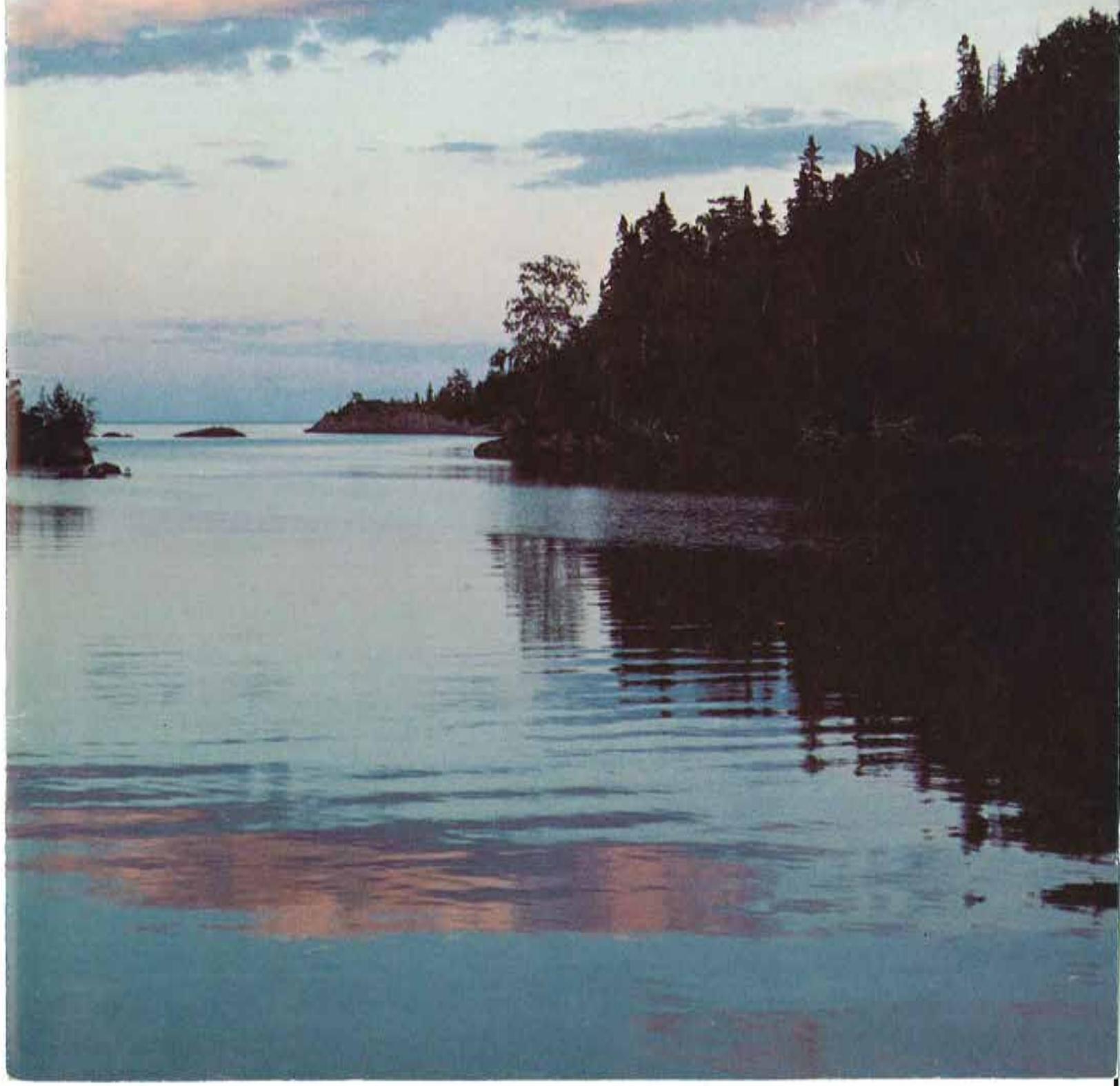

State of the Great Lakes



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Annual Report for 1985

Prepared by
The Office of the Great Lakes
pursuant to Public Act 128 of 1985
for Governor James J. Blanchard.

A Message

We in Michigan are confronting a great challenge. We hold in trust a resource that has become the envy of the world. The Great Lakes have given us a bounty beyond belief. Its fisheries have provided food and recreation for millions; its shores a home for industry and wildlife alike; its surface a conduit for grain from Thunder Bay to the world; its beauty a magnet for millions. Eight states, two provinces and two countries have shared in this bounty and now share the challenge to preserve the integrity of this magnificent treasure.

The history of joint efforts to protect and manage this resource began in 1909 with the formation of the International Joint Commission. Since that time, many other institutions have formed throughout the basin. Their influence, however, has been limited by the attitudes of governments and people within the Great Lakes basin. Many were lulled into complacency by the seemingly limitless capacity of the Lakes to provide us benefits and suffer our abuses. That changed with the environmental movement and led to the establishment and strengthening of programs to regulate pollution, preserve unique shorelines and scientifically manage fish resources.

From this strong foundation our attitudes and ideas have

from the Governor

continued to evolve. Recently, there has emerged a new spirit of cooperation between governments which holds great promise for the future of the Great Lakes. This region is committing itself to a basin-wide approach to deal with the problems of Lakes oil drilling, toxic chemicals in our waters and potential diversions. Just as Great Lakes waters flow between political jurisdictions, so do contaminants. Efforts undertaken in Michigan can only be effective if other states also maintain high standards. In the quest for new jobs and new industries, none of us should allow a relaxation of water quality standards. It is only by responding in a united manner to water quality or diversion threats that we can hope to successfully protect the resource upon which we all depend.

Michigan, as the centerpiece of the Great Lakes region, has become a leader in the drive to protect, utilize and properly develop our Great Lakes water resources. This year we have funded a new computer system to help manage the Great Lakes; we have committed more people to protection efforts; programs to monitor our progress toward water quality goals have been reestablished; we have initiated agreements to promote the wise use and conservation of Great Lakes water resources; and we have given recognition to individuals and groups who

have made and continue to make significant contributions to the Great Lakes. Much still remains to be done. Michigan, through the efforts of its citizens, dedicated public employees and elected officials, will continue to strengthen its commitment to the Great Lakes and provide for their unimpaired use by future generations.

James J. Blanchard

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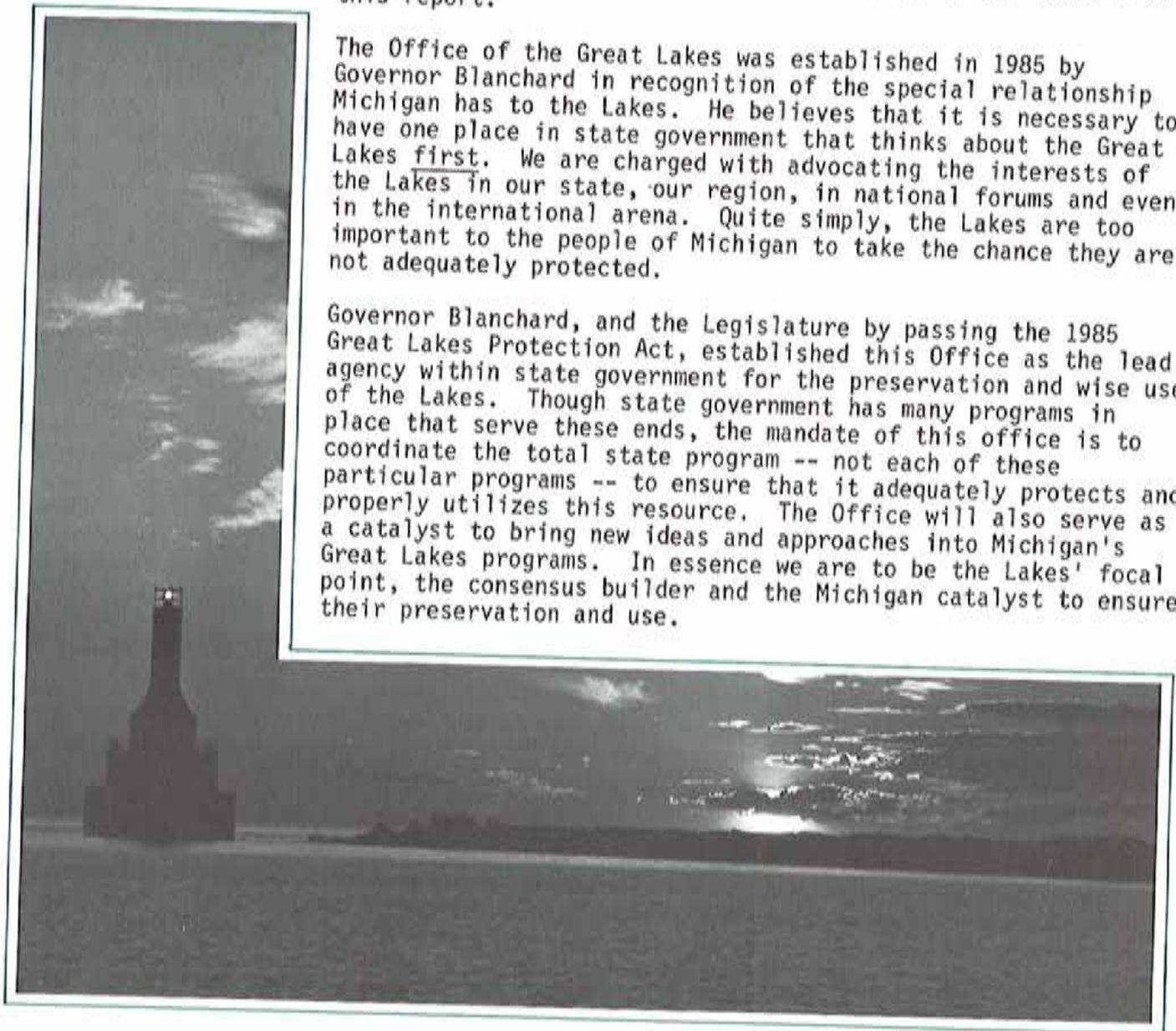


Introduction —

The bounty of the Great Lakes enriches the lives of all of us in Michigan. The Great Lakes define Michigan geographically, economically, and spiritually. We in Michigan are proud of our Lakes and of our efforts to protect them and to use them properly. I hope this annual report will act as a vehicle to highlight our successes, examine our weaknesses and set our agenda. The Lakes affect our lives in vital and complex ways, so it is fitting we honor their contribution to our state with this report.

The Office of the Great Lakes was established in 1985 by Governor Blanchard in recognition of the special relationship Michigan has to the Lakes. He believes that it is necessary to have one place in state government that thinks about the Great Lakes first. We are charged with advocating the interests of the Lakes in our state, our region, in national forums and even in the international arena. Quite simply, the Lakes are too important to the people of Michigan to take the chance they are not adequately protected.

Governor Blanchard, and the Legislature by passing the 1985 Great Lakes Protection Act, established this Office as the lead agency within state government for the preservation and wise use of the Lakes. Though state government has many programs in place that serve these ends, the mandate of this office is to coordinate the total state program -- not each of these particular programs -- to ensure that it adequately protects and properly utilizes this resource. The Office will also serve as a catalyst to bring new ideas and approaches into Michigan's Great Lakes programs. In essence we are to be the Lakes' focal point, the consensus builder and the Michigan catalyst to ensure their preservation and use.



A Promising Start

This first Annual Report will serve as a snapshot of the state government programs relating to the Lakes. In addition, it will touch on some of the major issues currently in the public eye. In the future, I expect that this report will emphasize other crucial aspects of the Great Lakes mosaic.

This report has sections devoted to state programs addressing water quality, water quantity, shoreline, economic development concerns and legislative activity. The report culminates with a review of the current state of the Lakes program and recommends future actions.

The emphasis in this report on the role and activities of state government in the protection and management of the Great Lakes is not meant to lessen the efforts of other states, provinces, federal governments or private organizations. The position taken by Michigan in support of a basin-wide approach makes programs conducted by other organizations just as critical to successful achievement of our objectives as do our own efforts. An excellent source of information on other organizations involved in Great Lakes activities has been compiled by the Freshwater Society and published by the Center for the Great Lakes. The lengthy listing of organizations in this publication gives an indication of the number of people sincerely devoted to the protection, use and development of the Great Lakes.

As Congressman Dennis Hertel likes to point out: "The Great Lakes are Michigan's past and our future." They shape our economy, our geography and our spirits. We must be wise stewards of the Lakes. I hope this report serves to make us all better stewards.

Thomas D. Martin
Director
Office of the Great Lakes



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There has been spectacular progress in pollution control since the 1960's, yet this progress has been tempered by the discovery of other more formidable problems we have yet to address fully.

Michigan is bounded by 3,288 miles of Great Lakes shoreline. Fully 40% of the Lakes are within our boundaries. Michigan is the only state or province to lie entirely within the Great Lakes basin; thus all our water eventually flows into the Lakes. This unique position within our splendid ecosystem carries with it special responsibilities and challenges.

The birth of the modern environmental movement crystallized public concern about our natural resources. The condition of Lake Erie graphically illustrated Great Lakes water quality problems. We all were shocked at the pictures we saw. Dead fish, polluted beaches, burning rivers and suds-filled lakes all marred our region's beauty.

Once thought virtually indestructible because of their enormous capacity, the Lakes are actually quite sensitive to environmental degradation. They behave much like a closed system. Only 1% of the total water contained in the system flows out in any single year, leaving pollutants to accumulate. Yet the Great Lakes system has shown a remarkable ability to respond when pollution is reduced.

There has been spectacular progress in pollution control since the 1960's, yet this progress has been tempered by the discovery of other more formidable problems we have yet to address fully. Phosphorous, a major cause of eutrophication, or aging lakes, has been reduced in Lake Erie by 50% since 1973. DDT levels in Lake Superior lake trout have dropped by two-thirds since 1977. Decreased PCB and mercury levels in Great Lakes fish are more recent accomplishments. These achievements are rewards for our efforts, while the new concerns remind us of the need to harden our resolve, hold the line on existing controls and respond to new threats to the quality of our Great Lakes.



Quality

Wastewater Treatment

The drive to improve the quality of the Great Lakes first concentrated on conventional pollutants such as phosphorous, suspended solids and nitrogen. Phosphates historically have been the biggest environmental insult to the Great Lakes. Initial efforts to address this problem resulted in the restriction of phosphates in detergents in all Great Lakes states and provinces except Ohio and Pennsylvania. Phosphates damage water quality by accelerating the natural aging processes of lakes. This leads to cloudy water, reduced fish populations, and taste and odor problems in drinking water supplies.

Sewage treatment plants have become the primary method of reducing these problems. Municipal wastewater treatment leads the DNR's list of public investment programs, with \$165 million being spent on construction or major improvement of wastewater treatment facilities and sewer systems this year. Since 1968, over \$2.4 billion of state and federal funds have been awarded to Michigan communities. In addition to awarding grant money to local communities, the Community Assistance Division of the DNR also reviews plans for treatment plants and oversees their construction and operation. In addition, it provides a link between the DNR, EPA and communities or industries to assist them in applying for permits.

There is a dynamic element of innovation evident in Michigan when it comes to the design and operation of wastewater treatment plants. The Houghton Lake Sewer Authority recently received an award for being the best-operated wastewater treatment plant in Michigan. The facility treats residential wastewater and discharges the treated effluent to adjacent marshland, flood irrigation fields or seepage ponds which filter out contaminants. This system actually increases the fertility of the fields and the quality of the water. It has served as a model for the design of similar systems throughout the United States. Creative programs such as this have been responsible for the dramatic improvements in the quality of Great Lakes water since 1972.

Municipal wastewater treatment leads the DNR's list of public investment programs - \$165 million in 1985.



Toxic substances have become so pervasive in the Great Lakes ecosystem that they have emerged as the most pressing problem now facing the Great Lakes.



Chemical and Toxic Substances

The inland seas, as they were called by early explorers, have given much to Michigan. The water has slaked our thirst and provided a place to play. The State's bays and harbors have played important roles in the development of our business and industry. Michigan's rivers have carried our refuse. These benefits have not been without cost.

In 1985, the Water Quality Board of the International Joint Commission listed 42 especially polluted "areas of concern" in the Great Lakes, 14 of which are in Michigan. Though not totally comparable, due to additions, subtractions and definitional changes, this compares to 47 cited basin-wide in 1976. Toxic substance contamination is a serious problem in all but two of the 42 areas. In fact, toxic substances have become so pervasive in the Great Lakes ecosystem that they have emerged as the most pressing problem now facing the Great Lakes.

Some toxic substances require decades to break down to harmless compounds. Some also have the ability to bioaccumulate; that is, to concentrate in the flesh of fish and other organisms, including man, which feed on fish or drink the contaminated water. The propensity of some chemicals to bioaccumulate first became apparent in the 1960's when reductions in the nesting success of eagles and osprey was traced to thin eggshells caused by DDT

accumulation in the birds. Great Lakes fish were soon found to be contaminated as well.

The State of Michigan reacted to these discoveries in 1969 by banning DDT. Though the environment responded almost immediately and now, 15 years later, DDT is not considered a problem in most Great Lakes fish, the legacy of this contaminant lives on in humans. Even today, anglers have blood levels of DDT two times the rest of the population. Other problems continued to surface: mercury in Lake St. Clair, PCB's throughout the system and asbestos in parts of western Lake Superior. The challenge is to contain these chemicals so we may enjoy their benefits while limiting their capacity to harm.

Initial responses to toxic contaminants in the environment were, by necessity, reactive. Since the initial ban of DDT in 1969, we have been able to develop a systematic approach to handling existing contaminant problems and reducing the chance that future problems will occur. Regulatory programs are designed not only to control existing sources of contamination but also to track chemicals that have the potential of causing problems.

Water Discharges

National Pollutant Discharge Elimination System (NPDES) permits are administered by the Surface Water Quality Division of the Department of Natural Resources (DNR) and issued by

the Water Resources Commission. They regulate the discharge of wastewater from municipal and industrial facilities to all the surface waters of the State. Discharge limitations for a variety of toxic and other waste substances are set as well as monitoring requirements.

While Michigan was the fourth state to administer its own NPDES program, the issuance of permits has not always been swift and expedient. A lack of money and people hindered efficient issuance of these permits. Recognizing these constraints, Michigan has made a real effort to reduce the backlog of permits. The Legislature has approved Governor Blanchard's request for 14 additional people to attack the permit backlog. Most industries dispose of wastes just as individuals do -- through public sewer systems. To control this source of contaminants, an industrial pretreatment program was developed to regulate these industries. Pretreatment requires companies who generate toxic and other wastes to provide adequate treatment before their discharges reach a municipal sewage treatment facility. The burden of cleanup cannot be passed through to wastewater treatment plants; it must be borne by the generator. Since 1980, local communities have been assisted by the state in developing plans to implement this program. This year we progressed a step farther and began approving these plans. It is estimated that in 1985, industries in over 100 Michigan

communities will be participating in this program.

Michigan also revolutionized the permitting process in January 1985 with the passage and implementation of Rule 57. This Rule mandates that human health concerns be considered and included as a part of the permitting process. The environmental, business, and governmental leaders who wrote it are convinced that this assessment approach is an important part of protecting human health and environmental quality. It gives detailed guidelines on how to evaluate risks and assess toxicity levels in water and tissue samples. Implementation of Rule 57 will allow the Water Resources Commission to more effectively regulate the discharge of toxic substances in the surface waters of the State.

Enforcement by the Michigan Attorney General's Office of standards set by discharge permits puts "teeth" in these programs. Working with the Water Resources Commission, Michigan became one of the first states to meet the Clean Water Act enforcement deadline. National precedents were set with the Hooker and Velsicol cases.

Enforcement action, however, is not the only way that compliance with these programs has been strengthened. A cooperative approach taken by industry and government has led to unique voluntary efforts by many companies to meet their responsibilities. Issuance of the Dow Chemical/Midland NPDES



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The Water Resources Commission unanimously issued a policy statement reaffirming that Michigan will not accept lower pollution standards for its waters.

permit and abatement order in June 1984 set a national precedent for control of toxic substance discharges and led to a \$5 million dioxin control program at the Midland facility.

Further, as mitigation for past damages caused by dioxin contamination problems in the Tittabawassee River, Dow has agreed to donate property to the State and construct an access facility at the mouth of the Saginaw River.

Michigan "heard the lion roar" this year when the Water Resources Commission unanimously issued a policy statement reaffirming that Michigan will not accept lower pollution standards for its waters. Faced with attempts to relax anti-pollution standards and congressional battles over federal sewage treatment funds for Michigan, the statement definitely ended the debate over whether Michigan's waters are "too clean". The Commission's policy supports efforts by Governor Blanchard to get the Great Lakes states and provinces to join Michigan

in taking an "anti-pollution pledge" not to compete for economic development by rolling back existing discharge permits and standards.

Air Discharges

Chemical substances also enter the Great Lakes ecosystem from the air. We are now finding Toxaphene, a chemical used very little in the Great Lakes basin in the Lakes. It is almost certain this threat arrived "air mail". The work of the Air Quality Division of the DNR, and comparable organizations in other states, in regulating toxic substances from air discharges plays a vital role in protecting the Lakes. Of the 1,000 or so air quality permits processed this year, 800 will deal directly with the regulation of toxic emissions.

Groundwater Entry

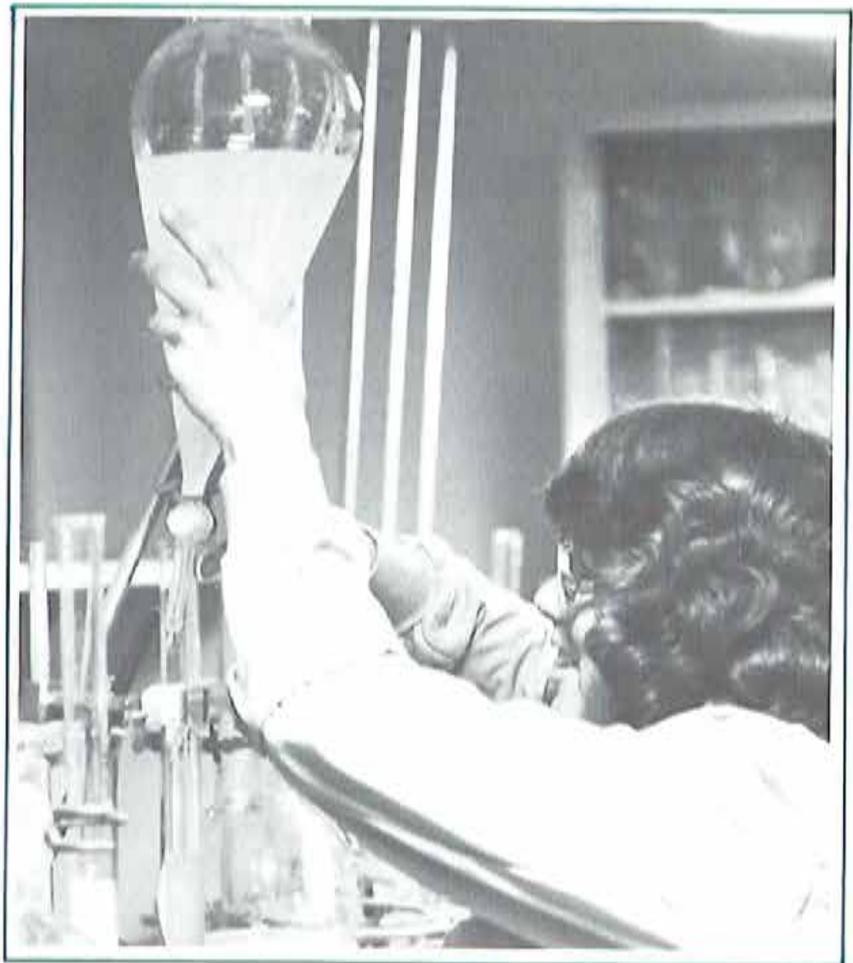
A major source of severe chemical pollution in Lake Ontario has been traced to abandoned dump sites on the Niagara River. On a smaller scale, in Michigan, seepage



from a location in Traverse City has found its way into the east arm of Grand Traverse Bay. This is a dramatic reminder that contaminated groundwater also poses a threat to the water quality of the Great Lakes. Groundwater discharge permits issued by the Water Resources Commission and administered by the Groundwater Quality Division, contain discharge limitations, monitoring requirements and restrictions to prevent contamination of groundwater with toxins. This Division also administers the cleanup of hazardous waste sites. Special recognition of this threat has prompted strong action by Governor Blanchard and the Legislature this year, with the appropriation of \$11.8 million to clean up the worst sites.

Prevention

Michigan's philosophy is to prevent hazardous materials from ever entering the waters of the State instead of waiting to react after they do. The addition of six new people to the groundwater permit staff this year demonstrates the desire of the Governor and Legislature to achieve this. Through the Hazardous Waste Division of the DNR, hazardous wastes are tracked from cradle to grave throughout the Great Lakes region. Licensing is required to insure that proper handling and transport of hazardous waste occurs and safety precautions are followed. Four hundred and fifty businesses and 3,600 vehicles are inspected and licensed annually under this program.



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Michigan also operates a manifest system which tracks hazardous wastes throughout the region. Once computerized, any individual shipment of hazardous waste can be tracked from its point of origin to its final resting place to insure safe disposal. There are currently about 5,000 waste shipments per month tracked by this program. In 1985, the number will increase substantially as full regulation of small quantity generators is accomplished.

The State is also addressing specific contaminants such as polychlorinated biphenyls (PCB's). Despite a state ban, PCB's continue to be discharged from small and diffuse sources such as electrical conductors which predate the ban and contain PCB's as a component. Under an Environmental Protection Agency (EPA) program, Michigan was the first state in the Great Lakes region to assume responsibility for conducting field investigations of sources of possible PCB contamination. Of the 150 or so inspections conducted annually, approximately forty percent of the responsible parties are found to be mislabeling, mishandling or improperly disposing of PCB's.

To insure we have sufficient information about dangerous substances, the Environmental Services Division of the DNR maintains a critical materials register. This register is an inventory of chemicals manufactured, used or discharged to the waters of the State. It is not complete,

however, and covers only some of the many users of critical materials in the State. In 1985, the Governor formed a chemical safety task force in response to the Bhopal disaster in India. Part of its charge is to make recommendations to the Cabinet Council on Environmental Protection on expanding this registry. The Governor has rekindled this program with an \$80,000 appropriation for next year.

Michigan also operates the Chemical Evaluation Search and Retrieval System (CESARS). The 250 most commonly found environmental contaminants are included in this computerized data base which can be used to provide instant data on the physical, chemical, and toxicological properties of these chemicals. Increased computerization of information relating to toxic substances and increased support for our three public labs will help Michigan in meeting current toxic program needs and in maintaining national prominence in the scientific field.

Research and Monitoring

Michigan's contribution to the advance of scientific knowledge on toxins will expand to international scope in 1986 when we host the second biannual World Conference on Large Lakes. This conference will provide an international forum for scientists, policy makers, business and citizen leaders to exchange and discuss scientific and technical knowledge concerning chemical contamination of large lake environments. Conference

support by foundations, environmental groups, government agencies, and industry, demonstrates the depth of the broad-based and world-wide interest in the Great Lakes.

Chemical substances in our waters not only cause tumors on fish or deformities in waterfowl, but ultimately may have a detrimental impact on human health. Fresh water fish represent the principal link between contaminants in the aquatic environment and humans. In 1982, the largest group of Great Lakes fisheaters ever assembled in a single study was enrolled. Five hundred seventy-two persons who ate large amounts of sport-caught fish annually were compared to a control group to determine the differing levels of toxic substances in their blood and tissues. Additional funding is needed to continue this study to reach firm conclusions and results and for other ongoing research conducted through the Department of Public Health, to determine the persistence of chemicals in humans as well as their immediate and long-term effects on health.

The monitoring of contamination in our Great Lakes system provides the yardstick to measure our accomplishments and serves to alert us to new troubles. In the area of toxic substances, fish contaminant monitoring has proven to be a scientifically sound and cost effective analysis method. Fish monitoring provides both the basis for human health advisories issued by the Department of Public Health,

and a primary method used to measure the effectiveness of programs to reduce chemical toxic contaminants in the Great Lakes. It has added benefits as well.

Investigations which uncovered the leaking Hooker Chemical dump site in Montague were initiated after abnormally high levels of contaminants were found in fish samples taken from nearby waters. Yet, prior to 1982, Michigan's fish monitoring system had suffered from neglect. To restore an effective program, the Fish Contaminant Advisory Committee was re-established in 1982 to coordinate efforts between the Departments of Public Health, Natural Resources and Agriculture. A Michigan Fish Contaminant Monitoring Plan has been created which outlines activities and responsibilities among the various units of government. And this year the Michigan Legislature has also responded by allocating \$356,300 in new federal grant monies to revitalize the state's fish contaminant monitoring program.

Michigan's monitoring will be coordinated with other state and provincial efforts to provide a better picture of Great Lakes toxic contamination. In a historic agreement signed in March 1985, Michigan joined with other Great Lakes states in establishing a common monitoring protocol and in issuing lake-wide health advisories on fish in Lake Michigan. Plans are underway to extend this lake-wide approach to other Great Lakes.



Chemical substances in our waters ultimately may have a detrimental impact on human health.



As point sources of pollution have been identified and brought under control, the curtain masking the extent of nonpoint source pollution has slowly lifted.

Michigan encourages this type of basin-wide approach to dealing with toxins and urges other states and provinces to cooperate in these much needed efforts.

Nonpoint Source Pollution

The next time you fly over Michigan take a close look at the rivers. Why does the Cass River in the Thumb look so different than the AuSable? Part of the reason is their locations. Soil, fertilizers, pesticides and other contaminants in runoff from hundreds of farm fields along the Cass can partially explain why the water is browner, cloudier, and of lower quality. Water, falling as rain in our urban areas, is also degraded as it flows down streets and through gutters. Farm fields, suburban lawns, and stormwater drain overflows are all sources of what is called nonpoint source pollution.

As point sources of pollution have been identified and brought under control, the curtain masking the extent of nonpoint source pollution has slowly lifted.

The EPA has targeted nonpoint source control as a significant environmental concern for the 1980's. This year, in a renewal of the Federal Clean Water Act, new funding has been proposed to address these sources of pollution.

Michigan has also responded. Governor Blanchard has directed the Cabinet Council on Environmental Protection to develop a statewide nonpoint

source pollution strategy. This plan, which is to be released late this year, will provide an approach to attack contamination from urban, transportation, and rural nonpoint sources.

Urban and transportation nonpoint source pollution includes storm water runoff from streets and parking lots, illegal connections of wastewater discharges to storm drains and combined sewer overflows. The Governor's plan and the work of the Water Resources Commission will address these problems.

Agricultural runoff has serious implications for water quality because of the amounts of pesticides and other contaminants it carries. It also contributes to a 26.9 million ton soil loss and consequently a reduction in the fertility of farm lands. A program to promote conservation tillage in 31 counties in the Lake Erie basin has succeeded in reducing the amount of phosphorus entering the Lake as well as cutting soil losses. However, additional reductions are necessary to meet target phosphorous loadings in both Lake Erie and Saginaw Bay. This year \$250,000 has been appropriated for establishment of demonstration projects to promote watershed-wide adoption of conservation tillage techniques. A similar demonstration program will focus on urban runoff reduction. The Michigan Department of Agriculture, in consultation with the Governor's office, will select

five watersheds in which to begin these pilot projects.

Perhaps the most diffuse and widespread source of nonpoint pollution to the Great Lakes is atmospheric deposition.

Acknowledging our inadequate knowledge of this problem, the Science Advisory Board of the International Joint Commission has established an atmospheric pollution task force which will evaluate the state of knowledge in this field. In an attempt to develop data which measures the impact of airborne pollution upon the Great Lakes ecosystem and detect trends in the level or pattern of deposition along Great Lakes shorelines, the Great Lakes Atmospheric Deposition Program, coordinated by the EPA, was begun in 1981. In Michigan, the Air Quality Division of the DNR is responsible for 13 monitoring sites along our shoreline measuring acidity and chlorides, nitrates, sulfate and heavy metals.

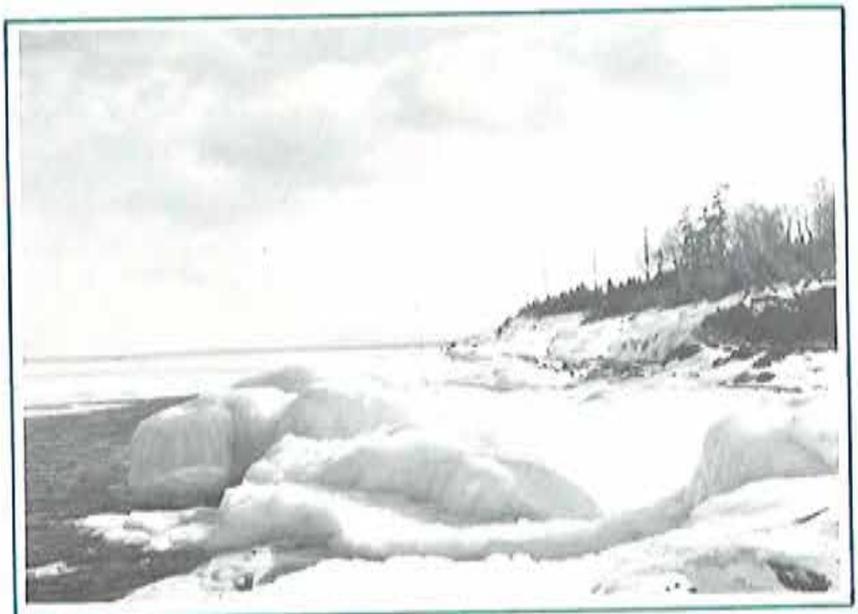
An additional need, data on toxic chemicals, however, is not being met. Recognizing this, the Great Lakes Environmental Administrators met and agreed to explore the feasibility of a joint program for monitoring air deposition of toxics. In response, Michigan convened a group of state, provincial and federal agency managers and scientists in August 1984 to develop a toxics monitoring proposal. The urgency of this need resulted in the endorsement of a comprehensive plan by the Great Lakes Environmental Administrators within nine months of this conference.

Implementation is scheduled to begin as early as the fall of 1985. This initiative, when coordinated with current monitoring efforts, will provide a more complete picture of the problem to aid us in the development of appropriate control strategies.

Summary

There are still trouble spots along the Great Lakes where environmental damage is severe and our ability to enjoy this water is limited. To address these, new efforts are needed to encourage the development of advanced water pollution technologies in the state. New technologies can provide the key to improving these waters without burdening industry. We must continue to explore and refine new filtering techniques or develop biological and chemical means to render toxic substances harmless. Economic prosperity and a clean environment can go hand in hand.

Economic prosperity and a clean environment can go hand in hand.



Water

This year's record high water levels serve as a sober reminder of the Lake's power to cause damage.

The Great Lakes are used by 4 1/2 million Michigan residents and 10% of the U.S. population as a source of drinking water. In Canada more than half of Ontario's residents get their drinking water from the Lakes. Much of our industrial growth and economic prosperity can be traced to this abundant source of clean water.

Water Use

Great Lakes states presently collect and analyze information on major water uses under the National Water Use Information Program. In Michigan, the Engineering-Water Management Division of the DNR, in cooperation with the U.S. Geological Survey, has collected data which gives an indication of how important the Lakes' water is to our state.

Withdrawals from the Great Lakes are approximately 10 billion gallons per day in Michigan, representing 90% of all our water use. The other 10% is withdrawn from inland lakes and streams and groundwater sources. Cooling and other aspects of power generation, represent about 70% of the total use. Industry uses about 18% for similar purposes while withdrawals for public supply, the water that comes out of our tap, demands 10%. Nearly all of this water is used, purified and returned to the Great Lakes.

Consumptive uses, in which water is withdrawn and not returned to the basin, make up a very small amount of the total water used in the Great Lakes basin. In Michigan, only a very small amount of water is consumed, the majority of that by agriculture for irrigation.

It has been projected that within 50 years our use of Great Lakes water will increase substantially. To respond to any future increased needs, Michigan needs a complete and detailed water use data system. Such a system would give us accurate figures on current use and projected demands to aid us in insuring an adequate water supply.

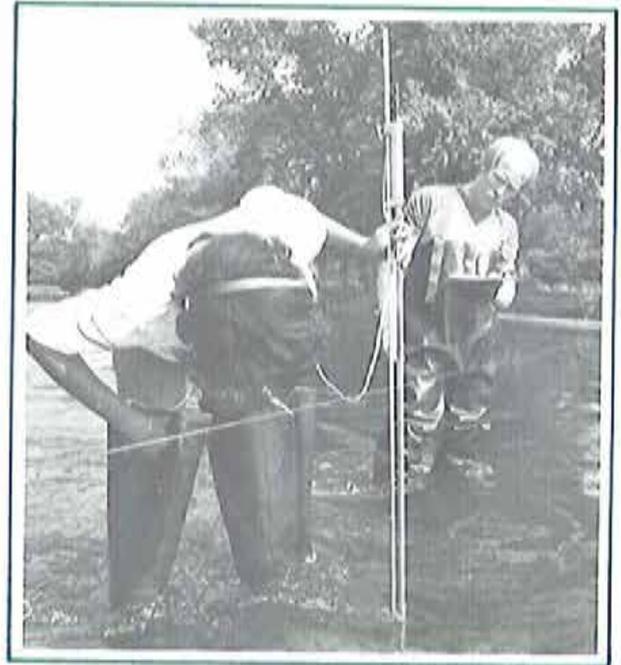
Water Levels

While the Great Lakes provide us with an unmatched bounty, they have their darker side too. This year's record high water levels serve as a sober reminder of the Lakes' power to cause damage. Water level variations generally fall into three categories: short-term episodic changes, seasonal variations and level fluctuations which extend over several years or even decades.



Quantity

Short-term episodic changes are caused by strong winds, in combination with heavy rains, blowing in one direction over the water. Lake Erie is a good example. When strong easterly winds blow for an extended period across the Lake, they pile water along the western shore, often leading to severe flooding and erosion. This can be dramatic at times and has increased the water level in the Toledo harbor 8 feet in one day with a corresponding drop in levels at Buffalo, New York. In Michigan, last Palm Sunday's flooding moved hundreds from their homes along the shores of Lake Erie.



Seasonal variations are caused by large increases in water flowing into the Lakes in the spring during snowmelt. These inputs can cause lake levels to vary up to 1.1 feet in Lake Superior and 1.9 feet in Lake Ontario during the year. Likewise, evaporation accelerates in the late summer generally dropping levels throughout the fall.

The largest lake level variations occur in fluctuations which extend over many years. The historic range of these long-term fluctuations have varied from 3.8 feet in Lake Superior to 6.6 feet in Lakes Michigan, Huron and Ontario. Climatic variations are responsible for the majority of this change. Drought periods or wet periods may not alter Great Lakes water levels until years after they occur. Some of the water which has caused the level of Lakes Huron, Michigan, St. Clair and Erie to reach record highs this year may have fallen on Grayling or Lansing two years ago! Likewise, any changes to flows at various compensating gates between the lakes would not affect levels for months or even years after they were initiated.

The State is assisting individuals affected by erosion and flooding caused by high lake levels. To help those landowners whose lakeside homes are in imminent danger of destruction from shoreline erosion, Governor Blanchard and the Legislature established an emergency loan program to assist them in moving their homes to safety. Under the program, administered through

To respond to any future increased needs, for water, Michigan needs a complete and detailed water use data system.



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the Land Resource Programs Division in the DNR, the state will pay a portion of the interest charges incurred on loans obtained from commercial banks to move homes a safe distance from the shoreline. Additionally, there is a program to provide 15% of the funds needed to build U.S. Army Corps of Engineers protective structures in endangered communities. Up to \$6 million has been committed to these programs.

In the fall of 1972 and the spring of 1973, \$46 million in public assistance was given to flood victims. Between 1972 and 1976, an equal amount in property damage, attributable to Great Lakes shoreline erosion, occurred. The intent of the shorelands program in the Land Resource Programs Division is to minimize future flood and erosion damage by requiring strict building specifications in these areas. Building and development of properties is not prevented but is managed and directed in an effort to reduce property losses from the natural hazard of floods or rapidly eroding shorelines. To date, approximately 300 miles of high risk erosion shorelines have been designated as well as hundreds of acres of flood-prone areas.

A flood hazard management program carried out through the Engineering-Water Management Division of the DNR regularly provides technical services, regulation and community assistance in an effort to minimize flood damage. Program elements include reviews of

major residential developments to establish flood elevations and evaluate location decisions and direct assistance to communities in the development of local flood hazard plans.

Flood forecasting is also constantly improved with the extension of a computer modeling system first developed in 1983 to cover the most flood-prone areas of the State.

Numerous other actions have been taken by state officials to address the flooding problems along Great Lakes shorelines. Five hundred rolls of plastic sheeting and 631,250 sandbags were obtained from the Corps for use in the construction of dikes in areas affected by flooding. State employees were made available to help fill sandbags. In an effort to relieve the strained budgets of local communities, the Governor requested and received a waiver from the Army Corps of \$180,000 of costs incurred in the purchase of sandbags from the Corps during emergency efforts to control floods this spring. Assistance was also requested and obtained from the Small Business Administration for residents affected by flooding in Wayne, Macomb, Monroe and St. Clair counties. Flooding and erosion will never be eliminated, but through these programs, the damages and hardships suffered by those along our Lakes can be reduced.

Water Management Policy

Effective management of the Great Lakes to reduce emergency problems like shoreline erosion

requires a long-term perspective and a regional approach. Because of the Lakes' size and slow response time, management strategies must concentrate on needs for water in addition to meeting short-term emergencies. It is for this reason that in 1985, at the request of Governor Blanchard, the Great Lakes states and Canada joined together in signing the Great Lakes Charter. This historic document stands as a firm expression of political will by the Governors and Premiers of the Great Lakes states and provinces. The stated purposes of the Charter are to conserve the levels and flows of the Great Lakes; to protect and conserve the environmental balance of the Great Lakes basin ecosystem; to provide for cooperative programs and management of the water resources of the Great Lakes basin; to make secure and protect present developments within the region; and to provide a secure foundation for future investment and development within the region.

This Charter commits the signatories to programs and processes specifically designed to accomplish two purposes: establish a united front against any future attempts to divert water out of the Great Lakes basin and establish a framework of water management policy which can be used to encourage and support economic development of the region.

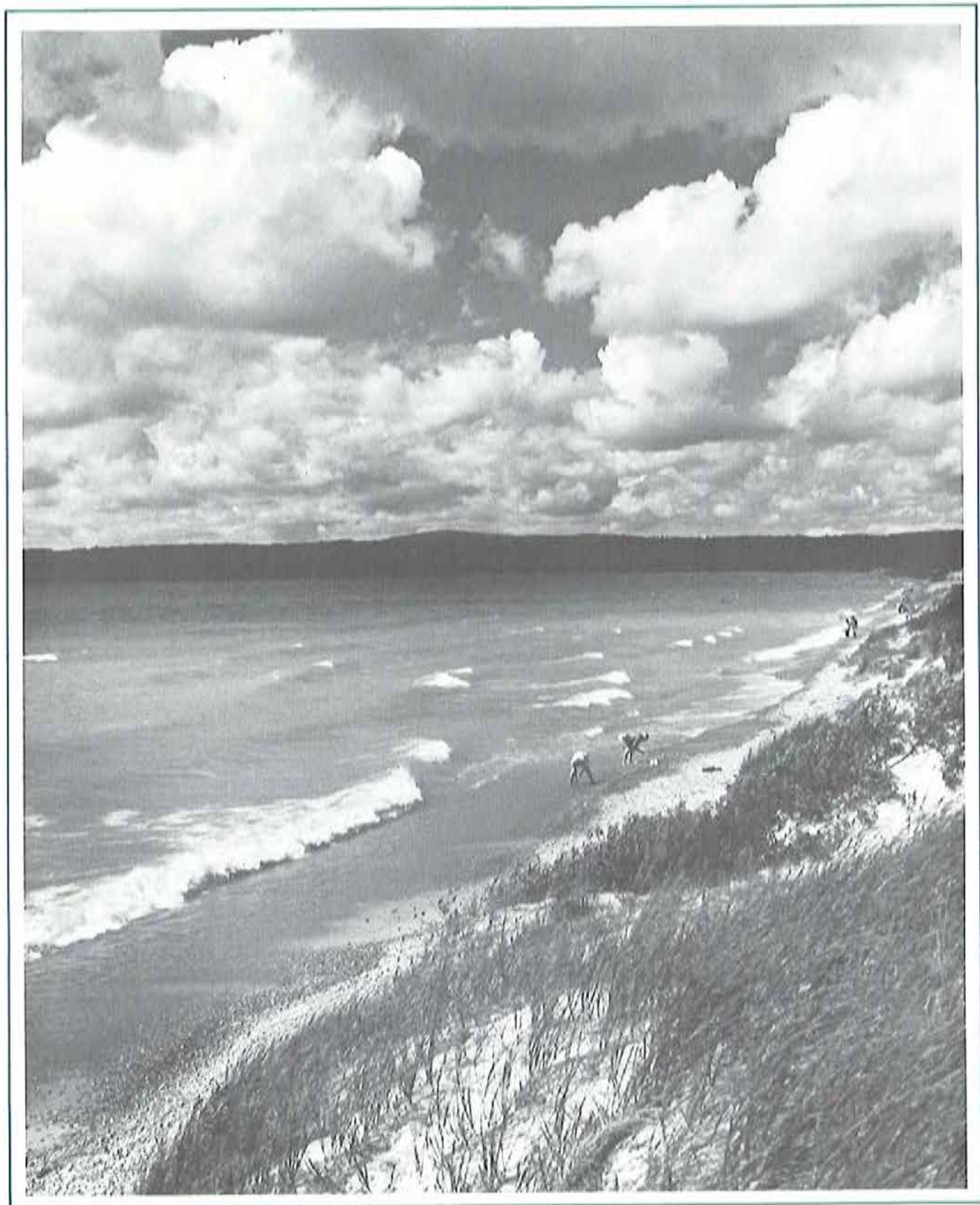
Michigan already has built on the Charter with the establishment of a Great Lakes data collection computer

system. This system, first proposed by Governor Blanchard and Attorney General Frank Kelley, became a reality when the Legislature appropriated \$600,000 this year for its creation. The high tech system will include data collected by state, federal, and Canadian agencies in the basin and will allow Michigan to analyze and predict the effects of diversion or consumptive uses. It will also allow us to better understand and monitor the effects of toxic chemicals on the lakes, enhance fisheries programs, and promote sound coastal development.

Another Charter-related item was approved when \$161,000, matching \$170,000 in federal funds, was appropriated for the establishment of the Great Lakes and Water Resources Planning Commission which is outlined later in the Legislation section.

Michigan already has built on the Charter with the establishment of a Great Lakes data collection computer system.





Our Beaches and Shores

"If you seek a pleasant peninsula, look about you." That statement is just as true today as it was 150 years ago when it was first incorporated into our state seal. From the spectacular dunes of Lake Michigan to the pebbled strands of Lake Superior, the Great Lakes shoreline has attracted thousands of people to play, relax and renew spirits. There has always been something soothing in the sound of waves breaking on the shore and the sight of sailboats plying the waters on the horizon of our clean, clear lakes. Michigan leads the nation with 3,288 miles of freshwater shore spawning everything from retirement homesites to busy marinas. Encouraging balanced use and management of Michigan's shoreland and bottomland resources is the responsibility of the DNR and is accomplished through a variety of programs.

Public access sites and beaches allow us the opportunity to enjoy and explore the wonders of our diverse shoreline. The DNR's Parks Division administers 41 areas located directly on Great Lakes shoreline. They contain 114 miles of Great Lakes shoreline and 130,000 acres of land representing over half of our total park system. While 5% of this shoreline is designated as swimming beaches, the remainder is valued for its scenic splendor, ecological diversity or the rainbow of recreational activities it offers.

Natural processes are not the only destructive forces affecting the quality of our publicly owned shoreline areas. Sometimes visitors themselves by their sheer numbers or private interests under pressure to develop shoreline parcels nearby, threaten ecologically sensitive areas. These concerns were at the heart of this year's attention on Great Lakes sand dunes.

Sand Dunes

Michigan's sand dunes are the largest assemblage of fresh water dunes in the world. Their formation began eons ago following the ice age when the forces of wind and water combined to grind glacial debris to sand and scatter it shoreward in rolling lines of dunes. These forces continue today and account for the changing character and nature of the dunes. The sand dune ecosystem extends inland through strands of beach grass, clumps of pincherry, and groves of oak, maple and white pine. In an effort to understand the ecology of the dunes and respond to recent concerns about their management, a sand dunes program was formed in 1985 within the Land Resource Programs Division in the DNR. This program will establish the sensitivity of the dunes and develop a management plan for their proper use and protection.

Michigan's sand dunes are the largest assemblage of fresh water dunes in the world.



Wetland areas are managed to provide hunting opportunities and vistas for nature lovers and birders.

The Michigan Land Trust Fund contains as one of its goals the expansion of public access to the Great Lakes and connecting waterways.

Michigan citizens have also been actively involved in the dunes issue this year. A citizens sand dune advisory committee was formed to study existing programs and regulations. Their recommended policy, adopted by the Natural Resources Commission in June 1985, will guide the management and protection of publicly owned sand dunes in Michigan. This management and policy development process is greatly aided by the Natural Features Inventory which provides a listing of all unique areas, including dune formations, and endangered species in Michigan. This program, run by the Nature Conservancy, provides invaluable support to state government in its quest to maintain the integrity of these unique areas.

Wetlands

Coastal wetlands, and the species they support, receive protection and management through the efforts of the Wildlife and Land Resource Programs Divisions of the DNR. From Munuscong Bay in Chippewa County to Nayanquing Point in Bay County, wetland areas are managed to provide hunting opportunities and vistas for nature lovers and birders. In addition to using hunters' license fees for land management, special non-game species and habitat management are now being promoted through monies made available by a State income tax non-game check-off. Strong public response to this check-off has made it possible to expand monitoring, research and habitat development for such

species as the Piping Plover, Common Loon and other waterdwelling species.

Land Acquisition and Waterfront Development

Michigan's citizens, however, are not content with research and management of existing areas. The overwhelming passage of Proposal B in 1984 reaffirmed their support for aggressive acquisition of land by the state to be used for public recreation and preservation. The Michigan Land Trust Fund was created in 1976 and contains as one of its goals the expansion of public access to the Great Lakes and connecting waters. Revenues created by oil and gas drilling and mineral production in Michigan are used to purchase these lands.

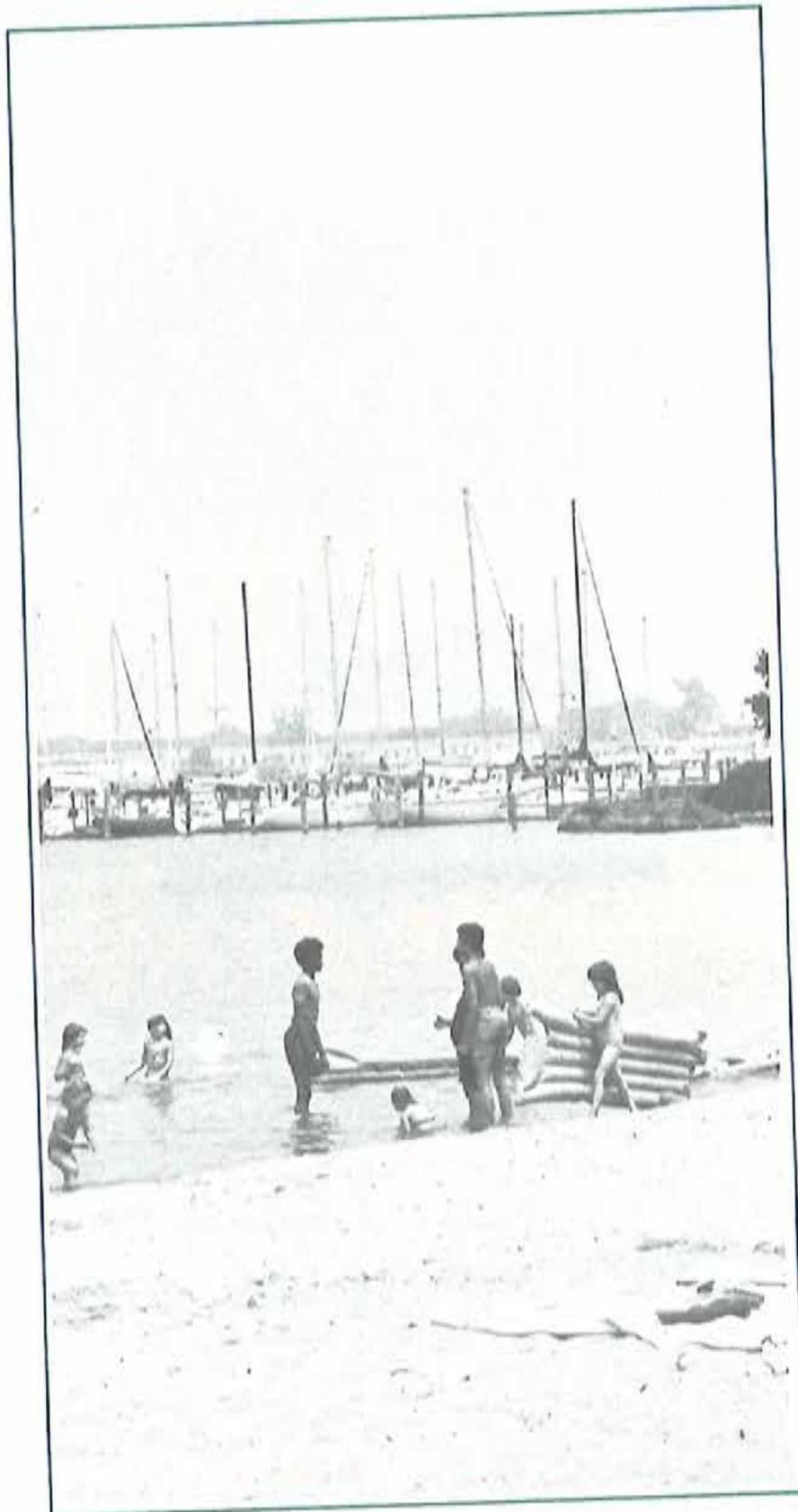
The Fund has made it possible to acquire such areas as land around El Cajon Bay, Grand Mere Dunes, Bridgman Dunes, and 1,000 feet of prime "sugar sand" beach on East Grand Traverse Bay. In 1986, with an expanded program, \$19.3 million will be available for the purchase of state and locally owned and operated park and recreation areas from this Fund.

Federal grant monies, through the Land and Water Conservation Fund, have also had an enormous impact on the development of recreational opportunities along the Great Lakes shoreline. In 1985, almost \$1 million of Land and Water Conservation Fund monies was spent on projects adjoining the Great Lakes. This Fund,

administered by the Recreation Services Division of the DNR, has contributed to everything from the development of a picnic area and trail along Lake Superior at Calumet Township Park in Houghton County to a beach development on Lake Erie. Demand for these limited resources is high: almost 300 requests have been received for 1985-86 funds totalling \$22 million. This request is ten times the amount of dollars expected to be available.

Through the Urban Waterfront Recreation Program, technical assistance is available to urban communities interested in developing and revitalizing their waterfronts to provide recreation or to serve as a catalyst for economic development. The downtown riverfront development in Detroit is a sterling example of this program. The results have been so spectacular and the demand for technical assistance so high that, in the 1984-85 supplemental budget, an additional \$3 million was added to expand these services.

Support and encouragement for waterfront development is also provided by the Michigan Coastal Management Program. Several urban redevelopment studies have been funded by this program to examine the current uses of the waterfront and evaluate proposed improvements, land use changes or expansions. In addition, they have worked to make Great Lakes facilities accessible to handicapped people.





Shoreline and bottomland programs aim to protect environmental values and yet retain flexibility to encourage wise resource use and development.



Shoreland and Bottomland Development

Many changes have come to the shores of the Great Lakes in the last few years. Pressures to develop shoreland properties for commercial or residential purposes are strong. Historically, regulations and controls have not been thorough enough to prevent developments which cause environmental damage or danger to shoreline dwellers. We are proud to have a system of research and regulatory programs which exerts strong control over shoreline and bottomland activities. These programs aim to protect environmental values and yet retain flexibility to encourage wise resource use and development.

Coastal area mapping and classification serves as the foundation of efforts to direct development and identify areas highly susceptible to erosion, flooding or environmental degradation. Areas that provide critical habitat to endangered or threatened species or have unique environmental attributes are also protected under the Shorelands Program of Land Resources. This program maintains extremely valuable habitat, in private ownership, necessary for the preservation and maintenance of fish and wildlife. Its use is restricted to only the most critical of habitats whose destruction would result in a significant loss to the public.

Other activities within the DNR designed to control alteration of the shoreline or bottomlands

of the Great Lakes include permitting for dredging, bottomland construction, salvage operations and bottomland mining. Dredging or dock construction can alter water flows, increase turbidity or otherwise affect areas miles from the development. These programs evaluate possible affects and unforeseen environmental consequences. More favorable locations or alternate designs can then be devised before construction begins, to minimize problems and protect environmental resources.

The state is responsible for protecting environmental resources and the public interest in private development, but also carries the responsibility of doing this in the least disruptive and most expeditious manner. State government has responded to the 20% increase in requests for permits last year for shoreline development by streamlining the permitting process, eliminating red tape and increasing the number of people to carry out required evaluations and inspections.



Economic



The Great Lakes will again serve Michigan as the foundation for industrial expansion as well as the base of a flourishing tourist industry.

One need only review the history of Michigan to see the significant role the Great Lakes have had in the economic development of our state. Industry and commerce were first attracted to the Great Lakes basin by the availability of abundant water and the accessible, efficient transportation the Lakes provided. Tourists were attracted by the abundant fisheries, the boating opportunities and the magnificent scenery. In the heyday of our economic growth, automobile production and related industries provided prosperity to millions of residents and a seemingly never-ending supply of high paying jobs and economic opportunity. But times changed, and Michigan found itself overdependent on a mature and deeply troubled industry. In our search to diversify our economy, we rediscovered the potential offered us by the Great Lakes. The Great Lakes will again serve Michigan as the foundation for industrial expansion as well as the base of a flourishing tourist industry.

Commercial Shipping

Forty active commercial ports and harbors grace Michigan's shores. Products entering and leaving these ports average approximately 100 million tons annually and consist primarily of taconite, limestone and coal shipments. Many of these shipments are tied to the steel industry and consequently have been declining as the production of steel has declined. Efforts to boost commercial shipping are hampered since it falls primarily under the jurisdiction of the federal government and is heavily influenced by developments in the private sector. Efforts by Michigan agencies and Congressional representatives, however, have contributed to the retention of vital Coast Guard and dredging services provided by the federal government to maintain shipping opportunities on the Great Lakes. Michigan has consistently fought for the retention of programs conducted through the Army Corps of Engineers for the building and maintenance of commercial ports. Efforts to impose inequitable user fees for dredging activities on shippers utilizing the Great Lakes-St. Lawrence Seaway will continue to be resisted by Michigan.

Not all efforts, however, have been directed at simply maintaining the status quo. Aggressive efforts to improve the Great Lakes - St. Lawrence Seaway system have resulted in strong support for a proposal to construct a new lock at Sault Ste. Marie to replace the aging Davis and Sabin locks. This new lock will insure that a breakdown of the Poe lock, the only lock large enough to accommodate many Great Lakes ships, will not cause a disastrous curtailment of vital shipments to heavy

Growth

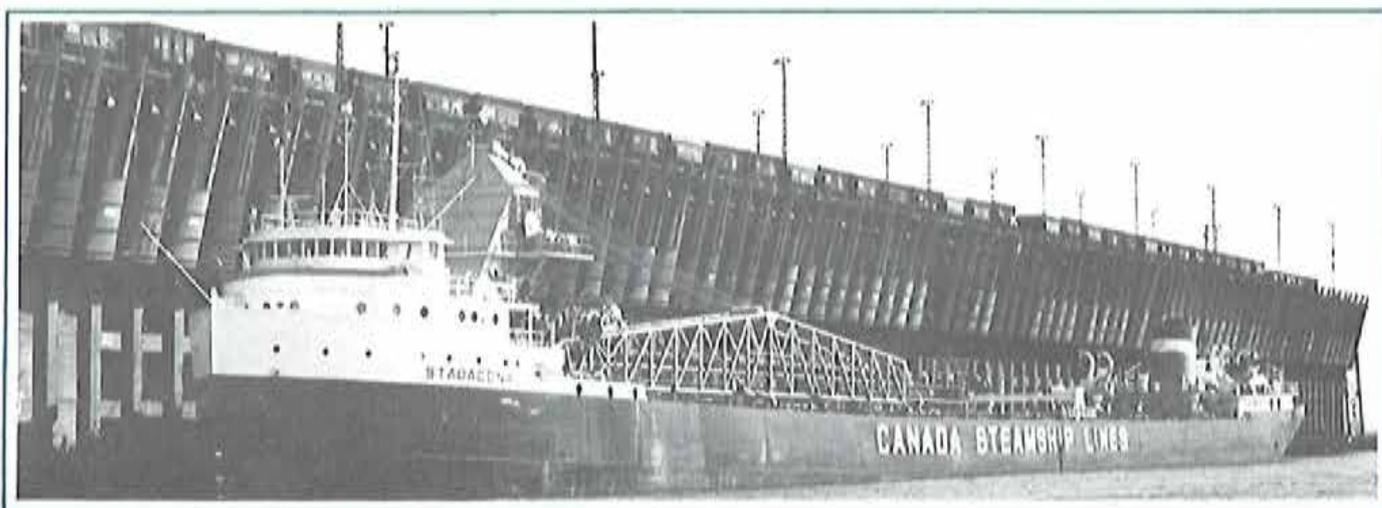
industries in ports such as Detroit. This \$230 million investment will have the added advantage of generating jobs in the eastern upper peninsula as well as the possible sale of millions of dollars worth of Michigan made materials and machinery. Further, the excavated materials of this process should be used in projects to protect and nurture the ecologically sensitive Isaac Walton Bay and Lake Nicollet areas of Lake Superior.

Another major accomplishment this year has been the development of a strategic plan by the Board of the Detroit/Wayne County Port Authority following discussions with shippers, port operators and governmental officials. To further the creation and effectiveness of this keystone port, state-funded support was increased by \$150,000 this year.

Export assistance provided by the Department of Commerce has a two-fold purpose, to increase shipments from Michigan ports and to assist state businesses in selling their products to customers all over the world. The abundant supply of water and the conduit to world markets provided by the Great Lakes - St. Lawrence Seaway are magnets to industries such as pulp and paper. Target industry programs to attract new business to Michigan consistently utilize these facts in the promotion and siting of possible new industries in Michigan. While the ultimate success of these efforts may not be realized for years, they play an important role in continuing efforts by Michigan to revitalize its industrial base.



Aggressive efforts to improve the Great Lakes - St. Lawrence Seaway system have resulted in strong support for a proposal to construct a new lock at Sault Ste. Marie to replace the aging Davis and Sabin locks.





Our abundant fishery supports commercial enterprises and a growing sports fishing industry.



Commercial Fishing

Commercial fishing remains a part of Michigan industry as well. Last year 8 million pounds of whitefish and 500,000 pounds each of carp and catfish were commercially harvested in Michigan contributing \$6 million to the economy. Promotion and marketing of Michigan harvested fish also occurs as an integral part of the Agriculture Department's marketing division's "Say Yes to Michigan Foods" campaign.

Sport Fishing

Our abundant fishery supports a healthy and growing sports fishing industry. Sports fishing is estimated to directly contribute \$500 million annually to Michigan's economy. Great Lakes programs, conducted through the Fisheries Division of the Department of Natural Resources, concentrate on establishing a naturally reproducing population of lake trout and on maintaining active salmon angling opportunities through a large stocking program. The stocking program, one of the largest in the nation, is managed not only for the benefit of anglers but also to maintain the integrity and ecological balance of the Great Lakes environment.

The realization that there are limits to the numbers of salmon and trout that can be stocked in the Great Lakes, led Michigan in 1985 to conduct a complete review of its program for each Great Lake. This review resulted in reestablishment of target goals for each Lake.

The sports fishing industry has also been greatly aided by a reduction in sea lamprey throughout the Great Lakes. The construction and maintenance of lamprey control structures and other river management programs have reduced lamprey numbers substantially. While lamprey levels are fairly low now, evidence uncovered this year indicates we may have future problems. Lamprey appear to be spawning in the St. Mary's River and surrounding waterways where current control measures do not affect them. Research proposals have been initiated to devise a control program against this naturally occurring regeneration.

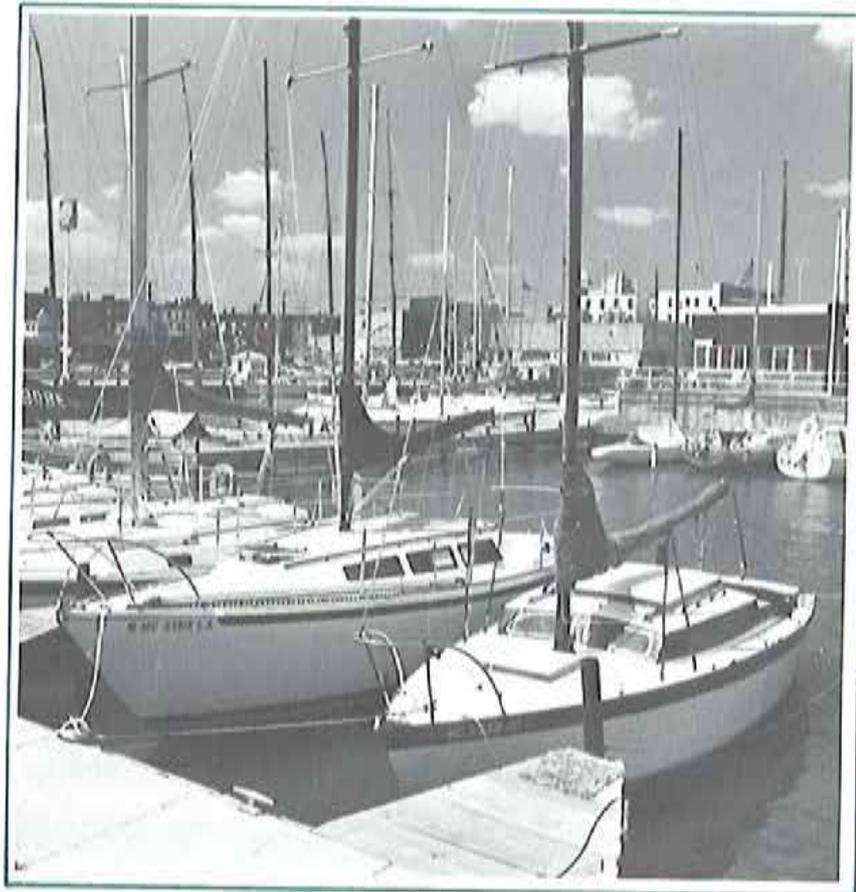
Fishing opportunities and the whole range of activities associated with them, are becoming increasingly emphasized in marketing and promotion campaigns to attract sport anglers to Michigan. Anglers are beginning to realize that sport fishing in Michigan is special for the quality of experience it provides rather than just the size and number of fish that

can be caught.

A monumental step forward in the continued management of Michigan's fisheries resource was achieved this year by the resolution of the long standing Indian fishing rights controversy. Through diligent efforts by DNR Director Ronald O. Skoog, Indian tribal members, federal officials, non-Indian commercial fishers and sport anglers groups, a management framework has been established. Its dual goals are separating conflicting uses and protecting the resource. "It is a blueprint by which the various groups can identify with certainty how their rights will be exercised and their interests served" said Dr. Skoog after the historic signing. "And by so doing, it provides an atmosphere in which economic development can prosper and social stability can be achieved." The agreement, and the arduous work yet ahead, will provide an opportunity for both sport and commercial interests to prosper while protecting the magnificent resource upon which they both depend.

A monumental step forward in the continued management of Michigan's fisheries resource was achieved this year by the resolution of the long standing Indian fishing rights controversy.





Boating registration has steadily increased since 1965 until today Michigan leads the nation.

Boating

Our recreational playground continues to expand on Great Lakes waters and is encouraged and supported by a number of state programs. Docks, harbors and public access sites give Michigan's 650,000 registered boat owners access and safe harbor on Great Lakes waters. Boating registration has steadily increased since 1965 until today Michigan leads the nation.

The increase in Great Lakes boaters can be attributed to many things including the active harbors program operated by the Waterways Division of the DNR. The addition of projects at Harbor Beach and DeTour will bring to 67 the total number of protective harbors and public marinas in Michigan.

Charter boats, used primarily on the Great Lakes, are also inspected and certified to insure their safety for public use. A rise in the quality of fishing on the Lakes has caused an explosion of charter operations from one in 1978 to over 1,000 this year.

Underwater Parks

Lake bottomlands as well have contributed to the recent surge in tourism within our State. Underwater preserves have proven effective in protecting Great Lakes shipwrecks and other aquatic resources, providing a safer environment for visiting divers and expanding local economies. Three preserves currently exist in Michigan: the 113 square mile Alger Bottomland Preserve near Munising in Lake Superior; the 288 square mile Thunder Bay Bottomland Preserve in Lake Huron near Alpena; and the 148 square mile straits of Mackinac Bottomland Preserve between Mackinac City and St. Ignace. It has been estimated that during the 1984 season, almost \$7 million was generated by the growing diving industry near the Alger Preserve alone. In an effort to expand this economic boon to other shoreline communities, a fourth preserve in the thumb area of Michigan has been designated this year.

The use of underwater preserves to achieve the dual objectives of wise use and preservation is only one example of the dedication within state government to achieve multiple goals. There are many outstanding examples of unique approaches to obtaining multiple benefits from activities.

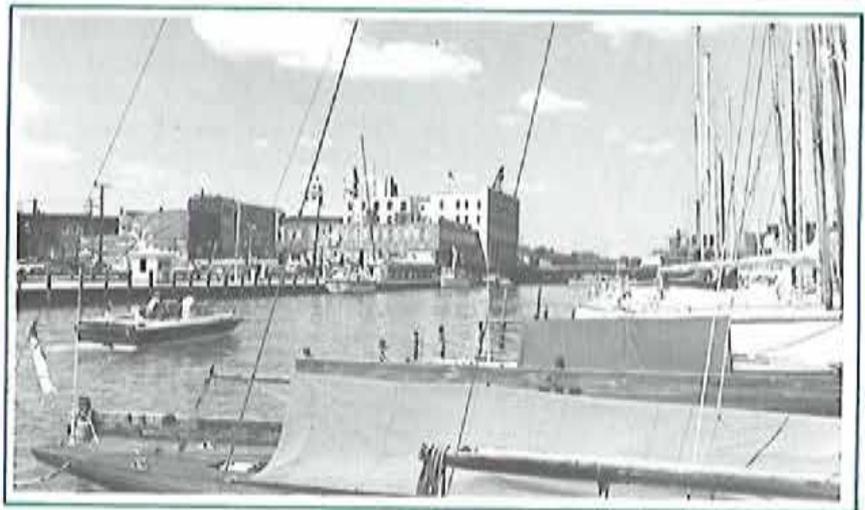
At Point Mouillee, near Monroe, containment facilities for the disposal of dredge spoils were designed and shaped to revitalize and expand a wetland which had been damaged by

erosion and wave action. This project is aided by \$800,000 in state money. Proposals have also been made to utilize polluted spoils from the dredging of Toledo Harbor in the reconstruction of Woodtick Peninsula in Monroe County. This Peninsula has been severely eroded and its reformation is vital to the protection of waterfowl habitat behind it. The State of Michigan will play its part in encouraging these efforts, often picking up the extra cost incurred in their construction. Through this, and the continued support and willingness of the Army Corps of Engineers, we can effectively put to good use waste material the disposal of which might otherwise harm or degrade the quality of the Great Lakes.

Summary

The Great Lakes play an important role in the economic vitality of Michigan. But this contribution ultimately rests on how well we protect the Lakes.

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1985 Great Lakes

Federal Legislation

Reauthorization and strengthening of the Clean Water Act leads the list of federal water legislation considered this year.

Highlights include:

- Authorization and money for the development of programs to address nonpoint source pollution.
- Recognition of the Great Lakes as a national treasure.
- Provision for rational and effective coordination of federal research, planning and management activities.
- Language to prevent backsliding on water quality and continue progress towards making all waters of the nation fishable and swimmable once more.

In addition, a bipartisan coalition has struggled to retain the traditional needs-based allocation formula for wastewater treatment grants in the Clean Water Act. The Senate-passed proposal would lead to harmful reductions in funds to Great Lakes states. The House version protects our vital resource.

Funding of Michigan's four major federal Great Lakes research institutions was restored by the U.S. House of Representatives after pleas from environmental and State leaders. The Reagan Administration had slated the Great Lakes Research Laboratory and the Michigan Sea Grant College for complete elimination as well as heavy cuts for EPA's Large Lakes Research Station and a continued freeze of the Great Lakes Fishery Laboratory budget. The funding levels adopted in the 1985-86 budget will allow these institutions to continue their research on such matters as toxic pollution, the health of fish and wildfowl, erosion, and flood control; all items of vital interest to Michigan.

Likewise, Congress has moved to reauthorize funding for the Coastal Zone Management Act, allowing Michigan's innovative program to continue.

In 1985, the Great Lakes States and Provinces joined together in signing the Great Lakes charter. This historic document stands as a firm expression of shared concern and political will on the part of these Governors and Premiers.

Legislation and Initiatives

The closing of five Great Lakes Coast Guard stations and the downgrading of one station in Michigan was also successfully avoided by restoration of funds for their operation in the 1985-86 budget. These closings, part of a Lakes-wide assault, would have endangered boaters.

Not all the news from Washington was good, however. The budget for the Great Lakes National program office, operated by the Environmental Protection Agency, was reduced slightly. The question of cost sharing for the operation and maintenance of commercial shipping channels and ports by the Army Corps of Engineers remains unresolved. Such fees could adversely affect Great Lakes shippers and businesses with the addition of a new burden on their operations.



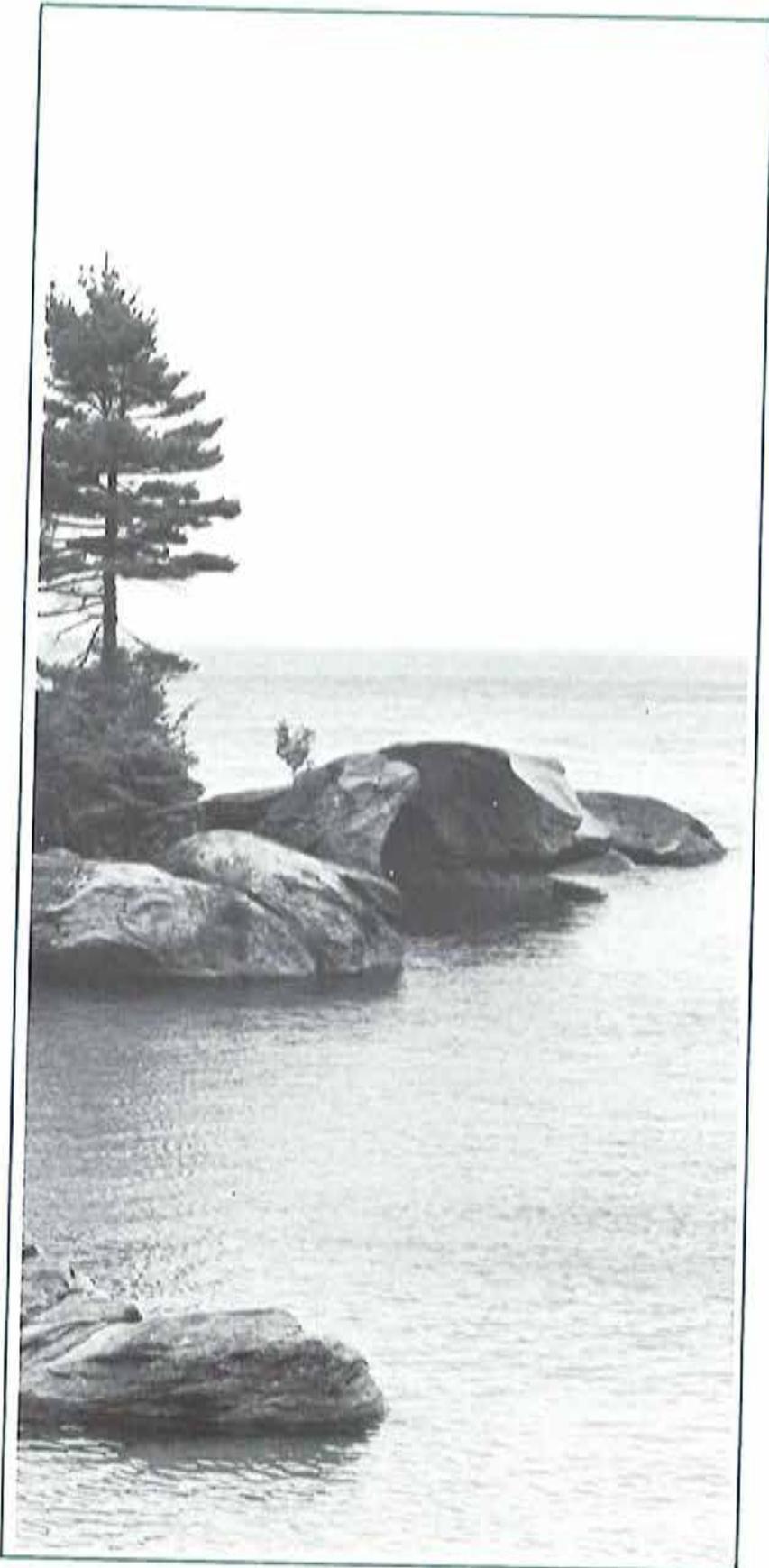
State Legislation

The Michigan Legislature clearly demonstrated its resolve to protect Michigan's stake in the Great Lakes and develop a long-term plan for their wise use and management.

Public Act 130 prohibits the diversion of Great Lakes water out of Michigan. While this law is not legally binding upon other states of the region, it makes Michigan's position against increased diversions clear. This anti-diversion stand will help to safeguard the Lakes while comprehensive water planning efforts (described below) are underway.

The Great Lakes Protection Act (P.A. 128) established the Office of the Great Lakes within the Department of Natural Resources and designated it as the lead agency within state government for the development of policies, programs and procedures to protect, enhance and manage the Great Lakes.

By amending Public Act 28 of 1955, the Legislature altered Michigan's representation on the Great Lakes Commission and mandated an anti-diversion stand by our delegation. The Great Lakes Commission is made up of members from all the States bordering the Great Lakes system. Its purposes include promotion of wise development and use of Great Lakes water, and encouragement of basin-wide planning. Recognizing that these are important needs, the appointment of new Michigan members will help revitalize and strengthen the compact.



A fourth law, passed this year, establishes Michigan as a leader in the region in advancing statewide water resource planning. Public Act 129 creates a temporary Great Lakes and Water Resources Planning Commission to develop a comprehensive state water plan. This mammoth task will involve identifying potential problems in meeting projected future demands for water within the state. The plan will recommend new legislation or policy to promote comprehensive management and protection of the state's water resources.

Initiatives

The number of initiatives undertaken in 1985 has truly made this a year of prominence for the Great Lakes in the region. Topping the list is the signing of the Great Lakes Charter discussed in the Water Quantity section. It represents the most aggressive and far-reaching action yet taken by the Great Lakes Governors and Premiers to develop a truly integrated and coordinated approach to addressing diversion and consumptive use concerns within the basin.

Michigan was honored to act as co-host to another example of cooperation between the United States and our northern neighbors, a Congressional-Parliamentary conference held in June 1985. Sponsored by the Center for the Great Lakes and the Northeast-Midwest Institute, its purpose was to discuss progress, priorities and plans for carrying out the Great Lakes Water Quality Agreement. The international commitment

expressed at this dialog continues to provide the strong foundation of cooperation needed for future actions to protect the Great Lakes.

In an effort to recognize Michigan citizens who have made outstanding contributions to the preservation or wise use of the Great Lakes, beginning this year four Great Lakes Medals of Honor will be presented annually. The medals, each named for one of the Great Lakes surrounding Michigan, are intended to give special recognition to those who have made an important contribution to the protection and management of the Great Lakes. The medals are:

Lake Michigan - for economic development and recreation

Lake Superior - for environmental protection and conservation

Lake Huron - for Great Lakes research

Lake Erie - for transportation and waterfront development

Summary

Through the passage of these laws and development of new initiatives in 1985, Great Lakes protection and management has been enhanced. This incremental progress brings us closer to establishing a comprehensive Great Lakes protection and utilization policy. We must assure that the efforts of this year are only part of a continuing and concentrated effort to improve the quality and use of our waters.

The Michigan Legislature clearly demonstrated its resolve to protect Michigan's stake in the Great Lakes and develop a long-term plan for their wise use and management.

Conclusions and Recommendations

Problems and priorities, like the Great Lakes waters themselves, ebb and flow, evolving with each passing year. Flexibility, responsiveness and vigilance must guide efforts to manage and protect the Great Lakes. State government in the fulfillment of its duty to protect the public interest and serve its citizens, must properly manage the resources we hold in trust for future generations as well as our own.

The preceding pages have outlined new as well as continuing efforts Michigan has undertaken to fulfill that charge. This section contains assessments which give a rough measure of the success of our efforts in meeting the challenges the Lakes present us. Additionally, it contains proposals to improve the quality of our stewardship of these wondrous waters.

Water Quality

Nutrient Pollution or Eutrophication

We have made striking progress in the control of nutrient pollution of the Great Lakes from point sources. Solid first steps have been taken to address nonpoint source nutrient problems. More must be done.

Proposals:

1. Continue to advocate for a full share of the federal wastewater treatment grant program to be allocated to the Great Lakes region.
2. Provide increased funding to develop nonpoint source pollution control programs.

Toxic Pollution

Levels of a few toxic substances in the Great Lakes have been reduced but many new problem substances appear each year. Because of their effects on living organisms, including humans, the difficulty of controlling them in the environment and their long life, toxic chemicals have emerged as the most pressing problem currently facing the Great Lakes. Michigan's program must be completed to ensure proper protection from toxic contamination.

Proposals:

3. Expand Michigan's monitoring and surveillance system to provide a more complete picture of the health of the Great Lakes. Fish monitoring, with its implications for human health, should be given special emphasis.
4. Seek an agreement among all the Great Lakes States to establish common approaches to controlling and disposing of toxics in our shared resource.
5. Prepare remedial action plans for all of Michigan's IJC designated Areas of Concern.

6. Prepare and implement a strong source reduction program to prevent toxins from ever entering the environment.
7. Continue expansion of our chemical inventory to fully monitor toxic substances before they become a problem.
8. Reach agreements with other states and provinces on common fish warnings and testing protocols for Lakes Huron and Erie.
9. Have all the basin Governors and Premiers sign Governor Blanchard's "Anti-Pollution Pledge" not to compete for economic development by relaxing existing water quality standards.
10. Continue to ensure full federal and state funding for Michigan Great Lakes research institutions.

Water Quantity

Strong collective action has been taken to preserve our precious water resources. Michigan has also formed the structure to ensure that we better manage our water resources for the future. Additionally, important steps have been taken to mitigate damages to Great Lakes shorelines.

Proposals:

11. Prepare a comprehensive, accurate reporting system for water use in Michigan.
12. Finalize the implementation of the Great Lakes Charter.
13. Continue to assist communities and homeowners threatened by the high water levels of the Great Lakes.

Our Beaches and Shores

Michigan has worked hard to preserve the unique beauty of our sand dunes. Likewise, we must continue to protect our shoreline while opening it to public access.

Proposals:

14. Continue to protect our sand dunes aggressively and work to end all mining of them.
15. Channel our recreational development resources to waterfront development along the Great Lakes system -- especially in urban or economically depressed areas.

Economic Growth

While Michigan's tourism industry is booming, our ports are dying. We must continue to reap the benefits of our clean environment through our strong recreation and tourism program. We must work hard to revitalize our shipping industry and ports.

Proposals:

16. We must ensure that any federal user fee system for the Great Lakes transportation network treat our region equitably.
17. We must obtain federal authorization for the second "super-lock" at Sault Ste. Marie. We must also ensure that the rubble from this project be used to create or protect valuable habitat.
18. Michigan has an abundance of products that are shipped for export from other states. To expand our economic base, we must devise a port development system to seat production, processing and shipping in our State.
19. With our mix of heavy industry, emerging high-tech companies, strong university research and clean water, we must bring all these concepts together and target the expanded development of the water pollution control technology industry.
20. Development of new parks, marinas and other recreation facilities must be closely examined for their economic development potential as well as their environmental integrity.
21. We must fully fund the "Indian Fishing Rights" settlement to ensure peaceful and proper development of our fishing resources.

Other Proposals:

22. The Governors and Premiers should jointly express their opposition to oil drilling in the Great Lakes by signing Governor Blanchard's Statement of Principle Against Oil Drilling in the Great Lakes.
23. We must ensure passage in Congress of the Clean Water Act with strong provisions opposing backsliding on water quality standards, establishment of a Great Lakes Research Office and the designation of the EPA Great Lakes National Program Office as the lead federal agency on Lakes water quality. Sufficient funding for these ventures must also be obtained.
24. Reform of the Great Lakes Commission must take place with the establishment of a new cooperative arrangement with the Council of Great Lakes Governors.
25. Michigan should form a special cooperative relationship with Ontario since they share so much of the Lakes with us.

These proposals will ensure that we continue the struggle to improve protection and wise use of the Lakes. While this list is not exhaustive, it does provide a positive direction for our programs.

We must remain activists. Like the Lakes themselves, we must adapt to changing conditions. As water flows from Lake Superior to the Atlantic Ocean, so too should dialog flow among the people of these areas. As water is used by industry and anglers alike, stewardship is shared. Preservation and wise use of the Great Lakes demands a constant effort to maintain and nurture these connections. Michigan must continue to lead these efforts.

Acknowledgements

This report would not have been possible without patient advice from many who care deeply about the Great Lakes. Valuable counsel was given by many within state government and by outside experts. Special recognition should be given to the composing efforts of Jan Hacker, the editing pen of David Dempsey, and the perseverance of Daiva Devereaux.

