

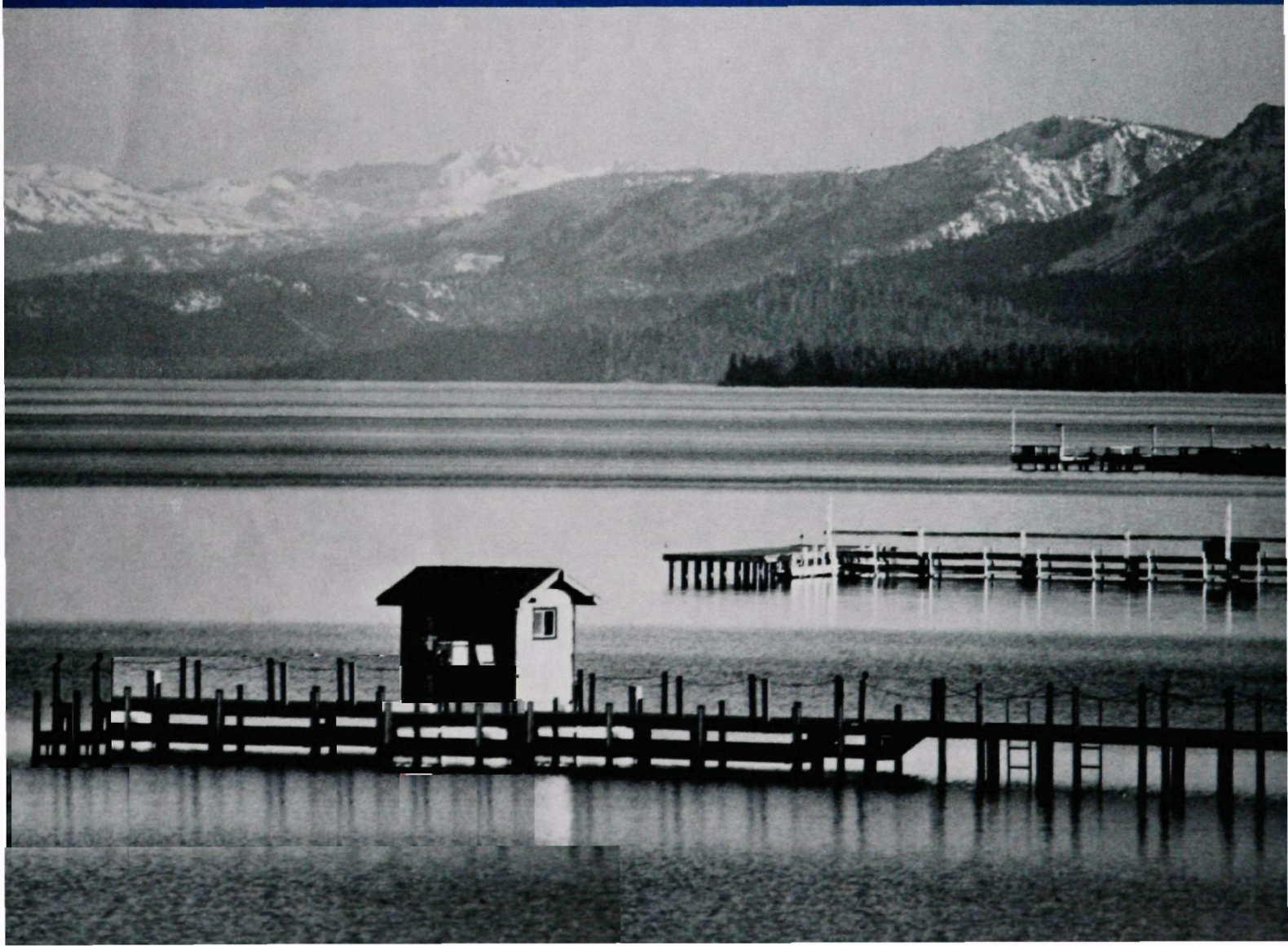
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## State of the Environment





# Toward a Cleaner Environment

**H**ow are we progressing in efforts to achieve a cleaner, healthier environment? To what extent have we succeeded in protecting public health and the environment from the pollutants that are byproducts of our highly technological society?

The following case histories are examples of what has been accomplished over the past decade in the nationwide effort to show that there is hope for a stressed and threatened environment. They also illustrate that while science and technology do not yet have all the answers, workable pollution controls do exist and can make a difference when they are used.

The list is not intended to catalog every pollution control accomplishment, however. The focus is on examples of water clean-up, although we do cite some examples of accomplishments in other program areas. The EPA Journal will report progress in air quality, solid waste control, and other areas in later issues.

Our report includes the status of pollution control in the Great Lakes, waste recycling in Hawaiian sugar mills, the return of the Atlantic salmon on the Penobscot River in Maine, the resurgence of aquatic life in the Savannah River, control of industrial pollution in the Mobile-Tombigbee River System in Alabama, an innovative pollution control approach in Muskegon County, Mich., action on the dumping of wastes in the Gulf of Mexico and the Atlantic Ocean, positive air cleanup results from a

vehicle inspection and maintenance program in Portland, Ore., cooperation in dealing with the hazards of methane gas in Denver, and safer controls over the tussock moth that damages Douglas fir forests in the Pacific Northwest.

While EPA has made enormous efforts over the past decade to improve environmental quality, in some of these cases EPA's role has primarily been to devise a strategy, to establish standards, or to help bring about a climate

in which others—State and local agencies, private corporations, the courts, citizen groups, and individual citizens—could take steps to improve the quality of the environment.

The examples in this list show how such a partnership can work for a better environment. Some recount triumphs of States and cities. Some are examples of outstanding accomplishments of individual citizens or of communities working together to deal with a common problem.

The list contains few unqualified successes. Hard-won gains are always subject to unexpected setbacks. The unresolved problems are many. And new ones are constantly being uncovered.

But while much remains to be done, these accomplishments, both large and small, offer evidence that with time and continued efforts, much more can be done to achieve a cleaner and more healthful environment.

The cases were prepared by EPA's Regional Offices and consolidated by the Office of Planning and Management in EPA headquarters.

Water pollution, emphasized in these cases, became serious and widespread with the tremendous industrial and population booms of the last one hundred years. The pollution rapidly worsened following World War II when use of man-made chemicals became more widespread. Industries and cities increasingly used rivers and lakes as dumping grounds for their wastes. By the mid-1960's water pollution in many areas had reached intolerable levels. These conditions led to the massive cleanup efforts in the 1970's. While many rivers and other waterways are still heavily polluted, cities and States around the country, usually with substantial assistance from EPA, are scoring significant gains in reversing the pollution tide. Here are some examples of what has been achieved:





## The Great Lakes

**T**he five Great Lakes—containing 65 trillion gallons of water and covering 95,000 square miles—are the world's largest reservoir of fresh water.

For more than a century many of the Midwest's largest and most successful cities and industries have depended on this water as a vital element in their growth. Billions of gallons of sewage and industrial and agricultural chemicals have

been discharged into these lakes because it was the most economic and convenient way to get rid of these wastes.

These discharges have prematurely aged some of the lakes, killed fish, and forced the closing of many bathing beaches.

While Lake Erie's condition became notorious, parts of

Lake Michigan and Lake Ontario also became seriously polluted. Most beaches on these lakes were closed. Millions of fish were killed. Although problems are less severe in Lake Superior and Lake Huron, even these bodies of water have some pollution problems.

In 1972, the United States and Canada signed an agreement to continue their joint

long-term attack on the sources of pollution. Updated in 1978, this agreement views the Great Lakes as an ecosystem of interacting components—water, land, air, and living organisms. It calls for control programs to protect this complex system by dealing more effectively with pollution from all sources including agricultural and other drainage wastes as well as

direct discharges from industrial and municipal pipelines.

In the most severely polluted lakes—Erie, Ontario, and Michigan—major pollution ills still exist, but progress is being made. A total of \$5 billion has been spent by EPA in the last decade to help clean up the Great Lakes. Additional billions of dollars have been spent by State and local governments and industries in the effort.

A 1978 survey of people who live and work along the lakes found that nearly all of them noted visual improvements in the lakes. At the same time, many shoreline property values are increasing rapidly. Recreation industries—sport fishing, boating, and vacation resorts—have been booming and several beaches long closed to swimmers have been reopened.

The prognosis for the Great Lakes then is cautiously optimistic. Here are some specifics:

**Lake Michigan.** This lake's industrial pollution created public alarm 10 years ago. A *Chicago Tribune* reporter's hand dunked into the Calumet River, a Lake Michigan tributary, emerged pitch black—and the photograph was sent around the world.

EPA conducted intensive water quality studies on Lake Michigan during 1976-77. Trends were developed by comparing results of that study with a 1962-63 study by the U.S. Public Health Service and with data from various universities during 1970 and 1973. In short, the report concludes that: (1) There have been continual improvements in nearshore conditions in the southern end of the lake which are strongly linked to remedial programs. The programs include the diversion away from Lake Michigan of the discharges of 12 municipal plants and one industry in Lake County, Ill., between 1973 and 1978; Indiana's phosphate detergent ban in 1972-73; and pollution abatement programs by northwest Indiana industries and municipalities through 1979. (2) The 1969 DDT ban has been very effective, with levels in Lake Michigan fish

reduced approximately 90 percent since that year. Although results of a PCB ban are inconclusive so far, there is some evidence that a downward trend has started.

(Lake Michigan was hardest hit by PCB contamination.) (3) During 1976, when the worst trophic conditions were found, Lake Michigan was still classified as oligotrophic (clean, clear) in all but the nearshore areas and in Green Bay, Wis.

In sum, there are some initial signs of progress on Lake Michigan.

Several other parameters of water quality suggest the need for further attention, including chloride levels, which are increasing more rapidly than in the past in the open lake, and changes in plankton.

**Lake Erie.** This is the shallowest of the Great Lakes (210 feet maximum depth as compared to Lake Superior's 1,333 feet, Michigan's 923 feet, Huron's 750 feet, and Ontario's 802 feet maximum depth). Lake Erie became overloaded with nutrients, largely from municipal wastes and rural runoff but also from industrial wastes and urban runoff. By 1966, 65 percent of the bottom water in the lake's central basin was without oxygen in the summer months. Bathing beaches were closed, and the recreation industry suffered most from nuisance algae.

EPA's Great Lakes National Program Office is in the midst of its second year of intensive water quality monitoring of Lake Erie (1978-79), designed to determine the effectiveness of remedial programs. There is some indication that Lake Erie is improving. All bordering States but Ohio have banned high-phosphate detergents; the appearance of Lake Erie and its tributaries has improved enormously, and winter 1978-79 Program Office tests at selected research stations conducted by boring through the ice revealed that oxygen content had improved.

In recent years aircraft pilots flying over Lake Erie began to notice that sheets of algae that had previously covered

large expanses of the lake were now significantly reduced in size. Sport fish planted in the lake survived, and gulls—a harbinger of cleaner waters—began to be spotted once again. The beaches, most of which had been closed by 1975, began to be reopened. And deep water in the central basin was without oxygen only five percent of the time.

**Lake Superior.** This lake has been plagued by asbestos-like particles, found in the tailings from taconite mining. These particles have gotten into drinking water in the western arm of the lake and have caused communities that once drew drinking water with virtually no treatment to turn to bottled water and to install filtration plants, which previously were not required on Lake Superior. EPA and the State of Minnesota were able to get the Reserve Mining Company to agree to stop dumping taconite tailings into the lake and to place them instead in a landfill. Discharges of taconite tailings into Lake Superior are expected to cease in 1980.

**Lake Huron,** next to Lake Superior the least polluted lake, has had serious problems in the Saginaw Bay area. Bay City, the Saginaw River, and its tributaries suffered from heavy industrial pollution, including discharges from the chemical industry. However, both scientists and local residents have noted substantial improvement in the quality of Saginaw Bay during the last several years.

**Lake Ontario.** A massive cleanup effort has been launched along the shores of Lake Ontario, the most eastern of the Great Lakes, and, next to Lake Erie, the most polluted.

EPA construction grants have provided millions of dollars to help build treatment systems in communities whose wastes used to pollute Lake Ontario. Today the sewage generated by over 95 percent of the population on the U.S. side of the lake is treated before being discharged into

the lake or its tributaries. Most of the systems provide secondary or tertiary treatment. This has significantly reduced the load of nutrients and oxygen-consuming wastes pouring into the lake.

Another part of the cleanup effort has been the ban on phosphates in detergents in Canada and New York State. Phosphate levels have decreased substantially—and more quickly than computer models had predicted. Because it is downstream from the other four Great Lakes, Lake Ontario has also benefited from the reduction in phosphate levels in the other lakes.

And, of course, the discharge restrictions in permits required by the Federal Clean Water Act have compelled industries as well as communities discharging into Lake Ontario to improve their treatment systems.

## The Tributaries of the Great Lakes

The Great Lakes ecosystem consists of dozens of major and hundreds of lesser tributaries within the United States. This is an update of some of the most dramatic improvements that have occurred within the eight-State Great Lakes drainage basin:

**The Cuyahoga River (Ohio).** No river in the U.S. has a more notorious national reputation than the Cuyahoga, which flows through Akron and Cleveland on its way to Lake Erie. By the mid-1960's it ran muddy brown; gas from fermenting organic material on its bottom bubbled to the surface, and the river's waters were so thick with oil that more than once the surface of the river caught fire. The Cuyahoga also had a bacteria count, especially after a heavy rainfall, matching that of raw sewage.

A detailed EPA study concluded several years ago that, even with the implementation of all planned pollution controls, the Cuyahoga will still be able to support only the most pollution-tolerant forms of life. Nevertheless, conditions have improved signifi-

cantly. The visible oil has nearly disappeared, and oxygen-demanding waste, cyanide, phenol, and phosphorus levels all have been reduced.

Problems still exist, however. Some debris and sewage still float on the river's surface, and the river continues to have excessively low levels of dissolved oxygen. Only if these problems can be solved will the Cuyahoga once again be fully healthy. Nonetheless, conditions have improved so markedly that plans are underway to build parks and green strips along the river's banks.

**The Detroit River (Mich.).** The Detroit River, which connects Lake St. Clair and the upper Great Lakes (Huron, Michigan, and Superior) to Lake Erie, is a major—if incomplete—cleanup success. Before the Civil War, the river supported a rich and varied population of fish. But, with increasing industrialization and with the rapid increases in the amount of human wastes to be disposed of, the Detroit River's quality quickly deteriorated.

By the late 1940's, 35,000 gallons of oil per day were dumped into the river's waters. A quarter-inch-thick coating of oil covered its shoreline, and grease balls 8 and 10 inches thick washed up on its banks. Finally, in the cold winter of 1948, 20,000 ducks diving into openings in the ice cover came up coated with oil and died. Massive duck kills, with as many as 40,000 dying a year, continued into the 1960's.

Now the obvious pollution problems are almost gone. Only a few hundred gallons of oil reached the river's waters in 1976. No large duck kills from pollution have occurred since 1968, and some local fishermen are calling the Detroit River's once-again blue-green water "the world's biggest trout stream."

At the lower end, however, the City of Detroit still discharges large volumes of inadequately treated sewage, and there is still considerable, if invisible, contamination by toxic substances.

**The River Rouge (Mich.).** The River Rouge is the Detroit River's most industrialized tributary. Its color had become a rich orange because of pickling liquor, a steel-processing acid that was dumped into it. Its surface was so thoroughly coated with oil that it looked black; the orange color could only be seen momentarily, in the wake of passing boats. A State of Michigan biologist at that time once drew a bucketful of water from the Rouge, and in an hour and a half, acids had eaten away the bucket's bottom.

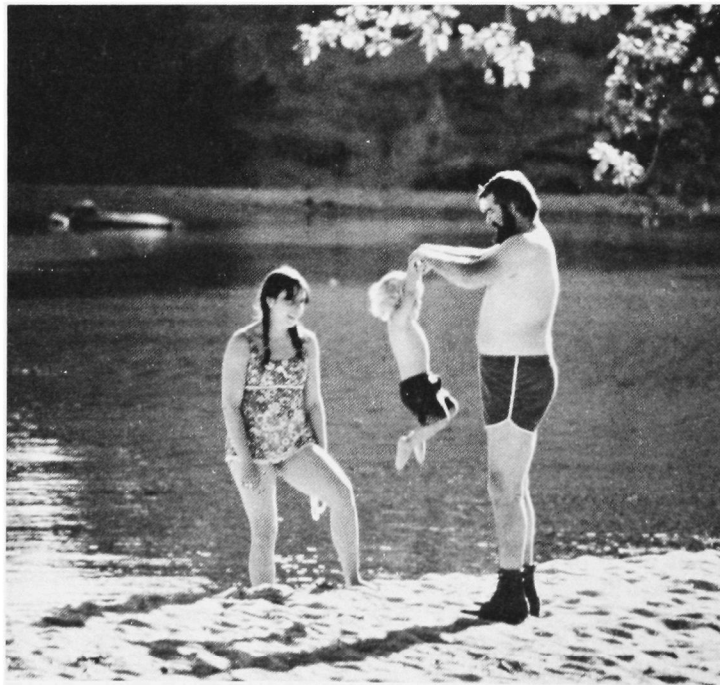
But the industries along the Rouge have now greatly reduced their discharges, and the river now flows green again. Egrets are returning to its banks.

Yet, while many of the pollutant sources from industry have been removed, further cleanup is expected when the City of Detroit implements a combined sewer-overflow program. In the upper reaches

of the Rouge, impoundments have aided in attainment of water quality. Further studies on best management practices for treating urban stormwater should significantly aid in attainment of fishable, swimmable waters.

Now, with the upgrading of most municipal discharges by secondary treatment plants and the elimination of 90 percent of the waste previously discharged by the metal plating industry, the Grand River's waters are significantly improved. Trout are plentiful, and fishermen come out in force to catch the salmon migrating to spawning grounds upstream. There is still an occasional spill from the metal plating industry.

**The Fox River and Lower Green Bay (Wis.).** The Fox is the largest river flowing into Lake Michigan and has been one of the Nation's most polluted waterways. Until recently it suffered annual fish kills due to wastes from municipalities and from the largest concentration of paper manufacturing in the U.S.



of the Rouge, impoundments have aided in attainment of water quality. Further studies on best management practices for treating urban stormwater should significantly aid in attainment of fishable, swimmable waters.

**The Grand River (Mich.).** Despite vigorous pollution con-

trol efforts, the Grand River still suffered from severe problems in the mid-1950's. In 1966 two major fish kills occurred.

At times, dissolved oxygen would be totally unmeasurable for a distance greater than 20 miles. Pollution controls installed in recent years have reduced the problems. Bay Beach, a park and beach area near the mouth at the City of Green Bay, had been closed since 1936 because of high bacteria

levels. In 1976 the beach was reopened.

Also, by 1976 the area of diminished oxygen levels in Green Bay, into which the Fox River flows, had been cut by a third to 50 square miles. As more industries and municipalities begin to meet pollution treatment requirements, even more dramatic improvements are expected. However, both bodies of water suffer from the more intractable problems of PCB's.

Ironically, cleaner water has produced a problem. During 1978 lampreys were observed moving upstream toward Lake Winnebago, and it is feared that if they become established in that lake, its sport fishery will be severely damaged. In the past, the polluted Fox River was an effective barrier to these pests.

**The Indiana Harbor Canal (Ind.).** The Indiana Harbor Canal carries wastes from the heavily industrialized cities of Gary, Hammond, East Chicago, and Whiting into Lake Michigan. The canal is made up almost exclusively of industrial and municipal wastes and is the most significant discharge to southern Lake Michigan. In the early 1970's a boat could not navigate the canal without blackening its hull with oil, and a hand carelessly dangled in the water would emerge with a black film. Lake Michigan waters surrounding the mouth of the canal were constantly discolored by iron-red discharges from the nearby steel industries.

Now oil is a rarity in the canal, and the iron-red stain is no longer visible in Lake Michigan. Beyond that, fish are occasionally seen jumping in the canal.

The steel mills and oil refineries have cleaned up their discharges reasonably well but several of the municipalities—specifically Gary, East Chicago, and Whiting—still have discharges that are not adequately controlled. And the canal, though considerably improved, still does not meet water quality standards.



## Other Waterways

**I**n addition to the Great Lakes and its tributaries, there are many other rivers and lakes around the country where progress has been made in reducing pollution.

Starting in February, EPA Journal will begin a series of reports on progress and problems in correcting pollution maladies in some of the Nation's better known rivers. Meanwhile, here are some examples of gains made in reducing pollution in some of our smaller rivers and lakes:

### Northern Rivers

**T**he Naugatuck River (Conn.) was so grossly polluted due to wastes

from 57 industries and seven cities that no fish could survive on certain reaches. Now, because 95 percent of the industries have pollution controls and there are seven new wastewater treatment plants, the water is clean enough to support small-mouth bass, bluegills, and bullhead.

**The Pemigewasset River** (N.H.), which runs through an important recreation area, was so polluted by the mid-sixties that few fish could survive in it and it was spurned by tourists. It was discolored, ugly, and gave off a terrible stench. Now with pollution controls both on industries and municipalities, 55 miles of the river are suitable for both fishing and swimming. The river is now the centerpiece of a successful vacation area.

**The Stevens Branch of the Winooski River** (Vt.) suffered from a fine granite powder that gave it a milky color. This powder, discharged by the granite and gravel industries, caused gill scour in fish and smothered their spawning beds. The various abrasives used by these industries also contributed to the problem. Now, both these industries are using an inexpensive treatment method that results in zero discharge to the river. The river, once suitable at points only for industrial use, is now suitable for swimming and other water-contact sports.

**Along the Kenduskeag Stream and the Penobscot River** (Maine) into which it empties, Atlantic salmon had, by 1947, virtually disappeared due to the discharges from seven pulp mills and from numerous

towns and cities along the Penobscot. With substantial control of all these pollution sources, salmon now thrive as far up the Penobscot and the Kenduskeag as the City of Bangor.

**The Mohawk River**, which flows through the heavily industrialized Utica-Rome area, was until recently so polluted that only "rough fish"—carp, bullheads, and suckers—could survive there. Now, with more than 75 percent of the dischargers controlled, more highly sought-after sportfish like large- and smallmouth bass, walleye, perch, sunfish, and even trout, which are highly pollution sensitive, have returned.

**The Hackensack River** by 1971 was officially declared to be a "highly disturbed and truncated ecosystem" that was "virtually dead." Many of the fish, shellfish, and crustaceans that had thrived in it for thousands of years had, over the span of a mere 40 years, been driven out. The river had become filled with garbage, rusting auto bodies, and industrial oil slicks. After an intensive five-year cleanup effort, the Hackensack Meadowlands Development Commission was able to report in 1976 that the river was coming back to life. Ribbed mussels have been introduced into its waters and have survived. Blue claw crabs are back in abundance. Waterfowl and shore and wading birds now frequent its banks, and stripers, alewife, and herring are turning up in fishermen's nets again.

**The Smyrna, St. Jones and Mispillion Rivers and Silver Lake** (Del.). These waters are all located in Kent County, Del. Construction of a regional wastewater treatment plant has dramatically improved water quality in all three rivers and has reduced considerably the rate of eutrophication of Silver Lake in the City of Dover.

**The Wisconsin River** (Wis.). The Wisconsin River's condition in the late 1960's was very grave due to the combined impacts of suspended solids and oxygen-demanding wastes from both municipal and industrial dischargers. The most critical industrial dischargers were pulp and paper mills. The river's quality had not markedly improved by 1975, although the rate of oxygen-consuming discharge had been lowered to 200,000 pounds per day. By mid-1976 the levels had dropped to 35,000 pounds and definite improvement was

discernable. Nevertheless, the State Department of Natural Resources now estimates that critical low flows in the Wausau segment might require a reduction of point source discharges to 4,000 or 5,000 pounds per day. This premise has not, however, been tested by an actual low flow, and it is suspected that even more stringent loading requirements may be necessary to obtain the planned objectives.

**Wilson's Creek** (Mo.), runs through Battlefield National Park, a popular outdoor recreation area. Until early 1978, municipal wastes from the City of Springfield caused such severe pollution of the creek that it was dark in color, gave off an offensive odor, and was unable to support any aquatic life. In 1978, however, an advanced wastewater treat-

ment plant was put into operation in Springfield. Within months the stream had a clear sparkling appearance with no odor and was providing support for at least two species of fish—carp and catfish—as well as such other wildlife as turtles, muskrat, and wild ducks. None of the park's employees had ever seen any of these animals along the stream prior to the opening of the treatment plant; they are impressed by the extent of the changes they have been witnessing and by the suddenness with which the transformation has occurred.

## Southern Rivers

**The Pearl River** (Miss., La.), which forms the lower boundary between Louisiana and Mississippi and into which Bogue Lusa Creek flows,

## Innovative Technology: Finding Something Better

**Muskegon County** (Mich.), adopted a form of alternative wastewater treatment to solve its worsening water pollution problems.

Near the end of the 1960's, each of the many independent communities in the county were trying to deal separately with their own municipal and industrial wastewaters in small, over-burdened treatment facilities. Several of the main industries and principal communities were still discharging inadequately treated wastewater directly into the county's lakes.

As a result, the three main

recreational lakes were becoming severely polluted. The specific problems encountered included severe algal blooms, encroaching weeds, and periods of foul odor. Swimming and boating were becoming unpleasant and unsafe. Older industries were closing or leaving rather than rebuilding, and new industries and businesses were not coming to replace them.

Muskegon County's solution was first to persuade its many independent communities to agree on a unified approach to the problem—then to develop a common wastewater treatment system. Working with authorities at the State and Federal levels, they designed and built a large scale spray irrigation system that would reliably and safely handle up to 43 million gallons of wastewater per day.

This land treatment system has removed about 98 percent of the oxygen-demanding wastes (BOD), suspended

solids, and phosphorus, and 70 percent of the nitrogen from the 27 million gallons of wastewater treated daily in the county. It is protecting and enhancing the quality of the county's lakes and streams as well as benefiting Lake Michigan. In 1975, the system also used its treated wastewater to irrigate over a quarter million bushels of corn grown on what had been sandy, unproductive soil. The project has served as a keystone in the county's effort to revitalize its economy.

Although the primary purpose of the Muskegon system is wastewater treatment, corn watered with the effluent yielded an average of 60 bushels per acre. That nearly equals the average 65 bushels per acre yielded by Muskegon County's privately owned farms—and the land treatment site has some of the poorest soil in the country. Sale of the corn reduced the cost of treating the wastewater by \$700,000.

**Hawaii.** Frequently, pollutants can be recovered and put to good use. The sugar industry in Hawaii is one example. Until EPA intervened in 1972, five sugar mills on the northeast coast of Hawaii were dumping 4,000 to 5,000 tons-per-day of sugar waste into the Pacific Ocean. Thick sludge banks accumulated on the ocean floor and red plumes of water fanned out in a thin film over the sea. As a result of EPA's enforcement actions, operating permits now require an end to these discharges and a reduction in suspended solids in the mills' effluents. With the addition of control equipment, the mills have achieved substantial compliance. In addition three mills discovered that they could use the wastes as a fuel to generate electricity and are now selling power to the Hawaiian Electric Company. Other companies are using the cane wastewater to reclaim land for cultivation.

was grossly polluted. This pollution was due in great part to wastes flowing in from Bogue Lusa Creek. Dead and dying fish could regularly be found on the Pearl as far as 30 miles downstream from its confluence with Bogue Lusa Creek. But much of the Pearl's problem was coming from other points on the river as well. Municipal wastes from the City of Jackson, Miss., for example, contributed floating sewage and noxious odors.

With the installation of a new treatment plant in Jackson, the floating sewage and the odors are gone. The same kinds of fish now found in Bogue Lusa Creek are also found in the Pearl both below and above the point where the Bogue Lusa joins it, and sea trout are now found in the river's tidal areas.

**Bogue Lusa Creek (La.).** In the early 1960's Bogue Lusa Creek was so grossly polluted that a scuba diver in its waters checking some equipment at a paper company's outfall suffered severe chemical burns. The water was so corrosive that it stripped the paint off a thermometer placed in the creek's water to measure its temperature. The Bogue Lusa shoreline was barren of vegetation and both its shoreline and its waters were devoid of all signs of life.

But beginning in the mid-sixties, public outrage was so great that the paper mills, chemical company, and municipal dischargers contributing to the problem began to clean up their pollution. Bogue Lusa Creek's color has now improved; fish have returned and are now free of the turpentine taste that formerly permeated their flesh. Catfish, bream, and crappies are once again to be found in the creek's waters.

**Sope Creek (Ga.),** a tributary of the Chattahoochee River in Atlanta, had suffered greatly from an explosive surge of suburban development. It had become little more than an open sewer. Abandoned by all pollution-sensitive aquatic life, it was populated only by ugly, highly pollution-tolerant or-

ganisms known as bloodworms. Swimming and fishing in its waters were forbidden.

With adequate treatment of the municipal wastewater that had brought on these problems, Sope Creek improved immediately. Within two months, all the bloodworms had disappeared, the odors were gone, the creek's color had improved, and fishermen were catching bream and largemouth bass along its banks.

**A Mountain River (N.C.).** In the early 1970's the French Broad River in the mountains of western North Carolina was grossly polluted. Many portions reeked with foul odors and ran black under a cover of foam. The cause of the problem was dissolved oxygen levels near zero due to raw sewage from the City of Asheville, together with metal precipitates and industrial salts from the Olin Corporation and the American Enka Company.

The two companies were very responsive to the new cleanup requirements called for in their 1974 discharge permits. After some initial resistance, the city has also been cooperative. The results have been remarkable. The odors and foam are gone and the water's natural color has been returning. Dissolved oxygen levels were improving rapidly and, by 1976, fish had already started to reappear. The only remaining problem is that wet weather causes overflows from the city's treatment works. A planned addition to the treatment works will eliminate this problem as well.

**The Neches River (Tex.).** On the Neches River in southeast Texas, the bass are back after 15 years and as one fisherman reports, they are "scrappy ones, and tasty, too." In 1976, a tarpon was caught in Lake Sabine on the Neches—the first caught there in 30 years. Other aquatic life has been reappearing in the tidal areas of the Neches as well. Shrimp have moved up the Neches in large enough quantities to plug

up industrial water intakes, and commercial crabbers have made money working the river.

**Tar Creek (Okla.).** Tar Creek, a little prairie stream in northeastern Oklahoma, was once a watering place for buffalo. But it became heavily polluted in this century. Its cleanup is now underway and long absent wildlife are beginning to return to its banks.

**Little Deep Fork (Okla.).** Not far to the south, Oklahoma's Little Deep Fork, once a clear stream while flowing to Lake Eufaula, was also running dark and discolored by wastes. A new treatment plant went on line in the town of Bristow in 1975 and the waters of the stream are once again clear and free of odor.

## Smaller Lakes

**Annabessacook Lake (Maine).** Prior to 1972, Annabessacook Lake was one of the four most polluted lakes in Maine. Algal blooms lasted 70 days a year, and it was rare for a person looking into the lake to be able to see more than three feet below its surface.

The main problem was inadequately treated wastewater from two towns and two woolen mills.

The solution adopted was to collect the wastewater from these four sources and transport it to a secondary treatment plant in Augusta, on the Kennebec River. Once treated there, the additional wastewater would have minimal impact on the river, and would greatly reduce pollution into the lake.

Although problems remain, Annabessacook Lake is substantially improved. By 1976, algal blooms lasted no more than 15 days per year, and it was possible to see 15 feet below the lake's surface. Work is now underway—aided by an EPA grant—to control runoff from the remaining non-point sources of pollution. These sources are primarily the dairy

and poultry farms in the lake's watershed.

**Lake Minnetonka (Minn.).** Lake Minnetonka is Minnesota's tenth largest lake and, due to its location only 15 miles west of Minneapolis, is heavily used for all forms of water-oriented recreation.

By the early 1960's however, the lake's quality had become unacceptable. Green scum and weeds were abundant; several fish kills had occurred; and many species of bottom organisms important in the food web—snails among them—had disappeared. Weeds and algae were thriving and consuming the dissolved oxygen necessary for fish to survive.

The problems were due primarily to the inability of the lake to absorb the effluent even from the secondary treatment plants that surrounded it. The solution was to transport the sewage to a new regional treatment plant on the Minnesota River, which could better accommodate the secondary effluent. By 1976, four years after the diversion, nutrient levels were dropping and surface algae were disappearing.

**Lake Hamilton and Lake Catherine (Ark.).** Hot Springs, Ark., has long been noted as a vacation area. But by the early 1970's, residents began to be distressed over the pollution of nearby Lake Hamilton and Lake Catherine. Raw sewage discharges were causing odor problems and presented a potential health problem that endangered the recreation industry, which is the lifeblood of the Hot Springs area.

The problem was due primarily to inadequate municipal wastewater treatment facilities, but septic tank overflows also played a major role.

Improvements to the treatment facilities are partially completed—others are still underway. But the water quality in the two lakes has already improved and the

*Continued on page 25*

# Other Cases

**Abandoned Car Project (Ky.).** Eastern Kentucky earned the nickname "Detroit's Graveyard" because of the large number of abandoned vehicles in the area. Kentucky's Department of Natural Resources and Environmental Protection set out with trucks equipped with a winch and loading ramp to haul in the abandoned vehicles and recycle them. The State agency relied on local service organizations to arrange for vehicles to be brought to a central collection point in each county. In a year-long demonstration project funded by the State and EPA, a total of 5,045 cars was collected. The State has since continued the effort, with some minor changes.

**Chattanooga (Tenn.).** Municipal officials believed 150,000 gallons of oil and sludge in tanks contaminated with pesticide posed a threat to the city's water supply. They feared that the tanks, left behind by the National Waste Oil Company when it filed for bankruptcy in 1978, would spill over during heavy rains. If such a spill were to occur, Chattanooga's municipal water supply would have been contaminated. The State, with technical support from EPA, filed charges, and the owner cleaned up the site, eliminating a major threat to the city's drinking water supply.

**Detroit (Mich.).** The expansion plans of the Marblehead Lime Company were threatened when the Wayne County Health Department Air Pollution Control Division found itself unable to issue a building permit. The problem was that a kiln the company wanted to purchase and convert was located in the city of Detroit in a heavily polluted area and would add an additional 91.2

tons of dust per year to the air where air quality standards were already seriously violated. Marblehead could get permission only if it found a way to offset the additional pollution it would cause. It finally came up with a plan to do so. By improving collection efficiency at an existing Marblehead plant and resurfacing nearly one mile of roadway owned by another company, the company would reduce emissions to the area's air by more than 144.7 tons a year. This would more than offset the emissions of the converted kiln. As a result of the actions to be taken, air quality would actually improve. The settlement also means an increased tax base for a beneficial impact on the balance of trade since lime previously had to be imported from Canada.

**Camp Grayling (Mich.).** The National Guard base here was aware that some local real estate agents were selling property bordering the base, which contained a tank firing range. It was also known that prospective buyers had no way to judge the noise level emitting from the range. The Guard contacted noise program staff in EPA's Region 5, who after conducting tests, prepared a report showing actual noise measurements at specific locations and providing a formula for predicting levels at any distance. The Guard used the results to relocate the range to reduce the noise levels off the base. Both landowners and prospective buyers are now benefiting from this cooperative venture. Noise levels off the base are lower and prospective home buyers can get the facts about noise conditions.

**Denver (Colo.).** As organic material in municipal garbage decays underground in landfills, methane gas is produced. While methane is a clean fuel, it can also be an explosion hazard when it reaches particular concentrations in enclosed spaces. In the Denver area, four children were seriously burned in 1976 in a flash methane fire at a con-

struction site where they were playing and in 1977 two workmen were killed in a methane explosion while working on a sewer.

In cooperation with the Colorado Department of Health, EPA's Denver regional solid waste office hired a contractor to examine 22 old metro-area landfills. Nineteen were found to be generating sufficient methane to be hazardous. The situation was complicated further by the fact that many of the former landfill sites have been built on. Schools, churches, shopping centers, and apartment buildings now sit above the former landfills.

With increasing recognition of the potential problem, local, State, and Federal agencies organized the Intergovernmental Methane Task Force to collect and disseminate the most up-to-date information to builders, developers, communities, and governments.

In March, 1979, more than 200 participants from 29 States, Australia, and Canada met in Denver to share information on the problems and promise of methane . . . promise, because methane can be used as fuel. In fact, a Department of Energy study is now underway to establish the feasibility of "piping" seven landfills together and collecting the gas.

Additional sites are now set for examination and policies are being developed to guide further public protection measures.

**HCN Cylinders: (New Jersey).** During the 1950's and 1960's, the American Cyanamid Company filled and distributed cylinders with liquid hydrocyanic acid (HCN), a fumigant used widely in the grain industry to control insects and rodents. Some 100 of the old cylinders are unaccounted for, causing safety concerns. The chemicals become unstable as the cylinders age, and if moved, the containers might explode. In cooperation with

EPA, American Cyanamid, headquartered in New Jersey, has worked out a new, protective procedure for disposal, using techniques that reduce the threat of danger of explosion as the cylinders are found. Another New Jersey chemical company, as a result of the American Cyanamid experience, has also cooperated in a similar effort.

**Portland (Ore.).** Vehicle inspection and maintenance programs were shown to be effective in reducing two major urban air pollutants—hydrocarbons and carbon monoxide—by a major EPA study conducted in Portland. The cars in the study which required repair generally only needed minor tune-up work to pass State inspection. And while the average cost of repair for cars requiring it was \$29.47, for half these cars the cost was \$14 or less.

**Tussock Moth Outbreaks (Pacific Northwest).** The U.S. Department of Agriculture has developed new techniques to control tussock moth outbreaks in the Douglas fir forests of the Pacific Northwest. The USDA research program was triggered by EPA's cancellation in 1972 of most uses of the pesticide DDT. In 1974 the timber industry sought an emergency exemption to allow continued use of DDT in controlling tussock moths. EPA granted the exemption on the condition that a comprehensive research program be undertaken to find alternatives to DDT. By 1978, acceptable alternatives had been developed. Outbreaks of the moths can now be detected before they reach epidemic proportions so that immediate corrective action can be taken on a localized basis. The USDA has also developed methods using Tussock moth-killing bacteria and a new chemical pesticide as alternatives to DDT. Meanwhile, new integrated pest management techniques are thought to be within reach. As a result millions of board feet of valuable timber are being protected at less hazard to the environment. □

remaining problems should be eliminated once all the planned facilities are placed in operation.

## Bays and Harbors

**E**scambia Bay, Pensacola Bay, and East Bay (Fla.). Before nearby industrialization and heavy development, these three large, interconnected bays supported a rich variety of marine life including speckled trout, oysters, shrimp, and even porpoises. There were important commercial oyster and shrimp fisheries. The clean sandy bottoms and clear blue waters also made it pleasant to wade and swim, attracting thousands of tourists each year.

Then, by the late 1960's and early 1970's, the condition of the complex of bays had deteriorated so rapidly that they appeared to be polluted beyond hope of recovery. The oysters and speckled trout were gone—and so were the porpoises. Commercial shrimp landings were down 99 per cent. Those brave enough to wade into the water trudged around in sludge and, if they stayed in too long, were in danger of developing a skin eruption. Furthermore, the entire 140 square mile estuary was in an advanced state of eutrophication, and fish kills were rampant, especially among the gulf menhaden, a small fish of considerable commercial importance. The biggest kill, which occurred in September, 1971, was so large that it had to be measured in miles of dead fish.

The principal polluters were industries that had grown rapidly in the 1950's. Among them were plants producing fertilizer, alcohol, ammonia, polyvinyl chloride, and nylon fiber. Inadequately treated municipal wastewater also played a major role, as did thermal pollution from a manufacturing plant and a power plant. Furthermore, tidal cir-

ulation was impeded by a dense barrier of pilings from a railway bridge.

With stringent pollution control efforts and the removal of unneeded bridge pilings, the system of bays was, by 1976, well on the way to a substantial recovery. Shrimp, oysters, and menhaden were all returning to the estuary's waters. Although fish kills still occur, they are much less frequent or severe, and planned pollution controls are expected to eliminate them completely.

**Kodiak Harbor** (Alaska). Since 1967, the residents of Kodiak had complained of foul odors, which were due to wastes from the town's 15 seafood processing plants. Untreated wastes, including decomposed fish and shellfish, were dumped under the docks and into the inner harbor. As a result, dissolved oxygen levels dropped to about 6 to 10 per cent of normal. These low dissolved oxygen levels cannot support a healthy community of marine organisms. Furthermore, 50 acres of harbor bottom were matted over with a black, foul-smelling sludge from which toxic and noxious hydrogen sulfide gas bubbled to the surface.

But since 1973 there has been a drastic reduction in indiscriminate waste disposal by the processors. One company responded to the problem by building a facility to convert solid seafood waste into a dry, packaged protein meal for export as animal feed. Kodiak Harbor should now be meeting all water quality standards.

**Grays Harbor** (Wash.), provides a point of passage for migrating salmon. Dissolved oxygen levels, however, had dropped so low that salmon could no longer survive the passage.

The harbor was suffering water quality problems due to numerous different pollution sources, among them: bacterial contamination from raw sewage overflows, depleted oxygen due to wastes from pulp mills and runoff from log wastes, as well as wastes from cranberry processors and seafood processors. Agricultural

runoff also played a role.

Recent pollution controls have doubled the dissolved oxygen levels, so the salmon can once again pass freely. And plans are underway to control the municipal wastes as well as the other point and non-point sources responsible for much of the remaining problems.

## Waterways Made by People

**T**he Houston Ship Channel (Tex.), was opened in 1913, and in the years immediately thereafter, there were no serious water quality problems. Buffalo Bayou, which winds through the City of Houston and forms the channel's upper reaches, was a lazy little stream notable for its Sunday swimming and canoe races.

But with Houston's growth into the Nation's third largest port and with explosive industrial development along the channel's banks, water quality began to deteriorate. By the early 1970's, EPA called the channel one of the ten most polluted major waterways in the Nation. Since then, significant reductions in discharge levels have been achieved. Oxygen-demanding waste (BOD) discharge levels, which were 400,000 pounds a day in 1970, were expected to have decreased by 90 percent by the end of 1979. The result is the return of dolphins to the lower end of the channel and the return of fish, including tarpon, to within five miles of the turning basin at the upper end.

There is, however, a new worry: heavy concentration of industry along the channel's upper end has led to concern about the possibility of high levels of toxic pollutants.

**Dillon Reservoir** (Colo.), located high on the Continental Divide, was built to supply drinking water to Denver. In

the early 1960's, only 2,000 people were living in its watershed and its water was of very high quality. But the reservoir itself stimulated the growth of a major resort area and by 1972, there were 55,000 housing units built, under construction, or planned. Furthermore, the recreational use rate, measured in visitor days, rose from 43,000 in 1966 to one million in 1976. The possibility of accelerated eutrophication and related harmful impacts on water quality loomed.

By 1976, four of the ten wastewater treatment plants above the reservoir had been upgraded to advanced treatment and four others had been phased out. These reductions in pollution from point sources helped, and will continue to help, maintain high water quality in the reservoir. Constant vigilance will be needed to protect the quality since the reservoir remains susceptible to accelerated eutrophication that could be fueled by increasing growth pressures in the immediate and surrounding area.

## Preserving the Wetlands

**T**he Tulalip Landfill (Wash.). Until last year, 5,000 tons per week of Seattle solid waste was disposed of in a large dump on the Tulalip Indian Reservation. The dump, located on vulnerable wetlands adjacent to Puget Sound, posed a significant threat to the fisheries and wildlife resources of the entire Sound and endangered the quality of nearby waters used by water-skiers, boaters, and scuba divers.

Legal complications arose because the Tulalip Reservation does not fall within the jurisdiction of State or local authorities. So EPA itself had to intervene, finally obtaining a consent decree requiring closure of the dump by April of 1979. The fragile ecosystem of the Puget Sound wetlands is now safe from these hazards to which it was too long exposed.

# The New Decade 1980's

The 1970's were a decade  
of historic environmental  
achievement.  
How will the 1980's compare?  
EPA Journal has asked  
that question of a wide spectrum  
of leaders who are concerned  
about the environment.

Here are their answers:

## Rene Dubos

*Professor Emeritus  
Rockefeller University  
Pulitzer Prize-winning author  
on environmental subjects*

“My belief is that the right to a good environment is now taken for granted by the immense majority of the population. Because of that it seems to me that people will not accept some of the conditions that they took for granted only ten years ago. They will not accept the amount of soot and sulfur dioxide that was in the air of New York City only 10 to 15 years ago. They will not accept the amount of garbage that there was in the Hudson River or Jamaica Bay.

Even if the controls over environmental pollution are relaxed, I think the present gains will be maintained. Moreover, some of the labor organizations are beginning to demand that environmental quality be maintained within the factories, which means that there will be if anything a further improvement in the places of work.

What I'm not so sure of is whether people will develop sufficient concern for the esthetic aspects of the environment. So my conclusion would be that there will not be a loss of environmental quality with regard to pollution, but I only can express hope that the concern for environmental quality will extend to its esthetic aspects.”

## U.S. Senator

### Edmund S. Muskie

*Chairman, Subcommittee on  
Environmental Pollution*

“Near the beginning of the last decade, I said in a speech that America was awakening to a new age. I said it would be an age when we in America finally realize that our world is not a cornucopia. There would be limits to resources, limits to air, water, and land, limits to the ability to sustain human life.

Going into the 1980's, these limits will surely not expand and the quality of our environ-

ment will still depend on how we respond to pressures that will come from those who would bypass environmental law in the name of energy and emasculate important regulations in the guise of cutting red tape.

The beginning of a new year, or a new decade, does not necessarily change the status of our environment or what we must do as a Nation to maintain its quality. But the 1980's will present us with a new environmental challenge. We made tremendous progress in the 1970's with the enactment of the Clean Water Act, the Clean Air Act, the Toxic Substances Control Act, the National Environmental Policy Act, the Safe Drinking Water Act, and many other landmark pieces of legislation. But our environment in the 1980's will be best served if we take on the challenge of implementing the legislative victories that we have already achieved.”

## Philip Caldwell

*President, Ford Motor Company*

“The outlook for the environment is very promising for the decade of the eighties because we now know that it is possible to reverse environmental damage. Much has been done to make our air and water clearer and cleaner. We have a better understanding of the roles our forests and wetlands play in the maintenance of our ecosystems. The American people will demand that environmental considerations continue to be weighed in our future economic expansion.

To facilitate weighing these considerations, we are developing more effective systems for measuring both the costs and the benefits of alternative plans for controlling pollutants. The task ahead is to maintain the country's economic health as we improve the environment. That task requires achieving an optimum balance among public health needs, environmental considerations, energy objectives, and economic goals. Making such judgments is never easy, but I am convinced we are learning to make them more effectively.”

## Janet Welsh Brown

*Executive Director  
Environmental Defense Fund*

“Things are likely to get worse before they get better, but they will get better in the 1980's. Steady pressure in the name of energy development and inflation control will continue in the early 1980's to roll back some standards protecting the environment. We will see further selective erosion of laws and degradation of the environment. In some cases this will be steady and incremental—as in the increase in acid rain and carbon dioxide—and in others the damage will be dramatic and irreversible—as in the destruction of land and contamination of water associated with huge strip mining and synfuel ventures, okayed for the “fast track” by the Energy Mobilization Board.

But public awareness of the health, environmental, and economic costs of misusing our air and water and land will not diminish. It will continue the phenomenal growth it had in the 1970's. As more and more citizens—and their elected officials—increase their understanding of the relationship between the environment and human welfare, as the cost of degradation becomes clearer, as people realize that synfuels are not filling their gas tanks while renewable resources take on their share of the job, then we will see a remarkable and permanent nationwide turn toward environmentally sound solutions to our energy and other resource problems. It will bring by the end of the 1980's a reversal of policies and strategies that now threaten the hard-won gains of the 1970's.”

## Gloria Steinem

*Editor  
Ms. Magazine*

“As Americans who stand largely outside the technological establishment, women may be better able to see the cost to this country and this Earth of the drive toward the technological profiteering of the powerful few.

As the majority of com-

munity leaders, we are also more likely to support populist concerns within the environmental movement, instead of the more elitist concerns that are important but have limited appeal.

For both these reasons of an outsider's clarity of vision plus inside community involvement, I believe that the women's movement and the environmental movement will and must become more synonymous in the 1980's. Women have always been the troops of environmental work, but have tended to be displaced when salaries, organizations, and hierarchy have been introduced.

In the 1980's, women will be in the leadership as well as in the ranks of environmental preservation.”

## Cecil D. Andrus

*Secretary of the Interior*

“The next decade presents a stern test for those who care deeply about environmental values. The American public has signalled many times that it is seriously concerned about our environment and is willing to pay for its cleanup and protection. But we must understand that no one can sign a blank check for open-ended costs. Our national economy and our resilient political system have their limits too. As we struggle to break free of over-dependence on OPEC oil, and try at the same time to maintain high living standards and control inflation, we face growing internal pressures. Public impatience with seemingly endless delays based on environmental purity could lead to a bitter backlash from voters who need jobs and understandably want to proceed toward energy independence. Environmentalists must learn to forego the dubious battles for lost causes, and concentrate instead on the big opportunities to win new ground and defend gains already won. Development and technology can co-exist with a clean environment and in fact can help achieve one, if we are wise enough to strike the right balances. Man and his natural

surroundings are fated to live together in tension, not perfect timeless harmony. Let us make that tension creative and turn it to worthwhile ends.

### Frank Wallick

*Co-Chairperson  
Urban Environment Conference  
Editor, United Auto Workers  
Washington Report*

“There are setbacks—but on balance I think the environmental movement is making great strides to clean up and making us all aware of the air where we live and work. I hope the old-line environmentalists will increasingly realize that the worst, most polluted environment is where millions of men and women work. This clean-up of the work place will take the skills and insights of the best environmentalists among us.”

### Vernon E. Jordan, Jr.

*President  
National Urban League*

“Environmentalism in the 1980's will have to become increasingly involved with the needs of people living in urban areas. This is where the majority of Americans are located and where environmental problems pose the greatest danger to health and well-being. And the urban environment has to be seen as more than air or water quality, for it also embraces economic and housing opportunities as well. These latter two elements cannot be viewed as unconnected to environmental issues in the 1980's as they have been in the 1970's, if our cities are to be made livable for all our citizens.”

### William G. Milliken

*Governor of Michigan*

“The environment will fare well in the 1980's because environmental consciousness has been firmly established in governmental decision-making processes. The National Environmental Policy Act, the Endangered Species Act, and Clean Air and Clean Water Acts are examples of actions which require consideration of the impacts of

our decisions on our natural world.

Perhaps one of our greatest challenges in the upcoming decade will be to reconcile the need to move toward energy independence with the need to protect our ecosystem.

Those of us who are conservation minded must be diligent in our efforts to assure that we do not retreat from the progress we have made, for our children—and theirs—share a right to the bounties of the Earth that is equal to our own.”

### Lloyd McBride

*President  
United Steelworkers of America*

“The easy answer is that we will see slow but steady progress in cleaning up the environment during the 1980's. The more significant answer, though, is that we are probably at a crossroad right now that will determine whether the progress will be far slower and far less steady than it ought to be. For the most part the laws we need for environmental controls in the workplace and in the general environment are on the books. What remains to be seen is if we have the political resolve to enforce those laws both by retro-fitting existing pollution sources and by assuring that future economic, industrial, and energy development be carried out in an environmentally sound manner.

I fear that our national will to do so is very close to being weakened. Politically attractive calls for regulatory “reform” threaten to beguile us into regulatory paralysis, and energy programs may needlessly be allowed to stampede over substantive environmental safeguards. While regulatory programs are often claimed to be impediments to economic and energy solutions, those problems require far more basic and structural solutions than tinkering with or even removing regulatory programs.

A loss of our environmental will would indeed be shortsighted. It would mean more health suffering and other social costs that accompany pollution; it would increase the

costs of controls that ultimately will have to be imposed; and it would continue mismanagement of our depletable resources. We have the tools to make the 1980's a decade of solid environmental progress. It only remains to be seen whether we will be forward thinking enough to use them.”

### Maggie Kuhn

*National Convenor  
Gray Panthers*

“I am optimistic about the health of the environment in the future, if we utilize our resources and energies to look to new solutions. Personal problems and needs cannot be dealt with without fundamental social, economic, and political change.

In a modern society of competing, conflicting special interests and aggregates of power, mediating forces must be found and utilized. Alternatives must be found and made legitimate.

We should press for alternative sources of energy, safe decentralized sources such as solar systems, windmills whirling in backyards, solar greenhouses on every house. These could supply our energy, a path endorsed by 94 percent of the American people according to a recent Harris Poll.

I rejoice in the new interest in neighborhoods. The neighborhood can indeed be a mediating, highly unifying force in the reordering of our national life and the survival and revival of urban places.

The pollution created by oil refineries, the poisoning of land and water by varied chemical wastes, must be exposed.

We can take the first step forward by being responsible critics of what we are now doing, by supporting and building alternatives, and by creating support groups. Coalitions with environmentalists and safe energy groups are essential for survival. We should be alert to the environmental dangers to our physical health and well being. We are the best possible stewards and protectors of the environment.”

### S. David Freeman

*Chairman, Board of Directors,  
Tennessee Valley Authority*

“America woke up in the 1970's to the realization that its life-sustaining resources were endangered. The challenge for the 1980's is to avoid going back to sleep. We are at a dangerous fork in the road. The energy shortages should reinforce our awareness that all of our resources are finite. Yet there is a nasty backlash in the air, aided by the red tape with which some environmental laws have become encumbered. The challenge for the 1980's is to advance environmental protection, especially the protection of our land—a job that has hardly been initiated. The prospects are by no means bleak if we focus on substance.”

### Esther Peterson

*Special Assistant to the  
President for Consumer Affairs*

“A fresh breeze is blowing that bodes well for the 1980's. Not only can we understand that statement in its literal sense—our efforts to reduce air pollution are having some effect—but many consumers are thinking “environment” as they evaluate what they buy. Assuming this trend goes on, we can expect less noise around the home, more small cars and bicycles on roadways, fewer broken bottles and torn plastic packages in our landfills and on our streets.

As the media now animatedly share news and documentaries on environmental traumas such as oil slicks, toxic chemical seepages into backyards and drinking water, so we can expect the media to build such concerns into their television dramas, talk shows, and syndicated columns during the next decade. Affected consumers, themselves, will probably become major media focuses. The viewers/readers will be that much more motivated to act in the interest of their survival, their health, and the ultimate cost that society would incur from not protecting our environment.

The consumer movement may well help our 1980's environment by taking advantage of the economic benefits in

returnable containers and recycled products. The more consumers support such choices, the more employment will be generated by environmentally "healthy" business. "

### U.S. Representative Bob Eckhardt

*Chairman  
House Commerce  
Subcommittee on  
Oversight and Investigations*

" I am concerned about the Administration's absorption with the intermediate situation concerning energy production problems in the environment and its failure to first address the immediate problems and then most seriously consider the long term problems. The most counterproductive program with respect to both inflation and the long term problem of environment is a crash program of producing synthetic fuels.

Also, Congress and the Presidency have caught the deregulation fever. The failure to establish standards of control and restraint has already sowed mine beds of hazardous waste and the relaxation of air quality standards now threatens to make of the Earth a poisoned hothouse where life is at best uncomfortable and at worst unbearable. Too much attention has been given to the unpredictable intermediate future and not enough to the observable present and predictable final result of a failure to plan and regulate intelligently. "

### Gus Speth

*Chairman, President's Council  
on Environmental Quality*

" I am confident that the 1980's will see a continuation of the progress we have made during the past decade in protecting our environment and natural resources. Despite our short term economic and energy problems, the basic commitment of the American people to a clean, safe, and healthy environment remains strong. Americans want their cities to be free of air pollution, trash, and noise. They want natural areas nearby where they can

fish and hunt and hike. They want to be able to work and play without worrying about ill effects from toxic chemicals or nuclear power plants. More than ever before, the American people appreciate that this is the only planet we have, and that we must walk softly on it. "

### Anthony Wayne Smith

*President, National Parks and  
Conservation Association*

" The state of the environment today is notoriously poor, and the prospects for improvement are dim. The plunge toward coal and nuclear power is dangerous; we should move into the oil to natural gas to methane and hydrogen sequence in the pipelines for cities, industries, and power plants; we should go from gasoline to gasohol to alcohol for autos and airplanes; we should go for cogeneration, wind turbines, windmills, and the mass production of photovoltaic cells. We should get urban sprawl under control, partly by focusing Federal programs on urban renovation. We should expand protection for parks, forests, wildlife, rivers, and countryside, and spend the necessary public funds. "

### Ruth C. Clusen

*Assistant Secretary  
for Environment  
U.S. Department of Energy*

" The state of America's energy supply and the state of her environment will be bound even more closely in the 1980's than ever before. National policy calls for using more and more coal in place of oil while the development of alternative energy sources continues. Coal is dirty, but plentiful. Feasible but expensive environmental control technologies will have to be used in direct and indirect coal burning. Conservation will provide a bridge over the economic maelstrom until renewable energy sources are able to power the United States. Environmentalists will have to take a more moderate role if they

want the gains of the sixties and seventies to last. Environmental groups should continue actions in Congress, in statehouses, in courthouses, and city halls to protect existing environmental laws; get their priorities in order so that the more critical issues will receive major attention; make a better case for the economic advantages of conservation and environmental protection. The environmental ethic is established firmly in the American consciousness, and what will be needed is a more responsible partnership between decision-makers and activists to permit us to cope with the energy crisis without environmental degradation. "

### James H. Evans

*Chairman  
Environmental Task Force  
The Business Roundtable  
and Chairman  
Union Pacific Corporation*

" In the sixties we recognized that our air and water resources are finite. In the seventies Congress passed a series of laws and EPA issued regulations to protect and enhance our national environmental resources. By the end of the seventies, we learned that there are technical and financial limits to our ability to achieve absolute environmental goals. We also learned that some environmental strategies can pose obstacles to the achievement of other, equally important, national goals.

In the 1980's Congress and EPA should continue to reassess existing environmental priorities and programs. Environmental goals determined to be ineffective should be modified to make resources available for more efficient environmental programs.

A critical reevaluation of existing and new regulations should emphasize the scientific and technical justification for each control strategy and explore cost-effective comparisons of alternative environmental programs.

During the 1980's we should strive to select balanced environmental strategies and goals which permit achievement of the Nation's economic

and energy goals, while at the same time continuing to enjoy an improving level of environmental quality. "

### Jack Lorenz

*Executive Director  
Izaak Walton League of America*

" The environment is not likely to improve in the 1980's. It is possible that we will lose some of the ground gained in the 1970's.

Key factors are pressure for rapid energy development, a faltering economy, unstable political conditions in energy-rich Third World nations, growing resistance to environmental regulation, and public dissatisfaction with the Federal Government.

These conditions are working together to force the environmental community to establish strategies that will hold the line on the progress of the past decade.

New proposals will and should come forth, but they must be built on those that preceded them. Retention of that foundation will be our greatest challenge. "

### Ruth J. Hinerfeld

*President, League of  
Women Voters of the U.S.*

" With each passing day the public has grown more aware that our natural resources are very limited. And with this realization comes the acceptance that the 1980's will require continued efforts to abate pollution, deal with hazardous wastes, preserve farmlands, encourage wise land use, and influence other major environmental decisions.

A personal environmental ethic has evolved—one which we believe will flourish in the 1980's if nurtured. People no longer talk about energy and environmental conservation in the abstract—they practice it. They recycle solid waste, conserve energy, and do their part to help save our resources.

The public has become increasingly aware of the danger of assuming that major problems we face in coping with high inflation, energy needs, limited food supplies, and other

areas can be easily solved at the expense of the environment.

Society will always face conflicting values and needs. But citizens have begun to realize that we must be on guard lest environmental protections be sacrificed in the rush to confront complex national and international problems.

The issues of the 1980's will include: preserving American farmland to insure adequate food supplies; coming to grips with the impact of various forms of energy development; learning much more about hazardous materials; focusing on the impact of diffuse sources of pollution from urban and rural areas on water quality; dealing with the acid precipitation issue.

We have learned through experience that protecting the environment is a dynamic process and citizens must continue to play a role in this vital effort. ”

### U.S. Representative Toby Moffett

*Chairman of the Environment, Energy, and Natural Resources Subcommittee*

“ Industry's neglect of environmental dangers will surely haunt us more and more in the 1980's. It is conceivable that the energy shortage of today could be the clean water shortage of the 1980's. New and different distinctions must be made in mapping out energy-environmental policy: How can our existing energy supplies be used more efficiently? What costs are being displaced to the consumer? What hidden, deferred costs are involved in a particular energy source or process? In our drive to produce more energy from depletable resources, we too easily ignore the cleaner, safer, renewable energy sources. The frightening irony is that we are sacrificing strong environmental protection precisely when the risks are highest . . . and when better alternatives are available. ”

### Russell Peterson *President National Audubon Society*

“ The environmental deterioration of the past century is largely energy related. The digging and burning of coal, the transporting and burning of oil, and the indiscriminate cutting and burning of trees, have had a devastating impact on our life-support systems.

The end of the petroleum era is fast approaching. Now is the time to dedicate ourselves to using our remaining fossil fuels more efficiently, while developing renewable solar resources that will provide future generations with safe, clean, endless energy.

This dual approach—more efficient use of energy and development of solar energy—provides an environmentally sound path into the future. Success in this venture will permit us to make the nuclear fission period a brief one and thereby minimize the threats to life currently accumulating from this alternate energy path. ”

### U.S. Representative Joseph L. Fisher *Co-Chairman, Environmental Study Conference*

“ The 1980's will see continuing pressure on the natural environment, both urban and rural. But the pressure may diminish somewhat with slower population and economic growth and if progress toward cleaner air, water, and industrial products mandated by laws passed in the late 1960's and the 1970's can be maintained. In the early part of the 1980's a strategic retreat on a few fronts may be necessary to enable the speedy laundering of a synthetic fuels program and an acceleration of investment generally. The best energy bets for the 1980's are conservation, solar applications, as well as research and development, renewable sources, and, at least a few new, environmentally sound, big ticket items. One hopes that the environmental movement has come of age and that the American people will expect and be willing to pay for a cleaner, healthier, safer environment in the 1980's and beyond. ”

### David R. Brower *Chairman of the Board Friends of the Earth*

“ The 1980's will be the either/or decade. We could choose the soft energy path, a concept invented by Amory Lovins. It can lead to a recovery of the senses. It is a world energy strategy for attaining a sustainable global society fueled by renewable energy, phasing out the use of fossil fuels in half a century, and requiring no nuclear energy at all. It minimizes the need for costly electricity, for hard to get capital, for vulnerable overcentralization, and for waste. It matches the energy needed with the most logical source.

Or we could choose the hard path which is just the opposite. Mr. Lovins has made clear the many reasons for choosing without further delay the soft path.

Many individuals and some corporations are already making that choice. By concentrating on energy productivity and conservation, they have made available, in the last five years, two and one half times as much new energy supply as has been provided by alternative hard path routes, including energy imports.

The Congress and the Administration have been slow to perceive the importance of the soft path. They are rushing down the hard path seeking strength through exhaustion, providing energy for a brief America.

A swift change in course, profiting from the soft path energy studies here and abroad, can vastly improve the world's chance to enhance equity, create jobs, reduce the triple threats of inflation, acid rain, and nuclear proliferation, and preserve irreplaceable resources inanimate and living. ”

### Michael McCloskey *Executive Director The Sierra Club*

“ The shape of environmental work in the 1980's will be forged by the course of arguments over the scarcity of high-grade resources. The depletion of oil, in particular, will fuel high rates

of inflation and economic instability. The high cost of exploiting low-grade resources will produce two sets of quite different pressures on the environment: severe pressures on one hand to improve productivity by trying to cut environmental investments and less consumption and throughput of raw materials on the other hand. Thus, the economics of scarcity may push us towards becoming a "conservative society" because we can not afford conspicuous consumption anymore. But there will also be loud voices claiming that we can not afford to install new pollution control devices. One can hope that slower growth in pollution will offset growing resistance to pollution controls. ”

### M. Rupert Cutler *Assistant Secretary for Natural Resources and Environment Department of Agriculture*

“ The people of America know full well that environmental protection cannot be sacrificed if we are to remain a thriving, productive Nation.

Farmers, ranchers, and urban dwellers realize that the quantity and quality of water, soil, forests, and other natural resources must not be degraded.

People will not tolerate further pollution that is hazardous to their health.

There are many other benefits from environmental protection, but those which have economic and health values will serve as substantial bulwarks against emerging pressures to gouge our natural resources and lower standards against pollution.

We must dedicate ourselves to carrying out the people's will. ”

### Allan Grant *President, American Farm Bureau Federation*

“ We have reached a cross-roads in environmental regulation. Adequate laws are now on the books to assure protection of the air, water, and land. However, these laws will survive Congressional oversight only if EPA imple-

ments them reasonably, responsibly, and within clearly defined boundaries of scientific knowledge. The day is past when EPA will be allowed to initiate regulatory action in response to unsubstantiated demands.

Implementation and enforcement of environmental regulations will have to be in harmony with intelligent economic growth and development so that environmental decisions show a dedication to the greatest good for the greatest number in our overall society.

Without a healthy economy, and the resultant employment opportunities, industrial expansion, and reasonable profits, the country will be unable to achieve any of its long-term financial objectives, be they environmental enhancement, social security, or national defense.

### Denis Hayes

*Director, Solar Energy Research Institute*

“The 1980's promise to be a decade of transition during which energy-related environmental problems will call urgently for resolution. Wisdom dictates an energy economy resembling a climax forest ecosystem in which energy is allocated in efficient, sustainable patterns. Solar and other renewable energy sources, with their benign environmental impact, offer us an opportunity to move toward such an economy. Shortsighted fixes would carry dire and perhaps irreversible consequences for the environment. This is a time for us to take the longer view and accelerate our switch to renewable energy.”

### Thomas Ehrlich

*Director, U.S. International Development Cooperation Agency*

“The outlook is positive. The developing countries of the world have changed their perception of environmental concerns dramatically since the Stockholm Conference in 1972. Most now see the necessity of environmentally-sound development and the pursuit of programs to restore or protect the natural resource base on

which future development depends.

The problems and priorities of desertification, water management, deforestation, habitat, species loss, and environmental education are gaining widespread recognition. Several developing nations have established ministries of the environment; others are learning more about the extent of their problems.”

### Thomas L. Kimball

*Executive Vice President National Wildlife Federation*

“Emphasis in the 1980's will center upon energy shortages and economic shortcomings, with environmentalists being hard pressed to hold gains recorded in the past decade. Our studies indicate that the qualities of our air, water, soil, forests, minerals, wildlife, and living space resources are either deteriorating or barely holding steady. Unless the Nation adopts a conservation ethic particularly in light of our expanding human population with its increasing needs, we are not optimistic about the state of the environment for the future. Such an ethic will require that we adopt simpler life styles, doing more with less.”

### Gray Jacobik

*Project Coordinator Year of the Coast*

“The fact that a new public education campaign that will involve hundreds of thousands of people has recently been launched, and that this campaign—“1980: Year of the Coast”—brings together the support of fishermen, sports and recreation users of the coast, and labor and urban groups as well as the environmental community, is a good indication that environmental issues will continue to have high visibility during the 1980's.

Environmental organizations are still quite strong at all levels: local, State, and national. The Coast Alliance feels that during the 1980's coastal zone issues will be a major concern. Environmental issues regarding the coastal zone have not been

adequately addressed and the full impact of the further degradation of the shoreline in recent years is just beginning to be experienced. Specific concerns such as offshore oil and gas leasing, onshore facilities siting, and coastal water quality will continue to be central. Loss of food-producing land due to dredge and fill operations and the health of fisheries in general due to commercial development as well as overfishing will become an increasing concern to Americans. Pressures are not going to let up on the coast.”

### Dr. David Rall

*Director, National Institute of Environmental Health Sciences and National Toxicology Program*

“Legislative tools now in place, the Toxic Substances Control Act, the Resource Conservation and Recovery Act, etc., were major accomplishments of the 1970's. The need now is to assure that we have the scientific information needed to use these tools most effectively. The Department of Health, Education, and Welfare in establishing the National Toxicology Program, has taken a significant step to coordinate and strengthen the development of this necessary scientific base. The actions we take will be critical for the environment in the 1980's and the 1990's.”

### Dr. Hope S. Dougherty

*National Director of 4H*

“Young people have a major stake in how our Nation faces up to the problems of our environment and energy. Moreover they want a meaningful role in helping to solve these problems as we enter the eighties. To do so they need opportunities to 1) become involved in individual and group projects which contribute to environment, 2) provide initiative and leadership in a wide range of environmental improvement efforts conducted

by local, area, and State environmental organizations and agencies, 3) explore careers and educational opportunities in environmental related fields, and 4) become gainfully employed in furthering the development and maintenance of natural resources. Accordingly a recent national 4H goals document has recommended that the 4H environmental improvement program must have high priority and resources allocation must be commensurate with the need. Conservation and wise use of our energy resources must be the theme of 4H programs and related to all pertinent subject matter areas. These recommendations are currently being implemented in all State 4H programs throughout the Nation.”

### George H. Lawrence

*President, The American Gas Association*

“Increased use of natural and supplemental sources of gas in the future are keys to protecting and enhancing our environment. Gas energy is the cleanest major source of energy available today. Combustion of gas produces generally less air pollutants than combustion of either coal or oil using the best available control technology. The increased use of gas in stationary installations has contributed significantly to the improvement of the Nation's air quality since the 1960's.

New discoveries of domestic gas as well as increased supply from Mexico and Canada and expanding imports should continue to make gas energy the centerpiece of future energy planning. For example, increased use of gas energy during peak pollution periods can make it possible for us to use 30 percent more coal by using just five percent more gas than today and still comply with current air quality standards. Indeed, the selective use of clean gas energy could be the key to overcoming the Nation's current standoff between our national needs to increase coal use while continuing to comply with the Clean Air Act.” □

# State of the Environment: A Fact Sheet

## Air

Nationally, sulfur dioxide is down 17 percent since 1972. Dirt and smoke are down 8 percent. Carbon monoxide is going down at a rate of 7 percent a year.

Overall, the Nation's air quality is improving. Combined data from 25 major metropolitan areas show that the number of unhealthful days declined by 15 percent between 1974 and 1977 while the number of very unhealthy days declined 32 percent.

Nine of the more populous and more polluted areas in this group showed even greater improvement, with a 35 percent reduction in the number of unhealthful days since 1974. These improvements are mainly attributable to a reduction in automobile pollution.

Data from about 50 of the most polluted counties across the country show that violations of ambient air quality standards generally either stayed constant or decreased between 1974 and 1977.

The greatest improvements were made in reducing violations of the carbon monoxide and sulfur dioxide standards. Violations of the primary ambient air quality standard (established to protect human health) for these pollutants declined by 43 percent and 54 percent, respectively, during the 4-year period.

Air pollution has by no means been eliminated. In 1977, the air in 2 of the 41 urban areas for which reliable data were available still registered in the "unhealthful" range for more than two-thirds of the days of the year. These two, the New York and Los Angeles urban areas, together contain almost 8 percent of the Nation's population.

Except where footnoted, these figures are from EPA-sponsored studies or the latest annual report of the President's Council on Environment Quality.

## Water

There were significant improvements in dissolved oxygen levels (the primary indicator of pollution from sewage and other organic matter) in the Northeast, South, and Great Lakes regions of the country from 1971-2 to 1977-8.

Phosphorus levels also improved across the country, especially in the Great Lakes area (where an international agreement with Canada limited phosphorus discharges) and in the Southwest.

For most cities where data go back far enough, analysis shows definite improvement in ambient water quality. For example, a study of coliform bacteria levels in rivers near 24 cities between 1968 and 1976 showed higher levels in only 4, no change in 2, and lower levels

in 18. (Fecal coliform bacteria are a common measure of water pollution.)

EPA has found more than 70 examples of clear-cut improvements in ambient water quality, from Hawaii to Maine, and from Alaska to Texas.

On July 1, 1977, about 50 percent of all major municipal dischargers had achieved secondary treatment; about 80 percent of all major industrial dischargers were using the "best practicable" technology. For industrial discharges alone this means a reduction of from 50 to 80 percent in key pollutants since 1972.

As of September 30, 1979, EPA had made grants of \$24.2 billion to cover the Federal share of 17,000 municipal waste-

water treatment projects. About 11,000 projects, representing \$22.1 billion, are in progress.

In the 6 years from 1973 to 1978, ocean dumping dropped from about 10.9 million tons a year to 8.3 million tons—a 24 percent decrease. This does not include dumping of dredged material. Federal law requires a halt to the dumping of all harmful municipal sewage sludge by the end of 1981.

In October, 1979, EPA set pre-treatment standards to control discharges from the electroplating industry. This industry is the largest single contributor of metal wastes to public sewer lines and treatment plants, accounting for over 70 percent of the cadmium and over one-third of the cyanide known to be discharged.

## Toxics, Pesticides and Radiation

EPA has begun reviewing new chemical substances before they are manufactured for commercial purposes to evaluate any risks which they may present to human health and the environment. The program officially began July 1, 1979.

The Agency has also published the country's first comprehensive inventory of chemicals produced in the U.S. or imported here. This initial listing of chemical names, published June 1, 1979, has 43,278 compounds.

Nearly 400 new chemicals are introduced into the market each year. For the first time, the government will be able to review these substances before their exposure to people or the environment.

EPA's review program, authorized by the Toxic Substances Control Act, requires chemical manufacturers to notify the Agency at least 90

days before they manufacture new substances.

One of the highlights in the pesticides area last year was action by EPA on a new program to encourage the use of a class of pesticides called biologicals. These include bacteria, viruses, and naturally-occurring biochemicals such as insect sex lures. These pesticides work on the target pest by means other than poisoning and generally affect a narrower range of life forms.

The Federal pesticide law authorizes EPA to help promote the development and use of such biologically integrated alternatives for pest control. A number of these agents already have received approval by EPA for either regular or experimental use. These biologicals now comprise less than one percent of the 35,000 pesticide products marketed in the United States.

In the radiation area, Agency scientists early last year monitored radiation levels in the wake of Chinese nuclear testing and found no evidence of radioactive fallout in milk samples taken from EPA's national monitoring network or in air particle samples. Researchers reported no increase in background radiation levels because of the testing. On another front, Administrator Costle warned that some Florida residents may suffer increased risk from cancer due to radioactive gases emitted by phosphate-rich soils under their homes. Last fall EPA sent a team of scientists to assist at the site of the Three Mile Island Nuclear reactor accident. This team has been awarded a gold medal for outstanding performance and dedication in establishing and conducting a comprehensive environmental radiation monitoring program at the Three-Mile Island site.

Noise	Hazardous and Solid Wastes	Economics
<p>In the past decade the number of local noise control ordinances has increased dramatically. In 1972 only 59 municipalities had some type of noise law. By 1977 that number had grown to 1,607. Today, more than 50 percent of the U.S. municipal population lives in localities having some degree of noise legislation.</p> <p>If current regulations controlling noise emissions from aircraft are implemented, and if special take-off procedures are used, the number of adversely affected people is expected to decrease from about 6 million to about 3.6 million by the year 2000, although it then may grow again with increasing air traffic.</p> <p>It is estimated that as many as 20 to 25 million people—about 1 in 10 in the United States—are exposed to noises of duration and intensity sufficient to cause a permanent reduction in their ability to hear. Of these, 10 to 15 million are estimated to be workers exposed to excessive noise on the job.</p> <p>Even now an estimated 13.5 million people in the United States are exposed outdoors to an average noise energy level of 75 decibels or more from transportation or recreation vehicles, a great enough level to cause risk of permanent damage to hearing.</p> <p>In the past two decades there has been a dramatic increase in the number of noise sources. There are more cars, trucks, motorcycles, and other vehicles; there are more office typewriters, houses equipped with air conditioners and labor saving devices, and more industrial plants.</p>	<p>The Love Canal disaster made the hazardous waste problem clear to everyone. An estimated 90 percent of hazardous wastes is being disposed of in ways that do not adequately protect public health or the environment.</p> <p>Working with the States and the Justice Department, EPA has investigated 300 hazardous waste disposal sites; seven major legal actions have been initiated and many more are under preparation. This effort will be substantially expanded during fiscal year 1980.</p> <p>The hazardous waste regulations will be promulgated over the next several months. As rulemaking progresses this initial program will be strengthened and expanded on the basis of information now being developed and assessed.</p> <p>Standards for disposal of other solid wastes on land were issued by EPA in September, 1979. States will use these standards to identify facilities that need to be upgraded or closed because of the adverse effects they might have on health or the environment.</p> <p>EPA grants will aid 63 communities in planning and developing projects to recover materials and energy from municipal solid waste.</p> <p>In addition to high interest and activity in waste-to-energy projects, there has been growth in recycling programs. In 1978, at least 218 cities had programs for separate collection of recyclables; 178 collected newspapers only, the others collected two or more materials which could be recycled. More than 500 buildings had office paper recycling programs.</p>	<p>In many cases, environmental regulation improves output and productivity by speeding up the reexamination of production processes.</p> <p>While it is nearly impossible to completely quantify this positive aspect of regulation, some examples make the point:</p> <p>(1) <i>Great Lakes Paper Company</i>—installed an \$8 million closed cycle waste treatment system, which they expect will save \$4 million a year in lower costs for chemicals, water, and energy while containing contaminated effluents.</p> <p>(2) <i>Long Island Lighting Company</i>—used a magnesium fuel additive to reduce sulfur trioxide concentration. This not only solved the environmental problem but also produced vanadium, a marketable by-product. In 1978, the company sold 362 tons of recovered vanadium for \$1.2 million, saved \$2 million in fuel because of increased thermal efficiency, and saved \$400,000 due to reduced boiler corrosion.</p> <p>(3) <i>Dow-Corning</i>—found that a \$2.7 million capital investment in equipment to reduce the amounts of chlorine and hydrogen lost to the atmosphere reduced operating costs by \$900,000 a year.</p> <p>(4) <i>The Georgia-Pacific Corporation</i>—developed a special scrubbing system to eliminate "blue haze" emissions caused by plywood production. Collection of the airborne pitch produced a thick liquid that has a BTU rating equivalent to #6 fuel oil. The company now uses this residue as a fuel supplement and collects enough to replace 51,000 gallons of #6 fuel oil each year.</p> <p>According to a 1979 study, if 1970 levels of air pollution were decreased by 60 percent, the health benefits would total about \$40 billion annually.</p> <p>In addition to studying health benefits, the 1979 study attempted to quantify the esthetic benefits that result from air pollution control in Los Angeles. Findings indicated that Los Angeles residents would pay \$650 million per year for a 30 percent improvement in air quality.</p> <p>Data Resources, Inc. (DRI) estimates that from now through 1986 the unemployment rate will be 0.2 to 0.4 percentage points lower with the pollution control program than it would have been without the program. Every decrease of 0.2 percentage points in the unemployment rate results in 200,000 additional jobs.*</p> <p>The DRI study also concluded that the costs of air and water pollution clean-up required by Federal legislation will add no more than 0.1 to 0.2 percentage points to the average annual inflation rate over the next eight years.</p> <p>Firms making equipment used to clean up air and water pollution had sales of \$1.8 billion in 1977 and are growing about twice as fast as the rest of U.S. industry.**</p> <p>EPA's program to construct wastewater treatment facilities totals \$44 billion authorized by Congress between 1973 and 1982. Each billion dollars spent for construction produces approximately 12,500 workyears on the construction site and about 19,300 offsite. (A work-year is the equivalent of one person working one year.)</p> <p>A 1978 survey for Resources for the Future showed that 62 percent of the public was willing to accept higher prices to protect the environment while 18 percent were opposed. □</p>

\*1979 report for EPA and CEQ by Data Resources, Inc.

\*\*Arthur D. Little, Inc. Study for EPA

EPA is charged by Congress to protect the Nation's land, air and water systems. Under a mandate of national environmental laws focused on air and water quality, solid waste management and the control of toxic substances, pesticides, noise and radiation, the Agency strives to formulate and implement actions which lead to a compatible balance between human activities and the ability of natural systems to support and nurture life.

If you have suggestions, questions, or requests for further information, they may be directed to your nearest EPA Regional public information office.

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