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United States
Environmental Protection
Agency

Region V
230 South Dearborn Street
Chicago, Illinois 60604

1979

Profile of Environmental Quality

905R79003

Region V The Midwest



ENVIRONMENTAL PROTECTION AGENCY

Since the start of the 1970s the people of this region have vigorously tackled pollution problems and have significantly improved the quality of the air and waters of the Midwest. In fact, America's fight for a better environment has been waged most vigorously in Region V - at Silver Bay and in Milwaukee, on the waters of the Cuyahoga and the Detroit, in the air over Cleveland and Gary, on the land at Montague and Mio.



In the pages that follow we try to define the size and shape of the environmental efforts in this region. The future will see strong demands for increased use of the Midwest's gigantic coal reserves, and pressures for growth and energy will compete with the needs to maintain clean air and water standards. Toxic chemicals will need to be more tightly controlled, and new answers must be developed to dispose of industrial wastes.

The enormous environmental problems of the Midwest have luckily been matched by enormous, multibillion-dollar commitments of business and public capital - and by a commitment by the people of this region to protect and restore a high quality of life.

A handwritten signature in black ink, reading "John McGuire". The signature is stylized with a large, looped "J" and "M".

John McGuire
Regional Administrator

Region V

For many of this country's first 200 years, our region's six states, Illinois, Indiana, Michigan, Minnesota, Ohio, and Wisconsin, have served as a vital hub around which the nation revolves. Efficient air and rail transportation systems, the diversity of our productive output, and the ambition, inventiveness, and skills of our people combine to make ours one of the most stable economies in the world.

But the very qualities that make Region V great are also the qualities that make it vulnerable to environmental problems. The continuing success of industry, agriculture, resource development, and tourism have all contributed to problems with our land, water, and air.

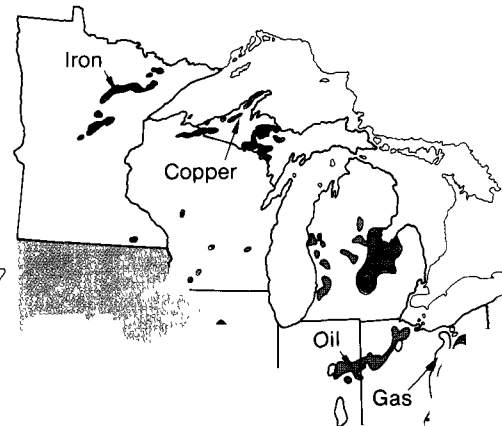
As part of a nationwide effort, the U.S. Environmental Protection Agency (EPA) in Region V functions in cooperation with other Federal agencies, state governments, and communities to maintain and improve the quality of the environment in our six states. Working on a local basis, sensitive to local needs, the goal of EPA is to protect both the environment and human health by eliminating unnecessary environmental risks, without inhibiting economic, industrial, or agricultural growth. The five-year trends used in compiling this environmental profile show that improvements have been achieved in many areas. However, much remains to be done. If all of us in business, labor, farming, and government continue to work hard, we can restore what has been damaged and protect for our children the natural abundance that we cherish.

Population



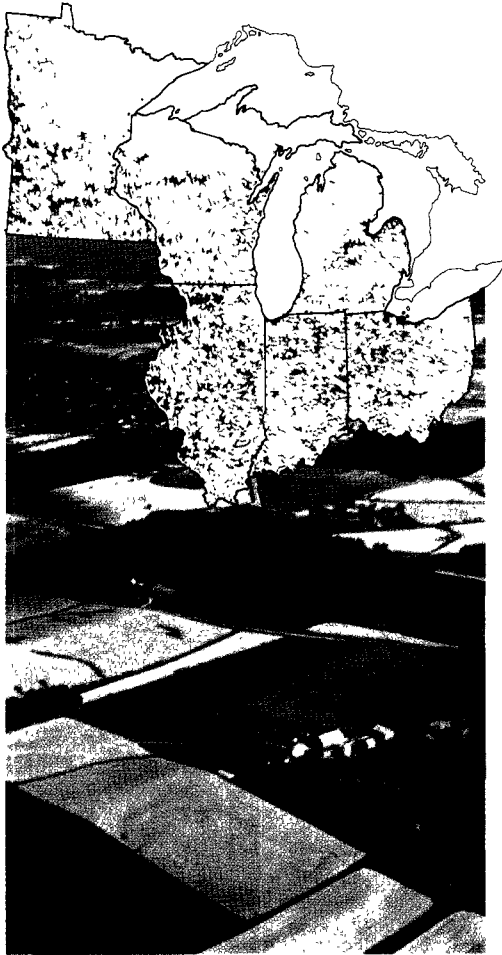
The fertile Midwest has traditionally been a settling place for many diverse peoples from all over the world. This generous land, with its extremes in climate and its abundance of raw materials for industry, has nurtured a rich cultural blend of independent, strong, and hearty people now numbering more than 44 million, some 20 percent of the total U.S. population. Of EPA's ten regions, which encompass the continental United States as well as Hawaii, Alaska, and U.S. territories and possessions, Region V has 23 percent of the cities with populations of 25,000 or more. An estimated 25 percent of the nation's manufactured goods are produced in Region V.

Mineral Resources



As the energy demands of the nation continue to grow and our ability and desire to rely upon foreign sources decrease, the coal and oil reserves within our region are becoming more important in meeting our high energy demands. These reserves will contribute to the economic security of the nation. Currently our region generates \$1 billion annually from the development of its coal reserves and an additional \$4.1 billion each year from the development of other minerals. Comprehensive programs are helping to preserve our environment while allowing development of these valuable resources.

Agriculture



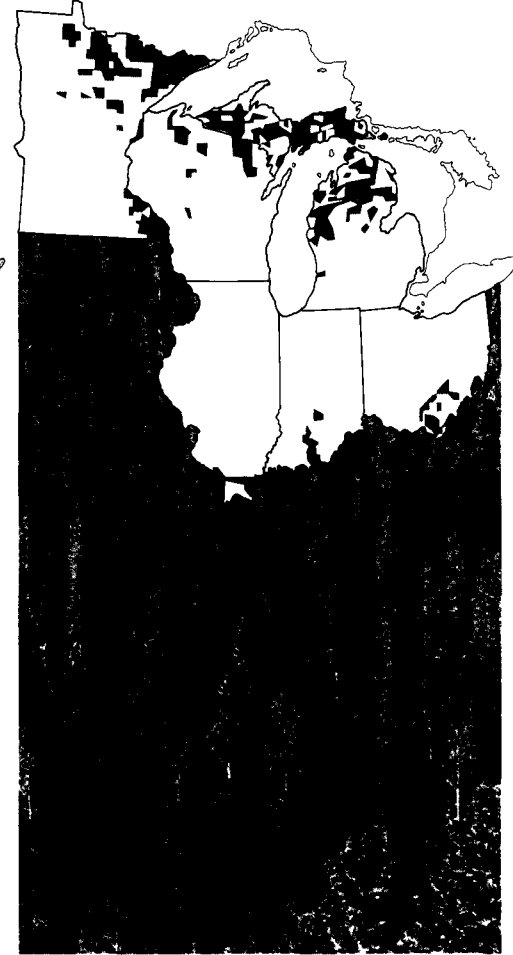
Region V is one of the most important agricultural regions in the nation or the world. Nearly 23 percent of the agricultural land in the U.S. is located in our region. This land produces 42 percent of U.S. corn, 36 percent of U.S. soybeans, and just over 25 percent of the nation's vegetables and melons. Region V accounts for a total of 22 percent of the farming income in the U.S. Seen another way, agriculture contributes more than \$20 billion each year to our region's economy and the greatest amount of agricultural pollution in the nation. Our remaining tillable soils must be used wisely if the Midwest is to continue to be so productive.

Waterways and the Great Lakes



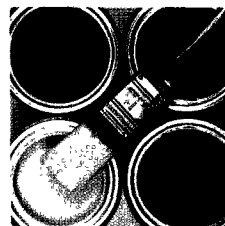
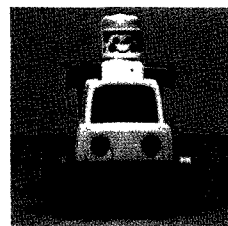
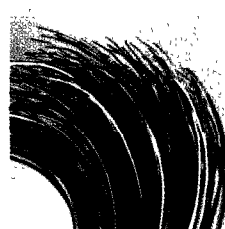
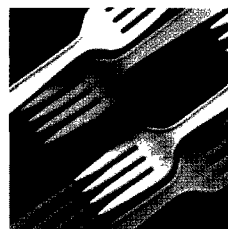
Although the Midwest appears to be land locked, the Great Lakes and their network of inland waterways link us to the Atlantic Ocean and the Gulf of Mexico. In fact, each year more cargo passes through the Soo Locks, in Sault Ste. Marie, Michigan and Ontario, than passes through the Panama and Suez Canals combined. The Great Lakes have enabled Region V to become the most highly populated area in the world that is this far inland. Because they allow agriculture and industry to function efficiently, and because their beauty supports major tourist and sport fishing industries, the Great Lakes might be considered the region's most vital geographic and economic asset.

Parks and Wilderness



Much of our beautiful Midwest landscape consists of rolling green hills, woodlands, urban skylines and pastoral scenes. But our region also contains some of the nation's most impressive parks and wilderness areas, fast-moving trout streams, and hundreds of thousands of lakes. Drawn by these and other features, tourists contribute more than \$5 billion to the Regional economy each year. Through careful management of our land, we can maintain its fragile functions as a wildlife habitat and a natural flood and erosion control mechanism and still derive maximum enjoyment from its beauty.

Toxic Substances



Chemicals are an integral part of our daily lives. Despite their usefulness, many chemical substances have the undesirable quality of being toxic; they can damage or poison our environment and can be a major threat to our health and welfare. When these chemicals reach our air, land, or water, they constitute the most hazardous portion of what we call pollution.

Examples of substances once presumed relatively safe but now known to be hazardous include asbestos fibers, the insecticide DDT, and the group of chemicals known as PCBs (polychlorinated biphenyls). Although they are now banned or severely restricted, such substances are extremely tenacious

and may be present in the environment beyond our own lifetimes. Their "biocumulative" natures allow them to gradually build to extremely hazardous concentrations in the environment and in plant, animal, even human tissues.

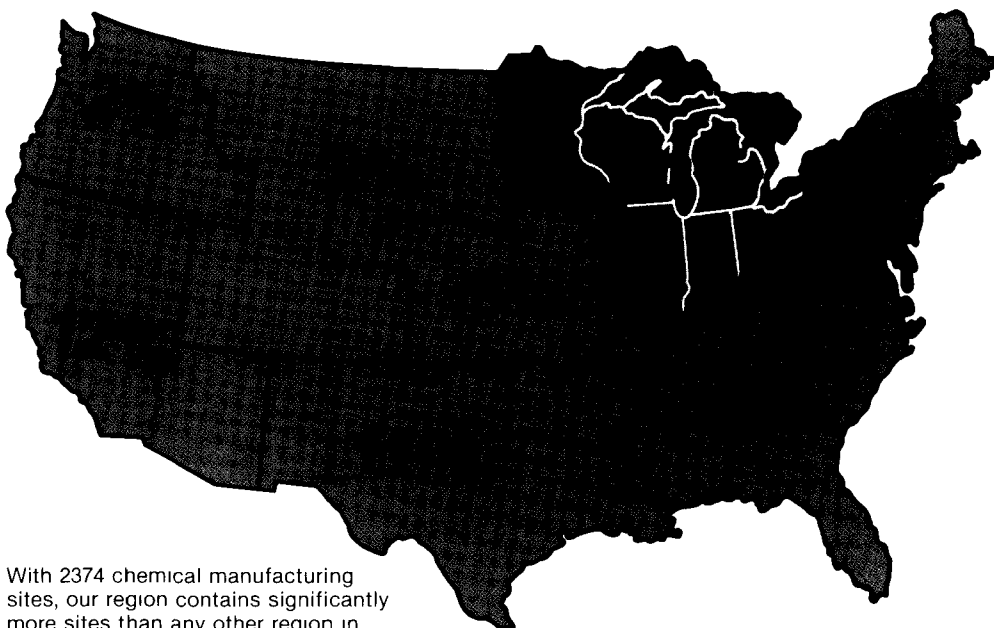
In 1971, the year after EPA was established, the Council on Environmental Quality developed specific legislation to prevent chemical-related episodes. After five years of debate by Congress, the Toxic Substances Control Act (TSCA) was finally passed into law in October, 1976. TSCA specifies that: 1) an inventory be compiled on existing commercial chemicals; 2) manufacturers submit to EPA a premanufacturing notice 90 days prior to producing any chemical not listed in the inventory; and 3) EPA's Administrator may prohibit or limit the manufacture, processing, distribution, use, or disposal of a chemical substance or mixture if he finds that it presents or may present an unreasonable risk of injury to health or the environment.

Region V's Toxic Substances Office coordinates regional EPA activities addressed in TSCA. During the first phase of inventory reporting, which was completed during 1978, the office responded to 5,000 industry inquiries and conducted instructional meetings in Chicago, Detroit, Minneapolis, Cleveland, Cincinnati, and Indianapolis.

The office directed Region V efforts relative to PCBs, sending 2,837 registered letters to the region's users of these chemicals, which were banned as of July 2, 1979. Its staff responded to some 2,000 PCB-related telephone inquiries and has inspected user sites for compliance. The regional staff will continue to expand this inspection program with Region V states during the next several years.

The region additionally coordinates response activities of nearly 100 regional episodes a year that involve toxic/hazardous chemicals, lending technical advice and assistance with testing, or sending technical personnel to the scene when it is appropriate in order to coordinate containment and countermeasure actions. In 1978 the office prepared a Contingency Notification Procedure for spills or emergencies in which more than one Federal agency has responsibility.

The Region V Toxic Substances Office has taken an active role to implement EPA's Voluntary Asbestos Control Program in the region's 25,000 schools. Technical assistance to the six states includes conducting asbestos workshops, providing consulting services, and working directly with appropriate state officials. To encourage public participation, Region V established toll-free telephone numbers and is conducting public-awareness meetings on asbestos. It is anticipated that the asbestos program will be expanded into a regulatory program for other public buildings and for other uses of asbestos.



With 2374 chemical manufacturing sites, our region contains significantly more sites than any other region in the United States.

Air Quality



The atmosphere has never been completely pure. It always contains contaminants from windblown dust, forest and range fires, gases emitted by organic decay, and other natural sources. But man-made contaminants have contributed thousands of tons per day from industrial smokestacks, automotive exhausts, waste incineration, fertilizer and pesticide applications, aerosol sprays, and innumerable other sources. In sufficient concentrations, airborne pollutants increase the incidences of respiratory and heart diseases and can increase fatality rates. Acid and corrosive rains from an atmosphere polluted by sources hundreds or even thousands of miles away can damage our property and have adverse effects on our food and water supplies. The effects of unchecked air pollution are a clear and present threat to the public health and economic vitality of our region, our nation, and the entire world.

The Clean Air Act of 1970 directed EPA to develop and achieve acceptable air quality standards. Monitoring stations at fixed locations have been established to evaluate progress toward achieving ambient air quality standards and to provide trend data used to adjust requirements and methods for achieving compliance.

Regionally, ozone remains the most pervasive pollutant, significantly affecting almost 80 percent of the population. Sixteen percent of the people in Region V are exposed to high concentrations of sulfur dioxide. This is an improvement from previous years, based on greater use of low-sulfur fuels and tighter industrial emission controls. Carbon monoxide exposure historically reflects monitored concentrations within the central city, although monitoring is increasing in suburban areas to reflect further population impact and traffic growth in those areas. While 29 percent of Region V's population is exposed to suspended particulates, the number of people exposed has been reduced in most urban areas since 1970, again because of greater use of cleaner fuels and more stringent controls on industries. Prior to the 1970 Clean Air Act Amendment, almost 100 percent of the population in major cities was exposed to particulate concentrations greater than the national standard. Significant progress has also been achieved in reducing air pollution from coal-fired power plants and from most of the steel mills that dot the region. As a result, the black, sooty plumes in our major cities have been reduced significantly.

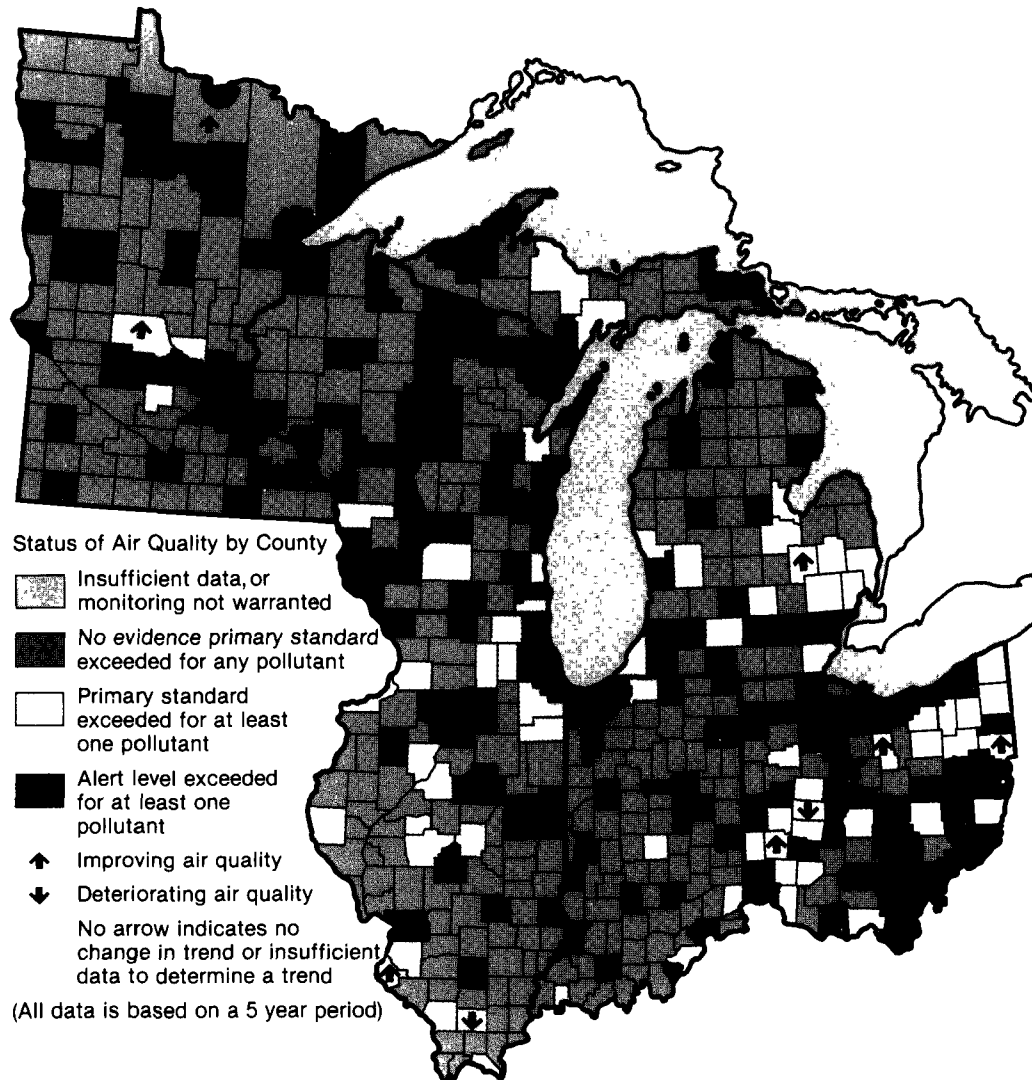
The hardest part of the job may lie ahead, as state and local governments begin to grapple with carbon monoxide, hydrocarbons and nitrogen oxides from automobiles. Despite the major technological advances developed by automakers, nine cities in Region V must go further, to mandatory auto inspections



and transportation planning to develop additional ways of cutting auto-produced smog.

Another very difficult job will be to protect high-quality air in certain parts of the region from deterioration because of growth. Four such areas have been already identified: Isle Royale National Park in Lake Superior, Seney Wilderness Area in Michigan, and the Boundary Waters Canoe Area and Voyageurs National Park, both in Minnesota. Other national parks requiring protection, such as the Indiana Dunes National Lakeshore, are being developed within urbanized areas, some near highly industrialized activities.

Beyond this protection for "Class 1" areas, the Clean Air Act mandates that any growth in other parts of the region be consistent with public health protection and highly industrialized areas that will be required to keep overall emissions below standards, even when new plants are added.



Air Quality

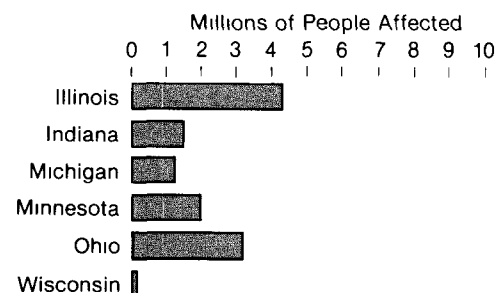
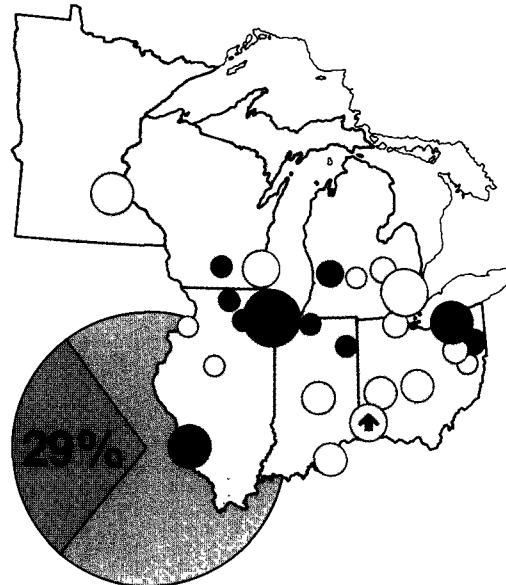


These maps depict the air quality status and trends for specific pollutants in the 25 largest urban areas in our region. These areas represent over 26,000,000 people, some 65% of the region's total population. The pie chart under each map depicts the percentage of this population exposed to levels of that pollutant exceeding the primary standards. The bar charts break this down further, on a state-by-state basis, depicting the estimated numbers of people exposed to these exceedences.

- Insufficient data, or monitoring not warranted
 - No evidence primary standard exceeded for that pollutant
 - Primary standard exceeded for that pollutant
 - Alert level exceeded at least once for that pollutant
 - ⬆ Improving air quality
 - ⬇ Deteriorating air quality
- No arrow indicates no change in trend or insufficient data to determine a trend

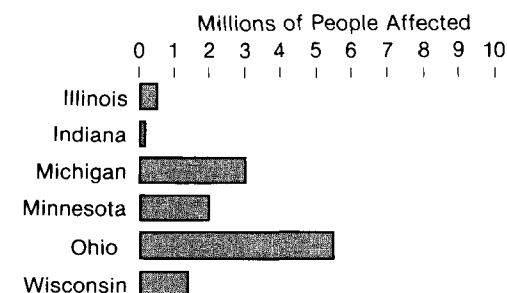
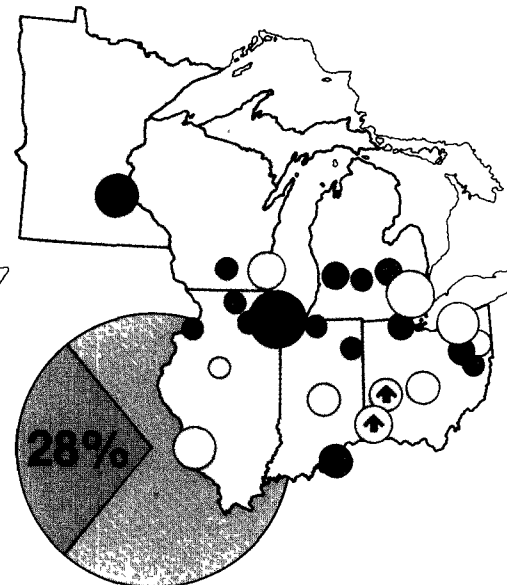
(All data is based on a 5 year period)

Total Suspended Particulates (TSP)



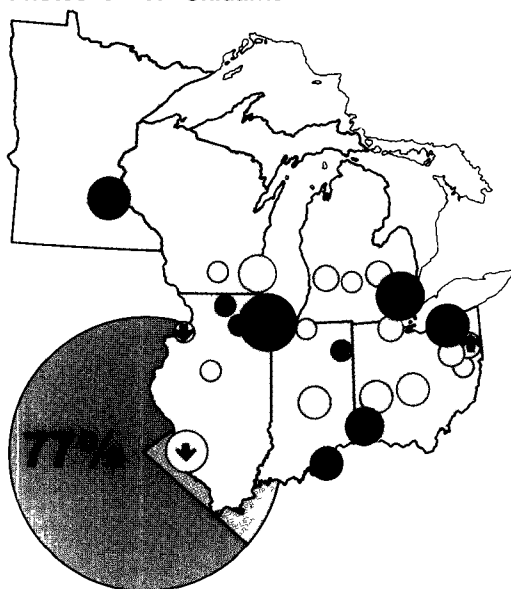
TSP is a measurement of particles in the air (such as soot, ashes and smoke) and includes non-toxic materials (dust and dirt) as well as more toxic substances (lead, asbestos, sulfates). Natural and man-made sources contribute to TSP which can affect our respiratory systems in varying degrees depending upon particle size and chemical composition.

Carbon Monoxide (CO)

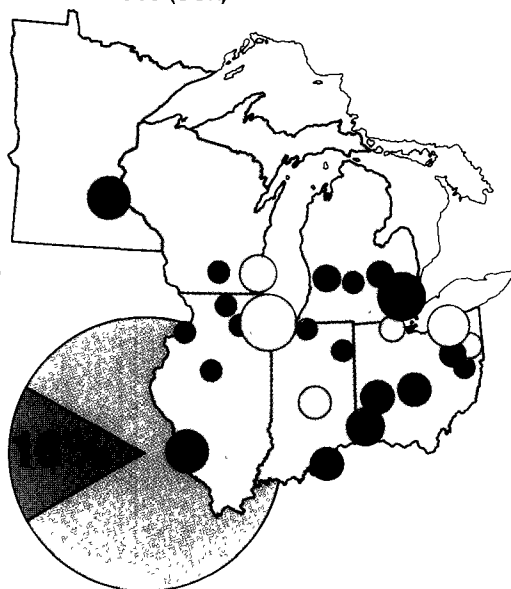


CO is a colorless, odorless, tasteless gas. It is a toxic by-product of combustion, with the automobile engine as the major source of this pollutant. CO in the lungs reduces available oxygen to tissues, and impairs visual perception and alertness. Continued exposure to high concentrations can threaten life.

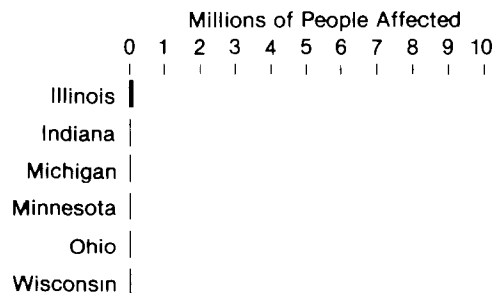
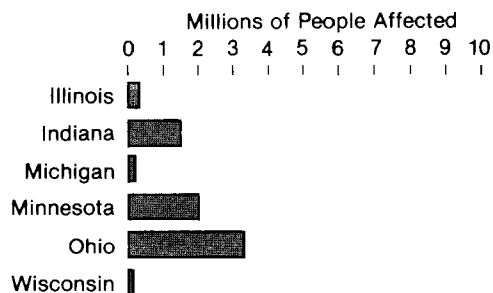
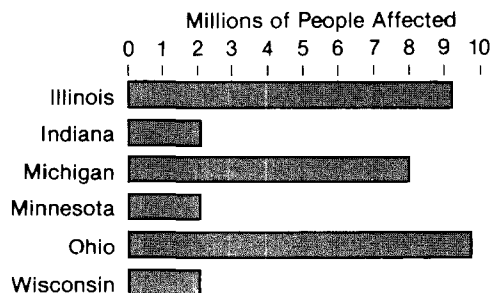
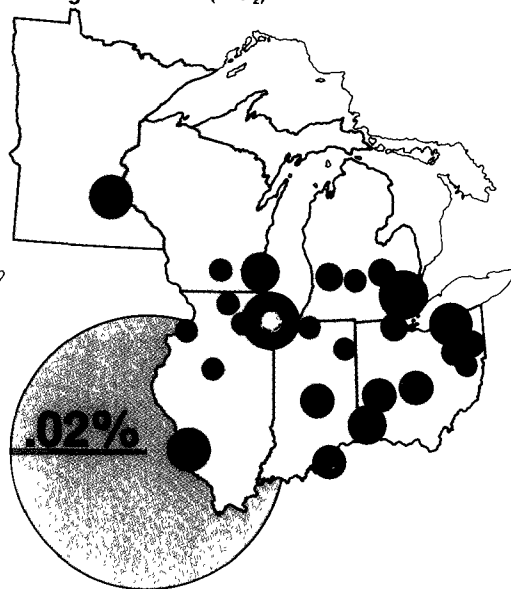
Photochemical Oxidants



Sulfur Oxides (SOx)



Nitrogen Dioxide (NO₂)

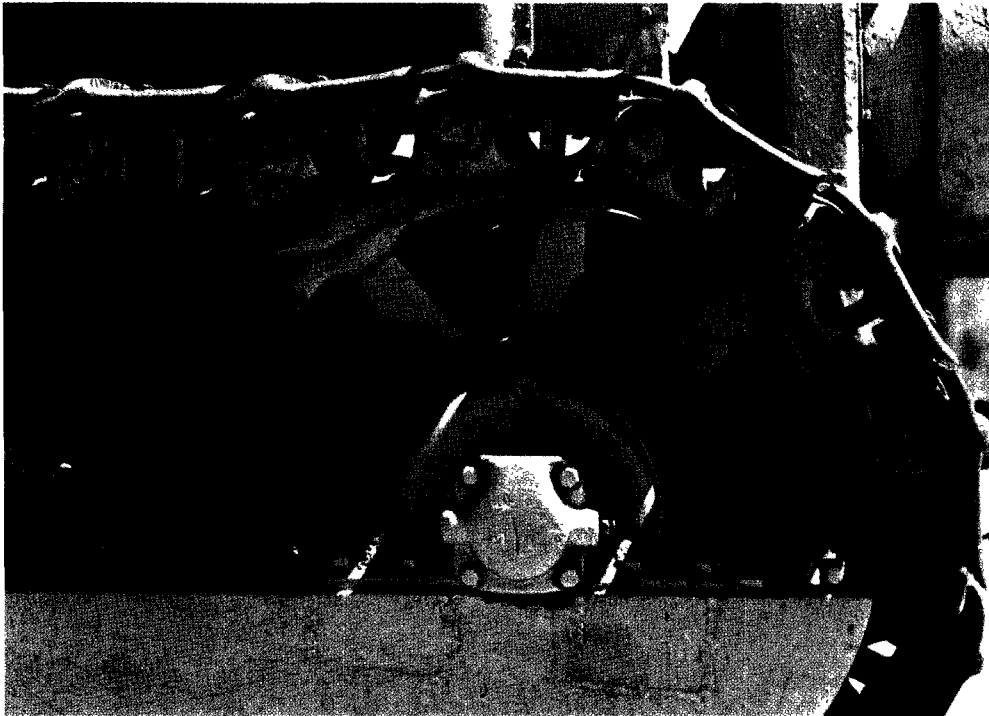


These compounds are formed by a series of chemical reactions occurring when hydrocarbons and nitrogen oxides from automobiles and other emission sources are exposed to sunlight. Ozone, the principle constituent, is a severe irritant to mucous membranes, that can reduce lung function and aggravate existing respiratory disorders.

Sulfur dioxide results from the combustion of coal and gas, and is a by-product in smelting operations. Sulfur dioxide reacts readily with other atmospheric pollutants to form sulfates, a group of compounds that aggravate respiratory ailments (bronchitis, emphysema and asthma) and heart disease.

NO₂ is a brown gas formed during high temperature combustion (automobile engines, power plant boilers) and reacts with hydrocarbons in the presence of sunlight to produce photochemical oxidants. NO₂ can affect lung tissue, reduce resistance to disease, contribute to bronchitis and pneumonia, and aggravate chronic lung disorders. The Chicago Loop Area currently exceeds annual primary standards. Detroit studies indicate a potential for that city to exceed standards.

Noise



Noise, considered by many to be the most neglected form of pollution, is a particularly pressing problem in Region V. For our region, despite its rural areas, contains 25 percent of the nation's urban population, more than any other region in the country. The Midwest is the air and rail transportation center of the U.S., and it also contains 25 percent of the nation's industries. All of these factors produce the noise that pollutes the region.

In a recent nationwide survey, noise was the number one complaint cited by city dwellers, with heavy street traffic a close second. In the same survey, crime came in from fourth to tenth place. It is noise

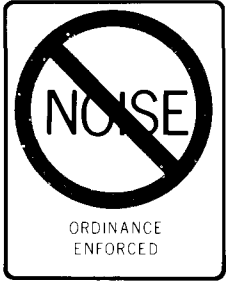
caused by motor vehicles that have been modified to make *more* noise, automobiles as well as motorcycles, that hits the hardest against anyone forced to hear it.

Noise isn't just a mild annoyance. Recent studies indicate that noise pollution directly contributes to increased incidences of heart and circulatory diseases, mental stress, ulcers, and digestive disturbances, as well as temporary or permanent loss of hearing.

The Noise Control Act of 1972 established a Federal noise-control program and charged EPA with carrying it out. One part of that program established standards for products distributed in commerce, and regulations for interstate motor carriers and the transportation industry. The control of noise was left to state and local governments, and EPA's Regional Noise Program assists these entities to do that job.

In November 1978 the Noise Control Act was extended by passage of the Quiet Communities Act. This places greater emphasis on assisting state and local governments to begin and to expand noise-control programs by providing grants for projects, technical assistance centers, and the like.

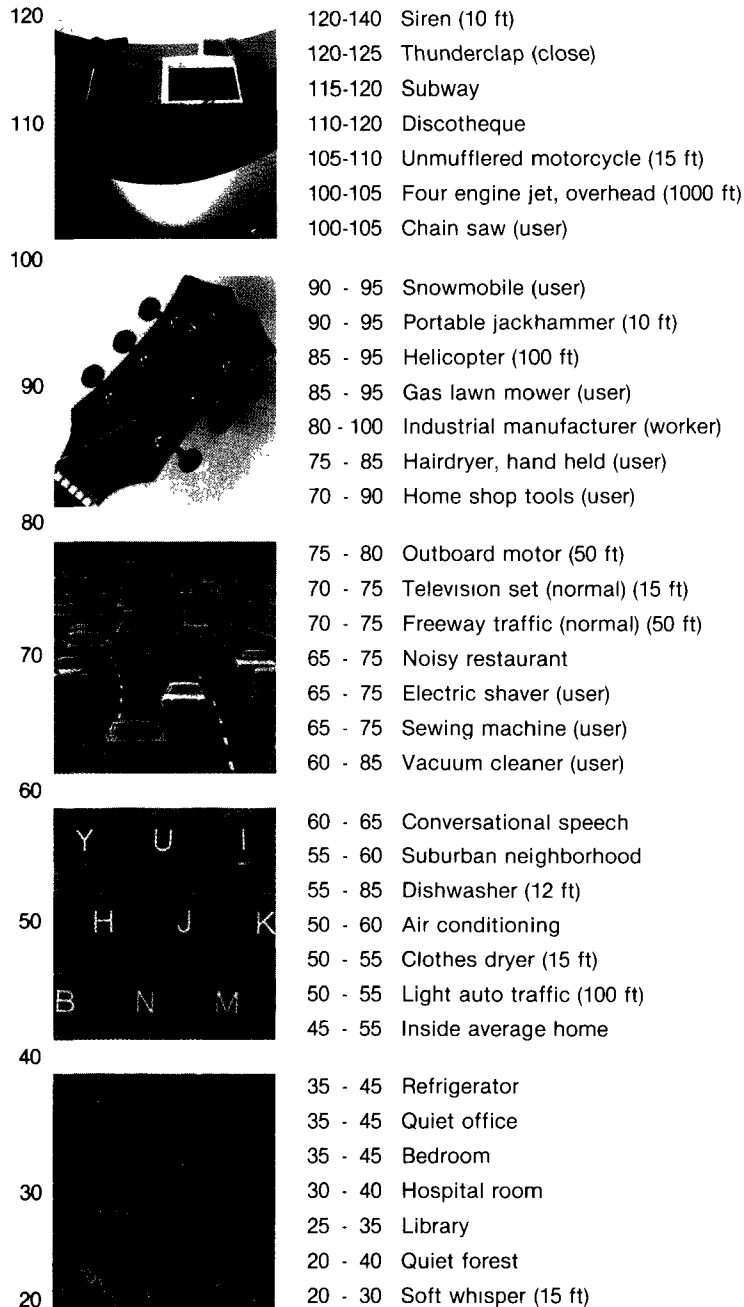
Region V's Noise Program sees increasing interest in addressing the sometimes intolerable insult of noise. The regional Noise Program is presently working with more than 100 Midwest communities to start or expand their noise-control programs. It has developed a Light Motor Vehicle Noise Control Ordinance that addresses the problem of noise from motorcycles, cars, vans, and lightweight trucks. This ordinance, which is in effect in several cities in Ohio, Indiana, and Wisconsin, is enforced by police officers who use sound-level meters at the same time they use radar to monitor vehicles' speed and issue citations for either offense.



A pilot program for noise control that was developed with local officials in Galena, Illinois is being adopted by other cities in the region and in the nation. The noise-control traffic sign that was developed

for this program by Region V is now on the streets of more than 11 cities across the country. The sign's purpose is to remind everyone, especially those persons who have modified their vehicles, to drive quietly when they enter a community that is enforcing an active anti-noise program. (Camera-ready copies of this sign are available to local officials who contact EPA's Region V Noise Program.)

The regional Noise Program also conducts Environmental Noise Workshops to acquaint public officials with information about noise control, ordinance development, enforcement, and benefits to the public. It also provides on-site assistance and training in noise measurement and enforcement, lends support at public hearings, and provides assistance in combating noise problems peculiar to one area. EPA also provides both technical and financial assistance to communities that are part of the national ECHO (Each Community Helps Others) noise-control program. Twelve communities, or some 484,000 people in Region V, have been served by this program to date.



The chart above illustrates the approximate decibel ranges of familiar sounds. (An increase of only six decibels doubles the perceived sound.)

Radiation



Radiation is a fact of our everyday lives. We are constantly being exposed to naturally occurring radiation in the form of infrared and ultraviolet rays from the sun, cosmic radiation from the atmosphere, and man-made radiation from microwaves and broadcast signals. We now know that continuous exposure to radiation that exceeds acceptable background levels has health consequences, and it is to this problem that EPA directs its efforts.

Currently, the greatest public concern is with hazards inherent in nuclear technology, largely because this is the most obvious potential source. Region V contains 20 operating nuclear-powered electrical generating plants, with 20 more

under construction and an additional 5 approved and on order. These constitute one-fifth of the nation's nuclear power plants. Further, a significant number of industries and businesses also handle radioactive materials. EPA, in its nine years of existence, has established extremely stringent guide-lines to protect the general public from radiation exposure at levels greater than those found in nature. EPA's Radiation Program provides technical assistance to states developing comprehensive radiological control programs, reviews environmental impact statements, and examines periodic operating reports for nuclear facilities. If necessary, EPA is available for on-site technical assistance in the event of a radiation-related incident and for radioactive waste-disposal problems.

Region V EPA's program collects, analyzes, and furnishes regional decision-makers with information on radiation and how they can protect the public at various exposure levels. The program also is an active participant on the Radioactivity Subcommittee of the International Joint Commission, the U.S.-Canadian entity that oversees the cleanup and maintenance of the Great Lakes.

Each of the six states in Region V must develop a Radiological Emergency Plan it can put into effect immediately upon notification of a radioactive contamination incident. The Regional EPA office works closely with the states in developing these plans and continues to review and help revise them as new developments occur. In the event of a serious radiation incident, officials of EPA's Radiation Program assist the states in activating their Emergency Response Plans, provide on-site assistance and advice, and take

action in accordance with Federal regulations to mitigate the problem.

EPA's Radiation Program has established eight environmental radiation monitoring stations in our region; they are operated and maintained by the states. Two of these stations run continuously and six are on standby, activated during fallout conditions such as nuclear reactor incidents or nuclear weapons testing.

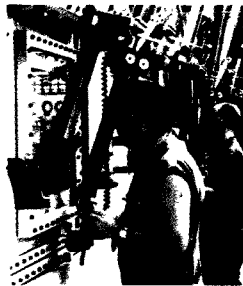
The ultimate disposal of radioactive wastes concerns hospitals, testing laboratories, manufacturers, mining operations, and even individuals licensed to use radioactive materials. Clearly, the problems reach beyond nuclear power plants. One former disposal site for low-level radioactive wastes is within our region, in Sheffield, Illinois. It is continuously monitored by the State of Illinois to assure that radioactive wastes do not migrate from the site. Morris, Illinois is the location of a storage site for spent nuclear fuel, the only such site in the U.S. It is continuously monitored by the operator (General Electric) and the Illinois Department of Public Health.

Before the Nuclear Regulatory Commission licenses any new nuclear facility in the region, personnel of EPA's Radiation Program review an environmental impact statement. Possible effects on the environment are evaluated, and EPA determines whether or not any of the effects might endanger the health and welfare of the population and recommends any needed modifications.



Nuclear Power Plants

- Operating units (20)
- ⊙ Under construction (20)
- ⊙ Ordered units (5)



Major Facilities Handling Radioactive Materials

Research Laboratories

- ① Argonne National Laboratory
- ② Battelle Columbus Laboratory
- ③ Fermi Laboratory
- ④ Mound Facility

Processing Plants

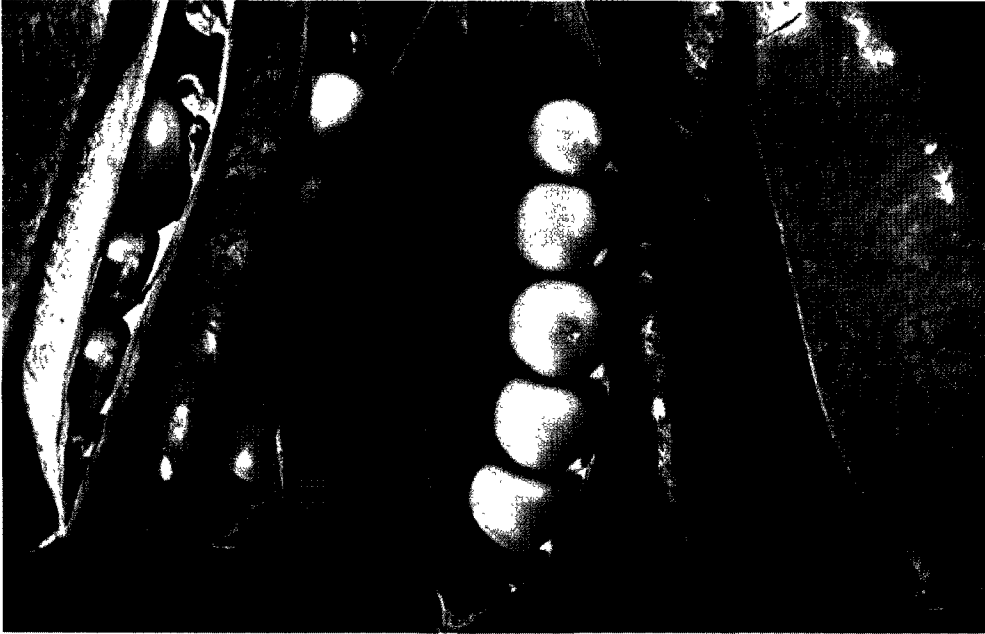
- ⑤ Gaseous diffusion plant
- ⑥ Uranium hexafluoride conversion plant

Waste Sites

- Nuclear waste disposal site
- Storage facility for spent reactor fuel



Pesticides

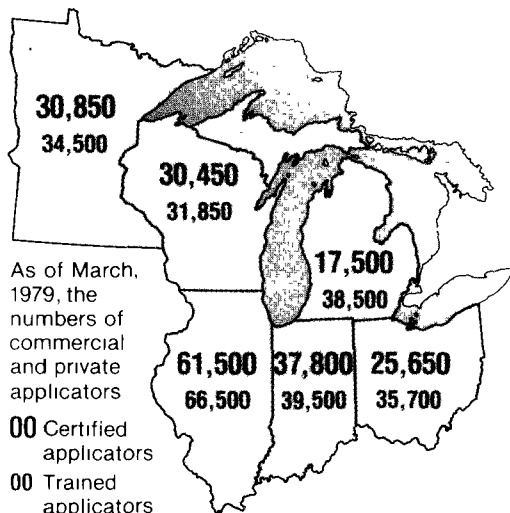


Author Rachel Carson's concern with the long-term effects of pesticide overuse was one of the driving forces behind the environmental movement in the U.S. In 1972 Congress strengthened the Federal Insecticide, Fungicide, and Rodenticide Act to reduce the presence of such persistent pesticides as DDT in the environment, to train farmers and commercial pesticide applicators, and to develop alternative ways to deal with pests.

Almost one-fourth of all pesticides applied in the U.S. are applied in Region V. Pesticides play an important and necessary part in agriculture, but their misuse can harm the user, either as a result of inhaling the chemical or absorbing it through the skin. Long-term residual effects can contaminate crops and can later harm people through the food chain. Wind and runoff from rain carry pesticides into rivers, streams, lakes, and groundwater. Many nonspecific pesticides kill birds, animals, and such beneficial insects as honeybees, as well as the intended pests.

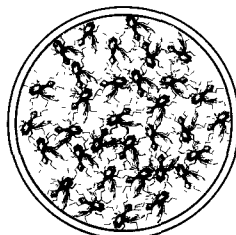
As shown in the illustration, continuous use of some pesticides has shown decreasing effectiveness; the pests that survive tend to breed resistant strains. Through successive generations more pesticide is therefore needed to deal with those new strains. One promising new approach to this problem is the use of Integrated Pest Management, which emphasizes the restrained use of pesticides in combination with natural controls: using an insect's natural enemies, sterilizing large numbers of insects prior to breeding, and disrupting insects' reproduction patterns.

Congress has authorized EPA to restrict or prohibit the manufacture, distribution, and use of certain pesticides that pose unreasonable hazards. EPA and its state counterparts, usually Departments of Agriculture, have set up programs to regulate pesticides from their manufacture to application. Comprehensive training programs to certify applicators who handle restricted-use pesticides have been taken by 200,000 persons in Region V who have then been authorized by the states to apply restricted-use pesticides safely and properly.



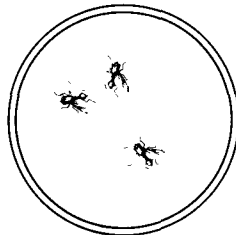
Other EPA programs specifically protect the region's many seasonal agricultural workers, whose possible overexposure to pesticides has resulted in the establishment of Pesticide Emergency procedures by EPA's Regional Pesticide Branch. This program provides for immediate action in response to reported pesticide emergencies in order to reduce medical, public health, and environmental threats.

EPA's goal, to limit uses of pesticides to those absolutely necessary, is realistic. The attainment of that goal will ensure both continued bountiful crop production and a significantly safer environment.

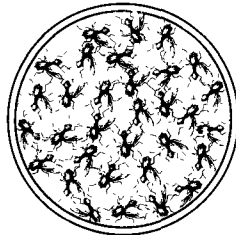


The continued annual application of pesticides has led to a gradual decline in their effectiveness. This has resulted in an increase in pesticide application concentrations.

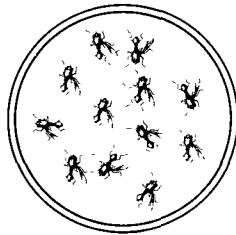
1. An initial application of a pesticide was made to combat a high concentration of insects.



2. The pesticide was effective in eliminating most of the insects. However, a few insects remained, as they had sufficient resistance to the toxic effects of the pesticide.

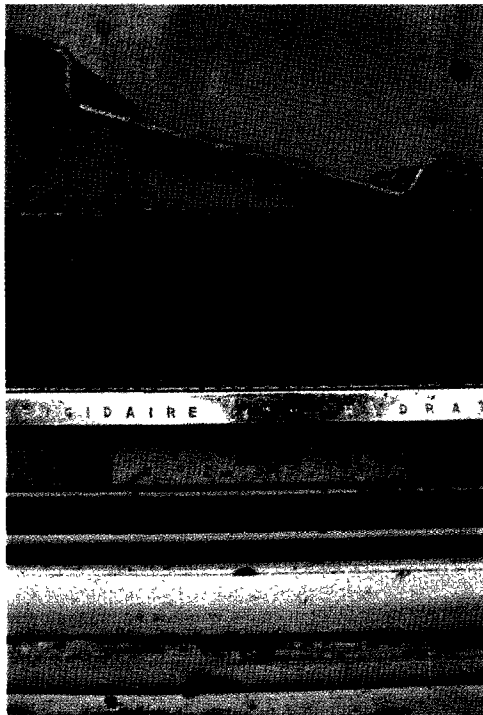


3. The offspring of the resistant insects appeared the following year and the pesticide was again applied in the same quantities.



4. This quantity was clearly less effective as a greater percentage of the insects were resistant. To eliminate most of the insects, another application of the pesticide at a higher concentration will be required.

Solid Waste



Most of us give little thought to what ultimately happens to our discards, but perhaps we should. As a nation we dispose of some 48 billion metal cans, 26 billion glass and plastic containers, and 30 million tons of paper each year. That's enough to cover the entire surface of Lake Michigan to a depth of one foot within a single year. The population of Region V accounts for 30 percent of these wastes.

As the chart illustrates, these are only the discards of individuals and therefore are only a small part of the total nonhazardous solid waste management problem. Even greater problems are caused by the vast amounts of solid wastes produced by industrial and mining operations, agriculture, sewage treatment plants, and other facilities. The effective collection and proper disposal of solid wastes is of vital concern to all of us.

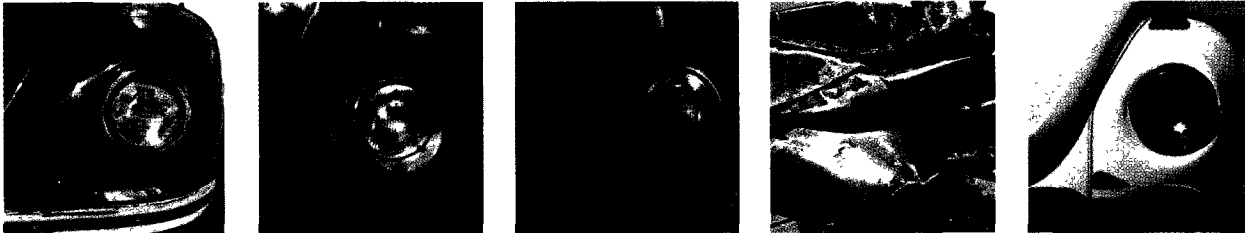
It has been common practice for communities to dispose of solid wastes by dumping them into lakes and oceans, burning them, or piling them in open dumps. Following the passage of the Resource Conservation and Recovery Act (RCRA) in 1976, EPA accelerated its national and regional efforts to assist states in developing comprehensive solid-waste management programs.

Through a system of grants, Region V's Waste Management Branch supports state programs and works with the states to inventory open dumps. This latter procedure will help to assure that no

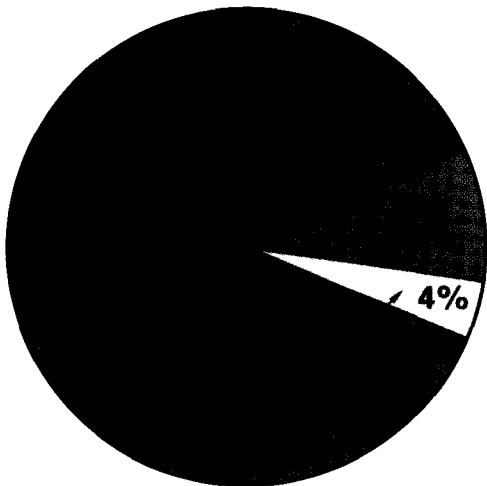
present or future environmental damage will be caused by obsolete sites. Waste-management programs are moving away from open dumping and open burning and toward conservation and recycling. Variations in geography, geology, population density, and climate determine programs that are best suited to each community. In addition, the Region V Waste Management Branch provides technical assistance to the states and local communities in resolving their specific waste-disposal problems.

The use of sanitary landfills is one viable alternative to open dumps and open burning of solid wastes, and it is one of the most common waste-management systems now in effect. While there continues to be public opposition to actual siting of these landfills, EPA's regional office works with state and local agencies to help approve proposals for environmentally sound land-disposal facilities and alternative systems.

Region V grants to the states also provide assistance for developing waste-management plans other than sanitary landfills. These technologies primarily involve separating or recovering materials from municipal waste and using the remaining burnable portion as a fuel or alternate energy source.



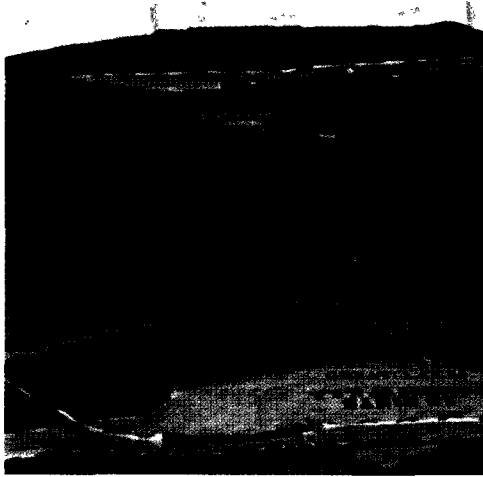
Utilizing Region V's technical and financial assistance, states' actions have reduced or eliminated environmental damage caused by open dumping and open burning. These two means of disposal, once thought to be the most economical, have proved to be the most costly in terms of environmental quality and public health and welfare.



Residential and commercial solid wastes contribute only 4% to the overall picture. This seemingly insignificant figure is better put in perspective when it is realized that this is 21,300,000 tons per year

Solid Waste

Resource Recovery



Each of us produces more than 1,300 pounds of solid waste annually. From this, low-technology recycling recovers only about 90 pounds of glass, metal, and newsprint, but even this small quantity has economic and environmental benefits. Resource recovery further reduces the amount of wastes that require permanent disposal.

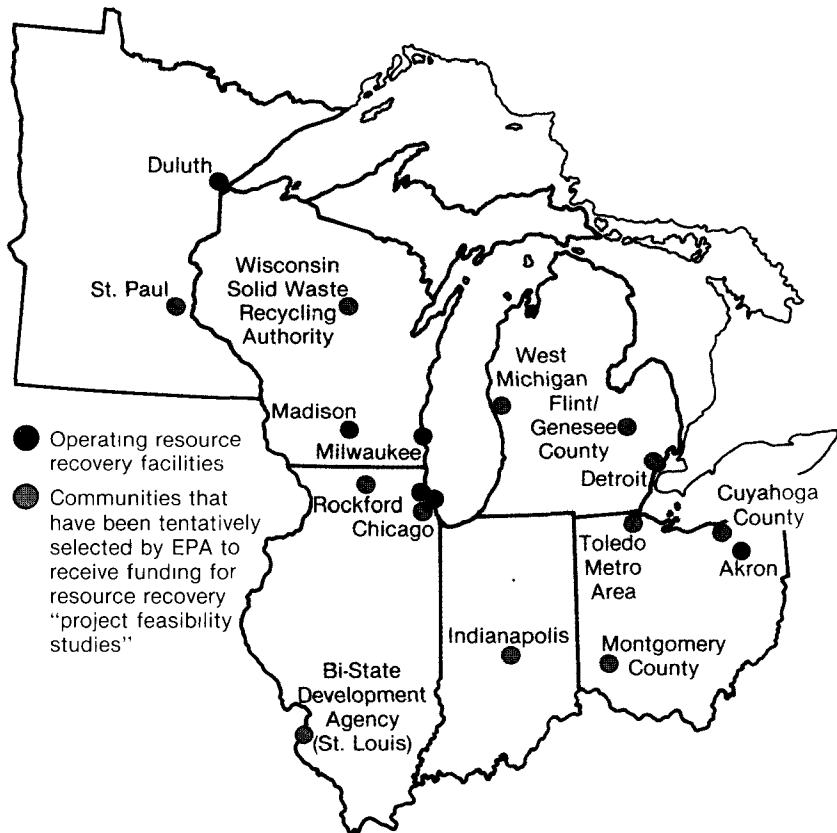
Resource recovery in the United States is still in its infancy, but operational prototype projects show great promise. For instance, one Chicago facility incinerates a portion of that city's daily solid wastes and is using the heat generated for steam that is sold to nearby local industries. Another Chicago facility converts a portion of combustible, residential solid waste into refuse-derived fuel (RDF) that is sold to Commonwealth Edison, which burns a combination of

RDF and coal in modified boilers in order to generate electrical power. The Americology plant in Milwaukee separates a portion of that city's solid wastes into recoverable metals and RDF, selling the metals to local manufacturers and the RDF to the local utility company.

In Madison, Wisconsin, discarded newspapers are collected by the city and sold on the open market to make new paper products. Discarded glass containers can be used to manufacture road-paving and roofing products. Such efforts to recover and reuse as many valuable resources as possible are gradually spreading throughout our region, from the individual household level to

industry-wide programs. The legislative actions of states such as Michigan to require deposits on cans and bottles, are prompting other states to consider similar legislation.

EPA Region V is currently supporting resource recovery by offering funds to as many as 11 local communities that are studying the feasibility of projects that may process as much as 15,000 tons of refuse a day and service a combined population of approximately 10 million. Part of the President's Urban Policy Program, these grants are intended to help communities find alternatives to landfills and use their wastes rather than bury them.



Hazardous Waste



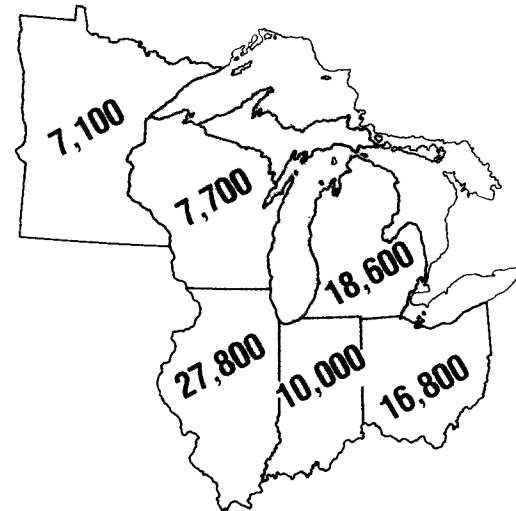
Hazardous waste management has become one of Region V's top-priority programs. These wastes are unavoidable by-products of our technology which, if improperly managed, can pose a serious threat to our health and the environment, particularly since many of them are not readily neutralized or destroyed. Such wastes range from dirty motor oil and spent batteries to biological hospital wastes, spent toxic industrial chemicals, acids, reactive substances, and discarded explosives. Region V generates nearly one-quarter of all hazardous waste in the U.S. and contains 23 percent of all hazardous waste disposal sites.

For the past 40 years, disposal of hazardous wastes was largely unregulated, resulting in abandoned and inactive disposal sites such as Love Canal in New York that now threaten to contaminate our air, water, and food supplies. EPA has been given responsibility to develop comprehensive, cradle-to-grave regulations that require the use of appropriate disposal and management programs for control of these wastes. EPA presently estimates that 90 percent of the hazardous waste produced nationally is not managed in a way that will meet upcoming Federal standards as set forth under the Resource Conservation and Recovery Act.

The magnitude of the problem is illustrated more clearly by the fact that Region V alone produces more than 5.9 million tons of hazardous wastes a year, or almost 25 percent of all hazardous waste generated in this country. The rate at which hazardous waste is generated nationally by industry continues to grow at approximately three percent a year.

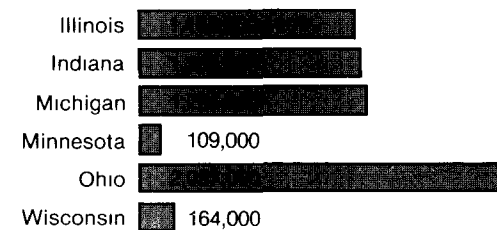
Working with the states, EPA has inspected many known dumping sites and has helped to identify and resolve potential problems at those sites. In 1979 Region V EPA made preliminary assessments on 106 sites; corrective enforcement action is being taken by a state or other entity on 23 sites. When the new Federal regulations become effective permits will be required for all facilities that treat, store, or dispose of hazardous waste. It is hoped the states will assume this permitting, if EPA determines that their programs meet or exceed the Federal minimum standards

EPA's Regional Waste Management Branch is seeking new solutions to the problems of hazardous wastes. One way to reduce our dependence on land-disposal is to increase development of



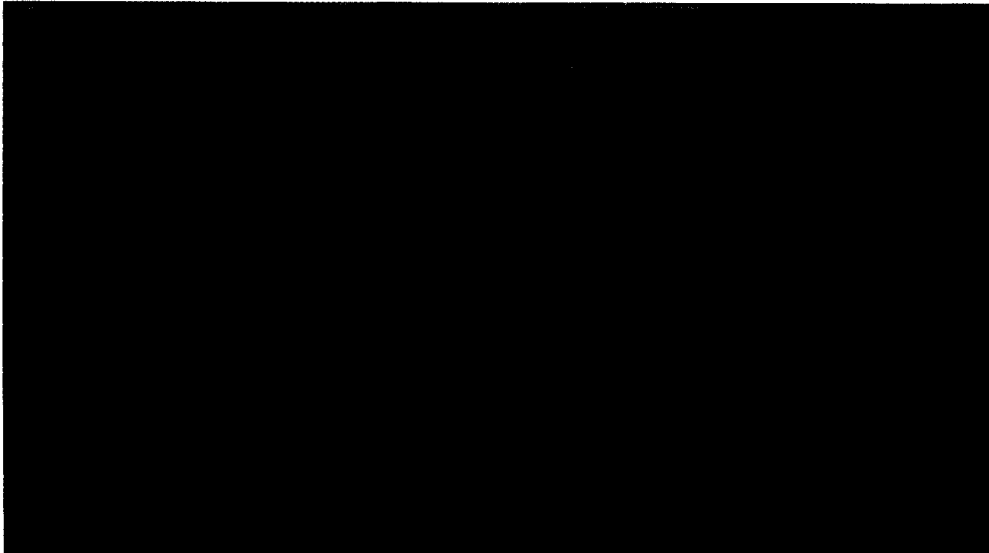
The map above depicts the estimated number of generators of hazardous wastes

The bar chart below illustrates the estimated annual volume of hazardous wastes, which is growing at a rate of 3% per year. At this rate, the volume will double in less than 25 years



waste exchanges. Transporting hazardous waste to a manufacturing facility that can effectively use it as a feed stock or recycle it helps to reduce the massive amounts of wastes otherwise requiring disposal.

Water Quality



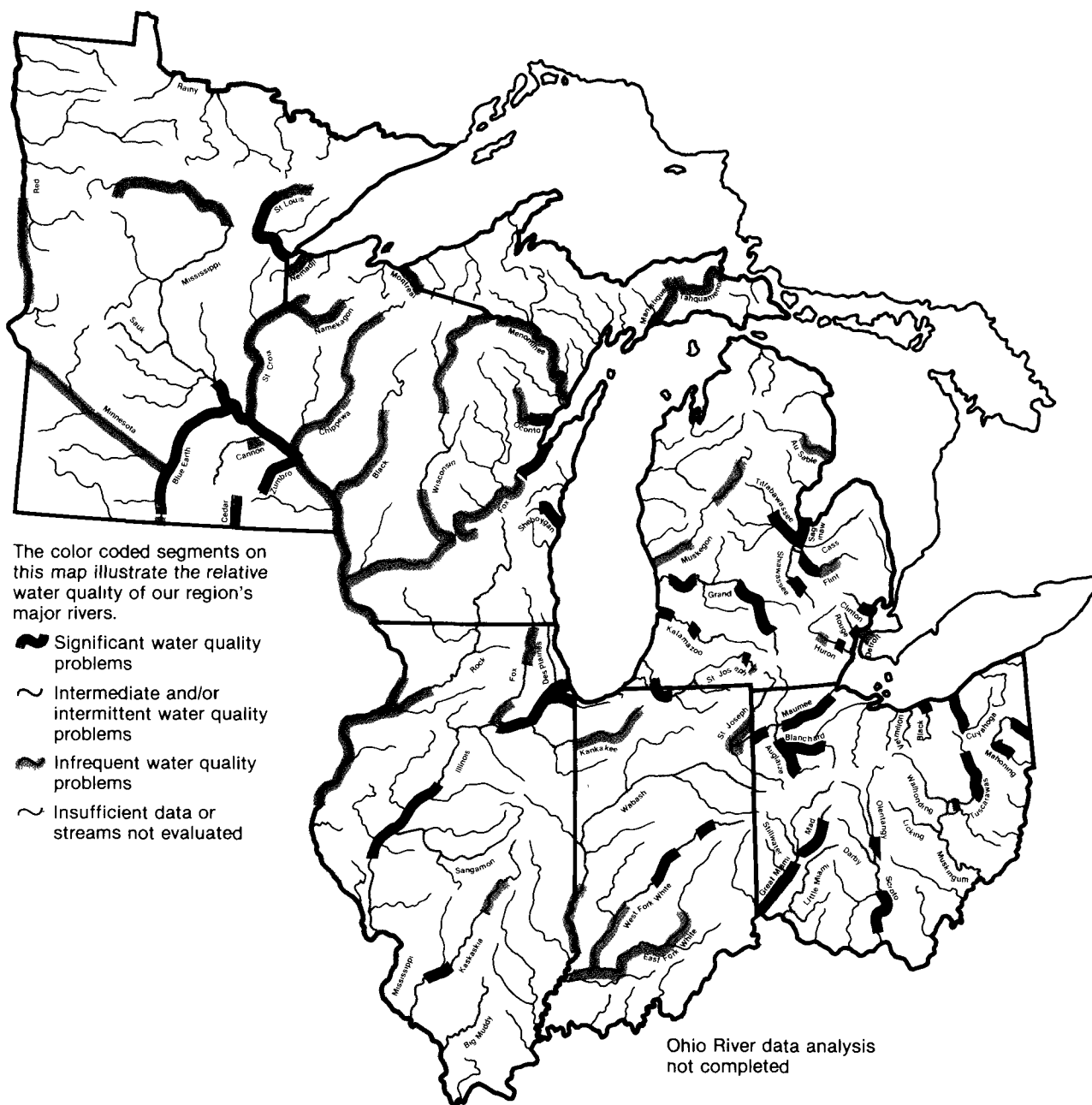
As individuals, we rely upon our region's fresh waters as our source of water for drinking and other daily needs, as well as for recreational activities such as boating, fishing, and swimming. Industry also relies upon fresh water as a basic resource necessary to many production activities. Cities and industrial centers grew around waterways for easy transportation, for easily obtained water supplies, and for readily available waste disposal.

Today many of our fresh waters are contaminated by toxic chemical-plant wastes, fertilizers, pesticides, heavy metals such as lead and cadmium, human wastes, and other substances that have entered the water directly or indirectly. Even atmospheric pollutants can eventually enter the water.

Two types of pollution sources have been identified. Industrial facilities and municipal wastewater treatment plants discharge pollutants directly into the water through pipes and channels. Fourteen thousand of these "point" sources currently discharge under pollution control permits in Region V. "Nonpoint" sources include stormwater runoff carrying fertilizer and pesticide residues, septic tank seepage, urban stormwater, and the like. Within the last two decades, overall contamination from point and nonpoint sources has become so severe that commercial fishing has been severely restricted and even banned in certain waters of Region V, and sport fishing enthusiasts have been warned to limit the amount of certain fish they eat. Some beaches have been periodically closed, as well.

The Clean Water Act Amendments of 1977 set goals to improve water quality by 1983. EPA was directed to review and update quality standards for all waters. Working with the states, EPA has implemented the National Pollutant Discharge Elimination System (NPDES), which requires permits for all point source discharges. Nonpoint sources are not permitted. In 1978 Region V became the first of EPA's ten regions to fully transfer the responsibility for the NPDES program to its six states.

Additionally, EPA's commitment extends to providing funds, \$61.7 million to date, to help 37 areawide and state agencies plan water quality management activities. In Fiscal Year 1979 (October 1978 to September 1979), EPA Region V awarded \$9 million to help its six states run their water pollution-control programs. EPA has also provided \$9.2 million to help restore 20 lakes in Region V and to protect them from nonpoint sources of pollution.

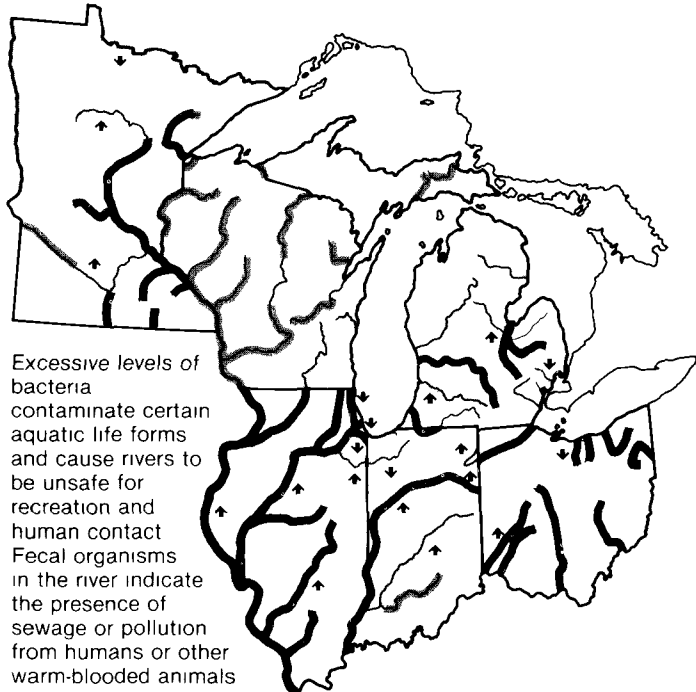


On the following two pages the maps illustrate water quality for specific pollutants. Water quality is based on a comparison of physical/chemical data with recommended State and Federal Water Quality Criteria. The arrows indicate the trend from 1974 data compared to 1978. Color coded segments indicate that an exceedance of water quality standards/criteria has been found somewhere on that river, but not necessarily on the entire river. Criteria differences may be a factor in abrupt changes at state lines.

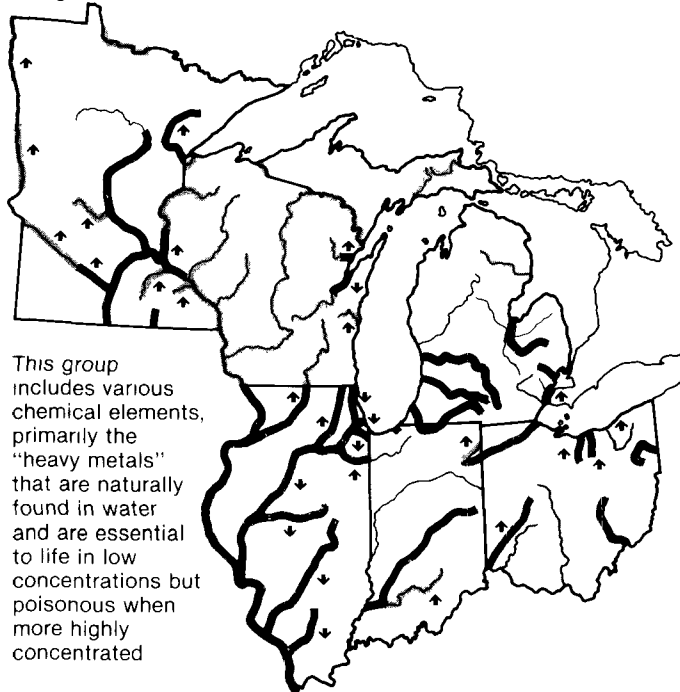
- Major contributor to exceedances
 - Minor contributor to exceedances
 - Not a contributor to exceedances
 - Insufficient data or no water quality standard
 - Improving water quality trend
 - Decreasing water quality trend
- No arrow indicates no change in trend or insufficient data to determine a trend

Water Quality

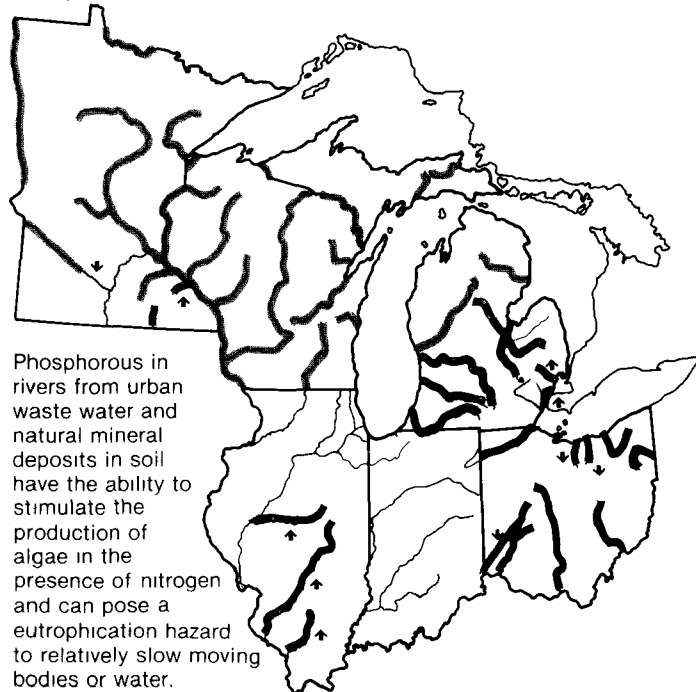
Bacteria



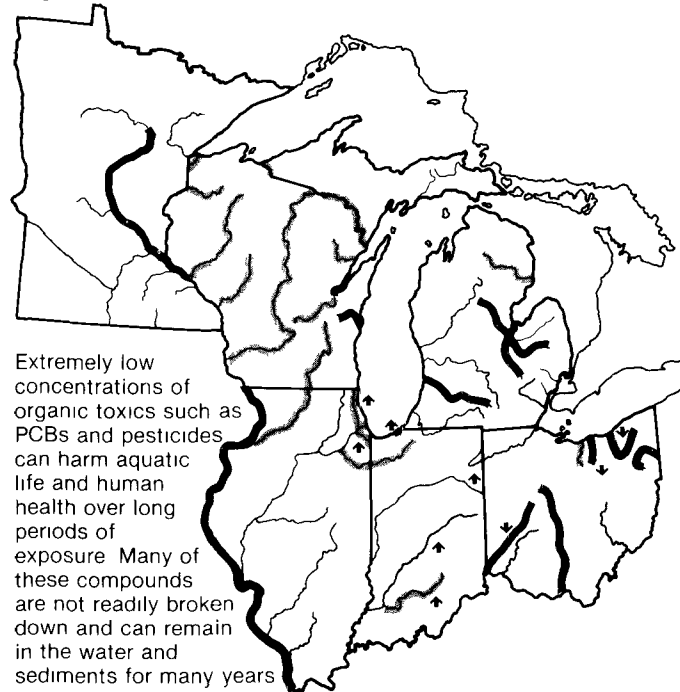
Inorganic Toxics



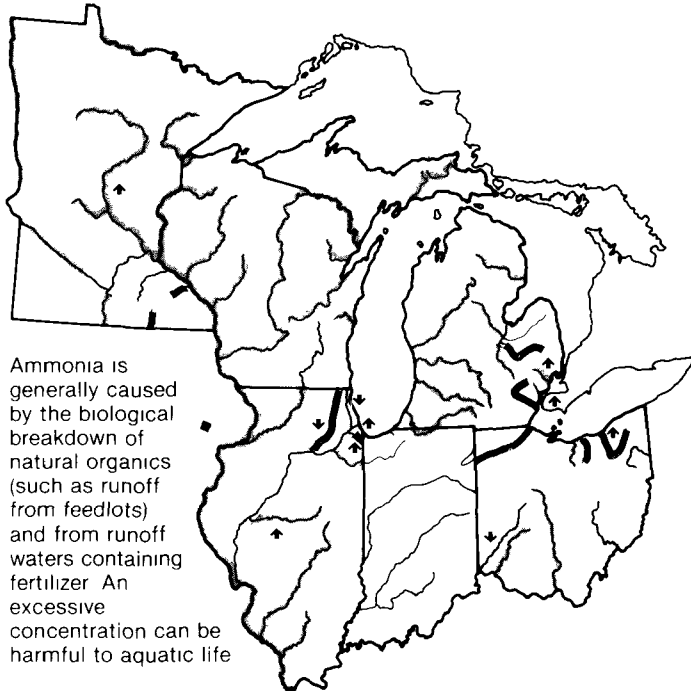
Phosphorous



Organic Toxics

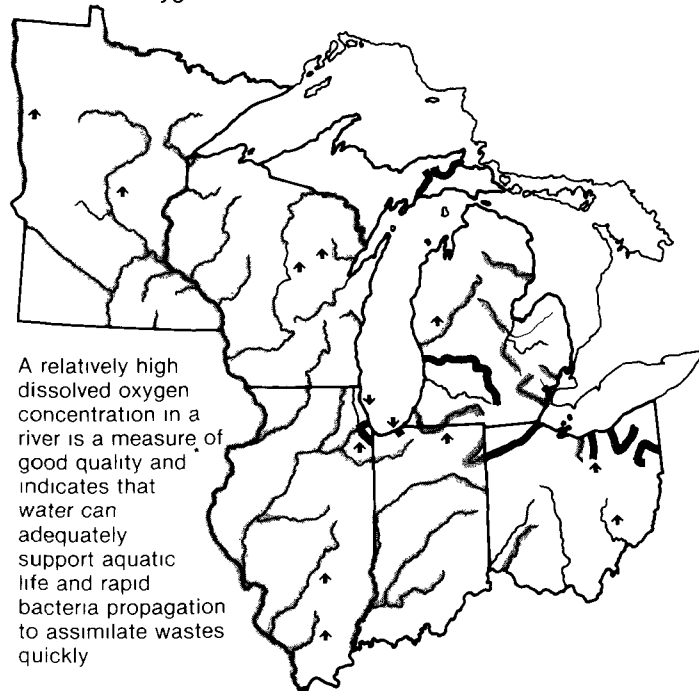


Ammonia



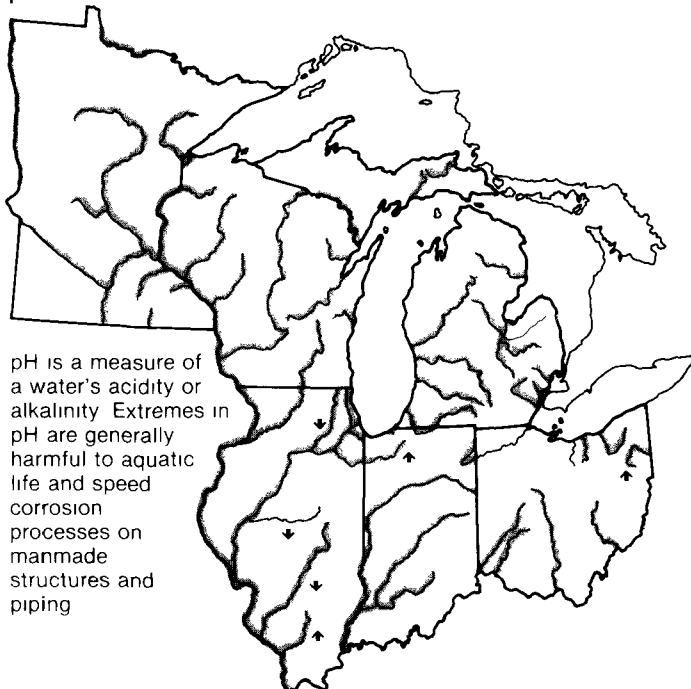
Ammonia is generally caused by the biological breakdown of natural organics (such as runoff from feedlots) and from runoff waters containing fertilizer. An excessive concentration can be harmful to aquatic life.

Dissolved Oxygen



A relatively high dissolved oxygen concentration in a river is a measure of good quality and indicates that water can adequately support aquatic life and rapid bacteria propagation to assimilate wastes quickly.

pH



pH is a measure of a water's acidity or alkalinity. Extremes in pH are generally harmful to aquatic life and speed corrosion processes on manmade structures and piping.

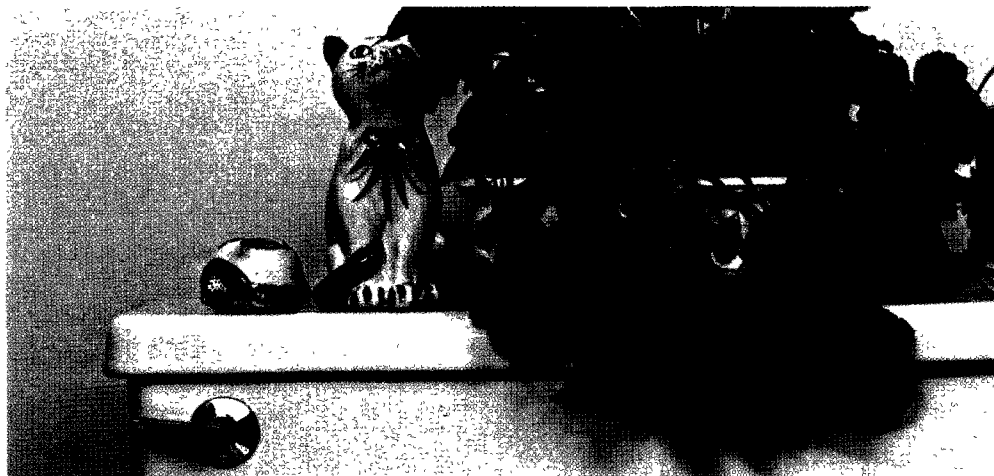
Temperature



Temperature changes govern the nature of biological life, the rate of chemical reactions, and the solubility of gases and solids in streams. As a rule, high temperatures present more pollution problems than low temperatures.

Water Quality

Wastewater Treatment



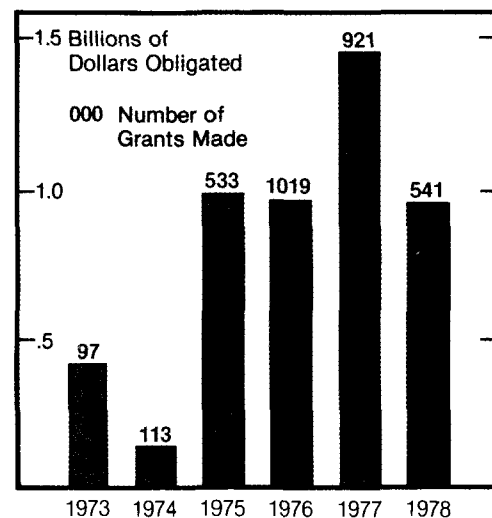
One of EPA's major goals is to reduce the pollutants discharged into waters from municipal and industrial wastewater treatment plants, and to eliminate completely all untreated discharges. Each industrial facility, city, community, and individual in our region must share the responsibility for water pollution, since all of us contribute contaminants that can eventually enter our water courses. For its part of this effort, EPA Region V is assisting communities through Federal grants for wastewater treatment systems. Municipal wastes account for more than 20 percent of the organic pollutant load in streams and lakes. This load, in turn, is responsible for the oxygen depletion in the water.

Since 1973 Region V has assisted with 3,560 separate grants for municipal pollution cleanup, obligating funds in excess of \$5.4 billion. This makes Region V's the most extensive environmental program in the nation. From 1973 through 1978, a total of 786 of these projects had been completed, with many more near completion. The largest programs under way at this time are in the major cities of Chicago, Detroit, Cleveland, Indianapolis, and Milwaukee, all of which have significant needs to abate water pollution.

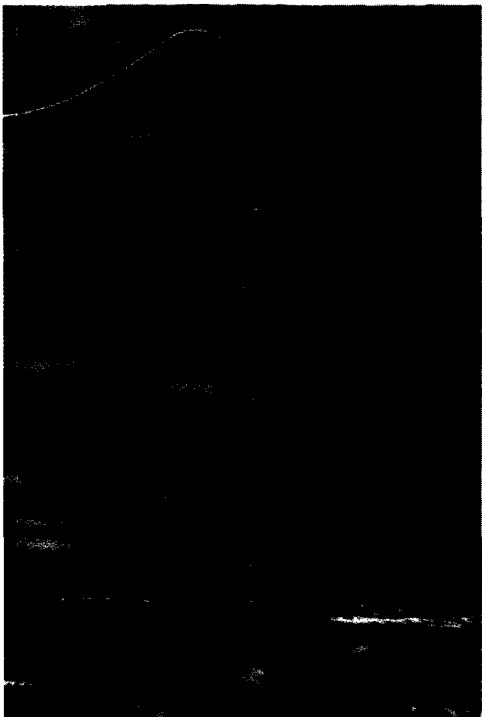
EPA is concerned about the secondary impacts of sewage treatment facility construction, including the potential for urban sprawl that new sewer lines make possible. In Wayne County, Michigan, for instance, EPA's environmental impact statement analysis recommended a modification of the Huron Valley interceptor project that is commensurate with the needs of the area but that also allows for growth.

In addition, alternatives to large regional treatment systems are being considered. Cluster systems, improved septic tank design, and the use of pressure sewers are just some of these new alternative, innovative, and, often, low-cost approaches that EPA funds.

Most industrial and municipal dischargers have taken steps to comply with state-administered NPDES permits. In Region V, as of March 31, 1979, 75 percent of the 525 major industrial dischargers and 55 percent of the 582 major municipal dischargers were in compliance with these water permits.



Safe Drinking Water

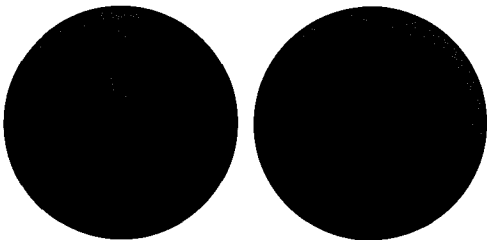


With the Great Lakes, favorable geology, and good rivers, our Midwestern water supply is one of the most abundant in a country known for the safety of its water supply. Still, at least 4,000 reported cases of illness each year are linked to drinking water contamination in the U.S.

The 1974 Safe Drinking Water Act directed EPA to establish standards of purity for water-supply systems, with each state eventually assuming management for implementing and enforcing that program. Covered under the Safe Drinking Water Act is every community water supply that has 15 or more connections or that serves more than 25 people daily, such as restaurants, camping sites, and roadside motels with their own water supplies.

Region V's Water Supply Branch provides technical advice, cooperative planning, and on-site assistance to states and directly to public water systems. In the past four years, EPA Region V has given financial aid of \$10 million to help upgrade state-run drinking water programs.

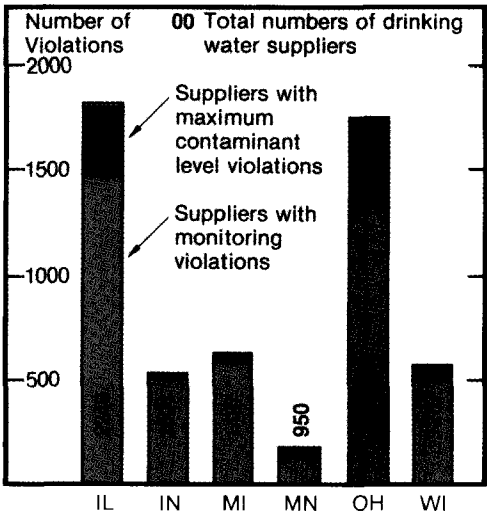
A new EPA program that addresses groundwater problems is currently under way. Groundwater, which is more abundant than all our lakes, rivers, and streams, is normally of good quality and requires less treatment than surface waters. The new program is aimed at protecting groundwater sources from injection of hazardous or toxic wastes. It establishes control of such injection and designates sole-source aquifers for underground systems that are substantial sources of a drinking water supply and are particularly sensitive to contamination. Another Region V program seeks to locate all pits, ponds, and lagoons that store, treat, or dispose of liquid wastes and evaluates any possible impact on groundwater from those sources.



Suppliers

Volume

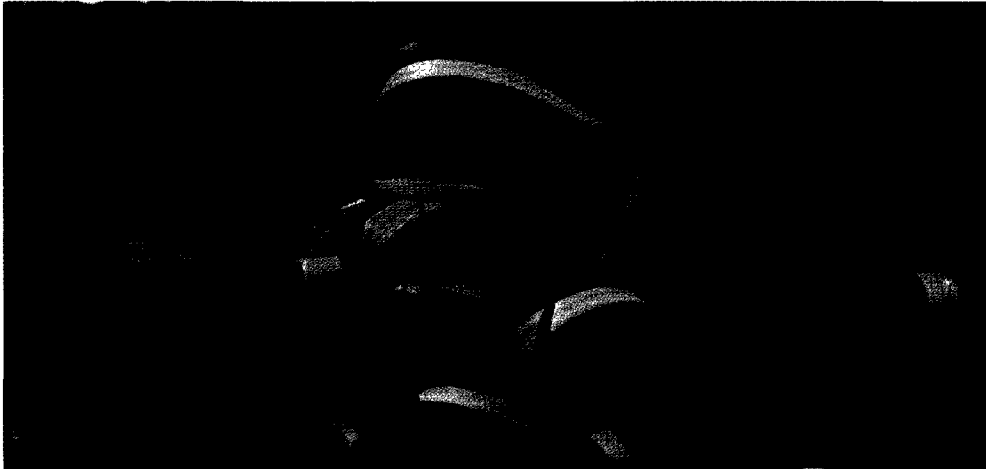
While only 7% of our region's drinking water suppliers obtain their water from surface sources (lakes and rivers), this number gains importance when it is realized that surface sources supply 55% of the total volume of the region's drinking water.



The chart illustrates for 1978 the number of water suppliers in each state with contaminant level or monitoring violations

Water Quality

Wetlands

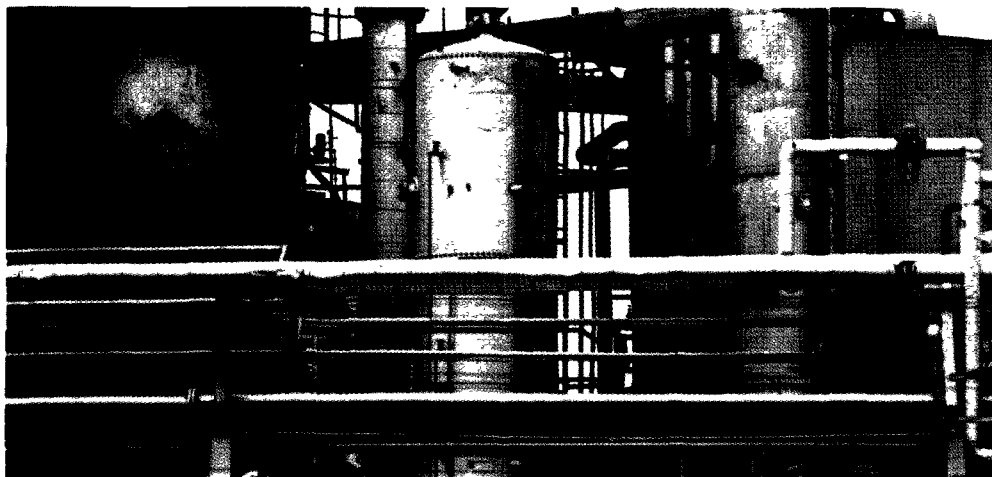


Despite recent environmental concerns, many people still think of wetlands as waste lands. Many land developers see marshes and bogs as cheap land to be drained, leveled, and covered with new construction. Communities see them as potential new suburbs and a desirable addition to the tax base once people can live and work there. Some people see them as little more than potential tourist attractions or places to hunt and fish. But few people stop to appreciate the vitality and utility of the wetlands. As a result, more than 70 percent of the wetlands in the nation have been destroyed in the last 100 years for housing developments, roads, airports, dumps, and other constructions.

Wetlands are biologically productive and provide the native habitat for plants and wildlife that can survive nowhere else. But these fragile and unrecoverable lands affect each of us even more directly, since they are an essential part of nature's system of flood control, erosion control, and water purification. Acting as natural sponges and settling ponds, the wetlands capture excess water runoff to prevent flooding and reduce silt and suspended particles in rivers and lakes. It is not uncommon to find that flooding problems can become worse as a result of destroying virgin wetlands when constructing flood-control projects.

Each year Region V's Office of Federal Activities, under Section 404 of the Clean Water Act, reviews approximately 3,000 requests for U.S. Army Corps of Engineer permits that might directly or indirectly affect wetlands. Based on EPA review, many of these proposed projects can be prohibited, restricted, or modified.

Oil & Hazardous Substances Spills



Based on a four-year average, more than 285,000 gallons of oil escape into our region's waterways each year. The Council on Environmental Quality (CEQ) is responsible for developing a National Oil and Hazardous Substances Contingency Plan. Region V EPA has developed a contingency plan to direct oil and hazardous substance cleanups on our inland waters and on commercial waterways within the region (excluding the Great Lakes, which are under the jurisdiction of the U.S. Coast Guard).

This regional contingency plan provides expedient and coordinated cleanup efforts for spills into water and waterways. In the event of a spill, one of six predesignated coordinators from Chicago, Cleveland, Detroit, or Minneapolis can be at the site within four hours. Once at the site, the coordinator makes certain that the spill is contained and removed properly and promptly. He or she then may gather evidence necessary to establish legal responsibility for the spill and to commence subsequent enforcement actions. In the event of a major spill, a Regional Response Team works with the coordinator to manage the situation. Typically, the Regional Response Team consists of representatives of the U.S. Coast Guard, the U.S. Fish and Wildlife Service, and other Federal agencies, all of whom are on call 24 hours a day.

As a positive step in preventing spills of petroleum products, vegetable oils, animal fats, tallows, and similar substances at the place of manufacture or use, the Regional EPA office requires processors, storage facilities, transporters, and users of these substances to develop and implement plans that reduce both the incidence and severity of spills. The on-scene coordinators, the Emergency Response Teams, and the regional contingency plan allow quick and effective response to spills anywhere in the region.

While improved reporting techniques now identify more spills that once were considered inconsequential and therefore were not reported, the actual number of spills in Region V is decreasing. In addition, available technologies used for cleaning up spills have advanced rapidly.

If you see an oil or chemical spill, you should report it immediately to the National Emergency Response Center in Washington, D.C. The toll-free, all-hours number is (800) 424-8802.

Water Quality

Great Lakes



The internationally shared waters of the Great Lakes constitute the world's largest system of fresh water. They contain 95 percent of the surface freshwater storage in the nation and 20 percent of the world's freshwater storage. More than 45 million U.S. and Canadian citizens live in the Great Lakes Basin, the area whose waters drain into the Great Lakes, and even more people depend upon the Great Lakes for their water supplies. Put another way, one-fifth of the U.S. population — and one-quarter of U.S. industry — rely upon the Great Lakes.

At the same time, the Great Lakes have been among the most abused waters in our country, and that abuse has had far-reaching effects. Since the area was first settled, the Great Lakes have been a convenient disposal site for every form of human waste and refuse. Industries, municipalities, and communities found it all too easy to discharge toxic substances, solid refuse and garbage, and biological wastes into the Great Lakes and the rivers feeding them. Runoffs from heavy rains and spring thaws of winter snows flowed into the streams, rivers, and the Great Lakes, carrying large amounts of fertilizers and pesticides with them. By the late 1960s, worldwide attention had focused on the severe contamination and pollution problems in the Great Lakes, which required direct and immediate action.

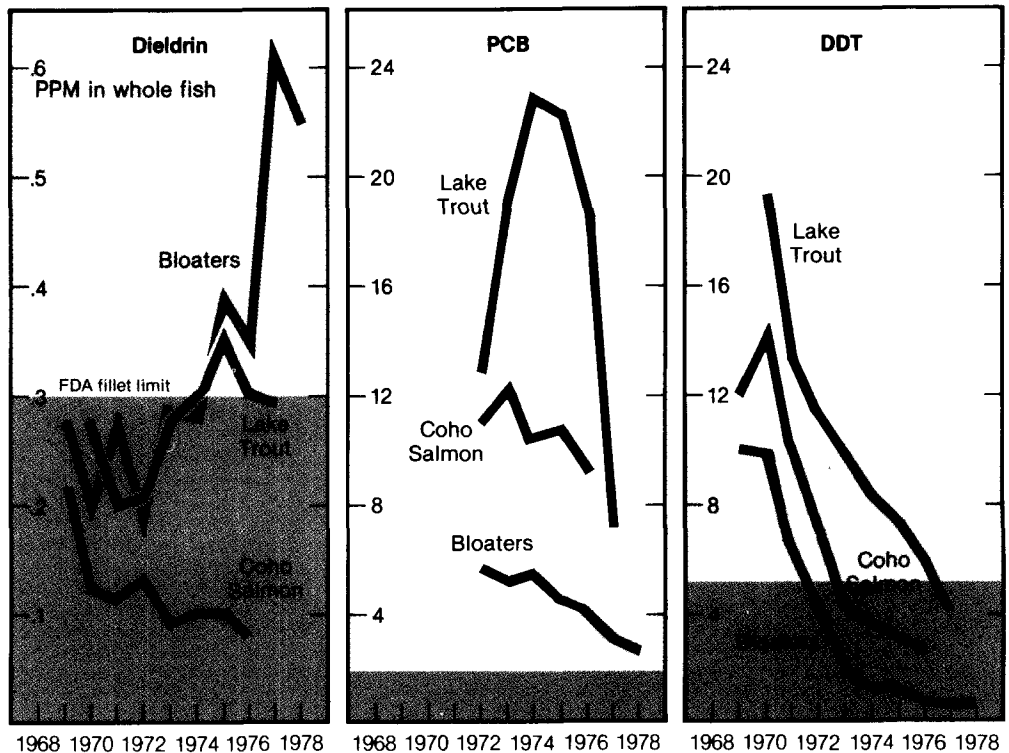
One major contributor to the problem was phosphate-laden water discharged into the Great Lakes. Phosphates are found in animal and human wastes, are used in laundry detergents to soften water and remove soil, and in fertilizers to stimulate plant growth. Unfortunately, phosphates also stimulate the growth of algae in water. These algae, when they grow in excess, lower the oxygen content of the water, causing such game fish as trout to die off.

Contamination by toxic substances also reached critical proportions in the Great Lakes. High PCB and DDT concentrations in the bodies of fish taken from Lake Michigan led to bans of commercial fishing on that lake and to consumption advisories for sport fishing. Lake Ontario developed major problems as a result of contamination from mercury and other toxicants discharged into the lake or into the Niagara River, which flows into Lake Ontario. Mercury and other toxicants

contaminated the waters and fish of Lake St. Clair and the St. Clair River. The insecticide DDT was present in alarming concentrations in the waters and fish of the entire Great Lakes ecosystem. Although the banning of DDT in 1969 and programs for the control of mercury and PCBs have lessened these problems, the residual effects continue today.

EPA, created by the President in 1970, was the logical Federal agency to be responsible for the Great Lakes cleanup. Billions of dollars were set aside to help towns and cities build modern sewage treatment facilities and to give industries a hand with treatment of their wastes. EPA's Great Lakes National Program Office (GLNPO), located in Chicago, is responsible for coordinating the implementation of the U.S. portion of the 1978 Great Lakes Water Quality Agreement between the U.S. and Canada. (The first agreement was signed in 1972, updating a 1909 Boundary Waters Treaty between the two countries.) EPA's Region V Administrator is co-chairman of the Great Lakes Water Quality Board of the International Joint Commission (IJC), the U.S.-Canadian entity with representatives from the eight states (Minnesota, Wisconsin, Michigan, Illinois, Indiana, Ohio, Pennsylvania, New York) that border the Great Lakes and from Canada and the Province of Ontario.

One method of reducing the discharge of phosphates is to ban the use of high phosphate detergents. Currently, all Region V states but Ohio restrict phosphate content of detergents, and water quality has shown improvements where restrictions have been effectively enforced. Other EPA programs work to halt the discharge of inadequately treated sewage, industrial chemicals, toxic and solid wastes, and other contaminants into the Great Lakes and the streams and rivers that empty into the Great Lakes. EPA also is taking measures to minimize the contaminants carried into these waters by runoff from fields and urban areas.



It is still too early to be completely optimistic about the water quality of the Great Lakes. Toxic substances continue to pose threats, and so does air pollution, which contributes a number of pollutants to the Great Lakes Basin. But there are improvements. Gone are some of the worst visible signs of pollution. Industries and local and state governments have made considerable improvements in cleaning up and monitoring their wastes. But more work is needed if these favorable trends are to be maintained and the Great Lakes are to provide high-quality water for present and future populations.

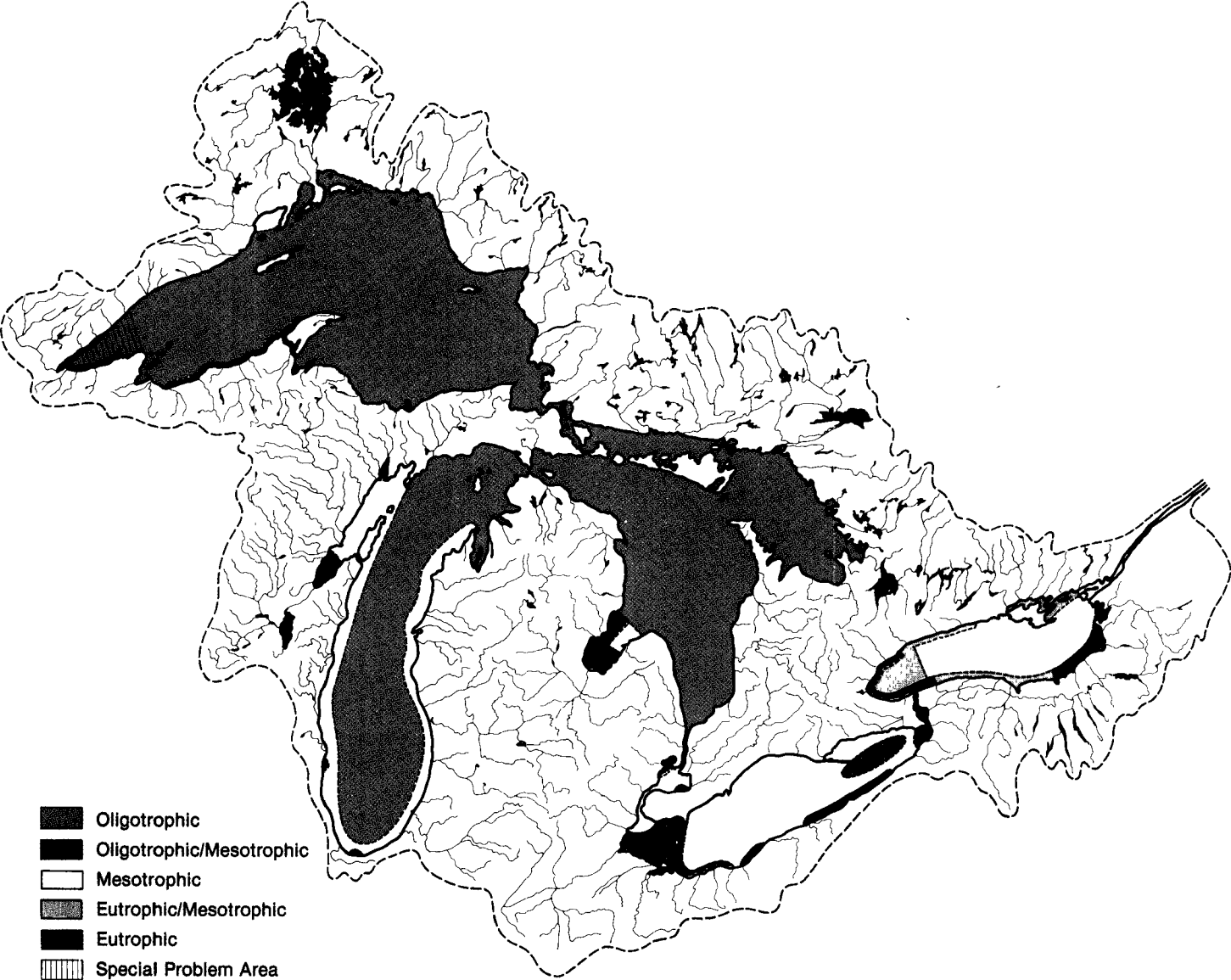
The graphs above illustrate the average levels of chlorinated hydrocarbons that were found in whole fish taken from Eastern Lake Michigan (near Saugatuck, Michigan).

- Probably above FDA limit
- Probably below FDA limit
- Below FDA limit

FDA limits are for the edible (fillet) portion of a fish. For illustrative purposes it is assumed that whole fish values are approximately twice the fillet value.

Water Quality

Great Lakes



The adjacent map illustrates the current overall health of the Great Lakes, from the standpoint of eutrophication, or aging. Together with the rivers and streams of the drainage area shown in white, the waters of this area are vitally important to the productivity and economic stability of the region. Rapid growth of algae has occurred in Lake water enriched by detergent-laden sewage and runoff from fertilized lands. As shown on the map, the enrichment is not uniform. In some areas the water is "oligotrophic," or clean, having little algae growth and good levels of dissolved oxygen to support fish life. In areas just developing a problem or having a past problem partially cleaned up, the water is "mesotrophic," or moderately enriched, with limited algae growth and a partial shortage of dissolved oxygen. In other areas, particularly near population centers, the waters may be "eutrophic," or highly enriched, with rapid algae growth and severe or seasonal shortages of dissolved oxygen.

Lake Superior

The largest of the Great Lakes, Superior is also the cleanest. But it has been plagued by asbestos-like particles from taconite mining, which have gotten into drinking water in the western arm of the lake and have caused communities there to install filtration plants, which previously were not required on Lake Superior. PCBs have been found in Lake Superior waters and fish; EPA's GLNPO and the University of Minnesota are seeking to define the extent of this new problem and to determine how effective the PCB ban is in controlling it



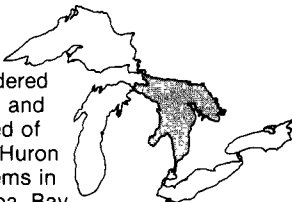
Lake Michigan

The only Great Lake entirely within U.S. boundaries, Lake Michigan has been hardest hit by PCB contamination. Because its extended-mitten shape creates a cul-de-sac, it requires many years for water that enters the lake to find its way out. This means that the lake will be slow to recover from any degradation that does occur. This fact, combined with Lake Michigan's heavy industrial and municipal pollution, created public alarm 10 years ago. EPA's intensive water quality studies during 1976-77 found that while the lake degenerated between 1970 and 1976, conditions have improved in years since. The 1969 ban on DDT has been very effective; municipal phosphorous treatment and phosphate detergent bans have helped to lessen the enrichment problem. Only nearshore areas and Green Bay, Wisconsin were not oligotrophic (clean, clear)



Lake Huron

Although still considered the second cleanest and second least-troubled of the five lakes, Lake Huron faces serious problems in the Saginaw Bay area. Bay City and the Saginaw River and its tributaries have suffered from heavy industrial pollution, including that from the chemical industry. Saginaw Bay, however, has shown substantial improvement during the last few years.



Lake Erie

Shallowest and smallest of the Great Lakes, Lake Erie has faced the most serious, and widely publicized, pollution problems. It became overloaded with nutrients, largely from municipal wastes and rural runoff but also from industrial wastes and urban runoff, which resulted in massive algae blooms. These blooms interfered with drinking water supplies, changed the ecological balance within the lake and interfered with recreation on Lake Erie. By 1966, 65 percent of the bottom water in the lake's central basin was without oxygen during the summer months, and many beaches were closed to swimmers. EPA and the Canadians are completing the second year of intensive water quality monitoring of Lake Erie, and there is some indication the lake is improving. Municipal phosphorus loads have decreased, particularly at Detroit. All bordering states but Ohio have banned high-phosphate detergents; the looks of Lake Erie and its tributaries have improved. Sheets of algae are receding and beaches are being reopened, but major and continued efforts are still required before significant improvements will be seen.



Lake Ontario

Since Lake Ontario's water flows out of Lake Erie and the heavily polluted Niagara River, this is the second most enriched of the Great Lakes. Portions of the eastern end of the lake have suffered oxygen depletion due to nutrients from the Bay of Quinte. Manufacturing and industrial facilities in both the U.S. and Canada have spilled Mirex and other toxic substances into the Niagara River and Lake Ontario, which in 1978 resulted in a temporary U.S. ban on all fishing in the lake. Like Lake Erie, some improvement has been found, but major efforts still are necessary. To a large degree, these improvements depend upon improvements in the other Great Lakes, which supply Lake Ontario's water.



For Further Information

If you would like additional information about specific environmental programs in which EPA is involved, please contact EPA Region V's Public Affairs Office, 230 S. Dearborn St., Chicago, IL 60604, or call (312) 353-2072. This office also maintains a supply of EPA publications that relate to the various programs, operates an informal speakers' bureau, and coordinates regional distribution of environmental films (all free of charge to the public). If you encounter an environmental problem, report it first to your local and then to your state pollution-control agency. (State numbers are listed on this page.) EPA Region V's numbers for general program information are listed below.

Air Pollution Programs	(312) 353-2212
Automobile Problems	
Catalytic Converters	(202) 426-2464
Certifying a Car for Sale	(313) 668-4277
Fuel Economy	(313) 668-4275
Fuel Switching	(202) 472-9368
Imports	(202) 472-9413
Tampering with Emission Controls	(202) 472-9363
Warranty & After-market Parts	(202) 472-9350
Great Lakes National Program Office	(312) 353-2117
Hazardous Wastes Program	(312) 353-2197
Noise Program	(312) 353-2203
Oil and Chemical Spills	
National Emergency Response Center	(800) 424-8802
Region V Emergency Response Center	(312) 353-2318
Pesticides Program	(312) 353-2192
Pesticides Poisoning Emergency	(800) 845-7633
Radiation Program	(312) 353-2203
Resource Recovery Program	(312) 353-2197
Solid Wastes Program	(312) 353-2197
Toxic Substances Program	(312) 353-2291
Water Quality Programs	
Wastewater Treatment	(312) 353-2121
Water Supply	(312) 353-2151
Wetlands	(312) 353-2307
Other EPA Facilities in Region V:	
Central District Office (IL, IN, MN, WI)	(312) 353-5638
Chicago, IL	
Eastern District Office (OH/MI)	(216) 835-5200
Westlake, OH	
Central Regional Laboratory	(312) 353-8370
Chicago, IL	
Environmental Research Laboratory	(218) 727-6692
Duluth, MN	
Health Effects Research Laboratory	(513) 684-7406
Cincinnati, OH	
Large Lakes Research Station	(313) 675-5000
Grosse Ile, MI	
Mobile Source Air Pollution Control Laboratory	(313) 668-4200
Ann Arbor, MI	

Each Region V state has environmental agencies to assist residents of those states with their environmental questions and problems. If a problem needs to be referred to U.S. EPA Region V, the state agencies listed below can do that for you—if you have notified them first. Pollution-emergency numbers, which are answered after business hours and on weekends, are also listed.

ILLINOIS

Illinois Environmental Protection Agency
2200 Churchill Road
Springfield, IL 62706
(217) 782-5562
24-hour number: (217) 782-7860

INDIANA

Indiana State Board of Health
1330 W. Washington St.
Indianapolis, IN 46206
(317) 633-0260
24-hour number: (317) 633-0144

MICHIGAN

Michigan Department of Natural Resources
Stevens T. Mason Building
Lansing, MI 48926
(517) 373-1214
24-hour number: (517) 373-7660

MINNESOTA

Minnesota Pollution Control Agency
1935 W. County Rd. B-2
Roseville, MN 53113
(612) 296-7373
24-hour number: (612) 296-7373

OHIO

Ohio Environmental Protection Agency
361 E. Broad St.
Columbus, OH 43215
(614) 466-8508
24-hour number (within Ohio only): (800) 282-9378

WISCONSIN

Wisconsin Department of Natural Resources
P.O. Box 7921
Madison, WI 53701
(608) 266-2621
24-hour number: (608) 266-3232

Environmental Protection Agency
Region V, Library
230 South Dearborn Street
Chicago, Illinois 60604

United States
Environmental Protection
Agency

Region V
230 South Dearborn Street
Chicago, Illinois 60604

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Penalty for Private Use
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