communicating the problems posed by exotic species to the public is another challenge. For example, purple loosestrife, now found in wetlands, has an attractive flower. Unfortunately, it also chokes out native species, thus reducing biological diversity. Non-native buckthorn and garlic mustard create similar problems. Through partnerships like Chicago Wilderness and EcoCity Cleveland, EPA works to raise awareness of these non-native species problems with local officials, school groups, and volunteer organizations.

Great Lakes Gains

The Great Lakes define the Region in every way imaginable. Protecting and sustaining our unique fresh water resources and their shorelines have been priorities from the beginning.

In 1972, for the first time, the Clean Water Act and the Great Lakes Water Quality Agreement between the United States and Canada imposed limits on the amounts of pollutants that could be discharged into the Lakes. More recently, in 1995, EPA published the Great Lakes Water Quality Guidance, which tightened water quality standards and will further reduce pollutant discharges into the Lakes.

in Washington, D.C. ... 1993 Cryptosporidium parasite in Milwaukee drinking water results in 100 deaths

Since the early 1970's, there have been tremendous gains, including:

• Lake Erie once again boasts fine walleye fishing, in part because phosphorus loadings, from sources such as municipal wastewater treatment plants and agricultural runoff, have dropped from about 28,000 tons per year in 1969 to about 11,000 tons today.

• Thanks to restoration efforts by Federal, State, and tribal agencies, and the Great Lakes Fishery Commission, lake trout in offshore areas of Lake Superior are self-sustaining for the first time since the 1950's.

To maintain this momentum, the Great Lakes National Program Office, based in the Region 5 office, was established in 1978 to work solely on Great Lakes protection issues, usually in conjunction with Environment Canada and the States. Current priorities: A Binational Toxics Strategy to virtually eliminate persistent toxic substances such as PCB's, dioxins, and mercury in the Lakes; and development of measures for biological diversity, exotic species, and chemical loadings – which will be used to report on the health of Great Lakes ecosystems.

Regional Administrator Francis X. Lyons gets an update on biological research projects from Lake Guardian *Captain Dave Moser. EPA's Great Lakes National Program Office maintains two research vessels. The* Lake Guardian *conducts research from spring to fall. The smaller* Mudpuppy *is used primarily for contaminated sediment sampling.*

On the Horizon

• Further research on new non-native species, such as the fishhook water flea, a zooplankton species that threatens to disrupt the food chain of the Great Lakes fishery, discovered in 1998 in Lake Ontario.

• Continued monitoring of the deformed frog phenomenon, first seen in Minnesota in 1995, and since observed across the United States. Scientists have not conclusively determined whether these abnormalities are specific to frogs and amphibians or are bellwethers of serious ecosystem damage.

• EPA Region 5 and Environment Canada will jointly publish lakewide management plans for Lakes Erie, Michigan, and Superior. The plans provide blueprints for ongoing restoration and protection.

U.S. Department of Energy

Migrating cedar waxwings are frequently spotted at the Fernald, OH, Superfund site.

SEP's: Providing Environmental Benefits

When settling enforcement cases, EPA may encourage the settling parties to give something back to the community where the violation occurred. Often, these Supplemental Environmental Projects (SEP's) focus on efforts to revitalize local ecosystems. Two examples of SEP's:

• Under a 1999 agreement for violations at three facilities, Ashland Oil deeded 274 acres of threatened Minnesota sand prairie, valued at $631,000, to the State for use as a scientific and natural area, including habitat for rare freshwater mussels. Today, it's known as the Grey Cloud Dune Prairie.

• At the U.S. Department of Energy's Fernald, OH, Superfund site, a $1.3 million intergovernmental settlement included creation of an on-site wild bird sanctuary and a plan to re-establish native landscaping, once the cleanup is complete in 2008.

... 1994 Brownfields program launched ... Bald eagle upgraded from endangered to threatened species ...

1995 Air quality standards attained by 67 percent of U.S. metropolitan areas ... Burrowing mayflies return

HEALTHY PLANET

Since EPA's early days, environmentally minded people have urged their neighbors to "Think Globally, Act Locally." The concept makes perfect sense: Local decisions and issues really do affect global environmental conditions.

In the decades since, the world beyond the Great Lakes has indeed moved closer to us. Today, in this multi-tasking information age, the Region 5 agenda has become increasingly global in its outlook and perspective. And sustainability – of communities, of ecosystems, and of local and regional economic bases – has become a watchword for virtually all our activities.

Climate Change

Ten of the warmest years on record have occurred since 1980. If the trend accelerates, global warming could lead to rising oceans, violent storms, increased air pollution, and unprecedented human migration.

Because household energy use contributes about 20 percent of carbon dioxide (a major greenhouse gas) emissions, a mix of voluntary restraint and technological innovation – including new developments in renewable and clean energy – will be an important step in the right direction.

Energy Star

Introduced in 1991, EPA's Energy Star, a program co-sponsored by EPA and the U.S. Department of Energy, encourages consumers, building owners, and manufacturers to voluntarily make energy-efficient choices. Products and properties that bear the Energy Star label stand out from their competition, because they reduce energy costs and protect the environment.

Today, Region 5 has about 720 partners in the Energy Star Buildings and Green Lights programs. These partners have pledged to upgrade their facilities with efficient lighting, heating, cooling, and ventilation systems. Current Energy Star Buildings partners include: Chicago Public Schools, City of Detroit, Kmart, the Green Bay Packers, and the State of Ohio.

Another category, Energy Star Homes, has about 280 partners in the Great Lakes Region committed to building homes that are at least 30 percent more efficient than the Model Energy Code.

To date, Region 5 partners have prevented the release of nearly 1 billion lb of carbon dioxide (equal to 290,000 cars removed from the road),

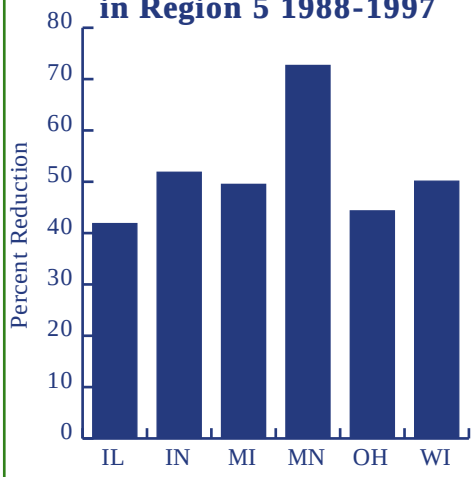
to Lake Erie, signaling healthier ecosystem ... 1996 Safe Drinking Water Act Amendments ... Sellers and

100 million lb of nitrogen oxides, and 36 million lb of sulfur dioxide.

Toxics Release Inventory

After a 1984 chemical release killed 2,000 people in Bhopal, India, EPA took steps to hold facilities more accountable for the hazardous materials they store or manage. Under the Toxics Release Inventory (TRI), certain industrial facilities must report annually to EPA and the States the amount of chemicals they release into the environment. The reports are then made available to the public. About 30 percent of facilities nationally required to track TRI data are in the Great Lakes Region.

TRI Reductions in Region 5 1988-1997



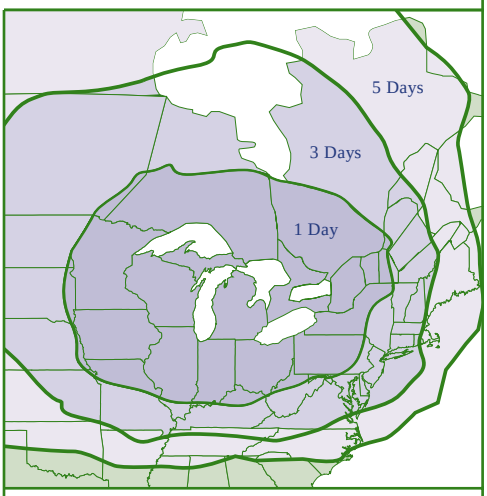
Reported releases of 268 core chemicals tracked since 1988 have dropped at least 42 percent in every State.

Since the late 1980's, many companies have reduced their releases and found creative ways to manufacture goods with less hazardous materials. Between 1988 and 1997, Region 5 TRI releases dropped from about 700 million lb to about 400 million lb. Releases of 268 core chemicals tracked by TRI are down by 47 percent since 1988.

The TRI concept is gaining momentum overseas, too. Australia, Canada, Japan, the Netherlands, Norway, and the United Kingdom have established their own pollutant release reporting systems. About 10 other nations are developing programs of their own.

Long-Range Transport of Toxic Substances

Increasing evidence suggests that persistent organic pollutants (POP's), a group of toxic chemicals, most of which appear on the TRI list, are hitching aboard air currents to points far and wide. They may even be bioaccumulating in the Arctic and Antarctic. The result: harmful effects on wildlife and the food web, potentially causing genetic and reproductive problems, and higher cancer rates.



In a matter of days, air pollution from the Great Lakes airshed can reach areas as far away as the Arctic Circle.

In 1995, the first international conference to discuss this issue was held in Washington, D.C. There, more than 100 nations agreed to develop a legally binding instrument to address certain POP's. Since then, steps have been taken toward creating an initial list of 12, including chlordane, dieldrin, dioxin, heptachlor, and PCB's. Closer to home, in Region 5, an effort to reduce persistent toxics in the Great Lakes from sources overseas is proceeding under the U.S.-Canada Binational Toxics Strategy.

Drawing upon its Great Lakes experience, Region 5 also contributes to EPA's global efforts to identify and manage persistent bioaccumulative toxics – primarily metals, such as mercury. A growing number of nations are beginning to address the movement of pollutants across borders. As in North America, there is

landlords must disclose lead-based paint to buyers or renters ... 1997 Office of Children's Health

growing recognition overseas that managing these toxics requires a comprehensive international approach.

Pesticides

Since the early 1970's, more than 80 pesticides have been banned or suspended because they bioaccumulate in the food web. Some of these chemicals have been linked to birth defects, sterility, and cancer, and helped push plants and animals toward extinction. Many have been banned or severely restricted overseas.

Though most uses of these pesticides are now prohibited, vast stocks are still stored in farm sheds and warehouses. Each year, Region 5 States sponsor collection drives to root them out for proper disposal. Since 1989, the State programs have collected more than 4.5 million lb of these unused pesticides – about 35 percent of the national total.

Overseas, the challenge is different: In Central and Eastern Europe, for example, authorities generally know where the pesticides are stored, but often the buildings have fallen into disrepair, increasing the potential for hazardous releases.

On the Horizon

• Continued technical assistance on environmental management challenges for Ukraine and the Baltic States of Estonia, Latvia, and Lithuania. Since 1993, Region 5 has been EPA's lead office, in cooperation with the U.S. Agency for International Development, for these former Eastern Bloc countries.

• Expansion of the Great Printers Project to Canada. Established in 1994, this Federal, State, and stakeholder partnership project aims to make pollution prevention, through planning and production processes, a standard operating procedure for lithographic printing firms in the Great Lakes Region.

• Additional visits from international researchers and policymakers. Since the 1970's, Region 5 has hosted scores of visitors from Australia, China, India, the Netherlands, and many other nations. Top priorities for many recent guests: international consistency in environmental data reporting and new strategies for managing contaminants at their sources.

Sustainable Forest Management

The Menominee Indian Tribe of Wisconsin, northwest of Green Bay, has been recognized by the United Nations, the Forest Stewardship Council, and the Rainforest Alliance for managing its forest resources with an eye on long-term sustainability.

The Menominee's trained foresters evaluate trees and species individually, with annual allowable cuts forecast in 15-year cycles. For shade species, such as sugar maple and beech, trees unlikely to survive until the next harvest are removed. For building-materials timber, stands are harvested over time, with many trees left as shelter and seed sources for the next generation. Trees that need full sunlight to grow back, such as red pine and aspen, may be clear-cut in a limited area.

Finished products, milled on the reservation, include door and window parts, wood siding, and paneling. Meanwhile, as the Tribe runs a profitable business, its management practices enable wildlife, including bears, bobcats, and eagles, to thrive in their natural state.

Menominee Tribal Enterprises

Chicagoland Bicycle Federation

fishhook water flea found in Lake Ontario ... 14 American Heritage Rivers named ... Clean Water Action

CHALLENGES

More than a full generation has passed since EPA was created. There has been tremendous progress in baseline environmental protection. Nearly all of the worst smokestacks and wastewater dischargers are now under control. The most threatening sites have been cleaned up, or will be in the near future. And where once there was dangerous indifference, a variety of laws now keeps pesticides, toxics, and other hazardous materials in check.

Since 1970, there has also been increasing recognition that environmental issues can be incredibly complex, that serious health hazards can come in microscopic doses, and that, when it comes to decision-making, everyone deserves a seat at the table. Looking ahead to the next decade and beyond, EPA and its Federal, State, and local partners face a range of challenges and emerging priorities that go well beyond the core environmental statutes.

Livability

As metropolitan areas expand, open space and farmland disappear. Commuting time grows, as well. Smaller towns suffer, too, as young people move away and smaller tax bases make it harder to manage environmental problems and challenge local polluters.

The next decade will bring much-needed attention to urban sprawl and other livability issues. Finding creative, affordable ways to revitalize Brownfields will play a critical role.

Rethinking transportation and dependence on the automobile will also be a common theme as the Nation takes additional steps to prevent or reduce air pollution and greenhouse gas emissions. More people will be working from home or relying on new modes of transportation for some trips. Imagine hopping a light-rail system from a home in Rockford to a job in Racine. Or stepping out of an Indianapolis townhouse and onto a battery-powered people-mover to get to the grocery store. In the decades to come, these scenarios could become real possibilities.

The term “edge city” will become more common, as well. Within Region 5, a number of metropolitan areas are rapidly growing closer together. Among them: Chicago-Gary-Milwaukee, Detroit-Toledo-Flint, and Cleveland-Akron. As the established cities sprawl into one another, key towns that lie between them will continue to evolve into hubs of commerce and employment. Inevitably, the rise of these edge cities will be accompanied by important environmental decisions.

Energy Use

Throughout EPA’s history, respected environmental thinkers have predicted that fossil fuel supplies would soon run out. That hasn’t

Environmental Education

While the Region 5 staff have always been available to visit classrooms and advise educators, EPA's formal environmental education program began with the 1990 National Environmental Education Act.

Today, the mission of our environmental education office is to advance and support State, national, and international education efforts, to develop an environmentally conscious public, to identify gaps in environmental education resources, and to provide environmental education training.

In practice, this means the Region 5 focus is on helping partner organizations, such as school districts, museums, nonprofit organizations, libraries, and other government agencies, maximize what they're doing already, and directing them to resources they may not have known about. As professional educators, our environmental education staff also assists our partners with curriculum integrity, keeping the focus on learning rather than advocacy.

In 1999, Region 5 awarded grants to 19 organizations in support of environmental education projects. Projects supported include teacher training programs, community-based educational initiatives, and children's health protection activities.

happened yet. In fact, new technologies have helped uncover new oil fields. But many policymakers strongly believe that industrialized societies need to ease their reliance on this traditional energy source.

New technologies will bring exciting new possibilities. The 1990's saw an expansion in energy-efficient technologies and a rebirth of the clean energy movement. Ideas for products now on the drawing board, such as fuel-cell powered automobiles and photovoltaic roofing shingles, may become commonplace in the new decade. Also encouraging: Utility companies are exploring renewable energy technologies, such as wind power and landfill gas-to-energy systems.

However, new technologies may also bring new environmental concerns. EPA will continue to work with its partners to meet these challenges as they arise.

Globalization

In the new century, environmental problems will continue to cross borders. Water pollution, air pollution, and depletion of the stratospheric ozone layer are problems that don't respect national borders. Neither does the buildup of greenhouse gases in the atmosphere that contribute to global warming. Nor do the birds, fish, and zooplankton that may be contaminated in one country, but become part of the food web in another. Facing down these challenges will require cooperative regional, continental, and global solutions.

Surging industry and technology provide new hope for the developing world. At the same time, Americans are acutely aware that increased affluence can also bring increased pollution, new health hazards, depletion of resources, and threats to critical ecosystems.

EPA hopes other nations can learn from some of our mistakes, as well as our successes. In the years ahead, one of EPA's critical missions will be to share and help other nations build upon our experiences, to provide a sustainable environment for generations to follow.

First Consumer Confidence Reports issued by local drinking water utilities ... 2000 ...

Region 5 Vision:
A sustainable environment where air, water, and land resources are restored and protected to benefit all life.

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