

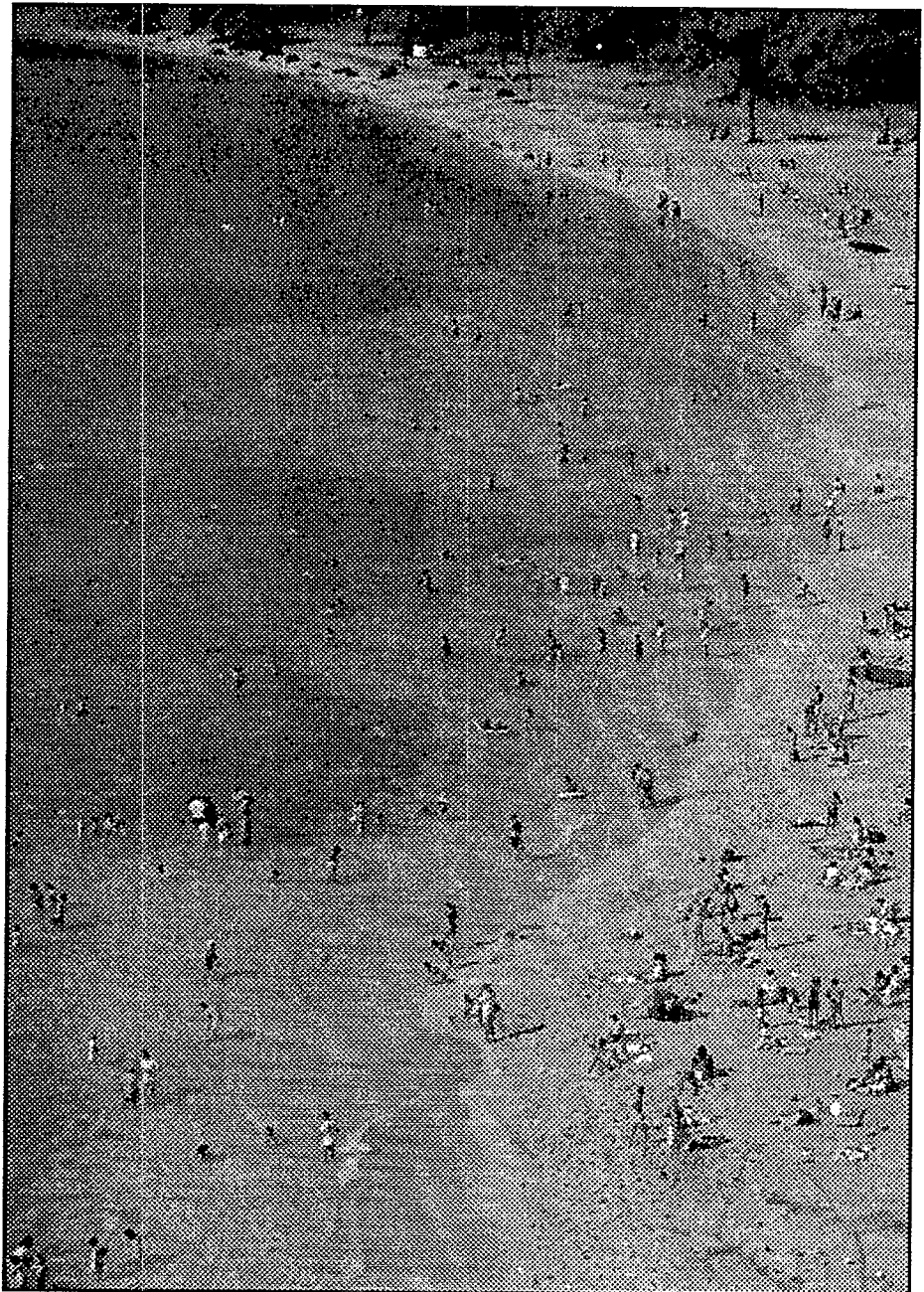
United States
Environmental Protection
Agency

Office of Water
Washington, DC 20460

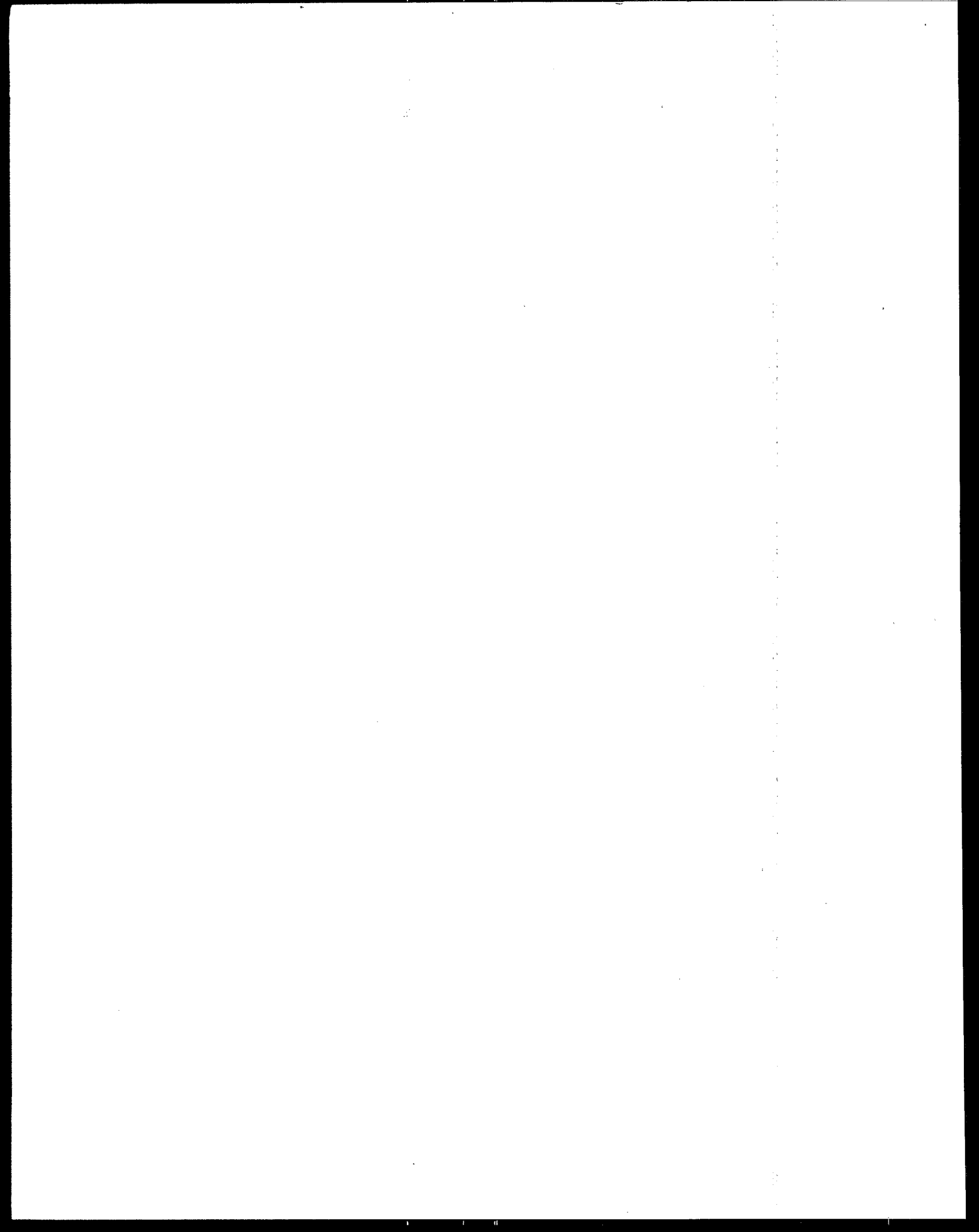
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May 1994



Clean Water: A Memorial Day Perspective

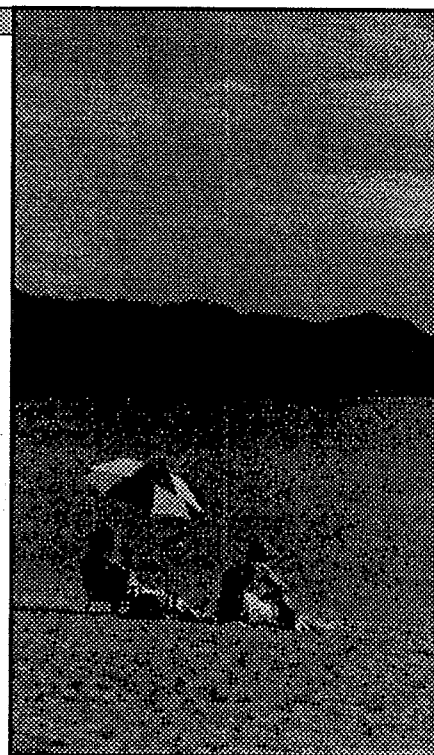


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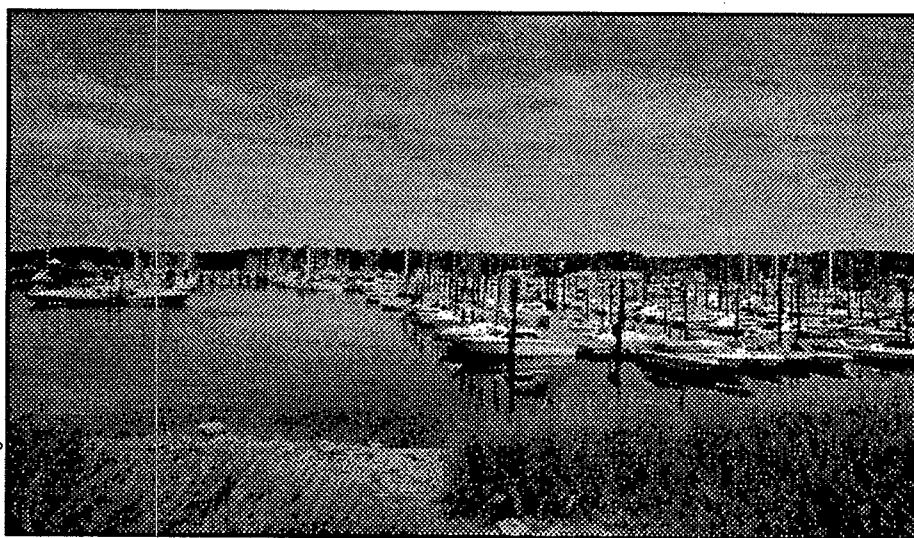


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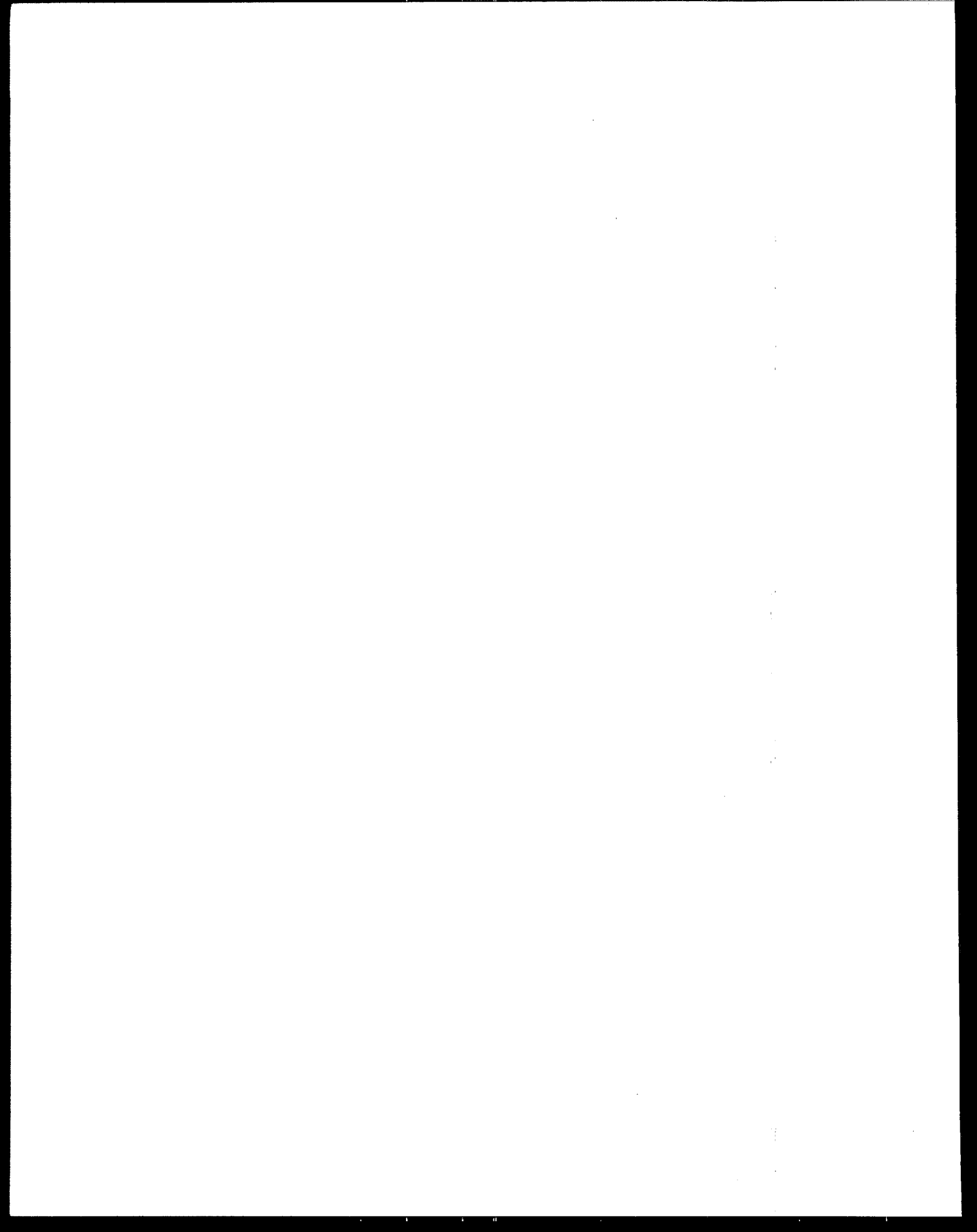
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David Small



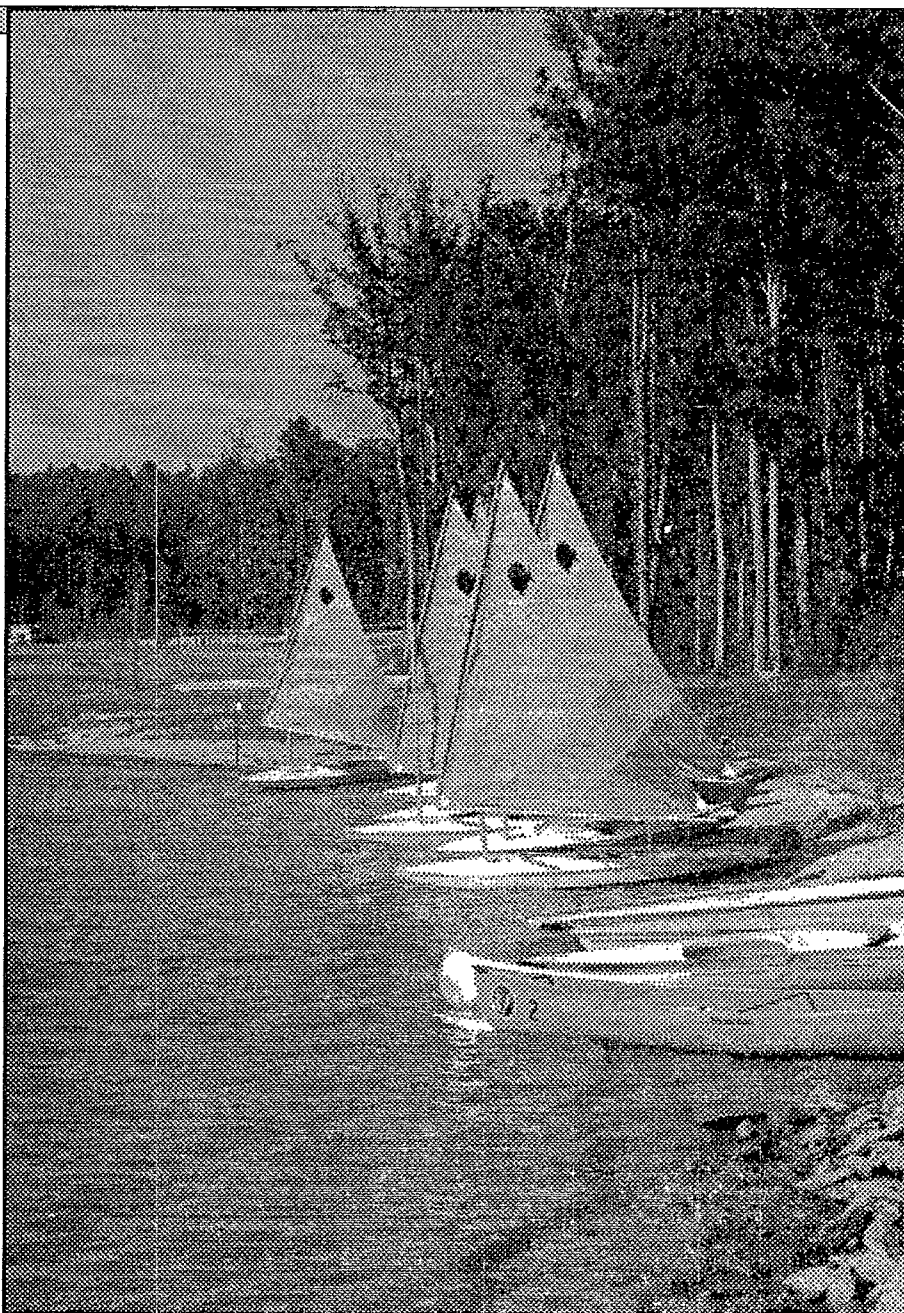
Pat Cunningham



Overview

The period between Memorial Day and Labor Day marks prime vacation time here in the United States, and for millions of Americans that means heading to the water. Each year, our beaches, lakes, rivers, and wetlands provide multiple recreational opportunities, such as fishing, swimming, and boating. There is compelling evidence of the contribution these activities make to local and regional economies. Consider the \$4 billion lost by the states of New York and New Jersey from beach closures following the medical waste washups during the summers of 1987 and 1988. While the full extent of economic benefits to the Nation has not been assessed, data suggest a significant contribution to the Gross National Product: billions of dollars are spent and millions of jobs are created annually from recreational activity.

The Clean Water Act is the national statute that protects our waters, and Congress is currently considering how this Act might be improved. The Clinton Administration has put forward a proposal to reauthorize the Clean Water Act to better address those sources, such as polluted runoff and toxic discharges, that continue to pollute our waters, and to provide states with more funds to assist with cleanup and restoration efforts. Those funds are expected to create some 400,000 jobs over the next decade, and they will help to ensure that clean waters are available for a wide variety of purposes, including enhanced recreational opportunities for all Americans.



Pat Cunningham

Water-Based Recreational Activities

Water-based recreational activities require clean water. If the water is contaminated with toxics or lacks sufficient oxygen, fishing suffers. If bacteria are found, swimming can become dangerous and beaches are closed. And, if aquatic habitat is destroyed, bird-watchers and hunters may find their opportunities for recreational enjoyment greatly diminished. Even non-contact recreational activities, such as boating, rely on aesthetically pleasing water, free of debris and noxious odors.

The examples below highlight the value of water-based recreation and provide further evidence of the need to keep our waters clean.

Sport Fishing

Each year, 36 million people participate in some form of sport fishing on our Nation's fresh and salt waters, spending approximately \$24 billion in the process. These expenditures ripple

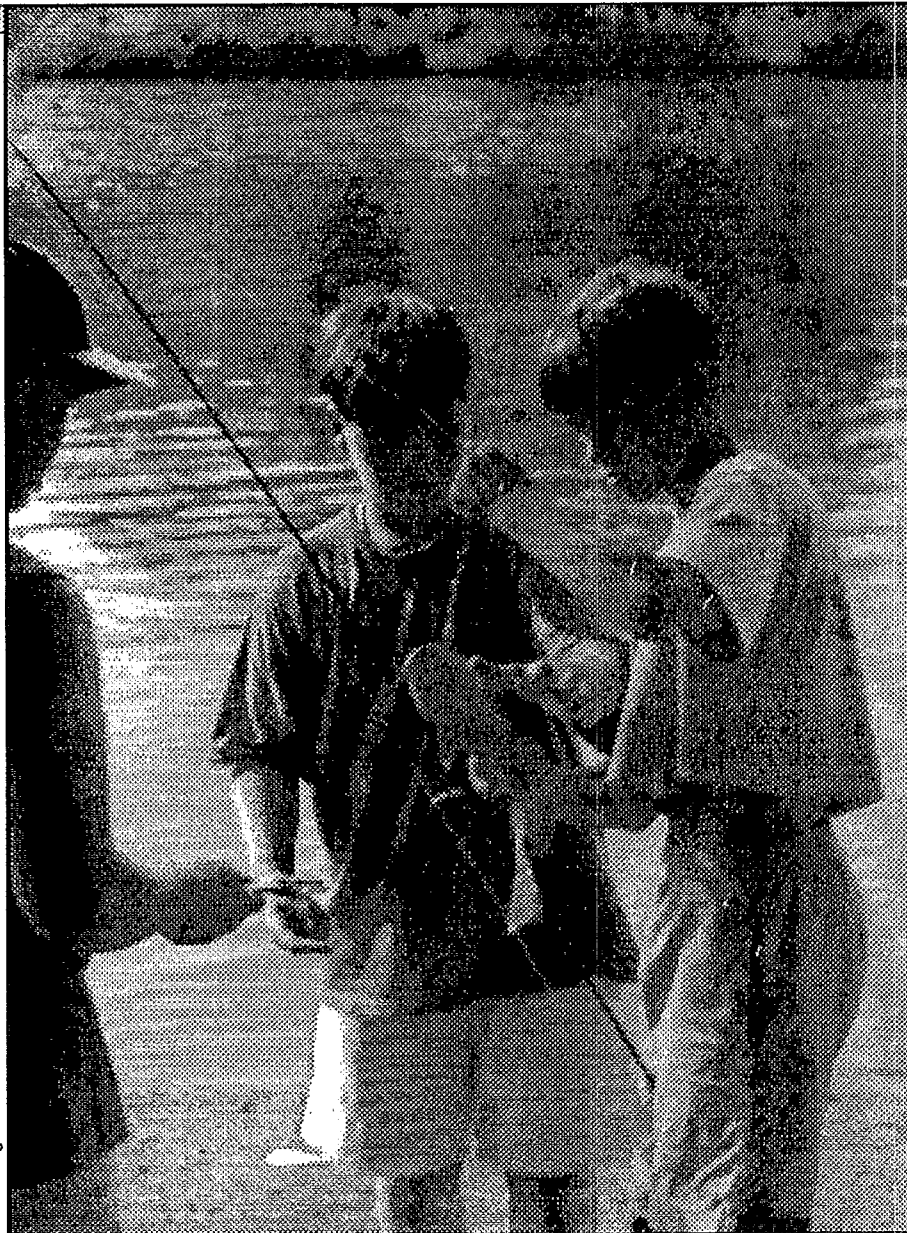
Each year, 36 million people participate in some form of sport fishing on our Nation's fresh and salt waters.

through the economy, generating \$70 billion in economic output and supporting around 1 million jobs, while also generating substantial tax revenues for local, state, and federal governments. In 1991, \$1.2 billion were contributed in federal income

taxes and over \$2 billion were generated in state income and sales taxes.

Fishing continues to grow in popularity. The number of anglers increased 11 percent between 1985 and 1990 alone, and expenditures on angling jumped 27 percent in that

same period. Participation in cold-water fishing is expected to increase threefold between 1990 and 2040, while warmwater fishing is expected to nearly double. Freshwater anglers now number more than 30 million and spend more than \$15 billion annually.



Pet Cunningham

Swimming and Beach Use

In 1987, there were 460 million trips to participate in outdoor swimming (nonpool). Much of this swimming occurred at the beach where Americans often choose to vacation. One study of the southeast coastal region found that beach visitors had an average stay of 2.5 days and spent approximately \$234 per person. In Florida, where the State's economy is closely tied to tourism, a study showed that beachgoers generated \$2.3 billion in economic benefits annually.

Wildlife-Related Activities

About 40 percent of all American adults made 342 million visits to outdoor sites in 1991 to enjoy nonconsumptive wildlife activities, such as bird-watching and camping. Of those involved in such activities, 23 percent visited oceanside areas; 64 percent visited lake and streamside areas; and 39 percent visited marshes, wetlands, and swamps. These visits generated over \$18 billion in spending.

Birdwatching is a prime example of a nonconsumptive means of enjoying wildlife, and it continues to grow in popularity. More than 76 million people in the United States consider themselves birdwatchers, and total annual expenditures by this group exceed \$20 billion a year. The number one interest of people observing birds

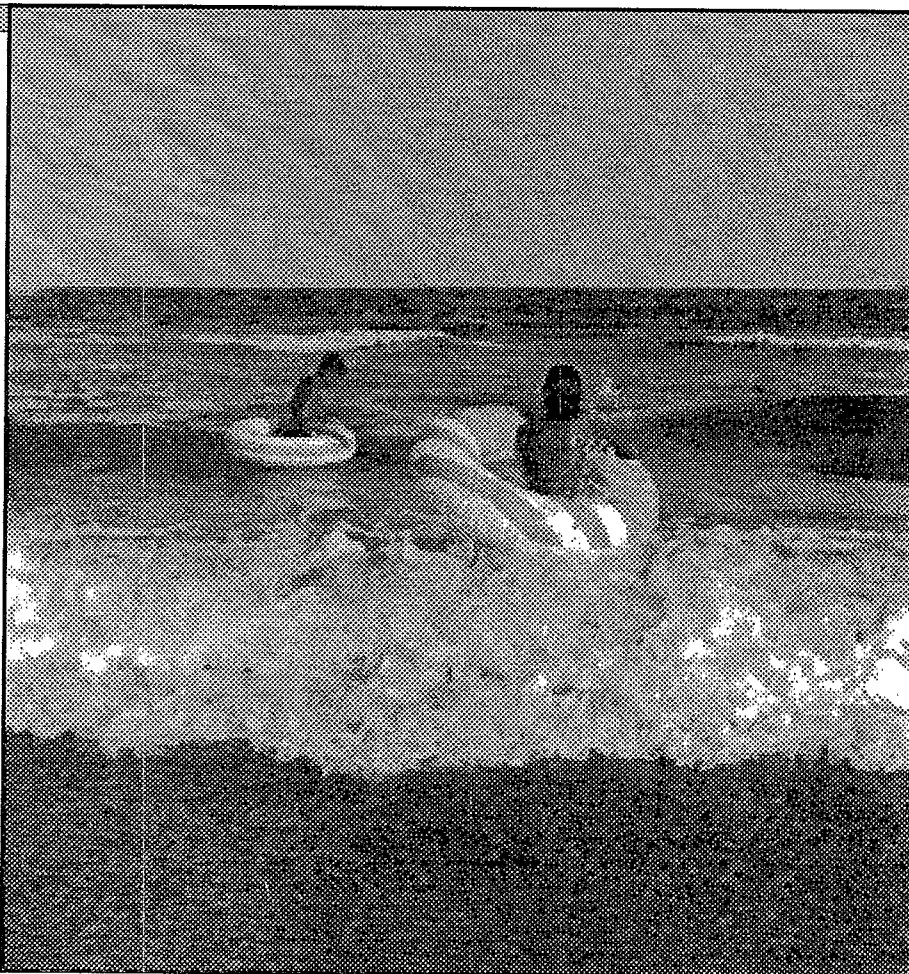
is waterfowl and shorebirds (64 percent of total participants). Birders are particularly interested in observing unusual or rare bird species, and 60 percent of the bird species listed as having unstable or declining populations are dependent on wetland or coastal habitats.

Bird observation is dependent on clean water, and many heavily used birdwatching spots are located in riparian, estuarine, and coastal areas. For example, the 80,000 annual visitors to Grand Island, Nebraska, to see the Sandhill and Whooping Crane

migration account for \$40 million of economic activity in that area. And coastal wildlife refuges routinely experience larger numbers of visitors than noncoastal refuges.

Companies catering to persons interested in various types of nature observation have enjoyed enormous growth during the past 10 years. Many shopping malls in the United States now have some type of nature-related store. The variety and total number of field guide books sold to aid in the identification and observation of wildlife, fish, and plant life has grown

Julie Fountain



considerably. Guided tours have sprung up in all parts of the country. In fact, ecotourism—long distance or extended trips for the enjoyment of nature—appears to be the tourist industry's fastest growing sector.

Hunting of water-dependent species is another important contributor to economic activity in many parts of the country, and much of this hunting takes place in wetland areas. Approximately three million hunters spent \$686 million in 1991 hunting wetland-dependent waterfowl.

A California rice grower earned over \$40,000 by managing and offering 4,500 acres of wetland habitat to 30 hunters for waterfowl and pheasant hunting activities.



Villa Brewer



David Seall

Boating

Americans took 220 million trips in 1991 to participate in motor boating. Total expenditures on recreational

In 1990, the boating-related recreational industry provided jobs for about 600,000 people.

boating (motorized and nonmotorized) quadrupled from 1970 to 1989. In 1993, some \$11 billion was spent at the retail level for new and used boats, motors, accessories, fuel,

repairs, club memberships, and other related items. In 1991, Americans owned 16 million recreational boats, half of which were motorized, with the remainder being sailboats, canoes, kayaks, and similar vessels. In 1990, there were more than 6,200 manufacturers of boats and boating accessories and 8,300 marinas, boat yards, and yacht clubs. In that year, the boating-related recreational industry provided jobs for about 600,000 people.

The Value of Clean Water: Profiles from Around the Country

The previous section provides an indication of how significant water-based recreation is to the national economy. What follows are profiles from around the country depicting how water quality conditions, sometimes improving and sometimes degrading, can affect the economies and quality of life in local communities. The effects are often far-reaching, thus the profiles are not limited to recreational impacts but include impacts in other areas, such as real estate values and commercial fishing, as well.

Boise, Idaho

The Boise, Idaho, Chamber of Commerce knows how to make an impact. The first impression when picking up a copy of the promotional brochure for the state's capital city is that of a beautiful river, bounded by generous green space along both sides, running through the middle of a thriving metropolitan environment. This same picture would not have been possible 30 years ago. For decades, the river served as a dumping ground: old cars were found scattered along the banks and raw sewage from homes and businesses was routinely dumped untreated into the waterway. Some said the wastes from slaughterhouses literally caused the river to "run red."

Beginning in the sixties, the residents decided they had had enough, and their outcry prompted the beginning of a movement to clean things up. A contiguous belt of parkland, later to be called the

greenbelt, was established along a corridor of riverfront property that was owned primarily by the city. Many in the community joined in to restore the area for public use. Some of the river's biggest polluters, such as the slaughterhouses, determined they could not continue to operate as they had historically. They moved their facilities away from the urban area, and significantly upgraded their operations and treatment capabilities in the process. Approximately \$30 million in federal funds were combined with state and local resources to build, upgrade, and expand the city's wastewater infrastructure. The latest water quality assessment from the U.S. Geological Survey showed that treated wastewater effluent from the city's facilities was of sufficient quality that it had no adverse impact on the

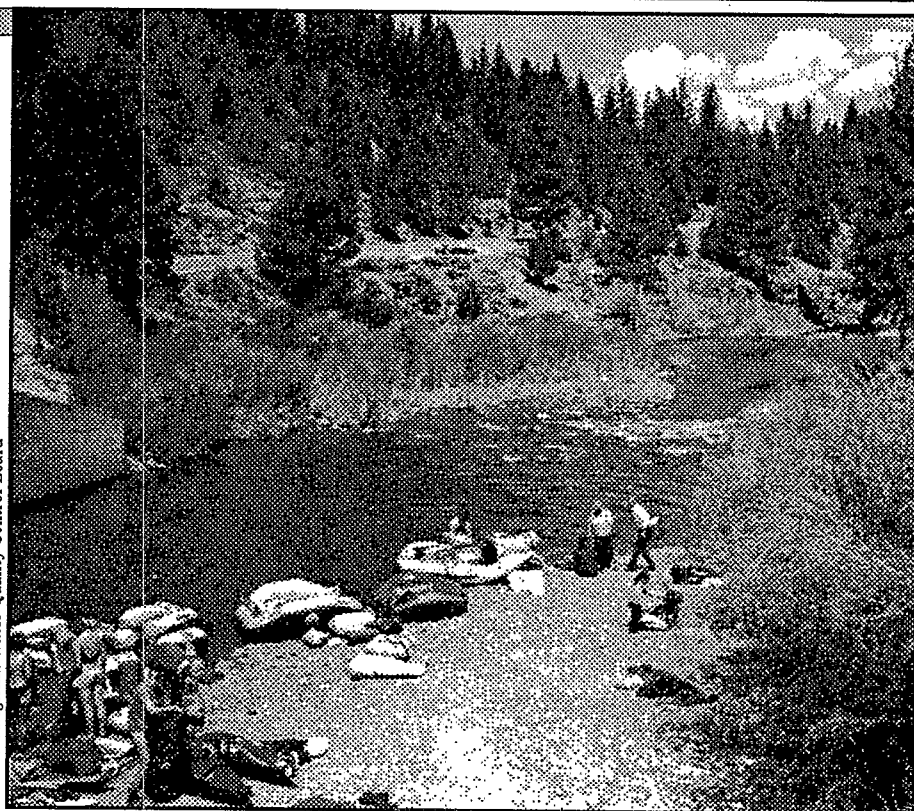
river. Further pollution control was achieved through city and county

Management of the Boise River has become a symbol to the community of a commitment to a lifestyle.

ordinances aimed at reducing polluted runoff from development. Most recently, multiple stakeholders from within the watershed have banded together to study and plan for the river's long-term management.

What have these efforts produced? Today, the citizens and businesses of Boise enjoy a vastly improved resource. David Eberle, a visiting professor at Boise State University, has studied the river and

California Regional Water Quality Control Board





Boise River

its impact on the residents there. He has found that "Boise residents have an especially personal connection with the great outdoors, and management of the Boise River has become a symbol to the community of a commitment to a lifestyle." As one resident put it, "People come to Idaho for the outdoors and move to Boise for the jobs."

Of all their environmental attributes, he has found residents are most proud of the river.

Swimmers, tubers, and canoers now enjoy use of the same river that was once considered unsafe for human contact. As one frequent user commented, "Ten years ago, I'd float the river and never see a soul. Last Saturday, there were 300 people and over 70 boats on the river."

Fish and wildlife are also benefitting. The river now supports a considerable waterfowl population, including an endangered species—bald

eagles. While problems with habitat and low flows in winter months prevent a self-sustaining fishery, the river's water quality is sufficient to allow 55,000 trout released every Spring by the Fish and Game Department to thrive. This is especially significant in a state where eight times as many people fish as the national average.

To celebrate the river's comeback, the city now holds an annual River Festival. In 1992, nearly 600,000 people traveled an average of 558 miles over a 3-day period to attend the celebration, and, according to Mr. Eberle, spending for items such as lodging, food, and souvenirs generated over \$20 million for the local economy.

The return of the river is stimulating the economy in other ways. While the Chamber of Commerce does not have exact figures relating the economy to improving water quality conditions, they do report that the river is a frequently mentioned attribute by businesses considering locating in Boise. Jay Clemens, Chamber of Commerce president, commented that "It's a unique thing to be able to walk behind your corporate workplace to fish in a relatively natural setting." Rather than avoiding the river, new and existing businesses now consider the waterfront a prime location. The same is true for residents, and this demand is reflected in average housing costs. On average, a waterfront property sells for about \$60,000 more than those not on the waterfront.

Today, the river makes Boise a special place to live. However, it is not without its problems. In particular, stormwater runoff can have significant water quality impacts, and, like many cities, Boise is struggling to control this runoff more effectively. As the population continues to grow, more and more people will desire access to the river, placing the river and its improved quality at risk. Boise's challenge is to maintain the dramatic achievements that have been made, while also looking ahead at ways to solve those problems that remain. This dilemma was articulated by Boise State Biology professor Bob Rychert. In an interview with a Boise magazine he stated, "The Boise River—as we study a limited stretch—has pretty high water quality in my view. The thing is, can you maintain it?"

Connecticut River and Long Island Sound Watershed

Twenty years ago, the Connecticut River was called "the prettiest sewer in the Nation." Inadequate levels of wastewater treatment, discharges of toxic pollutants, and polluted runoff were responsible for fouling this once wonderful waterway, as well as Long Island Sound, the estuary into which it drains.

Thanks to upgraded municipal and industrial treatment systems and federal and state programs under the Clean Water Act to control polluted



Connecticut River-Long Island Sound

runoff, water quality in both the Sound and the Connecticut River has begun to improve, and this, in turn, has generated economic benefits. According to a recent assessment, about \$5 billion is generated annually in the regional economy from boating, commercial and sport fishing, swimming, and beachgoing associated with Long Island Sound. And very significantly, Connecticut recently became the country's leading producer of oysters, surpassing both Louisiana and the Chesapeake Bay in the amount of revenue generated. In 1992, Connecticut oyster farmers harvested a staggering 894,000 bushels of oysters from Long Island Sound—compared to between 30,000 and 40,000 bushels in the 1970s. The estimated worth of the oyster industry is now \$46 million. John Volk, Connecticut's Aquaculture Director, attributes the remarkable growth both to the water quality improvements and to joint state/industry efforts to aggressively cultivate oyster beds off the coasts of Bridgeport and Stratford.

The once degraded Connecticut River is becoming a source of beauty, recreation, and economic

revitalization. Particularly in the lower river, canoeists, anglers, and outdoor enthusiasts now populate its riverbanks, and the river's natural ecological balance is returning. Although the returns of Atlantic salmon have not yet met expectations due to problems in the ocean, water quality improvements have contributed to annual returns numbering in the hundreds. The population of Atlantic salmon continues to increase in the river and is now supporting successful commercial and recreational opportunities.

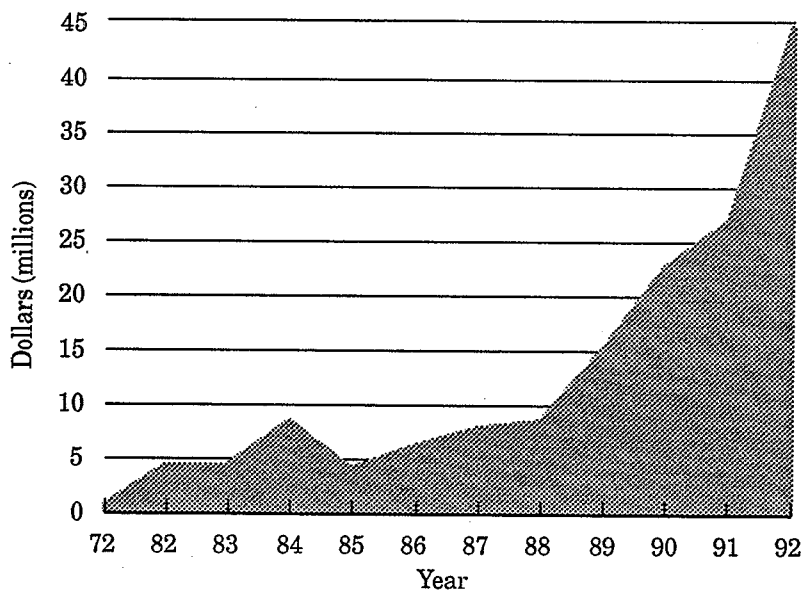
The river is now becoming a focal point for much recreational activity. During the past 2 years, the river has been host to a major triathlon competition, and the Greater Hartford

Convention and Visitors Bureau estimates that the event generates approximately \$4 million dollars annually from the influx of visitors to the state.

About \$5 billion is generated annually in the regional economy from boating, commercial and sport fishing, swimming, and beachgoing associated with Long Island Sound.

Bass fishing is becoming increasingly popular along the river, and, for an unprecedented 2 years in a row,

Connecticut Oyster Market Harvest



Source: Connecticut Department of Agriculture, 1994.

the river was selected as the host site for an eastern regional bass fishing tournament. Anglers from 12 states visited the Hartford area to participate. The tournaments lasted 6 days and were estimated to have generated about \$1 million in revenue each year. A professional "BassMaster" tournament is being planned for September 1994, which will be telecast on national television. Competitors from all over the United States are expected to come and fish in the Connecticut River.

Rowing has also experienced a resurgence along the river, and Hartford was recently selected over 14 other cities as the 1997 site for the United States Rowing Association Convention. Six hundred rowers from across the country are expected to attend, generating about half a million dollars worth of business for downtown hotels, restaurants, and shops.

"Hartford is an excellent choice for our annual convention," said Sandra Hughes, Executive Director of U.S. Rowing. "There is a strong rowing community in the area and Riverfront Recapture [a private non-profit organization committed to improving public access to the Connecticut River] is doing excellent work—developing an urban rowing program and putting on an annual regatta, in conjunction with renewal of the Riverfront."

While these successes are encouraging, many larger economic benefits are still unrealized as the riverfront's transformation has just gotten under way. Planners are beginning to look at land just outside the floodplain for

potential development. New condominiums and other tourist-related developments are envisioned. The value of these properties is expected to be significantly enhanced by current efforts to revitalize the riverfront as well as by efforts to improve public access to the waterway.

For the first time in more than a century, downtown Hartford will soon be reunited with the waterfront. A landscaped plaza is being constructed to link the city to grassy terraces that will provide amphitheater seating for as many as 20,000 people. A new Science Center is part of the riverfront restoration plans and is expected to draw a half a million visitors per year. In East Hartford, construction will soon begin on an expanded Great River Park, which will include a new amphitheater capable of seating about 300 people.

While the water quality in the Connecticut River is considered good and continues to improve, the river remains threatened by discharges from combined sewer overflows in three major cities. Following rainfalls, bacteria levels in the river exceed acceptable limits. Through its combined sewer overflow policy, however, Connecticut plans to control or limit the discharges, with the ultimate goal of making the entire river safe again for swimming. The community is beginning to recognize the tremendous value of the Connecticut River. A recent referendum on an \$80 million combined sewer overflow project in nine greater Hartford communities was overwhelmingly approved by a 4-to-1 margin, demonstrating the

residents' willingness to invest in water quality improvements.

With regard to Long Island Sound, excess nutrients have led to low dissolved oxygen levels, which continues to threaten this fertile estuary. The low levels of oxygen routinely observed during late summer months reduce the abundance and diversity of aquatic species. Efforts are now under way through the Long Island Sound Management Conference to target and reduce nitrogen loadings from both wastewater dischargers and polluted runoff throughout the Sound's drainage basin.

Cuyahoga River

For decades, industries along the Cuyahoga River, a tributary of Lake Erie that flows through the heart of Cleveland, Ohio, dumped poorly treated wastes, noxious chemicals, used oil, and solid debris into its waters. The effect of these unchecked discharges was to create a highly polluted river and shoreline for Lake Erie.

In a 1968 report presented at Kent State University, the authors described a river whose "surface is covered with brown oily film," where "large quantities of black heavy oil flowing in slicks, sometimes several inches thick, are observed frequently. Debris and trash are commonly caught up in these slicks forming an unsightly floating mess." The authors also noted starkly that "animal life (on the river) does not exist."

On June 22 of the following year, the Cuyahoga River caught on fire.

A stray spark ignited oil and debris that had accumulated on its surface. It was an event that embarrassed the people of northeast Ohio and became a symbol of the degradation that has resulted from a century of industrialization that took place without regard to environmental consequences. It also was one of the seminal events that led to the rise of the environmental movement, the establishment of the U.S. Environmental Protection Agency (EPA), and the passage, 3 years later, of the Clean Water Act.

In the 25 years since the Cuyahoga River blaze, industries, local governments in northeast Ohio, and the federal government have banded together in an effort to improve the quality of the river's water. Millions of dollars, much of it authorized under the Clean Water Act, have been spent to upgrade and expand

wastewater treatment facilities. Hundreds of permits limiting pollution to the river have been written and enforced by the Ohio and U.S. Environmental Protection Agencies. These efforts have paid off. Levels of dissolved oxygen have increased, improving the conditions for aquatic life, while levels of bacteria, ammonia, and other contaminants have dropped dramatically. Along with these welcome changes in the biological and chemical attributes of the river have come marked improvements in its aesthetic values.

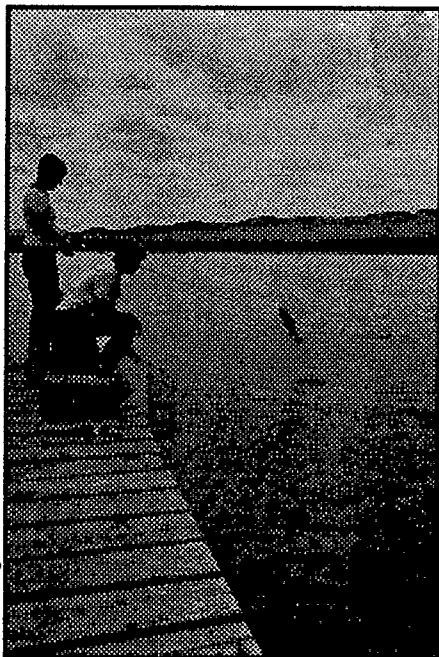
In the early 1970s, downtown Cleveland was a virtual ghost town after the normal working day ended. The area adjacent to the riverfront at Lake Erie, known as "the Flats," was a dilapidated warehouse district. The success Cleveland has had in recent years drawing crowds again to its downtown area is due, in no small part, to the revitalization of the Flats and the improvement in the water quality in the Cuyahoga River and Lake Erie. Today, the harbor area where the Cuyahoga River and Lake Erie meet is no longer choked with debris and reeking wastes. Instead, it is bustling with pleasure boats, which dock alongside fashionable restaurants and shops. The newly clean river has generated 3,500 tourist-related jobs in this 820-acre lakefront area, without sacrificing the 1,500 industrial jobs that already existed there. The Flats is one of the top tourist draws in Ohio, attracting seven million visitors each year. It also boasts a restaurant that is



Cuyahoga River

consistently at or near the top in gross revenues for restaurants nationwide.

The restoration of the quality of the Cuyahoga River and Lake Erie waters is one remarkable measure of the Clean Water Act's success, but the data reveal areas where progress has been slow. For example, increases in the species of fish in a water body typically lag behind other water quality improvements, and this has been the case in the Cuyahoga River, where fish populations are just now recovering. Industry and local government officials recognize that this recovery must continue. As fish populations increase, it signals more improvements in water quality and the promise of increased commercial and recreational fishing activities, and the jobs these activities generate. For northeast Ohio and other industrial areas like it, it is a promise that can be fulfilled by a continuing commitment to the Clean Water Act.



Pat Cunningham

The Chesapeake Bay

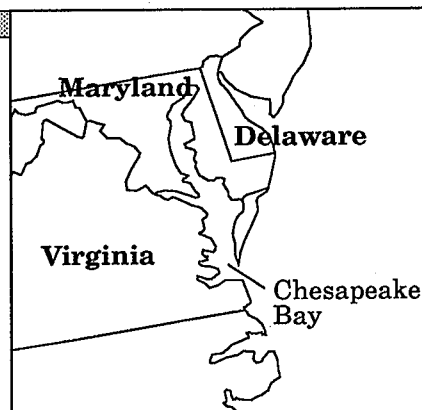
The Chesapeake Bay Watershed—the area that drains into Chesapeake Bay—stretches over 64,000 square miles into six states (New York, Pennsylvania, Delaware, Maryland, West Virginia, and Virginia) as well as the District of Columbia. Home to some 13.6 million people, the watershed extends as far north as Cooperstown, New York, the origin of the mighty Susquehanna River, and as far south as Norfolk, Virginia, where its mouth opens up to the Atlantic ocean. This wonderfully diverse and complex coastal estuary is surprisingly shallow—its waters average little more than 20 feet in depth. Famous for its crabs and rockfish, the Chesapeake is truly one of our national treasures.

While it is difficult to quantify the

economic benefits of a resource as vast and productive as the Chesapeake Bay, a 1987 study done by Maryland's Department of Economic Employment and Development estimated the value

A 1987 study estimated the value of the Bay from commercial fishing, port and ship building activities, and Bay-related tourism to be a staggering \$31.6 billion.

of the Bay from commercial fishing, port and ship building activities, and Bay-related tourism to be a staggering \$31.6 billion. Recreational activities such as boating, fishing, hunting, sightseeing, and dining on regional cuisine accounted for \$8.4 billion per year.

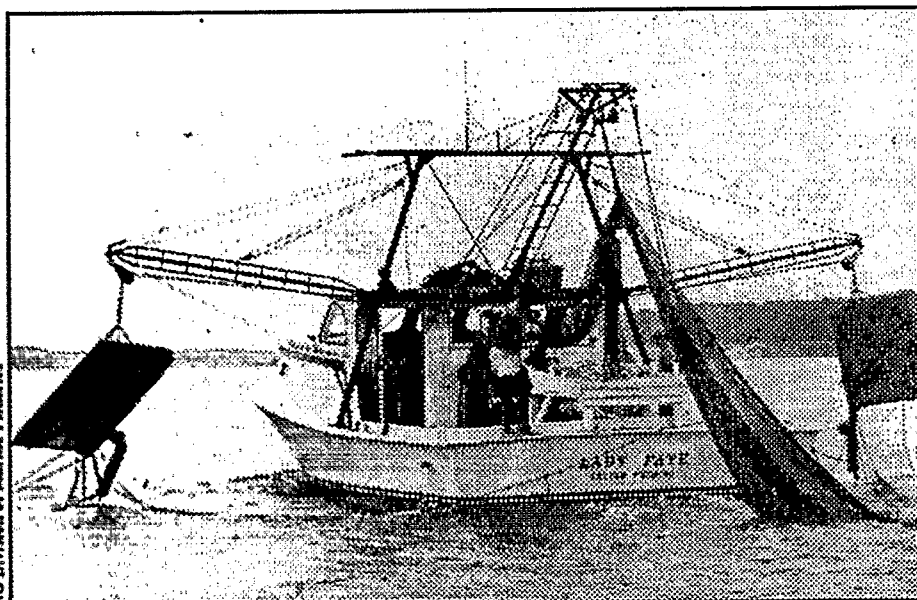


The Chesapeake Bay

From the 1960s to the late 1970s, it became clear that the Bay was in trouble. System-wide declines were recorded in the bay's fisheries, its underwater grass beds, and its oxygen levels. Commercial harvests of shad declined 35 percent in the Virginia portion of the Bay and 95 percent in Maryland, eventually causing a fishing ban to be put in place. Similar declines in striped bass resulted in a ban for that fishery as well. Previously, the striped bass population had sustained a sport and commercial industry valued in the millions of dollars annually.

The Bay's once prosperous oyster industry—decimated by overharvesting, disease and loss of habitat—began producing record low harvests. Major losses of underwater vegetation, critical habitat for dozens of species of fish and waterfowl, has also led to declines in numerous waterfowl species, including black ducks, redheads, wigeons, and canvasbacks.

The loss of wetlands also contributed to the downturn in the quality of the Bay. One study of a riparian forest in a predominantly agricultural watershed showed that 80 percent of the phosphorus and 89 percent of the



NC Division of Marine Fisheries

nitrogen were removed from the water by the forested wetland before entering a tributary of the Chesapeake Bay. When wetlands are lost, so is the ecosystem's natural buffering capacity.

In 1975, Congress directed the EPA to investigate the causes of environmental decline in the Chesapeake.

"The Chesapeake Bay is a vast natural resource with significant economic, recreational and social value to our state and our citizenry. We are beginning to see a recovery of the Chesapeake Bay as a result of a decade of hard work, determination, and commitment, spearheaded by the Chesapeake Bay Program . . ."

Maryland Governor
William Donald Schaefer

To achieve this goal, EPA established a Chesapeake Bay Program Office that has successfully formed partnerships with key Chesapeake Bay states, federal agencies, and other interested parties such as citizen groups to take action where needed. Initial efforts have focused on the Bay's most significant ecological problems: nutrient overenrichment, toxics, and loss of aquatic habitat.

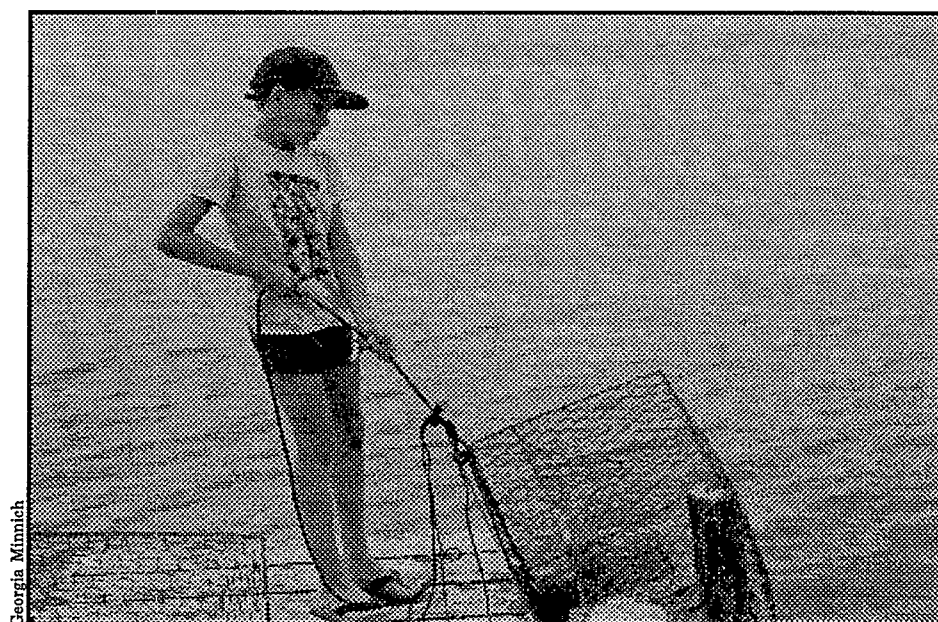
An historical Chesapeake Bay agreement signed in 1983 formed a binding partnership among EPA and

the governments of Virginia, Pennsylvania, Maryland, and the District of Columbia and moved the program from a research to an action phase. A second agreement, signed in 1987 expanded the scope of the original agreement with 29 commitments for action in priority areas, such as living resources, water quality, and population growth and development.

A centerpiece of the Bay agreement was the establishment of a goal to reduce nutrients by 40 percent by the year 2000 and to maintain that level or better thereafter. Nutrient reduction is essential to restoring Bay water quality. Excess phosphorus and nitrogen literally choke the Bay by contributing to abundant algae growth, which then clouds the water and blocks the sunlight needed by Bay grasses. Without sunlight, these grasses die and the essential habitat and food supply they provide

vanishes. Also, as the algae decomposes, dissolved oxygen is used up, forcing oxygen-dependent species to either leave or die.

Today, efforts to reduce nutrient loadings and restore water quality are beginning to have an effect. The Bay is beginning to see encouraging signs of improvement. Phosphorus levels in the main stem of the Bay have been reduced by 16 percent and nitrogen levels have been stabilized, despite significant population growth in the Bay watershed. Baywide, approximately 70,000 acres of underwater grasses are now growing. This represents an 86 percent increase in acreage since 1984, significantly reversing the declining trends of the 1970s. Artificial oyster reefs are being created in areas where oyster diseases have less impact and oyster survival is more likely. Watermen are being employed in the off-season to



Georgia Minnich

construct these beds and reseed existing oyster beds. Finally, the latest study on toxic releases showed a 52 percent reduction in reported toxic emissions in the Bay watershed from 1987 to 1991, compared to a national decrease of 22 percent from 1988 to 1991.

Future improvements in Bay water quality will depend, to a large extent, upon how well polluted runoff is controlled. Sewage treatment plants and air deposition are major nutrient sources for the watershed; however, as in so many parts of the country, runoff from agricultural and suburban lands continues to be the most significant obstacle to further water quality improvement.

The Great Lakes

The Great Lakes, collectively, are one of the world's outstanding natural resources, containing 20 percent of the



The Great Lakes

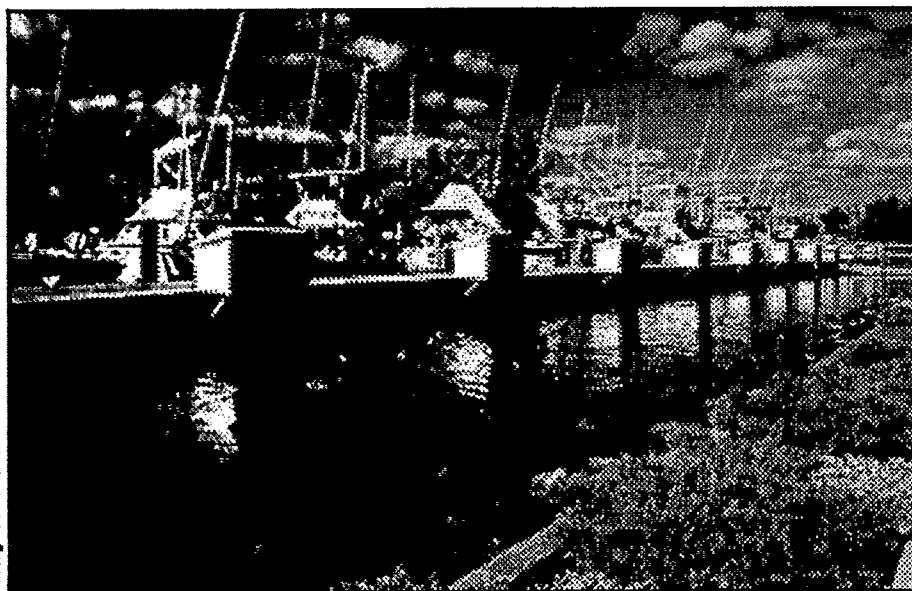
world's and 95 percent of the United States' fresh surface water. The Great Lakes Basin receives drainage from eight States—Minnesota, Wisconsin, Michigan, Illinois, Indiana, Ohio, Pennsylvania, and New York—and the Canadian Province of Ontario. More than 40 million people live in the Basin, including nearly 20 percent of the U.S. population and 50 percent

of the Canadian population.

The Great Lakes provide tremendous economic and ecological benefits to the area. One quarter of all U.S. industry and more than 70 percent of U.S. and 60 percent of Canadian steel mills are in the Great Lakes Basin. Over 23 million people depend on the Great Lakes for drinking water. The area affords habitat for a vast array of plant and animal species, many of which are native to the Great Lakes Basin.

Recreational benefits are also significant. Data from the mid-1980s indicate that recreational boating marinas employed almost 20,000 people. Boat sales and other boater spending (marina fees, licenses, repairs, etc.) amounted to almost \$4 billion per year. Fishing in connection with recreational boating and other recreational fishing expenditures add another \$3 billion to \$7 billion per year.

Water quality in the Great Lakes has improved significantly since the passage of the Clean Water Act in 1972. Although discharge loadings



Michigan Sea Grant

from wastewater treatment plants have increased due to population growth and development pressures, levels of dissolved oxygen have steadily improved. Reductions in organic material, solids, and phosphorus are noteworthy as well. For example, phosphorus loadings to Green Bay from the Fox River in 1971 were 4.8 million pounds. By 1982, this level had been reduced to 1.2 million pounds.

Chemical concentrations in humans and the aquatic environment have dropped sharply. Fish have returned to some harbors from which they had disappeared. The number of double-crested cormorants, a water bird that all but vanished in the Great Lakes in the 1970s, has climbed to 12,000 nesting pairs, and the number of bald eagles is nearing the highest level ever measured in Michigan.

Improvements in Great Lakes water quality have had a positive economic impact on the recreational fishing industry. Fishing licenses purchased in just one county of Green

Ohio's Lake Erie tourism industry is now an \$8.5 billion per year business.

Bay, Wisconsin, increased from 19,000 in 1970 to 51,000 in 1989. Boat registrations more than doubled during the same period, leading to an increase in demand for launch ramps and other boating facilities in the Green Bay area. The revitalization of fishery resources in Lake Ontario has spurred

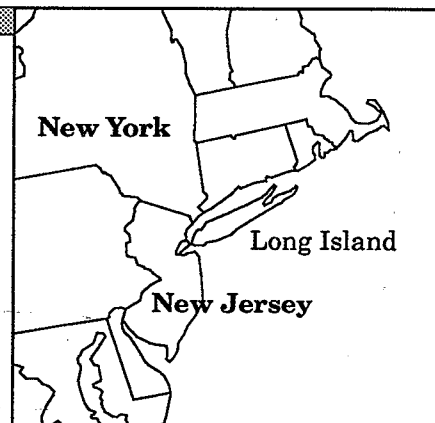
the development of the charter boat fishing industry, boater and angler access sites, fishing derbies, and additional employment opportunities.

Water quality improvements and increased lakeside development have caused people to return to the shore of Lake Erie to enjoy boating, fishing, swimming, and other activities. Today it is rare to see algal blooms, and bacterial counts in Ohio beach areas along Lake Erie have dropped over 90 percent from 1968 to 1991. As a result, the comeback of Ohio's waterfront has also seen an increased number of boating, camping, and vacation resort facilities. From 1986 to 1993 there was a 30 percent increase in the number of marinas in the Lake Erie Basin. Ohio's Lake Erie tourism industry is now an \$8.5 billion per year business.

Lakeshore cities have begun to restore their shorelines. Cleveland, Ohio, is now transforming its lakefront into a popular area for families and cultural activities. A new harbor and festival park have already been completed. Several museums are completed or under construction and an aquarium is planned. All this on the shores of a waterbody pronounced "dead" just 25 years ago.

The New York and New Jersey Shore

Every summer, millions of people flock to the New Jersey and New York shores to vacation and enjoy the beach environment. Unfortunately, during 1987 and 1988, garbage and medical



New York and New Jersey Shores

wastes washing to shore and high bacterial counts led to the closure of beaches. Although the washups occurred for only short periods of time, approximately 70 miles of beaches were closed each year. Beach attendance at Long Island dropped 50 percent after the first washups, and a New Jersey community reported that the number of beachgoers dropped from 1,200 per day to about 120 per day. The economic impact from these closures was significant: New York and New Jersey tourism industries lost more than \$4 billion.

A 1991 report published by the Natural Resources Defense Council (NRDC), *Testing the Waters III, Closings, Costs, and Cleanup at U.S. Beaches*, provides data on beach closures and advisories due to high counts of bacteria and other health threats. The report documents over 7,000 beach closures or advisories in 22 coastal states between 1988 and 1992. In 1989, there were over 1,000 closures or advisories and 70 percent occurred in New York and New Jersey; five New York beaches were under advisories for the entire summer. In 1990, the same was true for three beaches in New York. Urban

runoff and combined sewer overflows were identified as the primary pollutant sources responsible for the closures or advisories.

While the impacts to tourism are significant, other benefits are diminished by the same pollution that leads to beach closures. Commercial fishing is often affected as fish kills from polluted water reduce both the abundance and distribution of fish and shellfish stocks. For example, a massive fish kill that occurred off the New Jersey coast in 1976 resulted in a loss valued at \$11.6 million to the state's commercial and recreational fishery. Future losses due to the resulting reduced fish population from the kill were estimated at \$498 million.

Ecological quality also suffers. Extremely high levels of water pollution along New York and New Jersey's coasts have resulted in poor and unproductive aquatic and terrestrial habitats, which in turn results in the loss of the necessary organisms and aquatic vegetation that serve as food and habitat for fish and other aquatic animals, as well as terrestrial animals, such as birds.

Today, problems due to washups of floating garbage and medical wastes have been largely controlled along New York/New Jersey shores. An interagency action plan to clean up these wastes before they reach the beaches is now in effect and includes actions such as aerial surveillance to identify floating slicks that could potentially affect the shores and scheduled cleanups of floating debris around high moon tides and storms. Nevertheless, the beaches still face



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threats from other pollution sources, such as stormwater runoff and combined sewer overflows. Whenever it rains, these sources can lead to

serious water quality impacts. The extent to which they are controlled will be a key factor for future water quality and recreational opportunity.

The Clean Water Act's Imprint: How Has It Made a Difference?

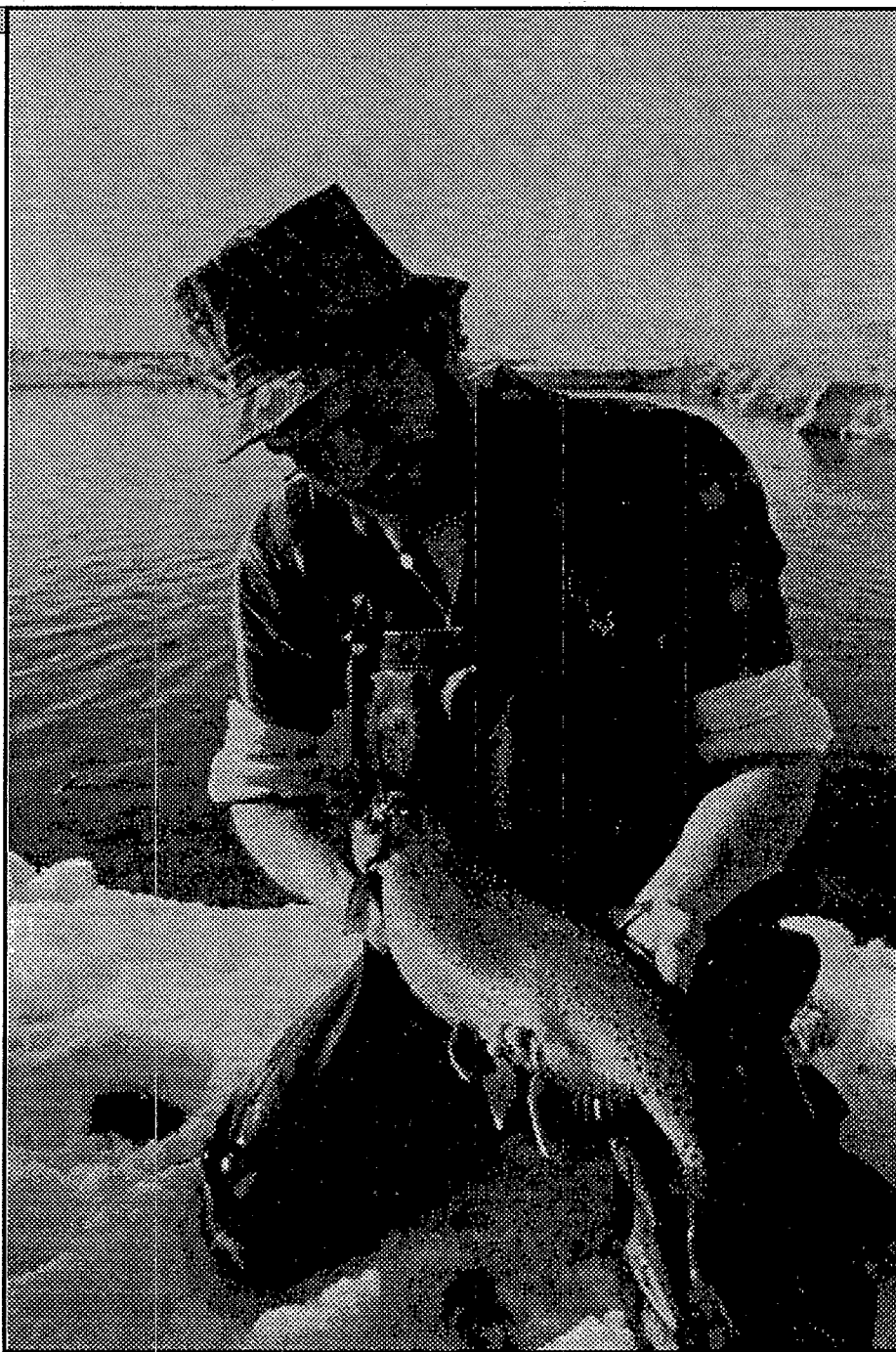
In 1972, Congress passed the Clean Water Act to address the extensive pollution that was degrading the Nation's waters. The original Act, along with amendments added over the years, has dramatically improved the condition of waterbodies in most parts of the country. As a result, America's water-based recreational opportunities, as well as other water quality benefits, are far greater than those available 20 years ago. More waters are now fishable and more waters are now swimmable.

Today, there are approximately 15,500 publicly owned wastewater treatment plants in operation, 94 percent of which provide upgraded levels of treatment. The improvements in wastewater treatment capabilities have been possible, in large part, because of federal resources. Approximately \$60 billion in federal funds have been made available since the Act's passage, and these resources, coupled with state and local resources, have resulted in dramatic wastewater treatment improvements. As a result of this investment, biological oxygen demanding substances from wastewater plants were reduced nationally by 37 percent between 1968 and 1988. This progress is even more remarkable given the 22 percent increase in waste loadings to sewers from a population increase of 27 million people and a two-thirds increase in economic and industrial activity.

Clean Water Act controls on toxic discharges from industry have had a similarly beneficial impact on water quality. The states and EPA have issued permits limiting pollutant

discharges from approximately 63,000 industrial and municipal facilities. National effluent guideline standards, which are used to set pollutant discharge limits for specific industries,

have been established for over 50 industrial categories, such as steel manufacturers and the oil and gas industry, typically reducing toxic pollutant loadings to waterbodies by



US EPA

90 percent. These guidelines set toxic pollutant limits based on use of the best available technology that is economically achievable, and a 1989 EPA study showed substantial water quality improvements when these limits were met.

Pretreatment, or reducing the amount of toxic pollutants that industries discharge to wastewater facilities for treatment, has also made a big difference in water quality. From 1975 to 1990, pretreatment has resulted in 95 percent reductions in metals loadings and 40 to 75 percent reductions in toxic organic loadings from regulated industries.

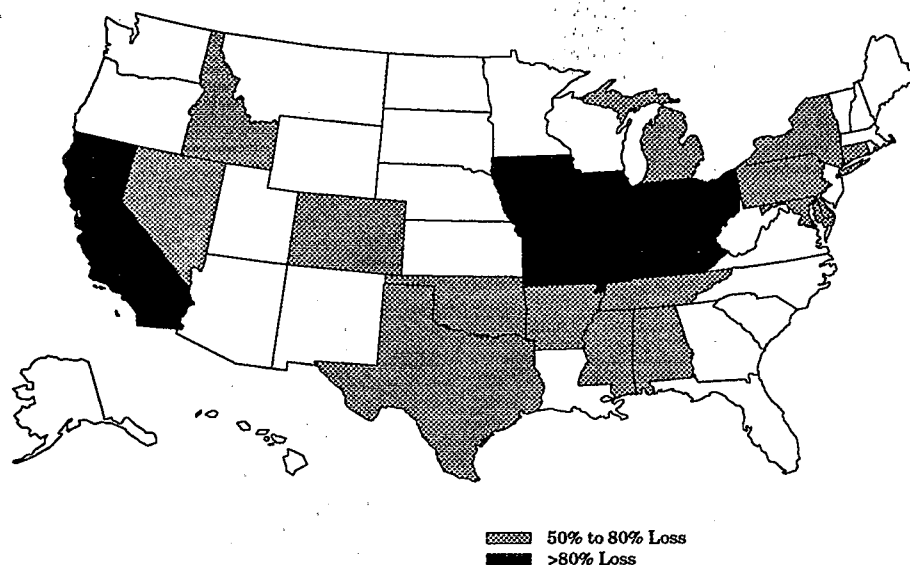
Reducing losses of critical aquatic habitat is another area where progress has been made. From the mid-1950s to the mid-1970s, approximately 450,000 acres of wetlands were lost in the United States every year. From the mid-1970s to the mid-1980s, that figure dropped to approximately 290,000 per year. This change resulted primarily from the Clean Water Act wetlands program, combined with new state wetland protection programs. Although data are not available, it is generally accepted that implementation of the Clean Water Act and some provisions of the 1990 Food Security Act, otherwise known as the Farm Bill, have reduced losses even further.

These estimates stand as testament to the success of the Clean Water Act and its vision; however, the job is not yet complete. In too many places around the country, water bodies are still not as clean as they could be and aquatic habitats continue

to be degraded. Although many improvements can be cited, previously undetected problems are becoming evident, and some problems continue to persist. Polluted runoff from our yards, streets, and farms is now the leading source of water quality impairment. And toxic chemicals continue to pose a risk to public health and our environment.

These problems pose difficult challenges, but, like the problems that came before, they can be solved. The pending Clean Water Act reauthorization presents the Nation with an opportunity to refine those portions of the Act that need improving so that an even more effective national framework is in place to guide future actions.

States with More Than 50% Wetlands Loss



Twenty-two States have lost at least 50% of their original wetlands. Seven of these 22 (California, Indiana, Illinois, Iowa, Missouri, Kentucky, and Ohio) have lost more than 80% of their original wetlands.

Source: Dahl, T.E. 1990. *Wetlands Losses in the United States 1780's to 1980's*. U.S. Department of the Interior, Fish and Wildlife Service.

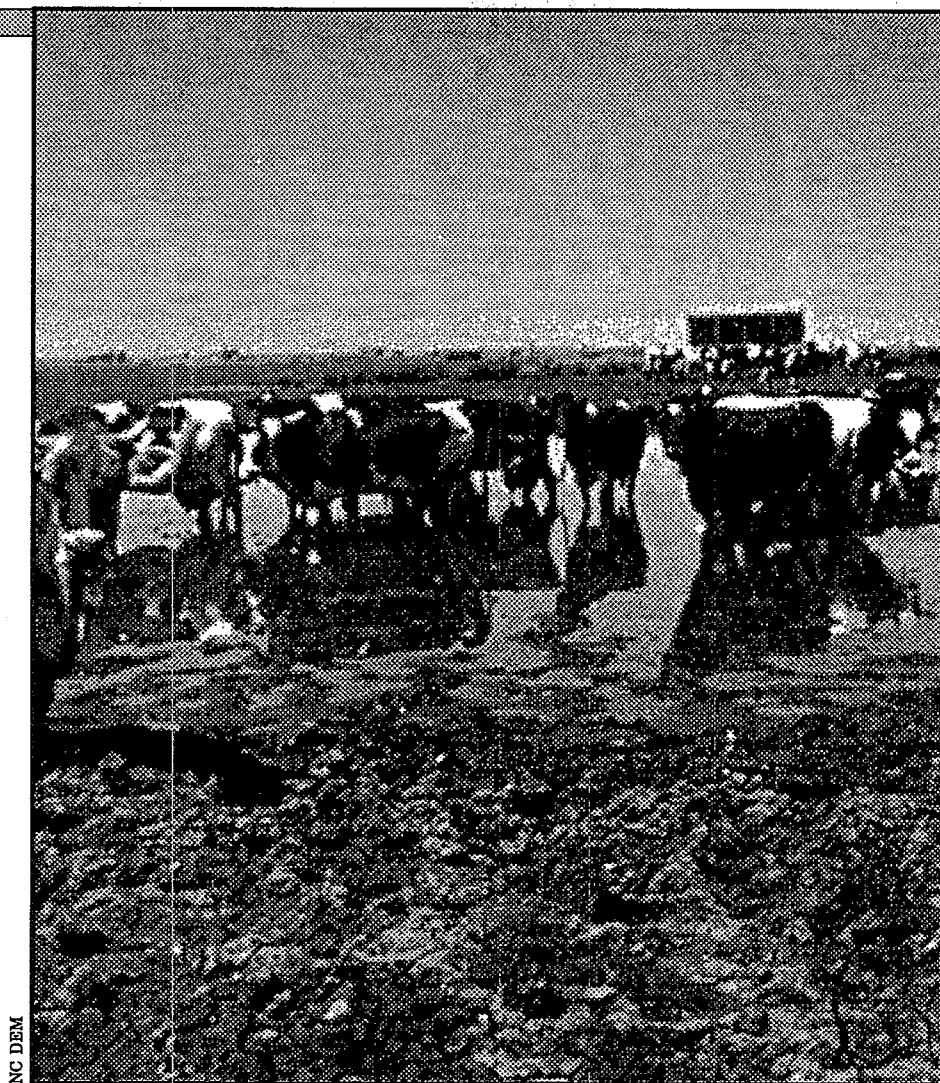
Future Benefits from a New Clean Water Act

In January 1994, the Clinton Administration proposed a package of legislative reforms for reauthorizing the Clean Water Act. These recommendations address the highest priority problems that are causing pollution and preventing communities from fully enjoying their water resources. If adopted and implemented, the recommendations would bring appreciable benefits, including more water-based recreational opportunities. An overview of the Administration's key recommendations and the associated benefits that could be expected is provided below.

Controlling Polluted Runoff

Most people think of water pollution in terms of toxic waste being discharged from an industrial pipe, and although these sources can still be a problem, for the most part, today's water quality problems are much less obvious. Studies consistently show that polluted runoff from multiple diffuse sources is the single biggest source of pollution affecting our waters nationally.

Controlling polluted runoff from hundreds or thousands of sources in an area is not easy; however, the magnitude and extensive nature of the impacts can no longer be ignored. The Administration is proposing a more comprehensive, targeted program that would be carried out primarily by the states with assistance from EPA. EPA would develop guidance specifying how polluted



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runoff should be controlled, and states would establish programs to ensure that these practices were put into

Strengthening controls on polluted runoff would improve the condition of 150,000 river miles and 7.1 million lake acres across the country.

place for those waters that are either threatened or impaired due to pollution runoff. After sufficient time for implementation, enforcement authority would be available to ensure action where needed.

If fully implemented, the Administration's recommendations would reduce polluted runoff and improve water quality in over 150,000 river miles and 7.1 million lakes acres that are now impaired or threatened.

Reducing Toxic Discharges

While the number of waterbodies being impacted by toxic pollutants are fewer than those being impacted by polluted runoff, where toxics occur, the impacts to public health and aquatic ecosystems can be severe. Toxics have been linked not only to cancer, but also to adverse neurological, reproductive, developmental, and immunological effects. Some sensitive species may die from exposure to these substances. These problems become even more acute when one considers that many toxics do not degrade easily and may be around for very long periods of time.

The Administration recommends greater authority for EPA to restrict or prohibit the discharge of toxic pollutants. Establishing limits on industry and setting numeric criteria for water quality are the two mechanisms by which toxics are now controlled; however, both can be costly and time-consuming. When scientific evidence demonstrates that a serious threat exists, the Administration would provide EPA with greater authority to take more immediate action so that public health and the environment are adequately protected.

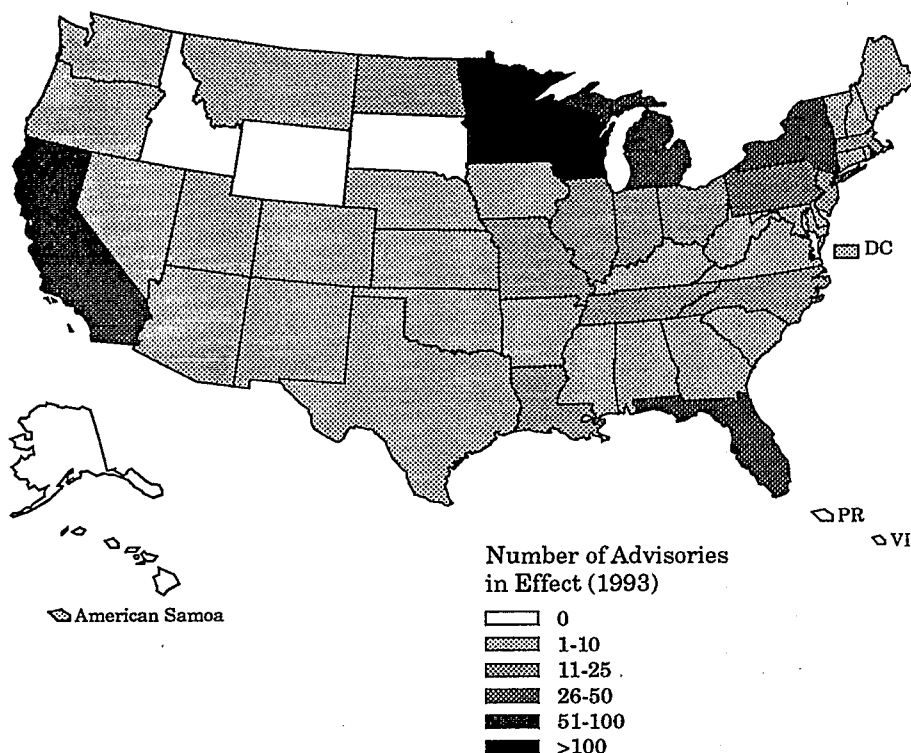
Decreasing toxics would have the effect of better protecting the environment and public health. For example, the number of fish consumption advisories and bans that are now in effect around the country would be reduced. This is especially important for people who depend on fishing for their livelihood, such as Native Americans and

and those working in commercial or charter boat fishing industries. In one report, charter fishermen in the Great Lakes reported routine declines in business of up to 40 percent immediately following a fish consumption warning.

Controlling Urban Runoff

Whenever it rains, runoff in urban areas, carrying a multitude of pollutants, such as oil, grease, pathogens, sediments, and herbicides is washed into local waterbodies. In many cases, this runoff can seriously affect water quality. For example:

Fish Consumption Advisories in the United States



Note: States that perform routine fish tissue analysis (such as the Great Lakes States) will detect more cases of fish contamination and issue more advisories than States with less rigorous fish sampling programs.

Based on data contained in the EPA Fish Consumption Advisory Database as of September 1993.

- According to the Natural Resources Defense Council, there were 1,592 days of beach closures or advisories issued in 1990, 2,008 days in 1991, and 2,619 in 1992. Combined sewer overflows (CSOs) and storm water were implicated as an important contributor.
- In 1990, pollutants from CSOs contributed to bans or restrictions on 597,000 acres of shellfish harvesting areas.

The current programs for reducing pollution from urban runoff are considered too complex and too expensive by many state and local governments. In the case of CSOs, the problem has been seen as so unmanageable that some cities have done little or nothing at all. The Administration's recommendations for controlling both CSO and stormwater management would improve the existing regulatory framework by providing communities with greater flexibility to target and adapt their efforts to better suit their particular situation. This approach would potentially save communities almost \$27 billion per year when compared to implementation under a strict interpretation of the existing Clean Water Act—without compromising water quality.

The Administration's proposal would reduce the number of overflows at CSO points from 50 to 80 events per year to 3 to 4. In so doing:

- Violations of water quality standards for these waterbodies would be reduced from 100 to 200 days per year to no more than 10 to 20.
- Nationally, over 1 billion gallons of raw waste that are now being discharged untreated would receive treatment.

These improvements, along with a more targeted program for controlling stormwater, would reduce shellfishing restrictions, fish kills, and beach closures and greatly improve the aesthetics of our Nation's waters.

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Strengthening State Revolving Loan Funds

Much of the progress that has been achieved under the Clean Water Act can be linked to the federal investment in wastewater infrastructure. Private citizens, industry, and all levels of government have recognized that money spent on clean water improves not only public health, but the health of the Nation's economy as well.

Between 1972 and 1987, the Clean Water Act authorized more than \$50 billion in grants to assist

communities with their wastewater infrastructure needs. In recent years, the grants program was replaced with a State Revolving Loan Fund (SRF). Rather than awarding grants to municipalities, the Act now authorizes EPA to award grants to the states to capitalize SRF loans. State agencies in turn award low interest loans and other forms of assistance to local governments and individuals to finance wastewater treatment needs. SRF loans can be used to build treatment works and sewer systems to serve homes and industries or to install measures to control polluted runoff from city streets, farms, and construction sites. These loans are repaid so that the fund is not depleted and remains available to other communities needing assistance.

Since the inception of the program, the Agency has awarded more than \$8.5 billion in capitalization grants to the states and Puerto Rico. These states have also contributed \$1.7 billion in required matching funds. Several states have also leveraged SRF assets to generate more than \$4.5 billion in bond proceeds.

The success of the SRF program lies in the flexibility it has afforded states to fund a variety of projects. States have made loans to big cities to build traditional wastewater treatment projects, to local sewer districts to build retention basins for nonpoint stormwater runoff, and to rural towns, which in turn make loans to homeowners to replace failing septic systems.

The Administration's recommendations would provide states with

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even greater flexibility, allowing such items as pollution prevention and water conservation to be funded.

The success of the program also lies in the nature of loan funding, inducing recipients to seek out the most cost-effective ways to solve their wastewater treatment problems. State officials report that SRF-funded projects proceed more quickly and at a lower cost than projects funded with direct grants.

The current authorization for funding the SRF expires in 1994; however, the Administration proposes to extend funding through 1998, at

\$2 billion a year with declining amounts through 2004. This investment, coupled with state contributions, will generate \$2 billion in SRF loans each year for clean water infrastructure and the jobs that investment brings. By the Agency's estimates, 22,400 jobs in wastewater equipment manufacturing and construction are generated for every billion dollars spent on clean water infrastructure. Thus, the additional \$13 billion that would be provided under the Administration's proposal would generate over 290,000 jobs for the country during the next decade.

When the figure for the SRF program is combined with other Administration funding initiatives, including \$4.6 billion for a drinking water SRF, \$480 million for nonpoint source controls, and \$400 million in grants for communities facing extraordinary treatment needs, the total federal investment proposed by the Administration for clean water infrastructure exceeds \$18 billion, with a potential for creating over 400,000 jobs.

Continued funding of the State Revolving Loan Fund would generate over 290,000 jobs during the next decade; total funding for all clean water spending could generate over 400,000 jobs.

These job estimates are important to note when considering the economic benefits of the Clean Water Act. However, they are conservative figures. They do not take into account the many jobs that would be created or sustained as a result of improving water quality conditions. Industries such as lodging, charter boat fishing, and recreational equipment manufacturers all depend on the availability of clean water resources to attract their customers.

Potential Job Creation Resulting from Continued Funding of the State Revolving Fund

State	Jobs	State	Jobs	State	Jobs
Alabama	3,296	Maryland	7,130	South Carolina	3,020
Alaska	1,764	Massachusetts	10,009	South Dakota	1,447
Arizona	1,991	Michigan	12,675	Tennessee	4,282
Arkansas	1,928	Minnesota	5,418	Texas	13,474
California	21,083	Mississippi	2,656	Utah	1,553
Colorado	2,358	Missouri	8,172	Vermont	1,447
Connecticut	3,611	Montana	1,447	Virginia	6,033
Delaware	1,447	Nebraska	1,508	Washington	5,126
District of Columbia	1,447	Nevada	1,447	West Virginia	4,595
Florida	9,951	New Hampshire	2,946	Wisconsin	7,969
Georgia	4,984	New Jersey	12,046	Wyoming	1,447
Hawaii	2,283	New Mexico	1,447	American Samoa	265
Idaho	1,447	New York	32,537	Guam	191
Illinois	13,332	North Carolina	5,320	N. Marianas	123
Indiana	7,104	North Dakota	1,447	Puerto Rico	3,845
Iowa	3,990	Ohio	16,595	T T of Palau	107
Kansas	2,661	Oklahoma	2,382	Virgin Islands	154
Kentucky	3,752	Oregon	3,330		
Louisiana	3,241	Pennsylvania	11,677		
Maine	2,282	Rhode Island	1,979		
				TOTAL	291,198

Conclusion

Clean water is an absolute essential for our economy and quality of life. However, the job of protecting this vital resource remains as challenging as ever. The population continues to grow, placing our waters at increasingly greater risk. At the same time, Americans maintain high expectations about water quality whenever they turn on their tap or venture out to enjoy recreational benefits at a lake, river, or beach. If our high expectations are to be met, we must sustain existing achievements and proceed aggressively to control those pollutants that still degrade our waters and prevent us from fully enjoying their use.

More effective ways for controlling polluted runoff, further reducing toxic discharges, and providing financial resources to support clean water efforts are the keys to ensuring clean water for ourselves and for future generations. The Clean Water Act reauthorization is the appropriate forum for getting these improvements in place. It is a critical opportunity, and one the country cannot afford to let pass.

Paul Goetz



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