



From the President's Desk:

Great Lakes United—A Progress Report

by Robert A. Boice, N.Y.S. Conservation Council



Exactly four years ago this coming May, an idea was born. With initiative supplied by the Michigan United Conservation Clubs and financial backing from the Joyce Foundation, a meeting was held at Mackinac Island, Michigan, to explore ways to unite environmental and conservation efforts throughout the Great Lakes Basin. More than 100 people representing 55 organizations, from the eight States and two Canadian Provinces bordering the Great Lakes system attended. All had one primary concern—to conserve and protect the natural resources and environment of the largest body of available fresh water in the world—the Great Lakes and St. Lawrence River Basin.

WHEREAS, we have agreed on the need for such action on the critical issues of:

- Water Quality;
- Hazardous and toxic substances;
- Atmospheric deposition;
- Regulation of levels and flow including diversions;
- Fish and wildlife management and habitat protection;
- Energy development and distribution;
- Land quality and land use practices;

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Great Lakes United: exciting projects ahead

by David Miller, Executive Director, GLU

Since becoming executive director January 1985, I have been inspired by the growth and enthusiasm of Great Lakes United. The support and dedication of member organizations and others, seeking common public policy initiatives to ensure the protection, conservation and proper management of the Great Lakes-St. Lawrence ecosystem, is a testament to the overall citizen desire to enhance this ecological wonder. This philosophy is the cornerstone of Great Lakes United and Great Lakes United is you. You are the citizens and organizations of the Great Lakes Basin representing the unselfish and unrelenting quest to insure that the needs of the overall ecosystem are met.

In this united spirit, many exciting projects lie ahead. This publication, for example, brings together the diverse interests of the Great Lakes under the common theme of an ecosystem approach to environmental problem-solving. THE GREAT LAKES UNITED is made possible by a grant from the George Gund Foundation of Cleveland, Ohio. It will be published quarterly with articles submitted by you, the citizens of the Great Lakes Basin. Mr. Edward Moran, our editor, is interested in your specific projects and would like to present them in this basin-wide forum.

In addition, Great Lakes United will work towards implementing issue-oriented action plans at our annual meeting this year. The resolution and

task-force sessions will not only focus on specific issue-oriented policies but also on joint action plans for more involvement by groups on a basin-wide level. Great Lakes United will be supporting member organizations efforts to hold regional strategy sessions so as to increase coordination among the organizations and citizens involved in Great Lakes Programs.

The most ambitious and exciting project for Great Lakes United is the Great Lakes Water Quality Agreement Public Participation Program. Great Lakes United, through matching grants from the William Donnor and Public Welfare Foundations, will hold 18 public hearings across the basin. Each hearing will allow citizens to air their concerns related to the implementation and the future governmental review of the 1978 Great Lakes International Water Quality Agreement.

The Great Lakes Water Quality Agreement, which was signed by the Canadian and United States governments in 1978, was developed to bring a basin-wide perspective to government assessment of and controls on the problems created by toxic substances and nutrient overloads in the Great Lakes environment. This document and the mechanisms set up under it are central to development of joint—Canadian-U.S.—monitoring, preventive and rehabilitation programs in the Great Lakes Basin.

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Great Lakes: The 1986 Congressional Outlook

by Jane Eldey, Midwest Representative, Sierra Club

In 1985 the Great Lakes gained significant new protection in several major pieces of federal legislation: most notably the Clean Water Act and Superfund. As we move into 1986 these new measures face an uncertain future before conference committees which will attempt to resolve differences between House and Senate versions of the bills. Several new pieces of legislation, from air to groundwater are expected in the second half of the 99th Congress.

The Great Lakes language in the Clean Water Act is not expected to be an issue in the conference committee. Compromise language has already been worked out. Thus, the future of the new Great Lakes Management Office and its coordination, reporting and regulatory functions seems secure on this level is another story. The major bone of contention between the House and Senate will be resolving funding for the sewage treatment plant construction grants program. The House is pushing for \$21-billion through 1994, the Senate for \$18-billion. Senate budget-watchers warn that Reagan may veto the Clean Water Act if the construction grants program exceeds administration budget goals.

The biggest conference committee battle will be over Superfund. With 105

Superfund sites in the Great Lakes Basin, the future of Superfund will have significant bearing on the future of Great Lakes water quality.

A total of 48 conferees will represent the various committees of jurisdiction. There are substantial differences in the House and Senate versions, with the House language much stronger in almost every key area. Many have predicted a long, contentious conference. Great Lakes United members should pay particular attention to conference action on standards, cleanup schedules, community right-to-know and funding levels.

The Safe Drinking Water Act is headed to conference at this writing. Groundwater protection language may or may not survive. If it passes, this modest beginning at federal groundwater protection may pave the way for other more comprehensive efforts which are expected in both houses this year.

There is one issue in Washington these days which dwarfs all others: the Gramm-Rudman-Hollings balanced-budget law. As one Hill staffer said, "Even if the environmental legislation makes it through conference committee it still has to survive Gramm-Rudman."

Washington is obsessed with the likely impacts of the Gramm-Rudman balanced-budget law. Little else will receive attention until the ramifications are more clearly understood. New research, regulation and management programs may fall prey to what is not-so-affectionately known as "Gram-bo." Automatic cuts in EPA would severely

ly hurt Great Lakes programs, which are already frequently raided for other legally required, underfunded EPA programs. EPA has tried to design a budget which could withstand cuts, but original estimates projected an automatic loss of \$300-million under Gramm-Rudman. (For a sense of scale, the entire EPA GLNPO budget is only \$4.9-million.) NOAA research programs, the subject of annual budget fights, face a similar fate.

Several major issues remain on the legislative agenda. On the top of the list: clean air and acid rain. Acid rain is the largest and most politically contentious part of the clean air package, but increasing concerns about toxic air pollutants and protection of existing clean air areas will also enter the debate. Look for new comprehensive legislation in both houses this spring.

Pesticides, a significant source of toxic pollution in the lakes, will come under review as Congress attempts to reauthorize the Federal Insecticide, Fungicide and Rodenticide Act. (FIFRA).

Other issues of interest to the region include the debate over high-level radioactive waste storage in Minnesota and Wisconsin, reauthorization of the Coastal Zone Management Act, and legislation to add two Great Lakes Islands to the list of National Wilderness Preservation System.

It will be a busy year. Sharpen up communication skills and let your members of Congress know how their decisions on these important issues will affect the lakes.



Robert A. Boice

Out of the Mackinac meeting came a document which was to be the keystone to the eventual birth of Great Lakes United—a Charter. The Charter provided a bond on which all parties concerned could find common ground to work together. That Charter reads as follows:

Great Lakes Charter

Adopted at the Mackinac Island Meeting, May 22, 1982

WHEREAS, the Great Lakes are the greatest fresh water system on earth; and

WHEREAS, 50-million people live within and influence the Great Lakes ecosystem and millions more receive economic, recreational and spiritual benefits from them; and

WHEREAS, there is a need for economic strategies compatible with maintenance of the natural system; and

WHEREAS, there is a need for cooperative and coordinated citizen action on behalf of the Great Lakes; and



Exciting Projects

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David Miller and Commissioner Williams

The 1978 Great Lakes Water Quality Agreement required the Canadian and U.S. governments to review it after the International Joint Commission (IJC) releases its third biennial report. The International Joint Commission has announced that it will release that report in 1986. It is expected, therefore, that the governments will conduct their formal review in 1987.

Two non-government reviews of the Great Lakes Water Quality Agreement have been announced. The Royal Society of Canada and the U.S. National Research Council charged a committee of scientists to review the Agreement. Their report was released in December of 1985. The Center for the Great Lakes has announced plans to conduct studies and hold a summit, in the fall of 1986, on the Agreement. In addition, the IJC and the Canadian and U.S. governments will be carrying out their own reviews. However, open public participation programs have not been incorporated in any of these programs.

The current administrations' policies, in both countries, have indicated a potential for a weakening of the agreement when it is scheduled for review in 1987. This potential exists despite the broad-based public support for the goals and objectives outlined in the current document. This public support has been emphasized by the 1985 Great Lakes Amendments to The Clean Water Act which officially recognized the international agreement and endorsed its purpose.

Despite these concerns and the geographic extent of the Great Lakes Basin, neither federal governments have scheduled public participation programs during the review of the agreement. Great Lakes United views the agreement as a "symbol" to the future survival of the ecosystem. Without increased public awareness, participation and long-term involvement, the goals and objectives of the agreement may never be implemented.

The goal of Great Lakes United's project is to compile public input and present its findings in a formal report to both federal governments and all jurisdictional parties in early 1987. The hearing panel will be comprised of eight citizen leaders in the area of water quality. They will assist the field coordinator, Tim Eder, in preparing the final report.

The 18 hearings are scheduled from July thru October of this year in locations chosen on the basis of the IJC's "area of concern" classification. The hearing locations and their descriptions are listed as follows:

Hamilton Harbor are IJC areas of concern.

Sarnia, Ontario Passing through Canada's chemical valley, the St. Clair River is contaminated with PCBs, mercury, heavy metals and dioxin; wastes from deep-well hazardous-waste disposal are now surfacing in the river. This is an IJC area of concern.

Saginaw Bay, MI Saginaw Bay is one of the most-severely contaminated areas in the Great Lakes; sediments are contaminated with PCBs, heavy metals and dioxins; this area is in a severe state of eutrophication. This is an IJC area of concern.

Sault Ste. Marie, Ontario The St. Mary's River is contaminated with heavy metals and toxic organics; fish are contaminated with mercury; there are both municipal and industrial discharges in excess of the accepted limits. This is an IJC area of concern.

Marquette, MI Fish are contaminated with mercury; a Superfund hazardous waste site is located here. This is an IJC area of concern.

Duluth, MN Two major leaking hazardous-waste sites are located in this area. This is an IJC area of concern.

Green Bay, WI Sediments are contaminated with heavy metals and PCBs; fish are contaminated with PCBs and furans; deformities and reproductive problems have been identified in fish-eating birds. This is one of the IJC's areas of concern.

Chicago, IL Sediments in the nearby Waukegan Harbor are contaminated with PCBs at levels as high as 50,000 parts per million. This is an IJC area of concern.

Gary, IN The Grand Calumet River and Indiana Harbor Ship Canal are severely polluted with nutrients, heavy metals and organic chemicals; virtually no fish are present. This is an IJC area of concern.

Grand Rapids, MI A contaminated groundwater plume is entering White Lake from a Hooker Chemical Company site. Muskegon Lake is contaminated with municipal wastewater discharges. Both lakes are IJC areas of concern.

Detroit, MI/Windsor, Ontario The river in this heavily populated and industrial area is contaminated with PCBs, mercury, cadmium, chromium, copper and zinc. This is an IJC area of concern.

Toledo, OH Both the Maumee River and the nearby Raisin River are severely degraded by toxic contaminants; fish are contaminated with PCBs and other persistent organic compounds. Both sites are IJC areas of concern.

Cleveland, OH The Cuyahoga River is severely contaminated by a wide range of substances from industrial and municipal discharges; fish tumors in nearby Black River have been noted. Both rivers are IJC areas of concern.

Erie, PA Two Superfund hazardous-waste sites and the Ashtabula River, which is severely contaminated with numerous heavy metals and toxic organics, are near Erie. The Ashtabula is an IJC area of concern.

Buffalo, NY The Niagara River is severely contaminated by the numerous hazardous-waste sites that are leaking into it and the industries that discharge directly into it. Fish tumors have been found in the Buffalo River and the Niagara River. This is an IJC area of concern.

The Great Lakes International Water Quality Agreement is the single most important document for the future of the Great Lakes Ecosystem. In order for citizens to continue to push for the agreement's goals and objectives in their local and regional areas, we must insure that the agreement is strong, implemented and understood. The main objective that "the discharge of toxic substances be prohibited and the discharge of any or all persistent toxic substances be virtually eliminated" (Article II (a)), can only be reached through public demand. Great Lakes United urges you to become involved in this hearing process, so your voices can be heard.

For further information on organizational or citizen involvement in these hearings, contact Tim Eder at Great Lakes United, (716) 886-0142.

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Cartoon: Charles Green

The St. Lawrence River—A View from Quebec

by Daniel Green, Société Pour Vaincre la Pollution

Every Quebecer knows that the French explorer Jacques Cartier discovered the St. Lawrence River 450 years ago but few realize that the river has been polluted for 300 years. Our history books depict the St. Lawrence as the route into the interior of the continent followed by the newly arrived European colonizers but they omit mentioning its use as a waste-disposal site. In fact, by the beginning of the 18th century, 23 shops and factories were already injecting their wastes directly into the river.

From the city of Cornwall, Ontario to the Atlantic estuary, the St. Lawrence River extends 700 km across the Province of Quebec. Bordering the river are nearly 3,000 km of shoreline along which are situated Canada's largest cities and factories. Even today the majority of these urban and industrial centers discharge their waste waters directly into the river with little or no treatment.

Obviously, the St. Lawrence is more than just an open sewer. Nearly five-million Quebecers draw their drinking water from the river while thousands use it for commercial and sport fishing. It still serves as a navigation route for commercial and pleasure craft. Paradoxically, those human activities which profit most from the river's exploitations are now threatening this rich diversity of uses.

A Poisoned Bounty

In 1978 a joint Federal-Provincial research group studying the St. Lawrence River identified toxic discharges as one of the major factors limiting the full utilization of the river's potentials. Since then, no action has been taken to improve the situation. Today, the St. Lawrence remains a vast hazardous-waste dump site.

The Société pour Vaincre la Pollution (SVP)—a Quebec-based environmental group—has compiled the available data relating to the contamination of the St. Lawrence River. Our research has allowed us to pinpoint nearly 60 large factories which annually discharge more than 109,000 metric tons of toxic wastes directly into the St. Lawrence. The result of 300 years of toxic-waste dumping? Today, we realize that the sediments of the St. Lawrence River are contaminated by heavy metals and organo-chlorinated substances.

The data compiled by the SVP demonstrate that along the industrialized zone of the river, nearly 140 km of the river bed contain contaminated sediments—23% of the 600 km² lying in the industrialized zone. The several hundred thousand tons of toxic substances which have already accumulated on the river bed represent a continuous source of contamination of indeterminate life-span. We know only too well today that these contaminated sediments are far from inert. They are constantly recirculated as a result of natural forces (currents, tides, ice movement, floods) as well as human activities (drainage, navigation, development and operation of hydroelectric installations, shoreline construction.)

Since the early 1970s, caution has been recommended for the consumption of fish caught in some regions of the river. It has been conclusively established that all fish caught upstream from Quebec City are contaminated with only the degree of contamination varying with the location. The most affected species are the northern pike, muskellunge, walleye and bass. The flesh of some specimens

of these species may contain up to a half-dozen of the toxic substances discharged into the river (mercury, cadmium, chromium, lead, PCB, HCB.)

This contamination is also taking its toll of the rare white whale, the Beluga. The number of this endangered species is dwindling due to massive PCB contamination. Experts predict that in less than twenty years the Beluga of the St. Lawrence River will be extinct.

The attitude of both the Federal and Provincial governments towards the polluters has always been extremely conciliatory. The keynote has been negotiation, never coercion or legal redress.

In the face of this continued governmental inaction and stalling, the SVP decided to take action by publishing the Pollution Map of the St. Lawrence River, thereby informing the Quebecers of the state of contamination of the river. (To order a map, send a \$5.00 check (CAD) to the Société pour Vaincre la Pollution, P.O. Box 65 Place d'Armes, Montreal Quebec, Canada, H2V 3E9.)

The map employs color-coding to indicate various types of industrial waste discharges and/or pollutants are identified. Municipal water supply intakes are labelled as are zones where fish are considered to be too contaminated for human consumption. Zones of contaminated sediments are clearly indicated as to the nature of the contaminants they contain.

The Dangers of Expanding Maritime Traffic

Each year, the International Seaway and the St. Lawrence River transport 120-million metric tons of merchandise. Montreal's important petrochemical industry is serviced by a heavy oil-tanker traffic. The SVP has always been concerned by the probable consequences of a major spill in the St. Lawrence, particularly during the winter months when severe weather conditions increase the risks of accident and render cleanup operations nearly impossible.

During a violent storm in December 1983, for example, three ships suffered damage, two of which spilled crude oil into the St. Lawrence Gulf. Due to adverse meteorological conditions, no cleanup operation was undertaken. More recently, in December 1985, severe storm conditions were again implicated in an oil spill when a barge carrying crude oil slipped free of its tug and ran aground on a rocky coast. Tens of millions of gallons of crude oil were spilled. Once again, cleanup operations were rendered next to impossible by high seas and drift ice.

These few examples illustrate the dangers presented by winter navigation on the St. Lawrence. Nevertheless, maritime shippers wish to lengthen the navigable season to the maximum possible; the construction of reinforced-hull ships and the efforts made to keep the Seaway open

throughout the winter clearly demonstrate this intention.

The SVP believes that winter-time navigation should be restricted in the St. Lawrence River, particularly in those portions upstream of Quebec City.

In addition to lengthening the navigable season, the maritime shippers want to increase the size of the locks in the Seaway in order to allow larger ships access to the Great Lakes. The decreased navigability of these larger ships will certainly increase the risk of collisions and oil spills. Dredging work to enlarge the Seaway will resuspend contaminated sediments.

While we are not in principle against development of commercial shipping on the St. Lawrence, we feel it is urgent to stress the point that the river



Great Lakes Limited

is more than a shipping route. Shippers must recognize the multiplicity of functions inherent in the nature of the river owing to its geographical location and ecological significance.

The St. Lawrence in International Relations

The St. Lawrence River is a direct access route to the industrial heartlands of Canada and the United States. The economic importance of the link between the St. Lawrence and the Great Lakes via the International Seaway is beyond dispute. Unfortunately, the ecological linkages between the Great Lakes and the St. Lawrence are less well understood. This sad statement of fact is well illustrated by the study released by the Federal-Provincial Committee on the St. Lawrence River. The study's terms of reference were limited to the ecology of the river between Cornwall, Ontario and the Atlantic estuary, comprising the boundaries of the Province of Quebec, without any attempt to integrate the influence of the Great Lakes on this ecosystem. Such oversimplification is symptomatic of the "territorial" approach to ecological problems.

Today, we realize that this type of problem demands an international approach. The quality of the water in the St. Lawrence depends, in part, upon the condition of water originating in Ontario or the United States. We may draw an analogy to the acid rain problem here; the degradation of the St. Lawrence River system must be treated as an ecological problem of international dimensions.

In the documents of the Interna-

tional Joint Committee one often encounters the ecologically erroneous notion that, of the eight American States and two Canadian Provinces bordering the Great Lakes Basin, Quebec alone does not really belong to this hydrological system. According to the different hydrological definitions employed, the eastern limit of the Basin is located at either the outlet of Lake Ontario, near the Thousand Islands or at the international boundary at Cornwall. It is, therefore, hardly surprising to learn that the Quebecers do not feel threatened by the problems of the Great Lakes Basin.

Long-Distance Contaminant Transport

The St. Lawrence is an international waterway. Before arriving in Quebec its waters flow through Ontario and New York. At Montreal the river is composed almost entirely of water from Lake Ontario which, we all know, is besieged by nearly 400 toxic substances.

As early as 1975, the SVP predicted that contaminants such as Mirex and dioxins originating in Lake Ontario would soon begin to enter the Quebec section of the river. Today, nearly ten years later, this prediction has unfortunately come true—traces of Mirex have been recently detected in the sediments of Lake Saint-François where the river enters Quebec.

Mirex, a proscribed insecticide, was dumped into Lake Ontario—on the American side—during the mid-1970s. It has been subsequently "transported" by currents as far as 300 miles downstream.

This phenomenon of "long-distance aquatic transport" implies that whatever is in Lake Ontario today will eventually find its way down to Montreal. The waste disposal sites belonging to Hooker Chemical (Occidental Chemical Corp.) of New York which are situated near the Niagara River represent an important potential source of in-pollution source for Lake Ontario. In addition, significant reductions in the concentration of PCB found in the fauna of the Great Lakes may signify that this contaminant is already being transported downstream.

The formation of Great Lakes United (GLU) four years ago has marked an important turning point in the promotion of an international consciousness in the conservation of the Great Lakes Basin; thousands of the border are beginning to demand that measures be taken to protect the Great Lakes and the St. Lawrence River. This was the reason which led the SVP to become one of the founding members of the GLU.

But for a coalition like GLU to be truly representative, there must be a large Canadian contingent. The Province of Ontario, with shoreline along nearly all the Great Lakes and the St. Lawrence is presently well-represented. This is not the case for Quebec with only two member-groups.

Most Quebecers have not yet grasped the nature of the ecological link connecting the St. Lawrence River and the Great Lakes. If Quebecers are to become concerned with the conservation of the Great Lakes/St. Lawrence River system, this link must be clearly demonstrated.

We must never forget that the water which flows by Montreal today has flowed by Detroit yesterday.

Daniel Green is a member of the Société pour Vaincre la Pollution, Montreal.



Permanent Solutions Needed for Dumps Along the Niagara River

by Pamela Millar, Pollution Probe Foundation

The Niagara River plunges over the American and Horseshoe Falls at the rate of 200,000 cubic feet per second. The mist has a distinct chemical smell. It's the smell of volatile organic chemicals which are stripped from the river water as it is thrashed and sprayed in the 180-foot drop. The Niagara Falls are more than a scenic view for romantic honeymooners. The Falls are perhaps the largest chemical air-stripping facility on the continent.

For several years now, the Niagara River has been recognized as the major source of toxic chemicals to Lake Ontario. But scientists are beginning to suspect that the Niagara River is also a major contributor to air- and land-pollution problems caused by long-range transport of toxic chemicals—toxic fallout. This means that the chemical pollution of the Niagara River is no longer simply a threat to the Lake Ontario-St. Lawrence River stretch of the Great Lakes Basin. It has become a problem of continental proportions.

The source of the problem is the complex of chemical industries which located along the New York side of the river in the 1940's to take advantage of the large volumes of fresh water and easy access to hydroelectric power. The hazardous industrial wastes of these industries are leaking from makeshift chemical dumps along the river.

Leaking chemical dumps make the largest contribution to the chemical load in the river. For example, recent tests by the New York Department of Environmental Conservation have confirmed that the most dangerous dioxin isomer, 2,3,7,8-tetrachlorodibenzo-p-dioxin (TCDD), is leaking into the river from the gorge face below the Hyde Park dump.

Hyde Park is one of two hundred dumps along the river, including the now well-known Love Canal. Unless these sources of toxic chemicals to the Niagara River are eliminated, Lake Ontario will continue to deteriorate as a source of drinking water, sports and commercial fishery, and as a freshwater ecosystem. Not only that, Niagara Falls will continue to spew its volatile chemical load and exacerbate the problems of long-range toxic transport. Unfortunately the recent cleanup proposal for the Hyde Park dump, as an example, provides little reassurance that negotiated remedial-action plans at these sites will, in the short term, significantly reduce the chemical burden of the Niagara River. The 15-acre Hyde Park dump lies about 1,800 feet west of the edge of the Niagara Gorge. The chemical wastes buried at the site contain mirex, benzene, lindane, mercury, C-56 and an estimated 2,000 pounds of 2,3,7,8-TCDD. Hyde Park has probably the largest single store of 2,3,7,8-TCDD buried anywhere in the world. To put this figure in perspective, it is estimated that all the Agent Orange sprayed during the entire Viet Nam war contained only 130 pounds of dioxin.

Between 1953 and 1975 Hooker Chemical Company (now Occidental Chemical Corporation) dumped a full 80,000 tons of chemical wastes in direct contact with the limestone bedrock which underlies the Hyde Park site. To date, the hydrogeological investigations have failed to determine the areal extent of the offsite migration of

the chemical wastes, now have the investigators defined the many bedrock fractures and other preferential pathways by which chemicals may move to the river.

In November 1985, the United States and New York authorities, together with Occidental Chemical Corporation, finally announced the long-overdue cleanup proposal for the Hyde Park dump.

The \$17-million-dollar cleanup plan would require Occidental to extract liquid chemicals from the dump and the shallow bedrock around it. It would also require some studies to define the location of the chemicals which have moved offsite into the lower bedrock formations, but it would stall any further cleanup or study of the site until an incinerator is given a regulatory permit to destroy the extracted wastes. For these and other reasons environmental and citizens' groups on both sides of the border have joined the Canadian and Ontario Environment Ministries in forcefully criticizing the proposal.

Environment Canada, Environment Ontario and Great Lakes United have formally criticised the plan for failing to stop leakage of chemicals to the river. The cleanup proposal would allow .5 grams of TCDD to be released to the river per year and would permit twenty percent of the chemicals dissolved in groundwater in the upper bedrock to enter the river without requiring any significant adjustment of the cleanup scheme. This continued discharge of incredibly toxic chemicals to the river is contrary to the Interna-

tional Water Quality Agreement of 1978 which requires that "the discharge of any or all persistent toxic substances be virtually eliminated." The critics claimed that the cleanup plan was not designed to eliminate the discharge of persistent toxic chemicals, such as dioxin, rather it is being used to justify the ongoing contamination of the Great Lakes Ecosystem.

The Pollution Probe Foundation, which has been active in the Hyde Park legal case and was granted *amicus* status together with Operation Clean Niagara and Operation Clean Lake Ontario, called the cleanup proposal fundamentally defective because it is based on flawed and insufficient data. According to Pollution Probe's brief, the substantial problems with the existing hydrogeological data base makes it impossible to assess the performance of the extraction system and make it equally impossible for the parties to provide any guarantees to the public that chemicals will not reach the river. The cleanup plan relies on only five wells along a 6,000-foot stretch of the Niagara Gorge-face to monitor whether or not chemicals from the bedrock are reaching the river. Pollution Probe maintains that without complete information identifying all the preferential pathways through the bedrock to the river, chemicals may well travel to the river along cracks and fissures and completely bypass the monitoring system.

The Pollution Probe brief also points out that while the cleanup is expected to cost Occidental Petroleum Corporation \$17-million dollars total, the

estimated cost to Canadian taxpayers, if the plan fails, will be in the order of \$170-million dollars annually. These costs, which would be over and above the unquantifiable costs for human health and the environment, would include installation and operation of advanced water-treatment facilities at waste-treatment plants around Lake Ontario, and the lost value of the commercial and sports fisheries in Ontario.

Considering the almost four million Canadians who take their drinking water from Lake Ontario could be affected by a failure of the cleanup proposal at Hyde Park, it is unthinkable that the government parties have agreed to a cleanup proposal which dooms us to decades of studies and experimenting with unproven small-scale technologies. While Canadians bear the substantial risks of technical failure at this and the remaining two hundred dumps along the river, the United States Environmental Protection Agency and New York Department of Environmental Conservation continue to tailor cleanup proposals to the convenience of industry at the expense of the public and the natural environment.

Like many transboundary pollution problems, the problem of toxic chemicals leaking into the Niagara River puts at risk a population which has little or no direct political access to decision-makers who have the authority to remedy the situation. For this reason alone, a Niagara River remedy will depend on basin-wide agitation on both sides of the border for comprehensive, permanent solutions.



Great Lakes United

Policy Options: Great Lakes Natural Resource Management

by R. J. Scradato, State University Research Center, SUNY at Oswego



The Great Lakes have supported the industrial backbone of two nations for decades providing jobs and recreational opportunities for millions of U.S. and Canadian citizens. Through the years, the Great Lakes system has been significantly impacted by industrial, agricultural, and municipal discharges, drainage modifications, inadvertent and planned introduction of xenobiotics, and a host of other factors which have imposed actual or potential limitations on the optimal use of the Lakes.

Because the Lakes lie within several jurisdictional domains, optimal use and protection of this resource has frequently been relegated to the special interests of a select few with undue consideration of the long-term implications of a specific course of action. And despite the millions of dollars expended by state, provincial, federal and private organizations to gain specific information for many of the pertinent Great Lakes' management issues, there still remain many unanswered questions which directly affect the Great Lakes' long-term viability.

Although research conducted on the Lakes has provided partial answers to many relevant questions, most of the studies have been designed and conducted to support policy decisions driven primarily by expediency. Although policy options should be assessed in light of pertinent research conclusions, resource management decisions are more often established in an information void because results are unavailable, inconclusive or have not been effectively conveyed to the interested public and policymakers by the research community.

Academic social and natural science researchers contend that basic research is what they know best, and that natural resource managers should draw from the results of sound research to establish policy. Managers stress the need to maintain harmony with societal needs and attempt to strike a balance with what is considered to be in the best interest of the user community and the resource.

Because the public is effective at shaping management decisions either by direct intervention or in concert with their elected officials, policy decisions are often established on perceptions of need which may be formulated without full benefit of relevant research findings. In the past, management policy decisions were commonly used to maximize utilization of a resource. Canals were dug to maximize shipping, hydroelectric projects were constructed to produce inexpensive electricity, and a host of other projects were conducted which were often singly focused, and implemented without due consideration of the long-term implications or impacts. More recently, major projects cannot be initiated unless a careful assessment of the inter-related impacts or effects is conducted by the proposing organization. Although this is a vast improvement over past practices, a basic lack of pertinent information relative to the optimal use of the resource precludes effective evaluation of potential long-term implications of a specific course of action.

Optimizing strategies, which theoretically have longer term effects and potentially benefit a broader constituency, are less-frequently adopted because of direct public or political pressure to arrive at decisions. There is general consensus that resource optimization requires detailed and careful attention to planning and an appreciation of the relative, inter-related benefits/impacts of a specific course of action. An optimizing strategy requires that policymakers have available specific research information to enable assessments of relative value or effects.

Resource policy decisions are directly influenced by the expressed interests of the public and elected officials, and the research community. It has long been recognized that natural system researchers are not especially adept at effectively conveying results or needs to the user community. Most university researchers are ineffective in this role because their rewards—tenure and promotions—are firmly rooted in

the quality and number of research publications, graduate instruction, and to a much lesser degree, community service. The public, on the other hand, is far more influential at shaping policy by advancing their interests to the management agencies through their political representatives or special-interest groups.

There is a direct and inter-related relationship between the establishment of policy by management agencies and the research community. Agency policymakers not only establish how a particular resource will be utilized, but also set future research priorities. Researchers conform to the policy-established research agenda by submitting proposals designed to meet agency directives regardless of whether resource optimization objectives are being met.

An ecosystem approach to natural resource management has been touted as the preferred approach by natural system researchers and managers. This approach, which more closely approximates resource optimization, however, is currently not possible because too little is known about inter-relationships, short- and long-term effects of natural and/or anthropogenic perturbations, and other pertinent information. Too often, researchers and manager have not been able to focus on relevant ecosystem questions primarily because this form of analysis is long-term, does not provide ready answers to managers and the public, and has not been set as a high priority by management agencies.

If an ecosystem approach to Great Lakes management is to be implemented, there must be a basic change in policy setting by management agencies. Long-term policy options must be assessed within an ecosystem context and the public, elected officials and researchers must recognize their respective roles to achieve this goal. In order to affect this objective, management agency representatives and researchers must focus special attention on working directly with the public to ensure that policy options are

addressed in light of available information, and not governed by perceptions of need or expediency.

Governor Cuomo in his January 8, 1986 "Message to the Legislature" instructed Department of Environmental Conservation Commissioner Henry Williams to prepare a twenty-five year Great Lakes Management Agenda to identify the major problems facing the Lakes and actions New York State could take to develop a comprehensive plan for the region. The Governor's initiative provides an opportunity to bring researchers, the interested public and management agency representatives together to establish a program which will enable progress toward attaining an ecosystem management plan. The public, elected officials and management agencies will seize upon this opportunity to make their interests and concerns known. Great Lakes researchers can play an active and constructive role by recognizing that they must be willing and available to actively participate in working with the public, agency representatives and elected officials to ensure research results and needs are carefully considered in setting policy directives. Although many Great Lakes researchers will actively participate in developing a comprehensive management plan, most will not. Not because of a lack of interest or appreciation of the importance, but because they are preoccupied with maintaining active research programs, and because they are not experienced in dealing directly with the public. There exists a core of specially trained individuals who have been highly effective in bridging the communications gap that exists between researchers and the user community. Natural resource advisory and extension staff have a proven record in working effectively with the public, elected officials, and researchers. They are able to effectively communicate and interact with a broad constituency to ensure the public understands the implications of specific research results, and equally important that researchers understand and appreciate the public's interests and concerns. Although there are only a few New York Great Lakes advisory specialists, they have demonstrated a willingness to work with interested parties. The public should be made more aware of the availability of Great Lakes advisory specialists, and researchers make special efforts to keep specialists updated of pertinent research results.

I recognize that the concept proposed in this note is not unique and will not solve the long-standing communications problem endemic to natural resource policy which my intent was to remind members of the Great Lakes community that we have an opportunity to become active participants in setting policy directives, and there exists a "window of opportunity" provided by Governor Cuomo's 1986 Great Lakes directive which may close without allowing us to move closer toward achieving an ecosystem management plan for the Great Lakes.

Remond J. Scradato is a geologist who has directed the Research Center at The State University of New York, College at Oswego for the past eight years. He also serves as the assistant protocol for research at the college. During the past eight years he has been extensively involved with Great Lakes toxic substance research and hazardous waste management.



Great Lakes Program

by Dr. Ann DeWitt Brooks, Great Lakes Program, SUNYAB

In the summer of 1985 the New York State Legislature established the Great Lakes Program at the State University of New York at Buffalo (SUNY at Buffalo). The Program, supported by both state and private funding, has as its focus policy-oriented research by faculty and graduate students. We are presently sponsoring three projects:

- an evaluation of the environmental consequences of the use of calcium magnesium acetate as an alternative to currently used road salts with the Lake Erie Basin as the focus of the study;
- an economic study on the valuation of (Great Lakes) water; and
- an analysis of the structures and interagency interactions of organizations with environmental responsibilities along the Niagara River.

In addition, we are developing projects with other research organizations which may study environmental mediation, land use and the Lakes, and state environmental law and regulations. We intend to publicize the outcome of our activities in a variety of ways: through publications, meeting, conferences, and educational programs. These will be directed especially to those decisionmakers, both public and private, for whom the subject seems most appropriate.

In support of our research the Great Lakes Program will serve as a clearing-house for activities relating to the Lakes. We are developing a Resource Directory of individuals within New York having expertise in subjects in-

cluding tourism and recreation, hydrology, toxics and pollution, environmental law, fish and wildlife habitat, environmental management, public policy, resource economics and several other areas. To date, approximately 90 such persons, many of whom have developed one or more Great Lakes data bases, have been included. This information has been computerized and will be printed in the spring. Further support for the program's research will be provided through a computerized bibliography currently being developed. The focus of this bibliography is the Lower Lakes and Canadian-United States environmental relations. The Program's resource room, a collection of reports, books, studies, and articles, which is open to the public, has a similar focus.

As part of our objective of increasing local interest in and understanding of the Lakes and issues surrounding their governance, we are developing a speakers series. On March 19, Professor John Carroll of the University of New Hampshire, spoke at SUNY at Buffalo. His two talks addressed the subjects of acid rain and Canadian-U.S. dispute resolution and the Great Lakes. On April 9 Mr. Davis Robinson and Mr. Blair Hankey will discuss Canadian-U.S. dispute resolution. Mr. Robinson is a lawyer in private practice and formerly a legal advisor to the United States State Department. Mr. Hankey is the present Deputy Director of the United States Trade and Economic Relations Division of Canada's Department of External Affairs and is the former Canadian

Secretary and Legal Advisor in the Office of Negotiations of Maritime Boundaries and Resources. Mr. Hankey argued the Gulf Marine case (involving fishing rights and boundary lines) before the World Court. This session will also be held on the SUNY at Buffalo campus O'Brien Hall. The public is invited to attend.

Anyone interested in learning more about the Great Lakes Program should contact Dr. Ann DeWitt Brooks, Associate Director, 350 Porter, Bldg. 4, State University of New York, Buffalo, New York 14261. The phone is (716) 636-2088.

Ann DeWitt Brooks, Associate Director of the Great Lakes Program at the State University of New York at Buffalo, received her Ph.D. in urban and regional planning from Florida State University. She taught planning and researched and written on social and intergovernmental issues and on rural planning.



Great Lakes United

Strawberry Island

by James J. Gardner

Strawberry Island, a small 20-acre island in the upper Niagara River, is rapidly eroding. The island, once over 200 acres, was heavily dredged during the forties and fifties. Man's intervention, by removing over 111 acres of the island's land mass, has accelerated the natural erosion process. Significant fish spawning and feeding grounds are sheltered and nurtured by the island. Many varieties of birds and waterfowl utilize the island's trees and wetland habitat. The Department of Environmental Conservation (DEC) has recognized that Strawberry Island and the waters around it, are a significant coastal fish and wildlife habitat. The island's land mass plays a key role in the overall hydrodynamics of the Niagara River system. Presently, these aspects of Strawberry Island are in danger of being adversely effected. It would be a great waste to jeopardize the natural ecological balance now occurring in this area.

My observations and first-hand knowledge of this problem are the result of 20-years worth of on-site experience. During this period of time I have taken many fishing, boating and skindiving trips to Strawberry Island. Beneath the waters of the island lies a veritable paradise of plant and marine life.

Critics of this preservation attempt say the amount of funds needed for the remedial work are not justified.

Opponents feels that the sportfishing and hunting groups do not contribute

Last summer the Legislature of Erie County passed a resolution calling for the formation of a task force to deal with this issue. The Strawberry Island Task Force would seek solutions to the problems confronting the island. Acting as the task force chairman, Mr. David Miller, Executive Director of Great Lakes United, with the assistance and resources of Great Lakes United staff, has unified our efforts. Along with a local attorney, Mr. James August, David and myself coordinated the formation of the task force. During this formation period, a number of meetings were held with private business, sportsmen clubs, environmental and conservation organizations. We also found the local media to be very receptive.

A resolution calling for the U.S. Army Corps of Engineers to study the island's erosion problems has been initiated by Congressman Henry Throckmold. With this study the Corps could then make recommendations as to the type and cost of the remedial work. It appears that the State Park's system will be agency channeling the funding for the project. There is also a developing possibility of corporate sponsorship for short- and long-term island maintenance costs.



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The next move pertaining to the island must come from the town of Enone. The figure in 1983 was \$3,944. I believe this translates to not only state, but county revenues as well. What will the economic impact be if these important and fragile spawning grounds on the Niagara River are disturbed? Perhaps another lost resource, much like the Blue Pike a few years ago. In other words, less fish, less fishermen, less money spent equals less revenue to the area.

Tonawanda, New York. They must donate the island to an appropriate agency or make efforts toward completing the task of remedial work with available state funding. The town must firmly establish their position, thereby providing the task force with a specific direction.

As in many issues facing the Great Lakes, it is the joint efforts of many concerned individuals and organizations that will determine the future of Strawberry Island. Hopefully, we can all continue the momentum moving forward in protecting and managing this unique resource for future generations to enjoy.

James J. Gardner is a Buffalo-area preservationist and one of the founders of the Strawberry Island Task Force.

Why the UAW is Involved with Great Lakes United

by Amos Bankston, UAW—Department of Conservation/Recreation

The UAW has been a pioneer in conservation for many decades and joined in with various organizations in support of the first Earth Day in 1970. The UAW has and will continue to work financially, politically, and through whatever means possible to help maintain a clean, healthy environment. In addition, the UAW is concerned with the current brand of anti-environmentalism and economic intimidation exhibited by some factors in our society. Furthermore, the UAW's long-standing concern over the rapid rate our country's natural resources are being depleted and the waste that is polluting our waterways, lakes, rivers, and streams is reflected in the following actions:

The UAW hosted the first National Clean Water Conference in Detroit in 1965 to stop pollution in the Great Lakes.

The UAW established a Conservation Department in our union in the sixties and urged that our local unions establish committees to work on cleanup projects in their communities.

In 1970, the UAW hosted a conference of Earth Day activists at our Walter P. Reuther Family Education Center at Black Lake in northern Michigan.

In 1976, over 300 environmentalists attended a conference at our Black Lake facility to examine studies from the government and non-profit organizations that in part concluded that most job losses from plant closings were not due to environmental regulations.

The UAW supports many programs to protect wetlands and has urged Congress to fully restore funding to Federal Great Lakes research programs.

We have and will continue to work with organizations to prevent acid rain and to request better standards for control of industrial discharges.

The UAW opposed new diversions into or out of the Great Lakes.

In addition, the UAW is concerned about the trend of some forces to blame environmental controls for causing inflation, unemployment, the previous energy crisis and even the problem of foreign imports. We realize that some of those that try to prevent workers in factories from attaining environmentally healthy working conditions would rather threaten forced shut-downs rather than to correct conditions.

The UAW wants to create a public awareness to improve our environment without damaging the economy or causing unemployment. Our members and their families are comprised of both urban and rural backgrounds. When they have an opportunity to leave the workplace they often take their families to outdoor recreation waterways and expect to enjoy the use of clean water. Conservation is a priority to the UAW, and we believe that all of the benefits of natural resources should be enjoyed by everyone.



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The Great Lakes have approximately one-fourth of the fresh water on the face of the earth, and it will take careful planning to insure that no damage occurs to our waterways in the form of toxic or hazardous dumping, spills, etc. The UAW will work shoulder to shoulder with organizations and the government to insure quality and proper management of the Great Lakes.

The Great Lakes are a very precious resource that we often just take for granted. We want them to remain clean and clear. The Great Lakes must never be taken for granted and raped of their water, fish or minerals. Corporations polluting the Great Lakes for profit could seriously effect resources in a short period of time. The Great Lakes with proper management will remain a treasure for many generations to come.

The UAW's continued involvement with Great Lakes United, we hope, will help to make the Great Lakes and the ecosystem a clean, safe and long-lasting pollution-free basin. We are proud that the UAW participated at the first meeting held to formulate and organize Great Lakes United. We have successfully encouraged many UAW (CAF) Community Action Program councils and local unions to join Great Lakes United.

Diversion: The Issue

by E. E. Moran, Editor/Lake Erie Coordinator GLU

Water diversion represents the altering of the natural course of a waterway for usage in another locale. This ecologically dangerous process is looked upon, by some, as the answer to high water levels and yet, by others, as a possible economic boom. We, at Great Lakes United (GLU), see this as a potentially catastrophic abuse of the ecosystem, impacting the region's environmental, social and economic character.

In the performance of my duties as Lake Erie Coordinator for GLU, I have spoken to property owners throughout lack of information or misinformation, see diversion as the answer to flooded or eroded property. In fact, many of these individuals have come to believe that high water levels have resulted from diversions into the Great Lakes. This is not true. All believe that their property should be protected before any thought is given to the ecosystem. This is not the way it should or must be.

The threat of water diversion is a reality. One such attempt that must be examined as a potential diversion involves the Ohio River Canal. This economic and ecological travesty was proposed to connect the Ohio River with Lake Erie. Conservationists, environmentalists, labor and government groups banded together against this proposal in Columbus, Ohio, on January 16, 1986. Aside from the obvious ecological dangers in this type of plan, if ignored, would set in motion an irreversible precedent to establish the mechanics to divert water from the Great Lakes Basin whether designed as such or not.

In Canada, a more grandiose project has emerged aimed at diking James Bay, creating a freshwater lake to be pumped thousands of miles, possibly into Lakes Superior, Huron and the St.

Lawrence River. This project, entitled the Grand Canal, would utilize the Great Lakes as a transfer station to sell Canadian water to the parched regions of the United States. The environmental and social impacts of this \$100-billion monster would be severe to both the James Bay and Great Lakes Ecosystems.

It must be recognized that high water levels are causing hardships. The easily embraced solution of diversion is not a clearly analyzed proposal. We would like to cooperate with homeowners to better improve coastal management and study the means of minimizing high-water damage by understanding the flow-through rates of the system. However, diversion is not the answer. If we were to fully increase the Chicago diversion and cease totally the Ogoki and Long Lac diversions, Lake Erie would drop only four-tenths of a foot, according to the International Joint Commission, with the end result taking 10-15 years to occur. That would not be sufficient to prevent the shoreline damage of last fall's storms.

In Lake Erie, the November 1985 storm caused a seiche, tilting the lake towards the eastern shoreline. A two-to-four-inch drop in lake levels, even if achieved overnight, would not have been compensated. The estimated eight-foot rise on the eastern shore caused the lake seiche. Great Lakes United believes long-term solution must be developed which respect and understand the inter-relationship of the hydrological system without bowing to the threats of diversion.

In its report of February 10, 1986, entitled *A Year After the Charter: The Threat of Water Diversions and the Implementation of the Great Lakes Charter*, GLU proposed a seven-point plan to build a

case for protecting the Great Lakes from potential diversions. The central focus of the program is water management, water conservation and the establishment of a public health and welfare case for the waters of the Great Lakes system. These points are advocated as a means to implement the goals and objectives of the Great Lakes Charter:



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1. Each state and province should formally incorporate a water registration system for all users of Great Lakes waters. This mandatory registration system should include amounts of water returned to the Great Lakes System and in what quality. In addition, this system should not be used to legitimize existing diversion. We should not accept this registration system as a basis for "grandfathering" all existing diversions and consumptive uses.

2. Establish present consumptive-use needs in the basin based on the registration data and develop projected future consumptive-use needs under a variety of economic growth scenar-

ios. This must be coordinated with the establishment of a data base that understands the quantity and quality of water available to the Great Lakes Basin.

3. Detailed analysis of the environmental, social and economic impacts of water diversion, and incorporate those findings into a public health and welfare case. Economic impacts could only be incorporated as they relate to the health and welfare of the citizenry, to avoid economic protectionism as in the El Paso case.

4. Advocate water conservation/improvement programs within and outside the Great Lakes Basin.

5. Develop state and provincial prohibitive diversion legislation based on the public health and welfare case.

6. Great Lakes jurisdictions would defend the legislative ban on diversion of Great Lakes water out of the basin in courts, based on the public health and welfare case. If the legal case was lost, Great Lakes jurisdictions could then incorporate a permitting system for water withdrawals.

7. Great Lakes jurisdictions would work with national and international leaders to develop and implement anti-diversion legislation and agreements.

We need to speak as one and promote the seven-point program of GLU and the building of a public health and welfare case for the Great Lakes. We must stop trusting in overnight, short-term answers to long-term problems. Remember that, while fragile, the Great Lakes are a powerful force of nature which calls for understanding and stewardship instead of futile efforts to manipulate. We, in the need for overnight solutions, may very well create irreparable havoc with one of nature's most delicate balances.



Toxic Fallout Finally Getting Attention in Washington

by Lee Botts, Lake Michigan Federation

Toxic fallout is getting more attention in Washington, but no new legislative proposals for control are pending for either the Clean Air or Clean Water acts.

The phenomenon is being noticed both by the Environmental Protection Agency (EPA) and by environmental lobbyists who have previously been concerned only about acid rain and Bhopal-type accidents.

The EPA concern results from attention to what the agency calls "integrated environmental management" and others call "cross-media management." In the Great Lakes, recognition that relationships between air, land and water must be considered is called an ecosystem approach to management.

In 1983, the Integrated Environmental Management Division of EPA sponsored a study of pollution in the Philadelphia metropolitan area that took a new approach. Instead of looking at air, land and water pollution separately, the Philadelphia study considered pollution from all sources.

Instead of looking at separate systems to control pollution in various forms, the study aimed to protect the environment as a whole.

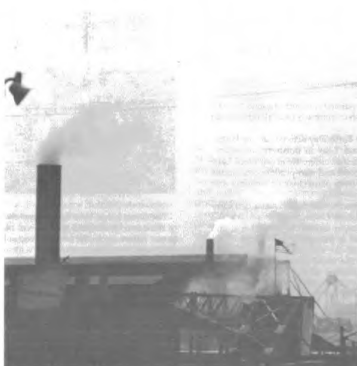
The idea for integrating environmental management grew out of recognition that most existing pollution-control programs simply move wastes around. Usually, pollution is dispersed and becomes more difficult to control. Well-known examples are the way tall stacks were built to put air emissions from power plants high enough into the atmosphere to protect human health in the local air quality areas identified by the Clean Air Act. In this way, action taken to meet air pollution control requirements fostered creation of acid rain hundreds of miles from the source of the problem.

One of the major difficulties of controlling acid rain is that now the power companies that produce the emissions argue that their taxpayers will not benefit from control of the emissions. Another difficulty is that it is more difficult to identify the exact sources that are causing acid rain far away.

Expanded use of landfills for disposal of wastes that formerly were discharged into waterways from the ends of pipes in another example of displacement instead of control of pollution. It has become obvious that the pollutants will still reach the Great Lakes, for example, either by leaching through groundwater, or by land runoff, or by evaporation into the air to become toxic fallout.

The Philadelphia study not only confirmed these phenomena but the most astonishing discovery was that the publicly owned sewage-treatment system was the largest single source of toxic chemicals into the atmosphere. Later measurements reduced the estimates of actual quantities, but studies in other areas have confirmed that many volatile organic chemicals escape into the air from sewers and sewage-treatment plants.

The chemicals and the quantities depend most on the kind of industrial wastes that are disposed of into the sewage-treatment system. By another irony, most publicly owned treatment systems have to treat more industrial wastes because the Clean Water Act forbids direct discharges into lakes, rivers and streams.



Great Lakes United

As a result, solvents or chemicals like benzene that volatilize easily might have been directly discharged into the closest lake before the National Pollution Discharge Elimination System (NPDES) was created by the 1972 water-pollution control act. Now they enter the sewer system, volatilize into the air and may still end up in the lake.

Significant emissions of such chemicals from publicly owned treatment systems have already been confirmed in Baltimore, Seattle, Dayton and Indianapolis. Now EPA is considering making measurement for such emissions a requirement in the pretreatment regulations that many municipal sewage-treatment systems must have under the Clean Water Act.

The Chemical Manufacturers Association is objecting that EPA can only control water pollution under the Clean Water Act, not air pollution. But the Natural Resources Defense Council is backing EPA up by pointing out that Section 304 of the Clean Water Act specifically prohibits creating other forms of pollution in order to protect water.

Among environmentalists in Washington, these new developments have given new significance to the efforts of Great Lakes lobbyists to obtain attention to toxic fallout. The National Clean Air Coalition has pledged to convene a group of scientific experts and environmentalists to consider how to address the issue in the Clean Air Act.

Previously, the coalition has opposed raising the toxic fallout issue in Congress for fear that it would detract from efforts to obtain acid-rain controls. One idea that may be discussed is to require that all publicly owned sewage-treatment systems that receive significant quantities of volatile organic chemicals from industrial sources be required to monitor emissions from manholes and from their treatment plants.

The term "toxic fallout" was coined in the Great Lakes to describe the

deposition of chemicals and heavy metals from the atmosphere that is a major source of such contamination for the lakes. It is not called toxic rain because the deposition occurs in both wet and dry form.

The vast amounts of water, the huge surface areas and the long retention-times for water make the Great Lakes especially vulnerable to atmospheric deposition of all forms of pollution but toxic fallout is the most serious. After scientists discovered that about one-fifth of the phosphorus that was accelerating eutrophication in Lake Michigan entered the lake from the air, they also found heavy metals and PCBs in rain and snow and attached to dust particles.

Discovery of high levels of PCBs in lake trout in a small lake on Isle Royale in northern Lake Superior in 1975 proved that the contaminants could be carried long distances through the atmosphere. Isle Royale has been managed as a wilderness national park since 1910 and has no other sources of PCBs.

When toxaphene was found in the same location in 1980, scientists realized that the contaminants could be carried into the Great Lakes basin from as far away as the deep south or the far west where toxaphene is most heavily used. Today, some scientists believe that pesticides are being carried to the Great Lakes from Central America.

It is estimated that half the loading of toxic contaminant to Lake Michigan is from the atmosphere, and toxic fallout is by far the largest source for Lake Superior, the largest and most vulnerable of all the lakes. Other sources of toxic contaminants include leaching through groundwater from hazardous-waste landfills and run-off of agricultural chemicals.

It is also likely that contaminants are evaporating from industrial treatment plants that remove chemicals from wastewaters by aeration. In one case in Michigan where an aquifer was

being cleaned by aeration, covers were used to prevent escape of volatile chemicals but few such control measures have been adopted yet because they are not required under any existing laws.

One reason attention to toxic fallout has been difficult to obtain is that the levels of contaminants in the lakes themselves are not high. Unlike the situation in Bhopal or elsewhere where accidental releases of toxic substances has caused death or imminent health threats, the low levels of contaminants in the lakes become dangerous through bioconcentration and bioaccumulation in the food chain.

This means that the tiny zooplankton absorb contaminants from water and from the phytoplankton, or microscopic plants, that they eat. Levels grow higher up the food chain until they can reach levels dangerous to humans in the top predators like trout and salmon.

because the most dangerous chemicals tend to concentrate in fat, the highest levels accumulate in the largest, most-desirable fish. All eight Great Lakes states and the Province of Ontario now issue public health advisories against consumption of certain fish. Some fish also cannot be sold in interstate commerce.

The atmosphere is not the only source of contaminants to the Great Lakes, of course, but it is likely to be the hardest to control. Even more recently, scientists have learned that contaminants can be released from sediments when they are stirred up by wind or passing ships or by animals that feed among sediments and excrete contaminants in gasses.

From sediments, the toxic substances can be re-dissolved in the water column or even passed through the water back into the atmosphere. Measurable amounts of such chemicals as PCBs can even be evaporated from the surface into the air. The effects of toxic contamination of the Great Lakes are becoming more obvious in the birth defects of fish-eating birds like the cross-billed-cormorants in Green Bay and the herring gulls elsewhere. More and more tumors are being found in fish in Great Lakes tributaries such as the Buffalo River in New York and the Black River in Ohio.

For now, the Great Lakes seem to remain a safe source of drinking water but worry about the future is growing. To residents of the Great Lakes basin, protecting the lakes and the people who live here may be enough reason to act on toxic fallout but other reasons may be needed in Washington.

Now that more attention is finally being given to the possibility of toxic fallout even though, perhaps we need to remind them how often the Great Lakes have provided an early warning system in the past. Now is the time to remind our Congressional delegations that when DDT, PCBs and accelerated eutrophication became problems in the Great Lakes, that perhaps we need to become global problem.

Prevention of release of toxic contaminants into the atmosphere is probably the only way to control toxic fallout. Washington may be realizing that such prevention is necessary for the rest of the country and the world as well as the Great Lakes.

The Grand Cal

by John P. Laue, Lake Michigan Federation

Despite its name, Northwest Indiana's Grand Calumet River is one of America's least-misty waterways. One of Lake Michigan's most-polluted tributaries, the Grand Cal starts in Gary, Indiana, flows 13 miles through a region dominated by steel mills, oil refineries, and other heavy industries, and enters Lake Michigan about 15 miles south of downtown Chicago. Ninety percent of the river's flow is discharged from industrial outfalls and wastewater treatment plants. The severe pollution from these sources has focused national and international attention on the Grand Cal. The U.S. EPA lists the river as a national "toxic hotspot," and the International Joint Commission (IJC) has singled out the Grand Cal as a "Class A Area of International Concern" which makes it one of the 18 most-polluted waterways in the Great Lakes Region.

The Grand Cal is a major source of pollution for the southern portion of Lake Michigan. A 1973 study by Argonne National Laboratories found that under certain conditions, polluted water from the river can enter one of Chicago's major water intakes. During the summers of 1979 and 1983, raw sewage diverted from two wastewater-treatment plants along the river forced beach closings both in Chicago and Northwest Indiana.

The Grand Cal's problems result from nearly a century of abuse by both industrial and municipal polluters. While millions of dollars have been spent in recent years to improve wastewater-treatment plants in East Chicago, Hammond, and Gary, these facilities are still major sources of pollution, particularly during periods of heavy rainfall.

While many of the steel plants and other industries along the river are now meeting current water-quality standards, no regulations are in place yet to limit discharges of toxic pollutants. The EPA has also identified 38 toxic wastefill sites within the river basin. Two of these have been designated as Superfund sites, and are now in the process of being cleaned up. Efforts are also underway to determine if toxic chemicals from these 38 sites are leaking into the river. "The Grand Cal is a lady with a past," says DePaul University Chemist Dr. Thomas Murphy. "She clings tightly to the tons of toxic materials accumulated in her bed over the last century." These sediments, which are up to 10-feet

deep in her riverbed, contain such toxics as PCBs, mercury, cadmium, arsenic and lead.

Although the highly visible pollution problems of the Grand Cal were first identified and assessed by federal agencies in the 1960's, little progress was made on developing plans to clean up the river until 1980 when the Lake Michigan Federation (LMF) published a report on the status of the river and helped to form a new grassroots citizen's group—the Grand Calumet River Task Force. This unique coalition of steelworkers, boaters, fishermen, and community leaders then worked with the Federation to convince EPA that a comprehensive, long-range cleanup plan for the river was necessary. The Task Force sponsored conferences and workshops to bring attention and support to their effort, and also organized river festivals which featured ethnic food, live music, and attracted thousands of residents who live along the river.

After building community and local political support, this group went before the IJC in 1983 to request action on the Grand Cal. The Chicago Region V office of the EPA responded to this request by making a commitment to develop a cleanup plan for the river. In March 1985, a comprehensive cleanup plan was issued which includes a comprehensive look at the river's problems as well as recommendations for solving pollution problems, first by forcing compliance with existing water-quality permits, and second by implementing new initiatives to address more difficult problems such as cleaning up toxic pollutants. One of the more controversial issues is what to do with the contaminant-laden sediment on the bottom of the river. Several alternatives were described in the plan, but no consensus has been reached on the best solution to this complicated problem.

In this master plan, the EPA joined the Lake Michigan Federation and the Grand Cal Task Force in declaring the rejuvenation of this river a real possibility. The report points out that strict controls on the seven major polluters have brought "dramatic" improvements in water quality in just the last five to ten years. The report concludes that the major factor now holding back the biological recovery is the discharge of toxic substances into the river with the primary culprits being the wastewater-treatment plants of

East Chicago, Hammond, and Gary—even though the three systems have received a total of \$108-million in federal grants since 1970. Despite this infusion of federal funds, the EPA report describes these plants as "chronic violators of federal cleanwater laws. All three...have experienced chronic problems in meeting discharge limits. All have a history of court-ordered compliance mandates and consent judgments." The report concludes that progress at all three plants has been "slow," and that after a decade of work "substantial program elements have yet to be completed" at these sites. The master plan includes 35 specific recommendations for the river, the bulk of them urging state agencies to get in compliance with the federal Clean Water Act.

Despite its flaws, this plan is viewed by many as a model of how citizens can become involved in developing plans to clean up the Lakes' toxic hotspots. "Someone has to take charge and solve this problem," says Grand Cal Task Force Chairman John Beckman. "The agencies and politicians ignored the Grand Cal's problems until we started to get involved. But once people began demanding that something be done about it, we got some positive action. It's not going to be cleaned up overnight, but we are now heading in the right direction."

The hottest issue facing the Task Force right now is a controversial proposal by the Army Corps of Engineers to dredge the heavily polluted Indiana Harbor Ship Canal, which connects the Grand Cal to Lake Michigan, and to construct a confined disposal facility (CDF) in the lake to contain these dredged spoils. The Corps recently issued its Draft Environmental Impact Statement (EIS) on this proposal, with a public comment period which will end March 31. This proposed CDF, which has been dubbed "toxic island" by critics, has drawn intense opposition from local environmental groups, including the Task Force and LMF, steelworkers unions, and community organizations. The U.S. Fish and Wildlife Service, Indiana State Department of Natural Resources and EPA are also on record as preferring an upland location over the lake site. While strong opposition exists to the lake site, there is also widespread support for the proposed dredging of the canal and harbor which is needed for both economic and environmental reasons, according to the Corps.

Because the canal has not been dredged in 13 years, ships carrying goods to and from the steel mills and oil refineries are now dragging bottom and stirring up the heavily polluted sediments. In the draft EIS, the Corps claims that the proposed dredging would stop "38,000 tons of sediment, including 800 pounds of toxic PCBs, from escaping into Lake Michigan each year." The Corps argues that when properly dredged, the canal acts as a "sediment trap" for pollutants from the Grand Cal which are now flowing directly into the lake because of the heavy amount of silt already in the canal.

This is an issue that places environmental groups in a difficult position, especially in an area suffering from double-digit unemployment. Everyone seems to agree that an upland site is preferable until specific upland locations are discussed. The Not-In-My-Backyard (NIMBY) Syndrome often takes root and opposition develops from the neighborhoods closest to the alternative land sites. This is one of the reasons why the Corps has found it so politically expedient to select a "lake site" for this project as well as other Great Lakes dredge-disposal projects. Jan Miller of the Corps' Chicago office points out that "the concept of a land site always sounds good, until the site is identified as a specific property, in a real city, in a real neighborhood, with resident, homeowners, and local governments all in favor of the site being anywhere else."

With the depressed state of the local, steel-based economy, some have argued that the issue of toxic disposal should be turned into an opportunity for Northwest Indiana to develop a new industry and create jobs. Innovative treatment techniques for dredge materials and comprehensive plans including the recycling of abandoned industrial sites are being touted as one strategy for recharging the region's economy. However, the pressure is now on to select a disposal site quickly before more comprehensive, long-range plans can be developed and implemented. Because of Gramm-Rudman budget cuts, local politicians are fearful that any delay in site selection will mean that the \$20-million earmarked for this project will be "deobligated" if a site is not selected this year.

There are clearly no easy solutions or answers to this problem, but the Federation is working with local environmental groups to pressure the Corps to seriously examine other alternatives. The proposed dredging of the canal is just one example of the difficulties in implementing a comprehensive cleanup plan for a Lake Michigan tributary that has served as a dumping ground for both conventional and toxic pollutants since the beginning of this century.

"We are under no illusions that cleanup of the Grand Cal will be an easy task or that solutions will be immediate," said Lee Botts, one of Lake Michigan Federation's founders and former LMF executive director. "But getting a handle on toxic hotspots like the Grand Cal/Indiana Harbor Ship Canal is absolutely critical to safeguarding Lake Michigan and the other Great Lakes."



Grand Calumet River



Toxic Blob in St. Clair River

by John Jackson, Friends of the Earth—Canada

The cleanup of the now-famous toxic "blob" that was oozing about just above the bed of the St. Clair River near Sarnia, Ontario, was completed late in December at a cost of more than \$1-million to Dow Chemical Canada. But residents along the St. Clair River and further downstream continue to worry about the implications of the revelations of the past few months.

- Dioxin has been found in the treated drinking water of municipalities as far downstream as Windsor.

- Ontario water quality guidelines are being exceeded in the St. Clair River. For example, hexachlorobenzene, a cancer-causing chemical, is present in the water at 370 times the provincial objectives.

- Fish as far downstream as Lake St. Clair are contaminated with dioxin and numerous other toxic organic compounds.

- The benthic community in the St. Clair River is severely impaired.

- Daily, 18,000 litres (5,000 U.S. gallons) of contaminated groundwater gushes in the Canadian National Railway tunnel that runs under the river between Canada and the U.S.

- Leachate contaminated with 2,4-D and 2,4,5-T (components of Agent Orange) is coming from Dow Chemical's landfill.

The Blob

The "blob" was supposedly created in August 1985 when Dow Chemical split 11,000 litres (3,000 U.S. gallons) of the dry-cleaning solvent perchloroethylene into the river. This solvent pulled dirt from the bottom of the St. Clair River, creating a black tarry mass, better known as the "blob," which covered about 600 square metres (650 square yards) of the riverbed just offshore from the Dow Chemical plant. In addition to perchloroethylene, the "blob" contained at least 18 hazardous chemicals including benzenes, styrenes, polynuclear aromatic hydrocarbons, chlorophenols, dioxins and furans.

But it is now clear that the "blob" was not the result of a single spill. Divers from the University of Windsor's Great Lakes Institute took samples from a pool of goosy black liquid in the same area in August 1984, a year earlier. But test results from Ontario's Ministry of the Environment labs were not given to the Institute and the public for over a year, until September 1985. Further investigations showed that the Ministry had known of the seriousness of the contamination in the immediate area for over ten years, but a 1979 report detailing these findings was not publicly released until September 1985.

The Sources of the Problem

The "blob" is just the latest incident to draw attention to Canada's "chemical valley," the area just south of Sarnia that is the centre of Canada's petrochemical industry. Imperial Oil, Esso Chemical, Polysar, Dow Chemical, Sun Oil, Shell Oil, Union Carbide, Ethyl Corp., DuPont, Petrosar, and Canadian Industries Ltd., are all located there. They form an intertwining conglomeration of pipes, smoke stacks and, the not-so-visible but just as common, discharge pipes that reach out into the St. Clair River and its tributaries.

The "blob" has reminded people in this area and downstream from it of the chemical soup in which they dwell and caused them to ask what living here means for their health and for the well-being of the environment.

One of the questions being asked by people in the area is what are the sources of the contaminants in the "blob" and in the "sons of blob" that have been popping up since cleanup was supposedly completed. Four sources are now being focused on by government investigators: sediments contaminated many years ago, industrial spills, regular industrial discharges, and wastes deposited into deep wells and salt caverns that may now be leaking into the river.

Although some industry spokespersons claim that the contaminated sediments are a result only of wastes deposited into the river many years ago, most observers are convinced that contamination is now being added to the sediments.

A report released in November 1985 by Environmental Canada and Ontario's Ministry of the Environment shows that industry reports an average of one spill per month of hazardous substances into the St. Clair River or its tributaries. In the past ten years, over 11,000 tonnes of hazardous material were reported to have been spilled into the river from the Canadian side. The question asked by many people living in the area is how many spills are never reported.

Added to these spills are the discharges that Canadian industries make into the St. Clair River on a regular basis under existing discharge permits. Each day 1.7-billion litres (450-million U.S. gallons) of contaminated industrial wastewater is poured into the river.

At least 12-billion litres (3.2-billion U.S. gallons) of liquid industrial wastes have been deposited deep underground in the Sarnia area. Some of them were pumped into 16 deep wells; other are in two salt caverns 580 metres (635 yards) underground. Indications are that these may now be welling up into the river bed. They are suspected to be the source of the contaminants constantly seeping into the railway tunnel.

In addition, there is growing concern about air pollution. Many hazard-

ous substances are burnt in industry-owned incinerators in the area. The largest of these, Dow's rotary kiln, burns many toxic chemical compounds but is subjected to only very limited monitoring. It has never been tested to see whether it emits dioxins and furans. The heavily contaminated contents of the "blob" are now being burnt there.

Government Actions

The Canadian and Ontario governments reacted quickly after the extent of the perchloroethylene spill and the existence of the "blob" became publicly known. Reports detailing the extent and sources of contamination being discharged by polluters were quickly compiled and released. The Ontario government began an investigation of the operation of its Sarnia district office to determine whether it had withheld information and had worked too closely with industry: the head of the district office of the Ministry was placed on temporary suspension. Intensive monitoring of the drinking water of downstream communities was instituted and a temporary activated-carbon filtration system was set up in one of these communities. Dow Chemical was charged with four counts of spilling a hazardous substance and fined \$16,000. The provincial environment minister promised to sharply reduce the amounts of contaminants that industry would be allowed to discharge into the river and to be tougher in prosecuting industry who break the law.

In addition, the situation intensified the commitment of the governments to the Upper Great Lakes Connecting Channels Study. This joint U.S.-Canadian study is examining the extent, sources and impacts of toxic contaminants in the St. Mary's River, the St. Clair River, Lake St. Clair and the Detroit River. It is hoped that this study, which is scheduled for completion in 1988, will become the basis for rehabilitating the St. Clair River waterway.

This recent flurry of government action is in sharp contrast to the years during which the seriousness of the situation was downplayed and ignored. The studies that are now being released, some of them long after they

were first compiled, prove that the seriousness of the situation was known by government and industry but that strong enough corrective actions were not taken. It also shows that most information was concealed from the public.

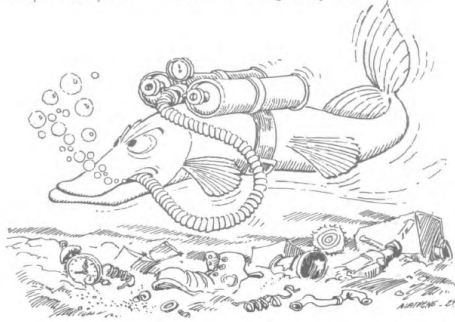
The Public Response

Fears about the unknown health implications of the contamination of the St. Clair River and anger with industry and government over their failure to take care of this problem has led to the formation of several new citizen's groups in the communities downstream of the "chemical valley."

These groups want government to provide them with safe drinking water by providing alternate water sources or by putting in activated carbon-treatment systems. They want industry to install more effective waste-treatment systems to stop the daily discharges of toxic substances into the St. Clair and to institute control systems that will stop the spills that seem to be a regular part of business in the area. They want government to be much more strict at forcing industries to stop contaminating the area. And they want government and industry to proceed to cleanup the contamination that already pervades the St. Clair River and the areas downstream from it.

Many members of these groups feel that over the past couple of months there has been a shift in government statements away from concern and urgency to reassurance that the problem is under control. The recent renaming of the "blob" to a "puddle" is viewed by many people in the area as just one sign of the downplaying that is already occurring. Citizens in the area fear that, if public attention on the problem lessens, the current flurry of action will slow down and there will be a rapid return to business as usual.

Great Lakes United is working with both Canadian and U.S. citizens' groups in the area to form a network of concerned groups. It hopes that such a network will be able to act as a strong voice to demand a cleanup of the St. Clair River.



Courtesy: David Green

Future Great Lakes Management— Beginning Steps in the Evolution of a Regional Approach

by Jan J. Hacker and Thomas D. Martin, Office of Great Lakes DNR

Michigan, long known as a center for industrial activity and educational excellence, is also a state rich in natural resources. With forty percent of the Great Lakes within its boundaries and 3,288 miles of Great Lakes shoreline, Michigan is aptly named the Great Lake State. That designation has not always been such a source of pride for Michiganders as it is today.

In the 1960's, the Lakes were more often seen as a source of embarrassment. The effects of unregulated sewage discharges made dead fish, polluted beaches and silt-filled lakes an all-too-common picture. This deplorable condition spurred Michigan to action and we began to clean up our waters. Environmental regulations were strengthened and increased and money was spent to ensure that the goals reflected in those regulations could be achieved. The attention devoted to these efforts was so great that today Michigan is recognized nationwide as having some of the strongest environmental-protection legislation, standards and programs in the nation. The result has been cleaner, healthier and more productive Great Lakes waters.

As proud of Michigan is of its accomplishments, there is also widespread recognition that these successes are only steps in a continuing progression. Expanded knowledge about the Great Lakes ecosystem has led to the discovery of more formidable problems we have yet to fully address.

In addition, there is a growing recognition that effective action to address these new concerns must extend beyond individual state or provincial boundaries. In a continuing evolution of thought concerning Great Lakes protection, state and provincial governments are coming to recognize not only the value but the necessity for undertaking regional action in addressing Great Lakes concerns.

The boundary waters treaty of 1909 between Canada and the United States and the Great Lakes Water Quality Agreement that followed, are the oldest examples of multi-jurisdictional institutions and goals to address Great Lakes issues. State and Provincial governments, however, are not signatories to those agreements and were not instrumental in their initial formation. The Great Lakes Charter, signed in February 1985 by the Premiers of Ontario and Quebec and the eight Great Lakes Governors, represents the first visible result of a growing trend toward positive regional cooperation and problem-solving initiated by state and provincial governments. This creative document details policies and programs to guide planning for and management of Great Lakes water use. Its development sprang from a need to strengthen the region's legal defenses against any attempts to divert Great Lakes water out of the basin or start major new construction.

While the Charter's objective is to build up legal defenses against diversions, the Charter is more than just an anti-diversion document—it is a positive document in our region's development. The climate it has created—one of regional unity in meeting shared problems—already is

beginning to have broader effects.

The Council of Great Lakes Governors, which sponsored the Charter, is emerging as the catalyst and consensus-builder in the region. Negotiations are proceeding, under their guidance, on a comprehensive and far-reaching agreement to address the pervasive problem of toxic substances in the Great Lakes.

Toxic substances in the Great Lakes have many troubling aspects. Once introduced into the ecosystem, they are very difficult to clean up. Knowledge about the damaging effects of these chemicals in natural systems also continues to evolve. Thus, disposal options which seemed prudent in the past are now being recognized as unacceptable. Finally, possible solutions and actions must take into account the fact that these substances will continue to be produced in greater amounts and varieties in the coming years. They are the building blocks for the goods consumers demand to maintain and increase a high standard of living. As with other forms of pollution, they also easily cross water boundaries, creating problems in adjacent state and provincial jurisdictions. Joint agreement by the state and provinces of the Great Lakes region on goals and actions necessary to address this problem is the only way to achieve positive progress in reducing the amount of these substances in the shared Great Lakes ecosystem.

In February 1986, another regional document was signed. Prompted by an unwelcome seismic work in Michigan waters by a Texas firm and the subsequent offer of that data for sale, the eight Great Lakes Governors and the Premier of Ontario joined together in signing a Statement of Principle Against Oil Drilling in the Great Lakes. The Statement is important in protecting the Great Lakes from the disastrous effects associated with oil spills. It sends a clear message to companies who may be interested that any action taken to pursue oil drilling will be met with firm opposition. It effectively eliminates any company's ability to get pressure on one jurisdiction. It should be noted that oil companies active in Michigan have shown no resistance to such a ban.

Provinces and states that share extensive boundaries between them have also acted to establish cooperative agreements. The longest boundary Michigan shares with an adjacent jurisdiction is an international one. The joint Michigan-Ontario boundary extends from western Lake Superior to western Lake Erie. Because so much of the Great Lakes are shared between them, the governments of Ontario and Michigan have formed and continued to nurture special cooperative relationships.

In January 1986, four environmental agreements were signed between these governments. The agreements establish (1) notification and consultation procedures for unanticipated or accidental discharges of pollution into shared waters; (2) annual environmental summits between the Premier and Governor to discuss topics of mutual interest; (3) joint responsibility and



clear lines of responsibility for preparing remedial action plans for the St. Mary's, St. Clair and Detroit rivers; and (4) areas of cooperation concerning monitoring and mitigation of transboundary air pollution especially in southeast Michigan/southwest Ontario.

The value of these agreements became immediately apparent less than a month after their signing when a series of spills occurred in the St. Clair River near Sarnia, Ontario and the existence of a long-term seepage problem became apparent. Full disclosure of information between the two governments resulted in coordinated testing of public water supplies in both countries and coordinated monitoring of the nature and extent of contamination from the spills. More importantly, the cooperation which occurred between the agencies charged with attending to the problem insured that both felt comfortable with the information they received. Energies could therefore be devoted toward remedial actions and problem-solving instead of interjurisdictional finger-pointing. As simple as this may seem, it is a valuable step toward reacting in a positive and responsive manner when confronted with emergency situations.

The growing trend in regional cooperation and problem-solving is evident not only in governmental relations but in the growing importance of private organizations as well. Regional organizations such as Great Lakes United and the Center for the Great Lakes play a valuable role in bringing into discussions a basin-wide perspective on Great Lakes issues. Their activities can encourage the collection and reporting of information comparable across jurisdictional boundaries; a necessary first step in efforts to manage the Great Lakes from an ecosystem perspective.

The continuing emergence of a new spirit of cooperation between the governments and institutions of this region holds great promise for the

future of the Great Lakes. The promise has ceased to be strictly "environmental." Enhancement of Great Lakes water quality and protection of the Great Lakes and their environs is not correctly recognized as an economic issue. The Great Lakes represent economic assets, an essential part of our infrastructure. An infrastructure which supports strong and growing sports fishery industries, commercial and recreational boating industries, underwater diving industries and commercial waterfront developments. By failing to maintain this infrastructure, we would forego the economic opportunities these Lakes offer us.

The Great Lakes region has not directed a great deal of attention to capitalizing on the potential the Great Lakes offer. We are only now beginning to realize the potential the Lakes have for creating jobs and for economic development. By adopting a cooperative approach to management and protection, the region hopes to increase its gains in these areas and to avoid the negative sum game which results from inter-state rivalry. The present economic and environmental needs are too important to waste valuable resources in fighting each other. Our efforts now and in the future must be devoted to positive regional development and problem-solving. Michigan is excited to be a part of this growing regional orientation. We hope the evolution continues.

Jan J. Hacker is staff specialist, Office of the Great Lakes, Michigan Department of Natural Resources. She received a BS in wildlife biology and a BS in forest management from Michigan State University in 1981 and a Master's degree in forest business management from the same institution in 1982. Ms. Hacker has a strong background in writing and resource management and has served in various capacities with a number of resource-management organizations. Thomas D. Martin is director, Office of the Great Lakes, Michigan Department of Natural Resources. He received his BA from American University and his law degree from Michigan State University. He served as General Counsel and Organizer to a consumer group in Detroit and was the Michigan Field Representative for the Sagan's International Union. He has served as a board member of the Great Lakes Task Force, the Economic Alliance for Michigan and as liaison to the Great Lakes Commission.

Lake Superior

by William L. Robinson, Upper Peninsula Environmental Coalition

In the sunshine of a winter afternoon, fields of rough ice stretch from beneath the granite cliffs all the way to the northern horizon. Rivers of blue water divide the ice, branching it into peninsulas and islands. Besides me, shadows of spruces and hemlocks drape the snowy cliffs and darken the frozen lake below. The only sound, heard by listening very carefully, is a quiet crunching and heaving of the ice, responding to winds until and waves unseen. There is no one out there, no one for as far as the eye can see. This is Lake Superior near Marquette in February 1986.

For more than two-thirds of the nights of my life, I have slept within a quarter mile of Lake Superior. Daily I think its water as it becomes part of me. When I swim, I become part of it. Still each time I see it, I am awestruck, sometimes by its vastness, sometimes by its serenity, sometimes by its power, but always by its beauty. Although each of the Great Lakes has its own special qualities, Superior is unmatched for everything that a lake can be.

Lake Superior's surface area of 31,699 square miles makes it the largest freshwater lake in the world, by surface area, and second only to Lake Baikal of the Soviet Union in volume. The surface of Lake Superior rests at 602 feet above sea level, while its deepest trough lies 733 feet below sea level. In those darkest recesses, researchers using a submarine recently found and photographed two species of fish, sculpins and burbot, living among smooth, hydro-coated boulders. It takes 191 years for water in this lake to replace itself, compared with 99 years for Lake Michigan and much less in the other Great Lakes. Thus Lake Superior, once polluted, would take several human lifetimes to cleanse itself by flushing.

Lake Superior looks much as it did when I would walk its beaches as a boy in the 1940's. The only obvious changes have come from high waters, largely a result of man's tinkering. White pines and red oaks, older than the Constitution of the United States, have recently fallen to the waves. These trees had committed the fatal error of growing from seeds left, perhaps by a squirrel, in sandy soil some 100 yards from the beach, not anticipating a future of compensating works, diversions, and 274-foot navigational depth requirements.

But there have been other changes, less conspicuous, some for the better, some for the worse. As kids, we commonly stepped in "tar" on the beaches at Marquette. Recently I have seen similar "tar balls" on Texas beaches—clumps of spilled petroleum bundled by the waves of the Gulf of Mexico. On the Marquette beaches they must have originated either from careless handling of fuel by shippers or from a nearby wood chemical plant. These tar balls are nearly non-existent on Lake Superior beaches, but cigarette filters have replaced them.

I also recall frequent infections of skin cuts and scratches from *Staphylococcus* bacteria picked up as we swam in water that had not adequately diluted Marquette's untreated municipal sewage. Today our sewage is treated and "staph" infections are rare.

Alfred Beeton's classic paper entitled *Eutrophication of the St. Lawrence Great Lakes*, published in 1965, indicated that the levels of dissolved solids, specifically calcium, sodium

and sulfates, which have been significantly accelerated by man's activities in the other Great Lakes, have remained very low and essentially unchanged in Lake Superior since 1886. Thus, accumulation of nutrients has not become a problem in Lake Superior.

Lake Superior still retains most of its native cold-water fish species, including lake trout, brook trout, whitefish and lake herring. Lake trout provide a superb sport fishery, particularly for travelers. Brook trout, once locally abundant as "coasters," which could grow to 5-6 pounds in the big lake and ascend streams to spawn, are, however, all but gone. The lake whitefish, an excellent table fish, is the heart of the commercial fishery, and the lake herring, another commercially valuable fish food, is staging an encouraging comeback.

In the past century, several exotics have been brought in, some intentionally to "improve" the fishing, and others inadvertently. From the Pacific watershed came the rainbow trout, or "steelhead" became established in the late 1800's, and still provides excellent sport fishing in tributary streams and near their mouths during spring spawning runs. Coho and chinook salmon attract fishermen to the mouths of rivers in fall and winter. The small, unpopulated pink salmon, accidentally released near Thunder Bay in 1956, ascended streams in the fall primarily in odd-numbered years, but peak runs reached in the late 1970's have diminished in the 1980's. Smelt, from the East Coast, were until a few years ago abundant, serving as prey for lake trout and a welcome excuse for spring beer-drinking and smelting parties at the mouths of streams. Smelt runs have declined in the past decade and no one knows why or whether they'll be back.

The villain of Lake Superior's fauna is the sea lamprey. This blood-sucking parasite, relatively harmless in its native Atlantic waters, found paradise when the Welland Canal cleared the way around Niagara Falls to Lake Erie and the upper Great Lakes. As with many exotic species introduced into a new and favorable environment, the lamprey flourished. After reaching Lake Superior through the St. Mary's River, the lamprey, in combination with heavy commercial fishing in the 1950's, devastated lake trout and whitefish populations, as it had done in the other lakes. There are still lampreys in Lake Superior, but their

numbers have been brought under control through the use of TFM, a chemical lampricide applied to tributary streams in which lamprey larvae spend several years before spawning. The cost of treating Lake Superior streams average about \$250,000 per year. Through extensive stocking in the 1960's and 1970's, lake trout have recovered and natural reproduction is beginning to supplant hatchery stocks. The more prolific whitefish came back on their own.

Ten years ago toxic chemicals were accumulating in Lake Superior fish to levels well above FDA-designated safe concentrations. In 1975 the Michigan Department of Natural Resources closed commercial fishing for off-shore lake trout, the fat deep-water species known as "siscowet" and "humper" trout, because they were commonly found to have more than ten parts per million (ppm) of PCBs and DDT (a metabolic by-product of DDE). The "lean" trout caught by sports fishermen were not a problem. FDA maximum safe levels are set at 2 ppm for PCBs. Samples taken from siscowet and humper trout in 1983 showed that PCB levels had dropped to well below the 2 ppm level and that DDE levels were barely detectable. The fishery for these fish was recently reopened.

A contaminant not as inclined to go away, however, is asbestos. The City of Duluth must filter its drinking water to remove amorphous asbestos particles, of which millions are present in a liter of lake water. The source of these tiny fibers is primarily finely ground tailing from processing taconite iron ore near Silver Bay, 50 miles up the shore from Duluth. Between 1955 and 1979 the Reserve Mining Company, under proper permits, dumped an average of 60,000 tons of tailings per day into Lake Superior. The tailing were supposed, by engineering estimates, to have acted like sand, sinking into a deep trough where they would cause no harm. But most of the tailings were much finer than sand, and the ultra-microscopic needle-like asbestos particles (of which there were more than 300 million per liter of water near the plant) were carried by currents hundreds of miles along the western and southern shores. It is believed that cancer of the digestive tract may be caused by asbestos particles taken in through food or water.

In 1980, after years of court battles, Reserve Mining Company was forced to dispose of their tailings in a settling pond created by an impoundment on

the Beaver River, about seven miles inland. But in 1984 the company claimed that low rates of ore production and water consumption in their processing, was resulting in a heavy stream flow, threatening to breach their dam, sending years of accumulated asbestos-laden tailings downstream into Lake Superior. They applied for and received a permit from the Minnesota Pollution Control Agency to release water from the dam. Studies by a dam agency indicated that the Beaver River above the impoundment carries a "background" load of about three million fibers per liter, and so the permit specifies that a maximum level of three million fibers per liter may be released. Fears of the average citizen are not soothed by this standard.

Various navigational and power interests have in the past several decades attempted to regulate water levels of Lake Superior by means of diversions into the lake from Canadian rivers designed by nature to flow north to Hudson's Bay, and by means of a dam (euphemistically referred to as a "compensating works") at Sault Ste. Marie which reduces flow into Lake Huron. Some argue that without the compensating works and with the high water levels in 1985, shore erosion in Lakes Michigan and Huron would have been greater than what was experienced. Corollary to that are arguments of Lake Superior shoreline-property owners, who claim that if an agency can take credit for the apparent beneficial effects of the compensating works, it should likewise assume responsibility for flooding and erosion of the Lake Superior shores.

At high water levels existing today, most Lake Superior property owners would be happy to sell lake water to anyone willing to take it. A pipeline to the Ogishla Aquifer may in 1986 sound like a good idea. But others feel that Lake Superior might be a case in which tempting and quick technological "solutions" may in the long run bring about more problems than they solve.

Besides tampering with water levels and allowing asbestos to be dumped, we are probably making other errors, such as permitting Ontario gold mines to place tailings where run-off and groundwater may carry concentrated heavy metals into Lake Superior waters, or by allowing development of campgrounds and picnic areas along stretches of shore where wilderness may be more appropriate, or by permitting the shipping of oil, toxic substances, and possibly radioactive material across a lake whose storms are known to destroy and sink our most modern and sturdy vessels.

A few years ago Wayland Swain, a former EPA scientist speaking at the Lake Superior Biological Conference, presented a thoughtful proposal for the future. He observed that Lake Superior, despite its problems, remains an example of a largely unspoiled body of water. School children in many parts of our continent are taught in art classes to color a lake blue. But many of them do not know why, thinking that lakes are gray, brown or green. They have never seen a blue lake. Lake Superior is blue, and Dr. Swain argues that it will be to the benefit of mankind to keep it that way.

His proposal to do so is to designate Lake Superior as an International Park. The regulations for this park would permit all current navigational and



Great Lakes Limited

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"The other lakes of the quintet are large and impressive; Lake Superior is awesome." —Grace Lee Nute, *Lake Superior*, 1944

by Thomas J. Klein, Sigurd Olson Environmental Institute



Great Lakes United

Thirty years later, Superior is still awesome. The water is still clear, the vistas still inspiring. But a lot has changed in Lake Superior country over the past three decades.

While the open lake areas of Superior may yet be crystal clear, some near-shore areas are often badly polluted. In a 1985 report the Great Lakes Water Quality Board identified seven "Areas of Concern" along the Lake Superior coast. Two sites—Iron Lake and Deer Lake—in Michigan's Upper Peninsula reflect localized and comparatively minor problems of contaminated sediments. Similar problems still afflict the Duluth-Superior harbor where heavy metals and toxic organics are still present in harbor sediments. Due to a sophisticated sewage treatment facility, the fish consumption advisories now in force should someday be just a footnote in the harbor's history. On the Canadian side of the lake, paper-mill operations have created serious point-source problems at Nipigon Bay, Jackfish Bay, Peninsula Harbor and Thunder Bay which has a variety of point-source problems. In all seven areas remedial action plans are improving the water-quality problems. So the changes now appear to be on the positive side.

There have been a lot of changes since fur traders and explorers with romantic names like Cartier, Groseillers, Nicolet, Marquette, La Salle, La Verendrye and Champlain roamed the rugged coasts. But the magnitude of the resource has not diminished with time.

Lake Superior still hold about 10% of the world's surface fresh water. In raw numbers, we're talking about 32 trillion gallons (give or take a gallon in this era of record high water; it's probably on the lake side of that number) under 32,000 square miles of Lake Superior surrounded by 2,900 miles of shoreline. If one could pull a plug to let out all of the big lake's water, one would cover the entire United States land mass with four feet of water.

That vast quantity of water has important management implications. Because of the quantity of water in the

lake and the relatively slight flow of about 600,000 gallons per minute at the St. Mary's River, it would require 400 years to remove 90% of any dissolved substance in Lake Superior. For Lake Michigan, the comparative number is 25 years; for Lake Huron 50; for Lake Erie only 6 and Lake Ontario 18. If it were ever severely polluted, Lake Superior would not be able to pull off the sort of biological miracle Lake Erie pulled off in the 1970's when it returned from the "dead." The extremely cold Lake Superior water (annual mean temperature of 40°F) also makes it more susceptible to damage from pollution.

Toxic Chemicals

And there still are nagging concerns about the lake's future. The presence of toxic substances in a lake with a thin population (a population in the basin—both sides of the border—under 700,000 people and slight industrialization has always been a bit perplexing. One study back in 1975 on Isle Royale gave the first solid evidence that Lake Superior's toxic problems were of atmospheric not point-source origins. In that study, a lake on a wilderness National Park in Lake Superior has fish with fairly high levels of PCBs. Ten years later scientists know that 80% of the total input of PCBs into Lake Superior resulted from atmospheric deposition. The total of PCBs entering Lake Superior via the air exceeds ten tons annually.

Also, dropping out of the air are other organic contaminants and a variety of metals such as aluminum, copper, chromium and lead. While scientists don't know the exact origins of the airborne pollution, its presence should be no mystery. About 30,000 chemical compounds are utilized in the Great Lakes Basin with an additional 1,000 being added every year. Perhaps it's just law of average, but about 400 of these chemicals are potentially dangerous. The EPA estimates that of all the toxic chemicals manufac-

tured in the U.S., a full third are produced in the Great Lakes Basin. And some find their way to water either through direct industrial discharge, wastewater treatment discharge (most plants don't "treat" toxic chemicals), run-off from agricultural areas (fungicides and pesticides), leaching from chemical waste disposal sites or through atmospheric fallout.

Many of these problem chemicals are not new. PCBs were manufactured in 1929; DDT in 1945. Quantities have been enormous. Though it's now totally banned, DDT is still present in Lake Superior. Others are more recent. They sound exotic—Dieldrin, Chlordane, Mirex, Heptachlor, Toxaphene, Lindane, etc., etc., etc.

Once in the lake they proceed up the food chain through a process of bioaccumulation. PCBs may be present in the water at one-five parts per trillion (seemingly a harmless level). But the plankton concentrates the chemical to a range of 20–200 parts per million. Guess who finally gets the prize?

With the 40-year retention time of pollutants, the toxic contaminant problem is actually more troublesome for Lake Superior than for the more publicized situations on Lakes Michigan or Ontario. If the new inputs of toxic compounds are not stopped (radical changes in our air laws would be necessary), the situation will only get worse.

Acid Rain

Acid rain is closely tied to toxic contamination. It is simply a route—the airshed—for toxic materials to travel. Usually "acid rain" refers only to a couple of contaminants—sulfur dioxide and nitrogen oxide. During a typical rainfall many other contaminants such as PCBs may be falling.

Because of its vast size and high pH, Lake Superior will probably never be acidified. It can absorb a lot of punishment, but thousands of inland lakes within the Lake Superior watershed may not be so fortunate. In the Upper Lakes area of northern Minnesota, Wisconsin and Michigan, the rainfall is approximately ten times as acidic as normal rainfall. Someday something will give, just as in the Adirondack area of New York state where 195 once-healthy lakes are clear and quiet, harboring no fish life. With nearly 30-million metric tons of SO₂ going up every year in the U.S., it's no feat of logic to expect that material to come down, somewhere.

The extent of aquatic damage depends upon many local variables—the softness of the water, the bedrock conditions, the surrounding forest type and local weather patterns. Canada is fearful that 60,000 Ontario lakes may be damaged or completely destroyed by acid rain.

In addition to the ethical questions of such widespread destruction, local economic effects surface. The loss of Canadian tourism would be enormous. In Wisconsin alone the tourism industry is a \$8-billion dollar industry, much of it water related. In the U.S., hunting and fishing activities generate 40-billion dollars of spending. Obviously, much of this is water related. Other economic considerations in-

clude damage to forest productivity and agricultural losses. While this issue goes beyond dollars, these effects must be considered. When the costs (and they are high) of cleaning up emissions through coal washing, scrubbers or other technologies are debated, the hidden costs of not cleaning up must be addressed. Soon.

Water Diversions

In discussions of water diversion, Lake Superior is typically the focus. It's easy to understand: the lake is the most westward extension of the lakes and it has, at least now, a surplus of water. Now reaching the 462-foot mark, Lake Superior like other Great Lakes, is filled to the brim. Water, water everywhere, but the west is dry. We have it. They want it. The only question is when.

The diversion issue is real. The Ogallala Aquifer which nourishes the Great Plains aridifies the soil water for twenty percent of all U.S. irrigated lands is drying up. Some give it only twenty years. The water table under Houston has dropped 200 feet during this century and Tucson may run out of water within twenty years, unless... Unless the parch-belt finds new sources. And don't think only in terms of a massive, new canal from Superior to Tucson. We already have canals—they're called rivers. Piping water from Lake Superior to the Mississippi where it can then flow gently to southern states puts a fairly close to Texas and Arizona. While the expensive, diversion technologies are feasible. What seems prohibitively expensive today might seem dirt-cheap in twenty years. Water is that precious.

The rapid growth of the southwest will keep putting pressure on the diversion options. In the 70's Nevada grew by 65% and Arizona by 53%. Of John "Megatrends" Naisbitt's ten cities of opportunity, only one, Tampa Bay, is east of the Mississippi. Soon we will have to move water these people or move the people back to the water. At times those of us on Lake Superior wish we had slightly less water. Our levels are artificially controlled at a level higher than might be best for our ecosystem. But opening the floodgates to Houston, Phoenix, or Albuquerque is not the solution to our occasional high-water problems.

Everyone has opinions about diversions. Most instinctively feel it's wrong. Some environmental true-believers will wax poetically about the horrors of changing the pristine conditions of the Great Lakes, especially Lake Superior. Let's keep in mind diversions are part of our Great Lakes regulatory system. There are five major diversions with the most famous (or infamous) being the Chicago Sanitary and Ship Channel constructed in 1908. On Lake Superior, the International Joint Commission has controlled levels through the works at the Soo since 1914. Since the 1940's, the two Canadian diversions, The Ogoki and Long Lac, have been bringing into Lake Superior about 4-billion gallons a day that Mother Nature wanted to see in James Bay. So we're not talking about a pure, natural system.

The real myth, however, is the notion that a water surplus does in fact exist. There is a lot of water, but it's all being used. Navigation, power generation and recreation all depend upon



Right-to-Know: Compromise Finally Reached

The end of a long-standing impasse on Right-to-Know was reached in February and March this year when a major compromise was forged on a package of Right-to-Know bills now before the Michigan State Legislature.

Three bills make up the package with HB 4111, HB 5250, and HB 5251 providing for the workers, firefighters, and community's right-to-know. The bills passed the House on January 14, 1986 by unanimous vote and were then introduced into the Senate Labor Committee. The Senate Committee voted the legislation out on March 5th with minor technical changes. The end to the standoff was praised highly by House Labor Committee Chairperson, Rep. Juanita Watkins (D-Detroit) as a "major step forward in the effort to protect Michigan residents from dangerous chemicals."

Agreement on the package was reached by a bi-partisan group of legislators from the House Labor Committee, lobbyists for the State Chamber of Commerce, the Chemical Manufacturers Association, UAW, AFL-CIO, and the Right-to-Know Task Force, a coalition of labor, concerned citizens, and environmentalists from around the state. But, while the business community has expressed full support for the compromise as a demonstration "that business and labor can work together to resolve issues and improve the climate for creating and protecting jobs in Michigan," others are hoping that more access to information can be

gained in future years than the bills currently provide.

All three Right-to-Know bills currently contain language that preempts local units of government from enacting regulations that are more stringent than the state measures. Environmentalists in the state have indicated a major concern with existing language that preempts local government agencies' power to enforce local community right-to-know regulations.

"The current language clearly interferes with the legitimate functions of local air pollution and sewage-treatment agencies by rendering as unenforceable, any authority such agencies have to require disclosure of workplace chemical hazard information," said Alex Sagady, Environmental Specialist for the American Lung Association, a member of the Michigan Environmental Council.

Environmentalists have been assured by the others working on the compromise, however, that these restrictions are not the intent of the preemption language. It is anticipated that several technical amendments will be introduced to clarify the intent. Support for the bill was conditioned upon the promises of all parties to commence negotiations on a more expansive community Right-to-Know bill, immediately upon passage of the current package.

Members of the Right-to-Know Task Force also expressed reservations about the limited scope of HB 5251, the Community Right-to-know bill. Scott Tobey, chair for the Task Force stated, "Each of our organizations is

committed to a continuing process of negotiations in 1986 on a more comprehensive community Right-to-Know. We are hopeful that a bill which addresses all community concerns about toxic chemicals can be enacted this year."

Discussions over the next several months on community right-to-know are expected to focus on the type of information that would be necessary to permit adequate emergency planning and hazardous substance management by local government agencies. A recent federal court ruling upheld the right of communities to require companies to provide information to local health officials on chemicals that may be an environmental hazard, an area not currently covered by federal standards. Many local communities and organizations believe this information is necessary to protect the health and safety of the community and the environment by preventing accidental leaks and spills and to adequately protect emergency personnel in situations where toxic and hazardous substances may be present.

—David Stead

Awesome

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stable water levels. For every less inch of draft on a modern 1,000-foot lake freighter, 200 fewer tons of cargo can be carried. The University of Michigan engineers working on a hypothetical diversion of about 6-billion gallons a day, estimate a lowering of Lakes Michigan and Huron by 6 inches. The loss to power and navigation interests would exceed 100-million a year. It really makes little difference how much water is under the surface. It's the stability of the levels, not total volume, that counts for navigation and coastal resources such as the priceless shoreland fish and wildlife habitat.

For the Great Lakes states keeping the water will require attention to pragmatic details on legal, economic, biological and political points, not lofty consideration of the philosophical. As the water crisis of the 90's approaches, those of us in love with the lakes had better listen carefully for the rusty squeak of water pumps to the southwest.

It is clear Lake Superior has benefited from the recent management approach which at least attempts to anticipate ecological consequences. The research sponsored by the International Joint Commission, the states and the province of Ontario has isolated the problems and suggested new, integrated solutions to our various environmental ills. All we need now is the political will to implement the costly but necessary improvements in air and water quality management programs.

If we clean up our act, Lake Superior will still be awesome in the 21st century.

Hydro Bill in Congress: The requirements for relicensing hydroelectric projects is the focus of a bill, HR 44, that has just received approval of the Michigan House Energy & Commerce Committee in Congress. HR 44 requires the Federal Regulatory Commission (FERC) to among other things, consider the probable impacts on fish, wildlife and recreation. Under the legislation, FERC must include the recommendation of the U.S. Fish and Wildlife Service, National Marine Fisheries Service, and state fish and wildlife agencies in the terms and conditions of licenses unless they are inconsistent with the Federal Power Act.

Nuclear Waste Disposal Still a Concern for Michigan

Although the U.S. Department of Energy (DOE) dropped Michigan from the running as a host state for a high-level nuclear waste repository in its announcement on January 16, 1986, Michigan residents could yet feel the impact of a decision to place a repository in one of the Great Lakes States.

DOE's elimination of Upper Peninsula sites being considered came about when DOE narrowed the field from 220 possible sites to 20 by applying a Region-to-Area Screening methodology. The screening methodology was designed to identify the most appropriate rock bodies in the region for housing the subterranean nuclear storage facility. But environmentalists acknowledge that while Michigan has been dropped from consideration, a very real possibility exists that either Wisconsin or Minnesota may be chosen to host the facility, a decision that has potential implications for all states bordering the Great Lakes.

Minnesota contains three primary sites termed "Potentially Acceptable Sites" by DOE, and five back-up sites within its borders. Wisconsin has only one primary site and one back-up. However, the primary site, the Wolf River batholith, is considered to be one of the nation's most highly ranked sites. Wolf River batholith is located in the Great Lakes watershed which causes significant concern among environmentalists who have advocated that the integrity of the Great Lakes be strongly considered in choosing a site for the repository.

If either Wisconsin or Minnesota are chosen, it is anticipated that Michigan's major highways could become important arteries for the transport of high-level nuclear waste to the facility. Concern also rests in the possibility that these wastes would have to be transported across both the Mackinac and the International Bridges.

Michigan law currently bans the shipping of radioactive wastes across bridges until the DOE can prove that shipping casks can withstand the impact of a fall from the bridges. However, the law was recently overturned by the federal courts. That decision is being appealed by the state of Michigan.

At a meeting of the Governor's Task Force on High-Level Radioactive Waste in Marquette in January 1986, MEC member group, the Upper Peninsula Environmental Coalition, presented a resolution requesting that the Task Force support neighboring states in opposing the siting of high-level nuclear waste facilities in the Great Lakes watershed. The resolution also states opposition to the transportation of such wastes on the Great Lakes and through Michigan by any means.

DOE is expected to hold an official briefing on March 13, 1986 about its screening decisions. The meeting will be held in Ironwood, Michigan. UPEC representatives say that they will be there to voice support for their Wisconsin neighbors and make their concerns known to the Department of Energy.

—Gayle Cooper

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For additional information, send request to the above address or contact:

David J. Miller, Executive Director
(716) 886-0142

Lake Superior

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shoreline uses, but any further developments, diversions, or manipulation of water levels or quality would be subject to the strictest standards and permitted only after review and agreement of an International Park Commission.

But there may be other means to accomplish Dr. Swain's objectives. Recent agreements on water quality quietly made between Michigan and Ontario, the Council of Great Lakes Governors Charter addressing diversions, and a new International Water Quality Agreement with stringent standards are promising and positive steps toward preserving the environment of the Great Lakes. But the concerns for Lake Superior are especially acute because this lake may be particularly sensitive, and the sparseness of human population in its basin

reduces our political voice. Whatever laws, treaties and agreements are developed will only work if people want them to.

I believe that all of us who love Lake Superior have an obligation to see that this international treasure is not tarnished. Children who now walk its shores deserve the same opportunity as I have had, an opportunity sometime decades later in their lives to pause atop a wooded granite cliff in winter sunshine and hear the quiet sounds of ice moving on pure blue water and stretching in white ribbons to the horizon.

Mr. William L. Robinson is a professor of Biology at Northern Michigan University, specializing in Wildlife Ecology. He received his Ph.D. from the University of Toronto. Mr. Robinson is a regional board member of Great Lakes United representing the Lake Superior Region.

Registration Deadline is May 9, 1986 for Great Lakes United Annual Meeting

The Board of Directors of Great Lakes United wishes to invite you to attend our fourth annual meeting to be held at Mackinac City, Michigan on May 16 - 18, 1986.

We are especially pleased to be holding our meeting in the Mackinac area of Michigan. First, because we are returning to the site of our beginning. Just four years ago we met on Mackinac Island to evaluate the formation of a Great Lakes Basin coalition. That meeting produced a Charter on which our efforts are based today.

Secondly, our annual meeting has been scheduled just prior to the World Conference on Large Lakes, to be held on Mackinac Island May 18 - 21. The State of Michigan is hosting the World Conference on Large Lakes and Great

Lakes United is not only one of the co-hosts of the meeting, but is also participating in the conference proceedings. By scheduling our annual meeting just prior to the Large Lakes Conference, hopefully, we have assisted those people who are interested in attending both meetings.

Great Lakes United has continued strong growth in its development. Since our last annual meeting we have gained an office manager and two new field staff people who are working within special grants given Great Lakes United. We are especially pleased with both the administrative and program progress our Great Lakes United team has made during the past year.

Alternatives Magazine Focuses on the Great Lakes

Alternatives Magazine's spring 1986 issue will examine some of the major issues facing the Great Lakes. This issue, to be entitled *Saving the Great Lakes*, will include discussion on such topics as resource use conflicts, water Quality, winter navigation, and organic and non-organic pollution.

Alternatives Magazine, published in co-operation with the Faculty of Environmental Studies at the University of Waterloo, has addressed contemporary social, technology and environmental themes and provided a forum for a critical but impartial analysis, comment and debate since 1971. This special issue is being assisted financially by The Max Bell Foundation through the Great Lakes Ecosystem Rehabilitation Project.

To obtain a copy of the Spring 1986 issue of Alternatives contact: Alternatives Magazine, c/o Faculty of Environmental Studies, University of Waterloo, Waterloo, Ontario, Canada N2L 3G1. The price for this issue is \$4.50 per copy.

The Pesticide Dilemma and Your Right to Know

A conference on pesticides and the citizens right to know will be presented by: Sierra Club Northeast Ohio Group, The League of Women Voters and NEO Coalition against the misuse of pesticides. It is to be held at John Carroll University, on April 12, 1986, from 10am til 3 pm. For reservations please contact Chauncey Gantz at (216) 942-7798. For additional information, please contact Emeline Clawson at (216) 321-3417.

12 out of 20, WHY!

The Department of Energy (DOE) is looking at a reduced number of sites at which to store nuclear waste. The number of sites being considered is 20. Strangely enough, 12 of the proposed 20 sites are located in Great Lakes States. The states of Minnesota and Wisconsin, as it is now proposed, will receive four primary and eight alternative disposal sites. The breakdown for primary sites is one for Wisconsin and three for Minnesota.

The DOE will be holding public hearings in an attempt to gather testimony on the proposed sites. Ashland, Wisconsin will be the site of one such hearing on April 9. Concerned citizens are urged to take part in any public hearings held pertaining to this matter.

NOW, THEREFORE BE IT RESOLVED, that Great Lakes United urges the U.S. Department of Energy and Atomic Energy of Canada, Ltd. that any potential sites for nuclear waste repositories in the Great Lakes/St. Lawrence watershed be immediately disqualified from any further consideration for such use, and furthermore, future plans for nuclear waste repositories must consider the magnitude and ecologic sensitivity of the hydrological features of the location being reviewed.

On May 19, 1985 at its annual meeting held in Chicago, Great Lakes United adopted the above-stated resolution pertaining to this matter.



From the President's Desk

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- Navigation issues such as winter navigations, additional locks, channel modifications, etc.; and

- Public support for Great Lakes ecosystem research, education and management;

THEREFORE, we resolve to establish a Great Lakes organization to provide an information exchange and a forum for working together on these issues.

With the above Charter as a guide, a Charter Committee, elected at the Mackinac meeting, met during that summer and early fall to draft organization by-laws, with a deadline to hold an organization meeting in the fall of 1982. On November 21, 1982 the organization meeting was held in Windsor, Ontario and the by-laws were officially ratified. The name GREAT LAKES UNITED was officially adopted and a Steering Committee was elected to continue development of the organization structure and to put together the first annual meeting. On May 6, 7 and 8, 1983, a little less than one year from the Mackinac meeting, Great Lakes United held its first annual session at the Book Cadillac Hotel in Detroit, Michigan.

Organizations throughout the Great Lakes Basin having an interest in the coalition were sent an invitation. The caption on that invitation read: "To Unite and Strengthen the Conservation and Environmental Voice of the Great Lakes-St. Lawrence Basin." Some 70 organizations responded. At this date the organizational membership of Great Lakes United has more

than doubled. By 1987 we expect over organizational members.

The 1983 Detroit annual meeting marked the formal existence of Great Lakes United. An energetic and aggressive Board of Directors was elected to guide the growth of Great Lakes United. During the next three years several milestones would be reached by GLU in organizational development, in education programs, and involvement in environmental action issues. Briefly, some of those milestones include:

- Incorporation
- Attainment of 501 c3 Charitable Status

- Publication of a membership newsletter "Action Update"

- Task-force development with printed environmental position statements.

- Success in meeting the winter navigation challenge

- "Great Lakes Week" proclamation and activities

- Success in obtaining a financial grant to hire staff and establish an office

- Hiring of an Executive Director
- Establishment of an international headquarters at Medaille College at Buffalo, New York

- Development and promotion of Great Lakes Week in Washington, DC
- Receipt of a grant award to hire a person to develop a membership campaign and produce a quarterly organization publication

- Receipt of a grant award to hire a coordinator for a Basin-wide public

hearing program on Great Lakes water quality.

No doubt some of the events taking place during the past three years have been missed in this list of milestones. Possibly the most notable is the ongoing commitment and involvement of not only Board members and officers but many, many other volunteers who were instrumental in these developmental years of GLU. One of the greatest strengths has been the continual effort to develop and improve a communication system plus maintaining an ongoing dialogue, not only with members and associates but with government leaders in the federal, provincial, state and local level, including the regional and national agencies and organizations serving the Great Lakes Basin.

For the first year and a half of Great Lakes United's existence, membership fees and donations from organizational members, particularly those serving on the Board of Directors, kept the organization solvent. A welcome boost came with the award of foundation grants to hire professional and support staff, set up an office and put a communication system in place. Foundations that have contributed financially to the success of Great Lakes United include the Joyce Foundation, Donner Foundation, Public Welfare Foundation, Gund Foundation and the Harder Foundation. One of the most significant highlights was the establishment of the international office of Great Lakes United in the "White House" at Medaille College. The

cooperative agreement between Great Lakes United and Medaille College has been instrumental in the organization's growth.

To assess the progress of Great Lakes United—or to put it in a bottom line mode—one must ask, what has Great Lakes United contributed that wasn't being done prior to its existence. To evaluate, we must first review the original Charter, plus compare Great Lakes United's activities and progress with the six objectives stated in the by-laws, which include:

- Education
- United States-Canadian cooperation and coordination

- Promotion of an Ecosystem approach to Great Lakes management

- Promotion of environmental/economic compatibility

- Development of strong public support.

Most assuredly, we have a long way to go to fully encompass the above goals and although my opinion could certainly be labeled "biased," matching the brief list of milestones reached over the past three years, with both the Charter and the by-laws objectives, I see strong evidence that Great Lakes United is on course and meeting the challenges set forth at the Mackinac meeting. With continued volunteer commitment, plus the tremendous advantage of having a competent, energetic and eager professional and support staff, Great Lakes United is not only measuring up to the rigid demands and challenges but is on course to a bright and productive future.



Citizen Support Needed for Environmental Bond Act

by Judith Enck, Executive Director, Environmental Planning Lobby

Environmental protection is a hot political issue and 1986 is an important political year with every member of the State Legislature and Governor Cuomo up for re-election.

No politician wants to be viewed as being soft on pollution. One can safely say that they all want clean air, pure water and ample open space. Who doesn't? Yet, the last few decades have taken a terrible toll on our precious natural resources. 1986 is the year to turn our general desire for a clean environment into political reality.

The task is enormous and now, more than ever, there is a need for every lawmaker, both Democrat and Republican, to forge an alliance and work with the citizens of New York State to reverse the alarming trend of environmental degradation.

In his State of the State Address, Governor Mario Cuomo announced his support for a 1986 Environmental Bond Act. The Governor's plan calls for spending \$1.2-billion of the money for cleaning up toxic waste sites and the remainder for land acquisition for the forest preserve, urban parks, historic preservation, and the protection of sensitive ecological areas.

A bond act is required because New York needs a large pool of money to begin this large-scale effort in 1986. Annual general fund appropriations will not provide enough money to deal with the enormity of our environmental problems.

Every day that passes in which the state does not remediate dangerous toxic dumpsites increases the possibility of citizens being exposed to toxic chemicals. With land prices escalating, acquiring unique and important tracts of land now can save the state large sums of money in the future. These are compelling reasons for a 1986 bond act.

New Yorkers have a proud history of supporting environmental bond acts. In 1965 New Yorkers approved a \$1-billion Pure Waters Bond Act to clean up our lakes, rivers and streams by a 4-to-1 margin. And, in 1972, a \$1.15-billion bond act for air pollution, solid waste, land acquisition and water quality also won voter approval. Clearly, we have a long way to go but this transfusion of money did have a major impact in improving the state's environmental quality.

New York has inherited a legacy of toxic waste sites. Toxic chemical dumping in New York State has reached a crisis point. 1,278 toxic sites have been identified in the State with at least 62 located in Schenectady, Montgomery, Fulton, Hamilton and Saratoga Counties. Even more discouraging is the fact that the 1,278 may only represent the tip of the iceberg and the state will likely uncover many more sites in the future. The average cost of remediating just one toxic site is \$6-million to \$10-million. The longer these sites sit there, the more likely it will become that wastes will contaminate groundwater beneath and near the sites. Cleaning sites now is a smart investment that will protect the public health and save responsible parties and taxpayers large sums of money. Delaying the cleanup process will significantly raise the final cleanup costs and jeopardize public health.

New York has a rich tradition of protecting the land. Almost one hundred years ago, in 1885, the State Legislature adopted a law which established the Forest

Preserve, consisting of state-owned lands in the Adirondack and Catskill regions. Today, the Forest Preserve comprises 2¼-million acres and is the largest and best-protected area of forests, mountains, rivers and lakes in the eastern United States. Governor Cuomo has proposed continuing this rich tradition by providing funding for land acquisitions in the forest preserve, funding for urban parks and funding for acquisition of sensitive ecological areas such as wetlands and essential habitat for wildlife.

While Governor Cuomo's bond act proposal is laudable, it also does not go far enough. The Environmental Planning Lobby (EPL) supports \$2-billion for toxic waste site cleanup and \$500-million for land acquisition. Governor Cuomo has suggested that 50% of the principal and interest of the bond act come from industries that generate toxic waste and 50% come from tax dollars. Since citizens had very little to do with creating toxic waste sites, EPL believes that taxpayers should not have to bear half the cost of cleaning up abandoned sites. Instead, 90% of the money for toxic cleanup should come from industrial fees and 10% from tax dollars. Though the EPL proposal is not identical to that of Governor Cuomo, the differences are not insurmountable, and a compromise bond act is likely to emerge.

Citizen involvement is essential if a 1986 bond act is to become a reality. Interested people should contact their State Senator and share their views on this timely topic. Lawmakers need to hear the opinions of their constituents on current issues like the environmental bond act. I am sure that your legislators would welcome your specific input so that they can fully represent the views of their constituents on this issue.

There is an old proverb that says, "Treat the earth well; it was not given to you by your parents, it was loaned to you by your children." While it's hard to live up to the expectations of old, wise proverbs, small steps, like active support for the Environmental Bond Act, bring us closer to preserving our precious natural resources for future generations.

Please contact your State Senator as soon as possible. If you're not sure who he or she is, call your County Board of Elections, found in the blue pages of your phone book. The Environmental Planning Lobby also strongly urges organizations and individuals to meet with your State Senator. They are usually in their district office during the latter part of the week. If you need more detailed information, please call EPL at (518) 462-5526. Also, please keep us informed of any response you get. We're asking you to contact your State Senator first, because Assembly leadership expressed support for the Bond Act. You can write to your State Senator at State Office Building, Albany, NY 12247

Judith Enck is the Executive Director of the Environmental Planning Lobby. The Environmental Planning Lobby is a statewide environmental advocacy coalition which lobbies in the State Legislature on environmental protection issues. The organization also works with state agencies for strict enforcement of environmental laws.

Legislative Update

Michigan WRC Votes on Anti-degradation: The Water Resources Commission (WRC) voted in favor of a three tier level of protection for Michigan waterways. The proposed position has been under review by Commission staff and will replace existing provisions. Staff for the Commission proposed that: existing water quality be maintained unless the WRC determines that the lowering of water quality will not be injurious to uses and is in the public interest; that lowering of quality in "protected waters" would only be allowed after demonstrating that lowering the quality is necessary to accommodate important social or economic development; that certain waters classified as "Outstanding Resource Waters" would under no circumstance be lowered in quality. Examples of Outstanding Resource Waters are: Wild Rivers designated under the federal Wild and Scenic River Act, and Wilderness Rivers designated under the Michigan Natural Rivers Act. The Commission further voted to include all of the Great Lakes in this category except "as these waters may be affected by direct discharges to the connecting channels and tributaries of the Great Lakes."

This is a revision of the rules approved by the Commission for submission to public notice and public comment. The Public Comment period ended on February 28, and the proposed revisions will be under further review by the Commission. The proposed rules

will then be forwarded to the Joint Administrative Rules Committee of the Michigan House and Senate for final approval.

Incinerator Emissions Study: The Toxic Substance Control Commission (TSCC) is drafting a work plan for a study on incinerator emissions. At its December 12, 1985 meeting the Commission voted to adopt four questions on non-criteria air pollutants that would be incorporated into the work plan. The questions are as follows: (1) Is there a potential or existing toxic substance threat to public health and the environment from non-criteria air pollutants/incineration in Michigan; (2) If there is a toxic substance threat,

what policy program, statutory or regulatory reforms are necessary to remove or reduce the adverse effect; (3) Are potential risks associated with incineration technologies acceptable and such that incineration could be shown to be a reasonable alternative to other forms of waste management; (4) If incineration is found to be a proper alternative technology whereby potential environmental and public health threats can be properly managed, what state policy, program, statutory or regulatory reforms are necessary to provide for its use? TSCC staff expect to have a complete study plan put together sometime this month.

May 1 & 2, 1986: Midwest Conference on Environmental Dispute Resolution

A conference will be held at the University Inn, Champaign, Illinois, to introduce the alternative techniques of dispute resolution, including when and how such techniques are most applicable. Workshops, role-playing exercises and several social activities will give speakers and participants opportunities to discuss the material presented.

Telephone Donna Herriott, at (217) 333-2883 for registration information. The registration deadline is April 16, 1986. Early registration is recommended.



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