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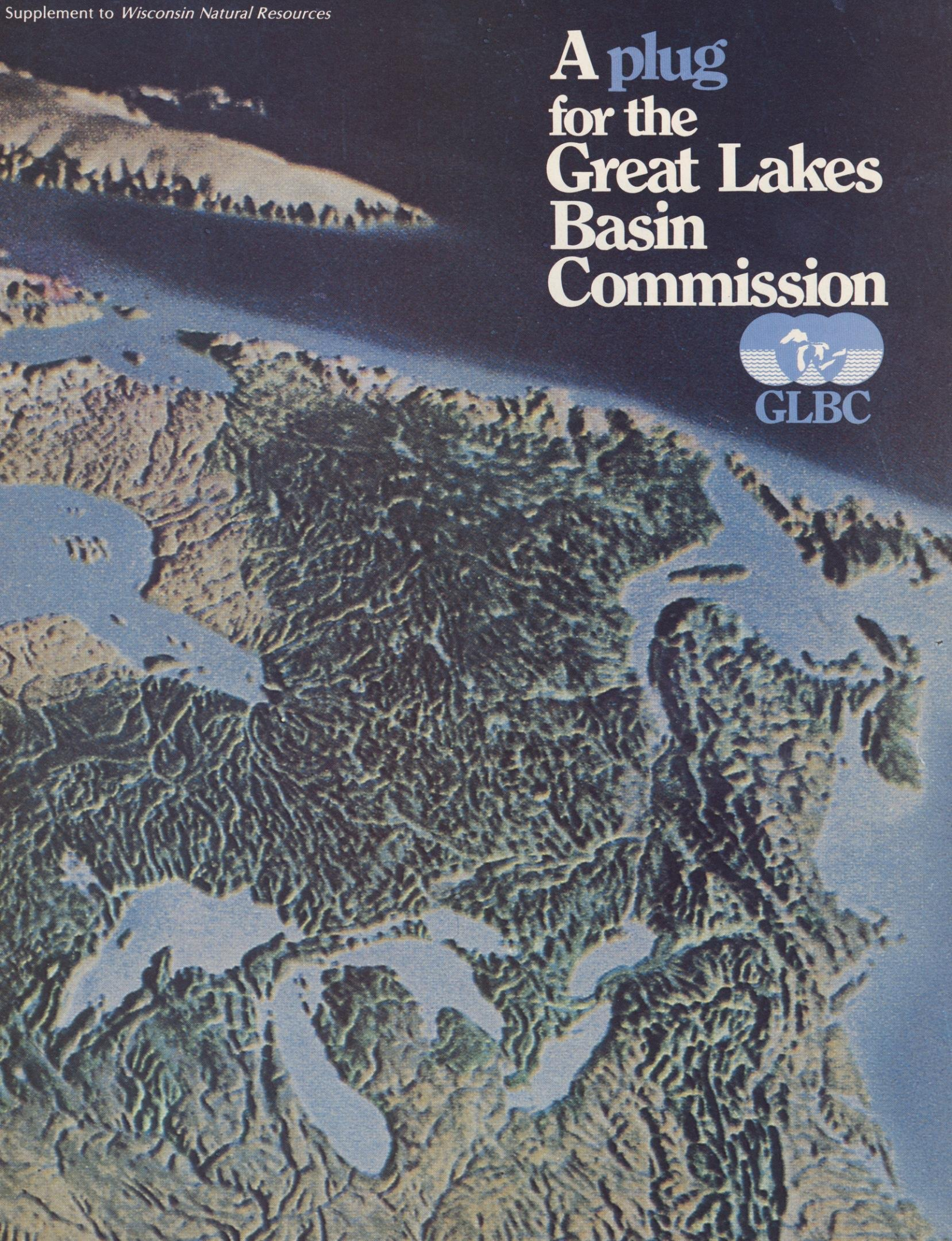
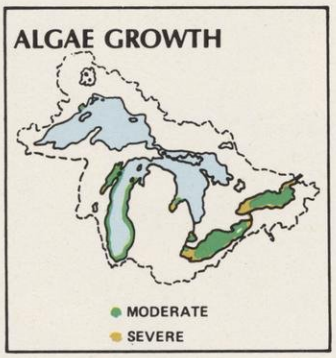
Supplement to *Wisconsin Natural Resources*

A plug for the Great Lakes Basin Commission

GLBC





Mammoth sandstone blocks like these on Hermit Island in the Apostles built the brownstone buildings of Milwaukee, New York and Chicago during the last century. From Door County to Superior, chunks of Great Lakes shoreline were cut and carted off to become city landmarks wherever sandstone could be easily transported by water. Photo by Walter L. Pomeroy.

Seen from an orbiting satellite, the Great Lakes are a tiara of amethysts at the brow of the nation. They are the world's largest inland sea. Together they contain one-fifth of the earth's fresh surface water and 90% of North America's. Their shoreline is longer than either the Atlantic, Pacific or Gulf of Mexico coasts in the US. So vast a jewel is a resource that almost defies imagination, let alone successful management. Two nations, eight states, a dozen U.S. federal agencies and a like array of Canadian ones are concerned with some aspect of using or protecting the Lakes. Add sport and commercial fishermen, ship owners, environmentalists, recreation-seekers, shoreline cities and towns, landowners and industries and you've got a bewildering array of issues and interests almost certain to conflict.

Right in the middle, trying to bring all viewpoints together and steer a course toward resolving conflict is the Great Lakes Basin Commission (GLBC). The Commission is a water resource planning agency. Its members comprise all the Great Lakes states, all federal agencies concerned with water, and one other interstate organization, the Great Lakes Commission (see glossary at page 14s). There are also two Canadian observers. The GLBC brings together government, citizens and industry to examine and resolve basin-wide water problems. Its primary task, assigned by Congress, is to develop a management plan for the entire Great Lakes basin. Some elements of the plan are completed—wetlands policy, coastal hazards, water quality, water conservation, hazardous waste management and the framework study which is an inventory of basic information. Others are still in the works—emerging energy technologies, groundwater protection, transportation, the relationship of water to energy and several more. On request, the Commission also studies other issues of concern to its member states and agencies. What follows is a discussion of some of these issues, places in Wisconsin affected by them and the Basin Commission's attempts to resolve them.

SANDSTONE & SAILORS

Historically, when people's eyes turned on the Great Lakes, they saw a resource to be exploited, and not always kindly.

The Apostle Islands, off the Bayfield Peninsula in Lake Superior, were used only lightly by prehistoric Indians, perhaps for yearly fishing forays. But by the late 17th Century, Madeline Island was well-established in the fur trade, first French, then English, then American. In 1834 the island also became a fishing center. Late in the 1800's the Apostles' red sandstone was carved into huge blocks and shipped off to become brownstone buildings in Milwaukee, Chicago, and New York. On Hermit Island today a double row of underwater pilings remain from a once-giant dock, and nearby massive stone blocks are stacked like children's toys, waiting for a boat that never arrived. Loggers went to work on the islands early in this century and by the 1930's many of the Apostles were cut over and bare.

The Apostle Islands and some coastline on the Bayfield Peninsula are protected now as part of the National Parks system, but threats remain.

"Every community around here is boostering to get people to come to the Apostle Islands' 'unlimited' beaches and sheltered coves," says Park Service Ecologist Bob Brander.

"Sometimes these islands are lined with sailboats and cruisers, mostly owned by Minneapolis/St. Paul people. We're trying to tell them there are limits to everything, but so far nobody's listening much. They say we're interfering with their affairs, their right to capitalize on this resource."

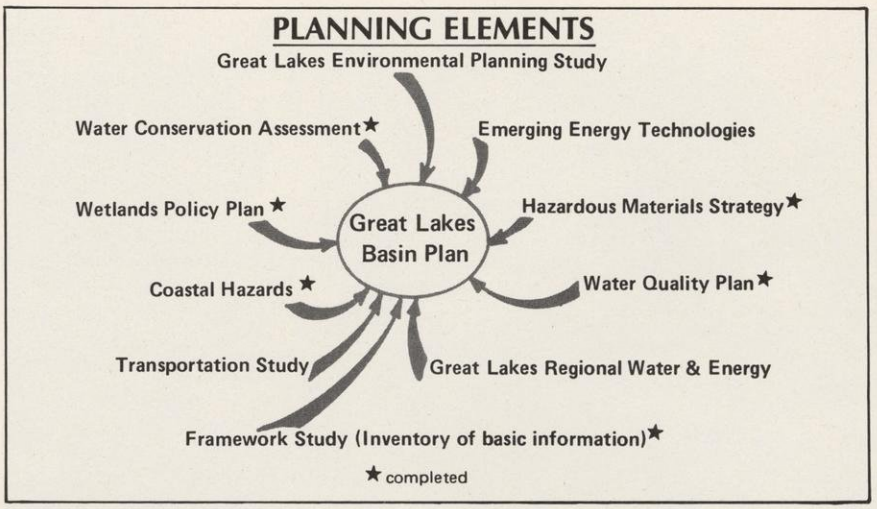
Such recreation pressure is increasing all along the lakes. More than five million people live within one day's drive of even the remote Apostle Islands. Through its coastal management committee and developing Basin Plan, the GLBC hopes to help Wisconsin and other states that border the lakes meet future demands.

EROSION

Saxon Harbor is a quiet sheltered cove between two blunt points of land that jut into Lake Superior east of Ashland. An access point where the high red banks dip to lake level, it is sandwiched between the Michigan border and the Bad River Indian Reservation.

When a nor'easter rips into this shoreline the wind has 300 miles of open, unhindered Lake Superior in which to build. Waves hit the unprotected red clay banks like a juggernaut. They undercut the base until huge chunks of wooded real estate slump onto the beach 75 to 100 feet below. Whole trees and clumps of trees come sliding down like pick-up-sticks.

This shoreline erosion is a totally natural process that's been happening for centuries. Early explorer's diaries describe the naked red clay bluffs as looking almost the same as they do today. Along the sparsely populated shore of Wisconsin's four Lake Superior counties it's not much of a problem. But put up a house and it is. Bluff, home, overlook and all have been known to go sliding into the water.



MEMBERSHIP:

Great Lakes Basin Commission

States:
Wisconsin
Michigan
Minnesota
Ohio
Indiana
Illinois
New York
Pennsylvania

Great Lakes Commission

Federal:
Environmental Protection Agency
Emergency Management Agency

Departments of:
Agriculture
Army (Corps of Engineers)
Commerce
Housing and Urban Development
Interior
Justice
State
Transportation
Energy

This supplement was prepared under the auspices of the Great Lakes Basin Commission in cooperation with Rahim Oghalai, DNR Supervisor for Interstate Planning and Walter L. Pomeroy, Director of Public Information, GLBC.

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Box 999
Ann Arbor, MI 48106

The Commission prints free Great Lakes fact sheets and a monthly newsletter, *The Great Lakes Communicator,* available upon request. Copies of any studies mentioned in this supplement are also available from the Basin Commission and many libraries.

Cover: *A three dimensional model of the Great Lakes area as seen from the upper atmosphere.*

Supplement by
Robin J. Irwin

Snowy owls migrated into Wisconsin in force this winter, looking for food. The problem of PCBs is so pervasive and world-wide that even these rare visitors from the far Arctic north show traces in their bodies. How they get them is a mystery, but GLBC studies show that 50% of PCBs entering Lakes Superior and Michigan are airborne.

It is possible to fight this natural erosion according to Tony Wilhelm, an engineer in nearby Ashland.

"But you don't try to fight Mother Nature unless you have good cause—and a lot of money," Wilhelm says. "Obviously we can't afford to armor-plate the whole Lake Superior shoreline, but in places where property values are high, some sort of structural solution is necessary."

A former city and regional planner, Wilhelm's engineering firm designed a demonstration shoreline stabilization project at Madigan Beach, a campground and picnic area on the Bad River Indian Reservation just west of Saxon Harbor. Danish burlap-woven plastic cloth tubes, almost six feet in diameter, were spread out and filled with sand to protect more than 1,300 feet of shoreline. At intervals other tubes jutted 100 feet out into the lake to break incoming waves.

The Madigan Beach Project is the largest installation using these so-called "Longaard Tubes" anywhere in the world, and in a sense it is both a success and a failure. It did stop erosion along the 75-foot high bank above it—for a time. But the project was a cooperative effort between five red clay counties (Ashland, Iron, Bayfield and Douglas in Wisconsin and Carlton in Minnesota), the Ashland County Soil and Water District, the Ashland County Board, U.S. Environmental Protection Agency and the Bad River Band of Lake Superior Chippewa Indians. Once built, it became an orphan.

"It's getting beaten all to hell," Wilhelm says. Driftwood and debris poke holes in the tubes and the sand inside filters out. Since only a few picnic tables sit atop the bluff that the tubes protect, there has been little incentive to maintain the project once it proved workable. Nonetheless, with some reservations, Wilhelm defends such "structural" solutions to shoreline erosion.

"Where maintained, this system works well," he says. "Sure, a textbook zoning approach or mandatory setbacks should be in force all along the lakes, but what do you do if you already have a house there? You can't have a policy of just letting erosion go—that's an incomplete approach."

The Great Lakes Basin Commission is trying to grapple with the problem of coastal hazards. It finds that shoreline erosion-prevention structures like the one at Madigan Beach are often costly, impermanent solutions that can sometimes accelerate erosion on neighboring shorelines or even spur increased development by creating an illusion of safety. Sometimes shoreline structures may be necessary to protect existing buildings, but long-term non-structural alternatives such as planting shoreline vegetation or limiting coastal development make more sense.

Lakeside Township, in Douglas County, was the first place in Wisconsin to experiment with a non-structural approach. Local planners there found they could measure average yearly erosion at any point along the township's Lake Superior coastline. They lobbied with the Douglas County Board and got an ordinance passed prohibiting new construction along any shoreline that might erode away within a building's estimated 60-year lifespan. Ozaukee County, on Lake Michigan, has now passed a similar ordinance and other shoreline counties may soon follow suit.

One reason for erosion along Lake Superior is high lake levels. Heavy rainfall last summer led to high water on all the lakes, but Wilhelm and many other Lake Superior residents think they are unfairly bearing more than their share of increased shoreline erosion. The U.S. Army Corps of Engineers, they claim, is using Lake Superior as a reservoir, holding back water at Sault Ste. Marie to limit erosion along more populated and valuable shoreline on Lakes Michigan and Huron. A Corps of Engineers spokesman says the Corps' hands are tied, that lake levels are determined by the U.S./Canada International Joint Commission (IJC) (see glossary, page 14s). The IJC, in turn, says lake levels are

set by international treaty with Canada, and not readily altered by either government. Lake Superior residents feel caught in the middle.

"We don't think that this balancing of the lake levels is wrong, in itself," says Wilhelm, "but there has to be some sort of compensation for those of us up here who pay the cost, who lose land when lake levels are high."

TRANSPORTATION

To really get a feel for the Great Lakes as an economic resource, as well as a natural and scenic one, you have only to travel to Duluth/Superior. It is Wisconsin's and the Lakes' busiest port, 11th largest in the nation. Each year, 3,000 ships of 35 foreign nations and 150 domestic fleets steam in and out of this busy harbor. In 1978, Duluth/Superior handled more than 45 million tons of cargo, mostly bulk shipment of iron ore, grain and coal, but also such general cargoes as steel, liquids, sugar beets, molasses, granite, matchsticks, and cement. A spider's net of highways and rail lines funnel over 100,000 trucks and more than 40,000 railroad cars into the port's wheat, corn and sunflower seed elevators. Mile-long, 110-car freight trains of Montana coal roll into Superior's Midwest Energy Terminal, where whole railroad cars are picked up and dumped one at a time while the coal flows onto ships by conveyor at 11,000 tons an hour, destined for the Detroit Edison power company in Michigan.

Clearly, transportation is big business, not only in Duluth/Superior, but also in Milwaukee and Green Bay, Wisconsin's other major ports. Smaller ports often handle specialized cargoes—Kenosha is known as the "reefer port" for its significant volume of refrigerated food cargoes. And all the ports depend on the interlinking network of highways and rail lines to supply the ships at dockside. When grain elevator operators at Duluth/Superior went on strike and the Milwaukee Road declared bankruptcy in 1979, it cost Wisconsin, Minnesota, and other grain states over $1-billion in just a few short weeks.

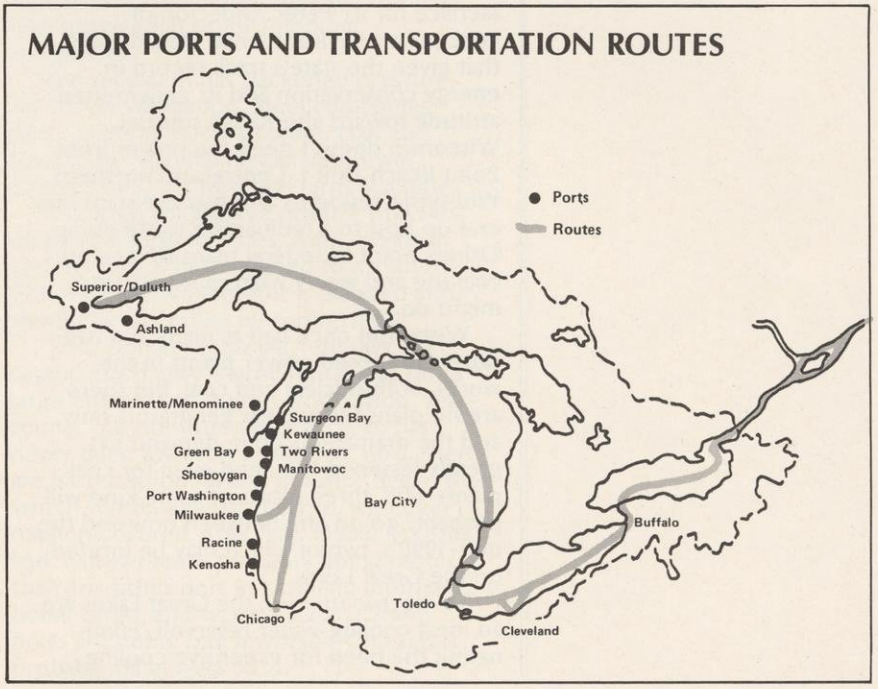
As important as this highway-rail-water network is, until now no major study brought together the effects of one upon the others. This is just the sort of work GLBC does best. As part of its basin plan, the Commission will spend the next two years tying together many state, federal and interstate studies of transportation in the region to project future demands on the whole system. When completed in 1983, the study will identify alternatives to enhance this vital international lifeline and advise federal and state policy-makers how to bring them about.

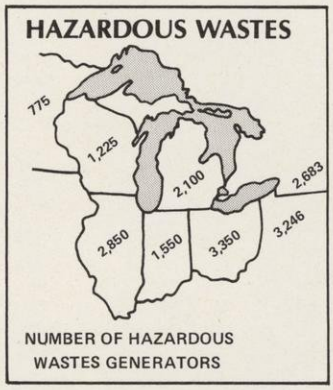
ENERGY

The Great Lakes Basin Commission is interested in how electric power is generated. It is trying to compile and investigate the impact of various lake state and federal energy policies on the basin and suggest alternatives. In Wisconsin, nuclear power is an issue.

Wisconsin Electric Power Company's Point Beach Nuclear Reactor perches at the edge of Lake Michigan a couple miles from the tiny crossroads farming village of Two Creeks.

It has 10 to 15-foot concrete walls that surround another three feet of steel-lined concrete containment building, and within this is the steel reactor vessel. The vessel is six inches thick and its 3,500 uranium fuel rods do the job they were designed to do—heat water to 600° F under 2,200 pounds pressure. This heats other water, creating steam to turn the plant's turbines. The steam is cooled and condensed by water drawn from Lake Michigan. Some 375,000 gallons per minute is warmed 12 to 19 degrees in the process and





Nobody wants illegally dumped hazardous wastes for a neighbor. Problem is, it seems no one wants safe, regulated legal sites, either. A new federal law that calls for "cradle-to-grave" records on hazardous materials will go a long way toward preventing illegal dumps, but without legal sites, safe disposal and storage remain a critical issue. GLBC studies show that resource recycling and regional disposal sites will help. *Photo by B. H. Mills*

discharged back into the lake, attracting many fish to its biologically rich plume.

Neither—nuclear opponents nor proponents—doubt that Wisconsin needs electric power, but many disagree about how much and where it should come from. Point Beach spokesperson Loretta Krcma says the decision is a personal as well as societal one: if we want continued electrical energy, what are we willing to sacrifice for it? Peter Anderson of Wisconsin's Environmental Decade says that given the state's track record in energy conservation and its enlightened attitude toward alternative sources, Wisconsin doesn't need the power from Point Beach Unit I. Central and northern Wisconsin residents also fear the state may end up host to a radioactive waste dump. Others point to federal plans to increase coal use and worry what more acid rain might do.

Wisconsin once had as many as a half-dozen proposed power plants in the works, both nuclear and coal. But there are no plans for nuclear generators now, and the dramatic drop in demand has greatly lessened the need even for coal plants. Still, three plants of some kind will probably go on line between now and the mid-1990's, two of which may be located on the Great Lakes.

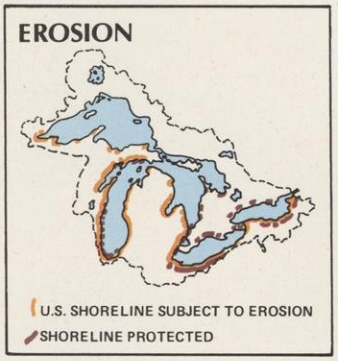
To electric utilities, the Great Lakes are an ideal cooling-water reservoir, eliminating the need for expensive cooling towers. But many would disagree that power plants are the highest and best use for Great Lakes shoreline. Actually, economic considerations (available cooling water, cost of transporting fuel, and future demand for electricity) determine where a power plant will be built as long as environmental constraints are met.

Energy options could have far-reaching affects on the Great Lakes. While the Basin Commission won't decide whether nuclear power is safe or unsafe, necessary or unnecessary, it is studying both non-nuclear energy alternatives and power plant siting. GLBC will finally develop policy options to help Wisconsin and other states follow energy policies that take effects on the Great Lakes into account.

HAZARDOUS WASTE

Big Bend, Wisconsin is a small village of 1,400 people about 10 miles south of Waukesha and more than 20 miles from Lake Michigan. For the GLBC it is a case history, an all too typical illustration of why commission hazardous waste studies are critical, why disposal alternatives are urgent. Big Bend has had an encounter with the chemical menace, polychlorinated biphenyls—PCB's.

PCB's can get into the environment. They



Far right: *At the turn of the century, Milwaukee and Chicago had roughly the same size population and each was boostering for its share of Great Lakes transportation business, as shown on the cover of this 1901 Chamber of Commerce publication. Chicago won the battle—its population and port business are now five times Milwaukee's. But the Cream City is still fighting—port officials hope a proposed new multi-million-dollar grain elevator will bring more corn for overseas shipment. And the GLBC Transportation study is expected to provide marketing data to help with planning.* Art courtesy of the Milwaukee Department of City Development

The Great Lakes are a playground for 35-million people. But until a decade ago, they had only a pauper's share of national parks—Isle Royale in Lake Superior and a handful of historic sites and monuments. Today the region boasts 12 national parks, including Wisconsin's Apostle Islands and parts of the Ice Age Reserve. But public access to Great Lakes shoreline is still limited—gas prices have chopped visits to remote parks while often tripling attendance at those near cities. On the surface, the answer would seem to be more parks, but increasing public access and preserving scenic Great Lakes dunes, marshes, beaches and bluffs don't always go hand-in-hand. Without careful planning we stand the chance of loving our parks to death, especially near cities. GLBC planners hope to help reconcile this dilemma. GLBC photo

tense and emotional. Residents talked of drums rolling off trucks, of vandals shooting holes in the steel construction with 22's, of tornadoes hitting.

By law, DNR had 60 days to respond to citizen concerns and arrive at a decision. Before the time was up, legal obligations became moot. Early in June, SED abandoned the project, citing citizen opposition and telephoned threats of violence and vandalism.

"We didn't think this thing belonged in this county or anywhere in the southeastern part of the state," says Ross. "Yeah, sure, we pushed it somewhere else, to some other community someplace, but I just didn't want this to happen to Big Bend. There has to be a safe way to do this, but not here."

So SED took its business elsewhere. And the question arises: was that the way to handle it? The company now plans to operate in Arizona, Ohio and several other locations. Ohio has extended feelers to toxic waste handlers on the theory that industry will locate and stay in places where hazardous industrial by-products can be quickly, safely, and economically dealt with. In the long run society can't just send toxic and hazardous wastes "away" because "away" will always be in somebody's back yard. If hazardous wastes are to be safely and legally kept out of the environment, regulated and monitored disposal sites are a necessity. But in Big Bend and elsewhere, many of the roadblocks to safe disposal are as emotional as they are technological.

The Great Lakes Basin Commission recognizes that not every state needs a disposal site for every kind of hazardous waste. Some states could share disposal facilities where economy of scale and reasonable transportation costs make such interstate cooperation feasible. Not only that, but a hazardous waste in one industry might be a raw material for another. The Commission has put together an extensive, impressive stack of reports on hazardous waste generation. The report shows quantities produced in each state, the volume known to be disposed of and the quantity left over to be dealt with. Resource recycling and interstate cooperation, the commission says, will go a long way toward keeping dangerous chemicals off our land and out of our water.

build up in fish, animals, and humans who eat them. They have infected the Great Lakes. In high enough quantities, research shows PCB's can cause nervous disorders, reproductive failure, behavioral problems and skin ailments in laboratory animals. Although federal law now prohibits manufacture and sale, much of the chemical remains "at large," especially in industrial components and electrical transformers.

And that's where Big Bend comes in. A Waukesha company known as Safety Engineered Disposal (SED) is in the business of getting PCB's out of the human environment. It has developed a substitute product and contracts with various businesses in Milwaukee and elsewhere to remove and store quantities of liquid PCB's. It is also working to find a chemical way to make PCB's harmless. But when SED tried to bring its business to Big Bend, a flash flood of outraged protest boiled up.

On February 6, 1980 officials from SED submitted applications to DNR for a PCB handling and storage facility in Big Bend. Company officials expressed willingness to—and in fact did—comply with all legal requirements to get their facility approved and operating. But what they didn't do was talk to anybody in Big Bend.

On March 24, DNR published a legal notice in the *Waukesha Freeman,* announcing the application and inviting comments or requests for a public hearing. That's when things began to hit the proverbial fan.

Three weeks earlier, on March 7, DNR had sent a summary of the project and a copy of the public notice to the Big Bend village clerk. Due to a foul-up at the town hall, Village President Harlan Ross says he never saw it.

"The first anyone in Big Bend knew about the proposal was when DNR ran the ad," Ross says. "My phone almost jumped off the wall."

In rapid succession, angry letters began arriving at DNR headquarters in Madison, the Vernon Town Board went on record opposing the project and Big Bend officials called an emergency Village Board meeting to organize against the proposal. Big Bend was clearly in a fighting mood.

"We planned to tie this thing up in the courts for years," says Ross. "People were against it 100%."

More than 400 Big Bend residents had signed petitions against the project and requested a public hearing. The village hired a chemical engineering consultant at $500 a day to help present their case. By the time DNR convened a public hearing on May 6, Big Bend was loaded for bear.

SED planned to store the PCB's in 55-gallon drums inside larger, portable steel "warehouses," four drums to a warehouse. Each was to be rigged with a 24-hour alarm system in case the drums inside began to leak. The steel warehouses would be outdoors surrounded by a diked yard.

But Big Bend residents didn't think the safety precautions were enough. They distrusted SED and, by implication, DNR. The atmosphere at the public hearing was

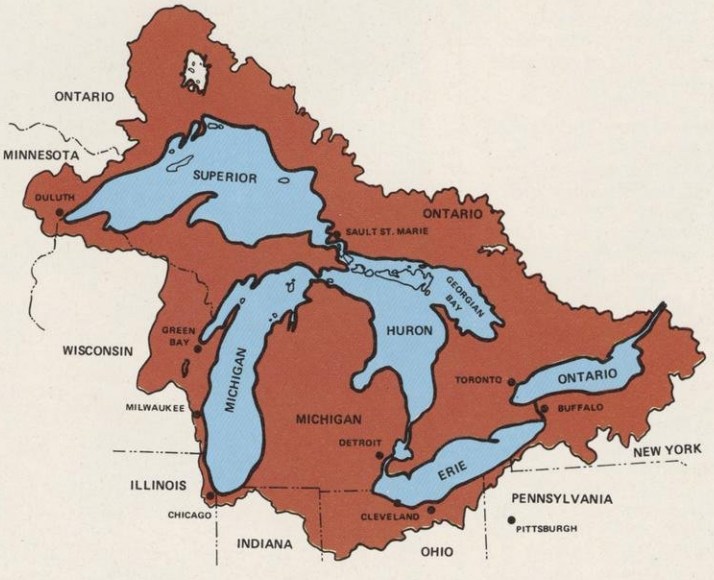
SOURCES OF ATMOSPHERIC WASTE

CITY	PARTICULATES	NITROGEN OXIDES	SULPHUR OXIDES
DULUTH	77	66	74
MINNEAPOLIS	370	300	360
GREEN BAY	250	190	150
MILWAUKEE	290	170	140
CHICAGO	1260	810	640
DETROIT	530	390	280
CLEVELAND	760	270	370
PITTSBURGH	2400	760	560
BUFFALO	150	84	35
TORONTO	230	160	41
SAULT ST. MARIE	69	66	140

THOUSANDS OF TONS PER YEAR

About half of these air pollutants fall as acid rain, much of it in the Great Lakes Basin.

GREAT LAKES DRAINAGE BASIN

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LAKE HURON
WISCONSIN
MILWAUKEE
LAKE MICHIGAN
CHICAGO
ILLINOIS
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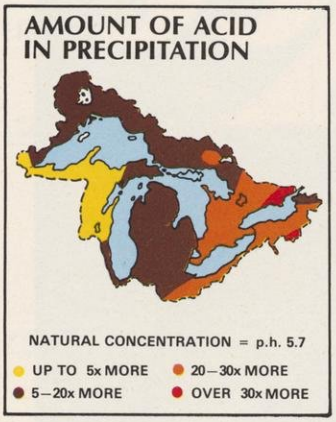


WINTER NAVIGATION

"Thirty-seven percent of the United States' gross national product is produced within a circle 300 miles around the City of Chicago, according to the U.S. Department of Commerce. It includes Milwaukee, Chicago, Detroit, Cleveland, Toledo and Minneapolis-Saint Paul. There's no place in the world that manufactures more. Our production of manufactured exports in this North Central States region of the country—basically the Great Lakes Basin—is by far, far larger than any other part of the country. And it's the same with agricultural products."

That's a quote from Rear Admiral Roy F. Hoffman, retired Navy officer and director of the Port of Milwaukee. He's a man who has spent more time with his feet on the steel decks of ships than on solid ground. He's a man who knows about maritime commerce, about moving goods from place to place on water, about the comings and goings of boats and cargo. He's also a man who hates ice.

"It's a real enigma that here we sit on the largest inland seaway in the world," he says, "and we can't really capitalize on this low-cost marine transportation because we have the natural limitation of wintertime ice. There's no reason in the world we shouldn't be taking advantage of this natural waterway, no reason why we can't continue commerce the year-round on the southern part of Lake Michigan."

This flume at Silver Bay, Minnesota spewed more than 280-million tons of taconite tailings into Lake Superior during the past 23 years. It was a classic case of exploitation. The dumping was not stopped until March of 1980 after a long court battle in which Reserve Mining Company used every legal tactic it could muster. Wisconsin was a party to the action against Reserve. The case became even more notorious after possible cancer-causing asbestos fibers in the tailings were found to contaminate drinking water in Superior and Duluth. Upshot was that Superior reverted to use of wells, Duluth was forced to build an expensive filtration plant and Reserve was ordered to cease using the lake as a dump. The giant delta created by the tailings still releases fibers and researchers are looking for ways to isolate it.

Lakeshore landowners and the Corps of Engineers spend millions every year attempting to control shoreline erosion, but still the lakes create scenes like this. The Great Lakes Basin Commission has proposed many solutions that are already being used in Wisconsin. They include sensible shoreland zoning that sets new buildings back from the edge of erodible bluffs, out of harm's way. Natural vegetation and runoff control can help protect older, existing buildings.

Ships have been shuttling cargo around the Great Lakes for more than 100 years, yet every winter all shipping comes to a halt for up to 4 1/2 months—from roughly December 1 to mid-April. That "natural limitation" is a factor Admiral Hoffman doesn't like to tolerate.

"We have technology to deal with it, there's no question about it. The Corps of Engineers spent seven years doing a study and actually operated five of the years on the upper four lakes, year round. Technology is not the problem."

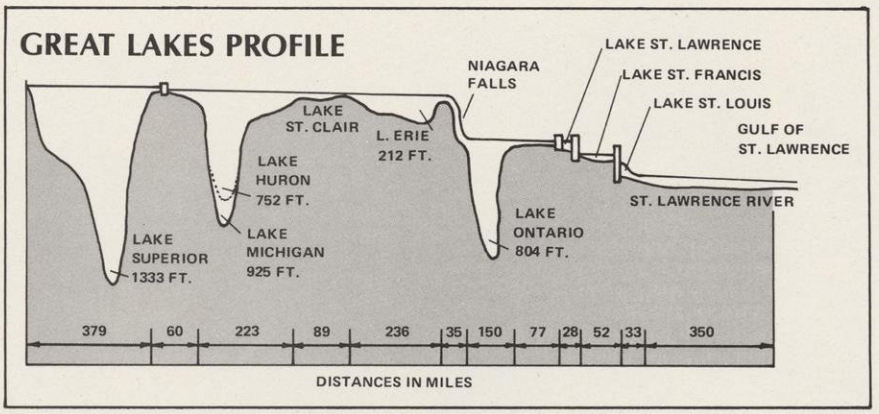
The problem, as Roy Hoffman sees it, is environmental opposition to keeping navigation lanes open all winter, using icebreakers in mid-lake and special bubblers in ports and locks. When the Corps of Engineers planned to complete the final phase of its seven-year study—a demonstration project on the St. Lawrence Seaway—environmental groups in New York State objected. They feared a panoply of environmental ills ranging from increased shoreline erosion to ice dams blocking water flow to the river's hydroelectric plants. At their urging, New York's governor went on record against the demonstration. The Corps abandoned the St. Lawrence phase of the study and eventually submitted its report to Congress.

"What that study will tell you is that in the opinion of the Corps of Engineers, we could operate cost-effectively 11 months out of the year," Hoffman says, "although the study actually reduces the recommendations to 10 months, more as a compromise to the environmental opposition than anything else, I think."

But environmentalists aren't the only ones who don't like the idea of year-round navigation on the Lakes. Captain Dennis Aho operates an ore-boat on Lake Superior and is past president of the International Shipmasters Association, a fraternal organization he calls the "voice of captains, pilots and first mates on the Great Lakes." Aho and other ship's officers are not enthusiastic about the idea of sailing in winter.

"Sailors want to be with their families at that time of the year," says Aho. "It's the only chance we get." He also talks about "unsafe, lousy working conditions"; of ice grating against the hull day after day, preventing sailors from getting a decent amount of sleep; of decks and lifeboats sealed inside a six-inch coat of gleaming ice; of aged ships not built for the rigors of forcing a path though the winter ice sheet.

"For years we've been trying to get fixed, all-weather navigation aids—concrete or steel tripod structures with lights, laser beams or radar. But they say there's no money to pay for them. Yet, if a buoy goes under the ice and I run aground, I'm the one who loses my license."



"The last seven or eight years," Aho says, "shipping companies have pressured us to go later every year—to late December, then January or even early February. The shipping companies say they need the tonnage. Huge ships mean huge profits, but only if they keep operating."

Aho works for Oglebay-Norton of Cleveland, Ohio, owners of the ill-fated *Edmund Fitzgerald* which went down in Lake Superior five years ago. This firm ships taconite, coal, and limestone for Reserve Mining Company out of Silver Bay, Minnesota. But of 21 ships, only five operated last year because of the U.S. economic slump. More than 800 sailors were laid off by Oglebay-Norton alone, Aho says, a situation repeated at other shipping companies.

The recession has slackened pressure for winter navigation. Steel companies don't need as much taconite, coal and limestone. Manufacturers ship fewer finished cars, tractors, and farm machines.

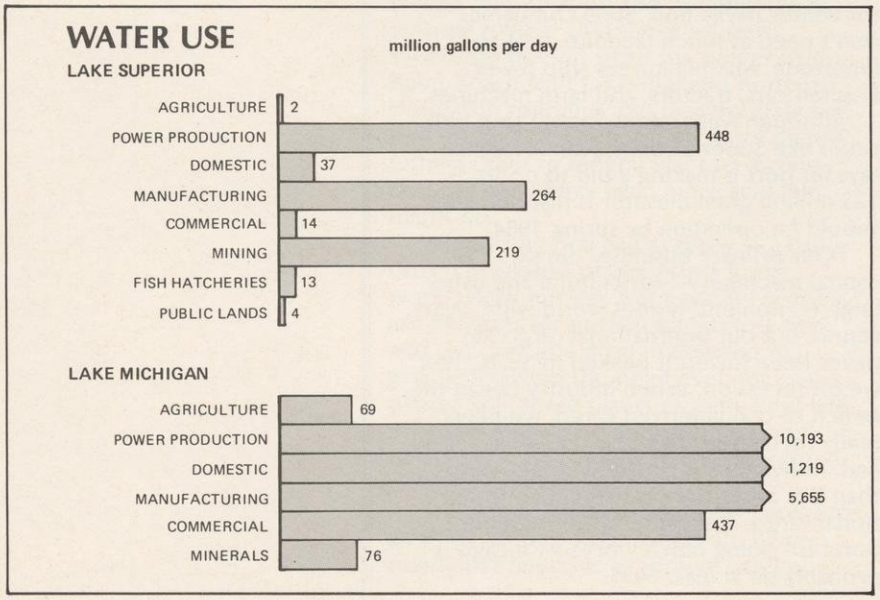
Although Milwaukee doesn't ship bulk cargo like Superior does, Adm. Hoffman says his port is making a bid to do so. A $25 million grain elevator is planned and should be operating by spring 1984.

"Our primary business," he says, "is capital machinery—agricultural and other large equipment. It goes world wide, year-round, but our international cargo has never been lower. It peaked in 1970, then we hit recession. When industry began the switch to containerized cargo, we never really recovered. This year (1980) is really bad. Milwaukee is probably doing better than any other port in handling international cargo, and we're off 20%. Some ports are doing much worse—Chicago is probably off at least 50%."

A dredge in Green Bay harbor. Sediments constantly fill port areas and navigation interests seek deeper channels to accommodate larger and larger ships. Most ports in Wisconsin and elsewhere have toxic materials locked in bottom sediments that require expensive, special handling. When tests show PCBs or heavy metals like lead, chromium or mercury in dredge spoil, the material must be isolated in diked disposal areas enclosed by clay and rock levees to permanently confine the pollutants.

When the recession ends, winter navigation might well become a pressing issue again. But economic drawbacks could seal its doom. In 1979 Michigan Governor William G. Milliken asked the Great Lakes Basin Commission to conduct an independent cost-benefit study of winter navigation. Corps of Engineers statistics had estimated that for every state and federal dollar spent keeping the lakes open in winter, more than three dollars would come back into the economy. But the Basin Commission found that Corps costs were either seriously underestimated or uncertain, while benefits had been overstated. Winter navigation was not quite the good deal the Corps claimed. What's more, the Commission found that increased traffic could be achieved by other means. Many states, including Wisconsin, have now expressed strong doubt about going along with the project. Ultimately Congress will decide whether or not to appropriate funds.

Adm. Hoffman favors winter navigation for the Port of Milwaukee. He's also concerned that increasing federal and state regulations governing PCB's and other toxic materials in dredge spoils will increase paperwork, time and costs for the port. He'd like to see federal subsidies increased and fees reduced or at least held stable at locks on the St. Lawrence Seaway.



THE ECOSYSTEM

But among those who use, govern, or love the Great Lakes a new view on managing them is beginning to take shape. It's a viewpoint that sees the lakes as a whole, not just as a navigation system, a fishing grounds, a power plant cooling reservoir, a recreational playground or any single one of a hundred different uses.

"We believe we can avoid creating new problems by looking at the Great Lakes as an ecosystem, not a plumbing system," says Basin Commission Chairman Lee Botts. "In the past, we looked at the lamprey eel, DDT, PCB's, or phosphorous as separate problems to be dealt with individually. But as people worked on these problems, a new consciousness began to arise, an understanding that addressing individual problems as separate issues does not protect the future of the lakes as a whole."

This "ecosystem approach" to managing the lakes is still a growing, developing concept, but one that has already reaped substantial dividends. In the 1960's people began to realize that phosphorous from laundry detergents and sewage plants was depleting oxygen and causing the lakes to age too fast. By the early '70s local and statewide bans plus industry response to public opinion virtually eliminated phosphorous in detergents. In 1972 the Great Lakes Water Quality Agreement between the U.S. and Canada set a limit of one milligram of phosphorous per liter of sewage effluent. When fully achieved, that limit will reduce phosphorous inputs into the Great Lakes by more than half over the next decade or so. Hoping to do even better, when the U.S./Canadian agreement was updated in 1978, it was suggested that the limit for sewage effluent be reduced even further to a half-milligram per liter. Costs would have been stupendous.

GLBC took a close look at this proposal

as part of its water quality plan. Removing phosphorous from sewage is expensive, usually requiring electricity or chemicals. If sewage plants were forced to cut phosphorous discharges even further, it would cost as much per liter to reach the half-milligram level as it did to reach one milligram and with hardly any beneficial effect. GLBC found that one-fifth of all phosphorous reaching the lakes enters via the atmosphere or land runoff. The only way to effectively limit phosphorous further is to deal with these sources, not regulate sewage plants.

"We can't restore the lakes to the way they once were," says Lee Botts. "We've lost too many species. Too many things have changed and we don't know enough to *create* an ecosystem. But we think we might be able to prevent further decline."

Dealing with the Great Lakes as one vast natural ecosystem is only half the problem. There's an equally large and complicated *institutional* ecosystem to be dealt with. For citizens, or even governments, trying to influence overall policy on the Great Lakes, that institutional complex can be a labyrinth of dead ends.

"It's difficult to look at an issue that's basin-wide and then come up with a way to influence the process that decides that issue," says Jonathan Ela, Midwest Representative of the Sierra Club. "It means you have to go through layers of bureaucracy to find out who's making the decisions and every decision involves a multi-faceted lobbying effort."

"Winter navigation is one of those issues," Ela says, "it goes on year after year and it wears you down. The number of interim reports and surveys and demonstration projects become increasingly elaborate and complex. It's a very difficult issue and it ties in with all kinds of navigation concerns and impacts on the lakes. You can come up with a laundry list of environmental damages, but that's not the end of it. You can also look at winter navigation and ask if this is going to be the economic prybar that industry needs to justify longer locks, deeper channels and a major expansion through all seasons."

"Yet, who do you lobby on winter navigation?" Ela asks. "Do you lobby the Corps? Do you lobby the Great Lakes Basin Commission? The Great Lakes Commission? The International Joint Commission? The Congress? And if it's the Congress, then who? The Appropriations Committee? Any other committee? In both houses? Nobody has any ultimate decision-making authority when it comes to the Great Lakes."

"I sometimes think it would be easier to come up with something like a 'Great Lakes Bill of Rights' that would lay out just what the ground rules and purposes of the lakes are rather than going through these enormous subject areas one at a time and trying to come up with any real way to influence the process."

"Those of us who know the lakes tend to think of them as a unit," Ela says, "although politically they are not. They are some part of a transportation program, some part of a clean water program, some part of a *whatever* program. It's very hard for the lakes to have a separate political identity, for governments to recognize them as something that should be a separate focus of attention. Instead, they are always part of some *other* nationwide problem."

"There isn't a separate sense that the Great Lakes should be handled differently from how you handle other bodies of water for cooling power plants, for this, that or whatever else. There should be some way of achieving that distinctness, but how you do it without rewriting volumes of federal laws and codes? I don't know."

The Great Lakes Basin Commission is a

Morning mists highlight hundreds of gossamer spiderwebs around this wooded swamp near Lake Superior. Time was, people thought wetlands were wastelands to be drained or filled. But no more. Wisconsin is taking initial steps to protect marshes, swamps and bogs, but the Basin Commission worries about other Great Lakes states that are not.

To best save them, the Basin Commission says lake states should inventory, evaluate, and research their wetlands, then develop tax breaks or other protection incentives for landowners. Wisconsin is now mapping all state wetlands to help counties protect them under the Shoreland Zoning Act.

POWER PLANTS

way to do it. GLBC provides the forum, the "glue" that brings federal and state agencies together. It aims to show that the Great Lakes really do have a separate ecological identity unlike any other on Earth and that our institutions can manage them, despite the complexity. It is the only governmental entity in which the bureaucratic and biological ecosystems of the lakes are wedded.

The family planning that grew out of this marriage has already produced some bright offspring and more are on the way.

The institutional ecosystem: A Great Lakes glossary

Just about everybody who occupies a piece of Great Lakes shoreline, all the way from Superior to the St. Lawrence Seaway, does something to manage it. Individuals as well as city, town and county governments are involved. Beyond that, a maze of regional and state agencies act to use or protect the lakes. In Wisconsin, this so-called "institutional" ecosystem consists of at least these departments or agencies:

- Natural Resources
- Transportation
- Development
- Health and Social Services
- Public Service Commission
- Coastal Management
- Geological and Natural History Survey
- Northwest, Southeast, Bay Lake and East Central Regional Planning Commissions
- The Fox Valley Water Quality Planning Agency
- Soil and Water Conservation Districts
- University of Wisconsin

For the true extent of institutional involvement, multiply all of the above by nine because each state and the Canadian province of Ontario have their own array of similar institutions. Stacked on top are all the federal agencies in both countries.

With such a super-bundle of independent administrative entities, getting them all to push the same management button when needed has been a problem. Attempts to solve it have spawned a whole series of basinwide organizations.

Among them is the GREAT LAKES BASIN COMMISSION which is the subject of this supplement. But there are also these:

GREAT LAKES COMMISSION
2200 Bonisteel Blvd.
Ann Arbor, MI 48109

Formed in 1955, the Great Lakes Commission brings the eight Great Lakes states together to consider common problems and pass along state concerns to the federal government. Its principal interest is in ports, navigation and commerce.

GREAT LAKES FISHERY COMMISSION
1451 Green Rd.
Ann Arbor, MI 48105

A U.S.-Canadian agency established in 1955 to conserve fishery resources in the Great Lakes. The Commission operates the sea lamprey control program, sets up and coordinates research designed to maximize fish stocks.

UPPER GREAT LAKES REGIONAL COMMISSION
123 West Washington Ave.
Madison, WI 53715

A federal/state partnership that promotes, plans and provides grants for economic development projects in northern Wisconsin, Michigan, and Minnesota. It encourages recreation, tourism, industry, transportation, energy conservation, regional energy resources, and local and state planning.

INTERNATIONAL JOINT COMMISSION
100 Ouellette Ave., 8th Floor
Windsor, Ont. N9A 6T3
Canada

The IJC was created by the Boundary Waters Treaty of 1909 between the U.S. and Great Britain to prevent disputes and settle questions along the Canadian frontier. Nowadays, this commission regulates international water levels and flows and monitors the U.S./Canadian Water Quality Agreement which committed the two governments to cleaning up the Great Lakes. It also undertakes studies, and reports its findings, conclusions and recommendations to both governments.

GREAT LAKES SEA GRANT NETWORK
University of Wisconsin Sea Grant Institute
1800 University Ave.
Madison, WI 53706

Designated Sea Grant colleges in states throughout the Great Lakes Basin make up a network that conducts marine research and education. Sea Grant advisory and public service programs disseminate Great Lakes information to interested groups, private industry, government agencies and the general public.

LAKE MICHIGAN FEDERATION
53 W. Jackson Blvd. S. 1714
Chicago, IL 60604

Practices and encourages citizen participation on policy issues to protect and preserve Lake Michigan through education, publications, lobbying and workshops. Conducts programs and projects on energy, environmental education, land resources, natural areas, recreation, toxic and hazardous materials, water pollution and water resources.

SIGURD OLSON ENVIRONMENTAL INSTITUTE
Northland College
Ashland, WI 54806

Sigurd Olson Environmental Institute promotes public education, citizen participation and research on environmental issues in the Lake Superior region. The Institute acts as a liaison between citizen groups and government agencies and conducts workshops, citizen action training sessions, and adult education courses on water quality, land use, mining and other environmental issues of importance and concern to Lake Superior area residents.

Rain and spring runoff carry 380,000 tons of Wisconsin red clay into Lake Superior every year. Nearly a million acres in Ashland, Bayfield, Douglas and Iron counties are involved. This aerial view shows the red-tinted watershed system at Superior Harbor where the Nemadji River drains into the St. Louis River on the Minnesota border. A 1,000-foot ore carrier is loading taconite at the Burlington-Northern dock. The GLBC "Watershed" project proposes ways to bring nonpoint pollution of this sort under control. Wisconsin has been working on the problem ever since 1954. Photo by Mora McCusker

The Kenosha municipal water supply intake is located in Lake Michigan about 4,000 feet beyond this harbor breakwater. Kenosha pumps about 20-million gallons per day and is one of 15 Wisconsin cities that draw domestic supplies from the Great Lakes. In all, about 1½-million Wisconsin residents drink lake water. Water conservation plus a long range pure supply are goals of the Great Lakes Basin Commission. Photo by Robert Baumeister

These ships from throughout the world wait to load corn, wheat and sunflower seeds at Duluth-Superior during the 1979 grain millers strike. The Twin Ports rank number one on the Great Lakes in waterborne commerce and 11th in the nation. Volume is about 46-million tons per year. While taconite shipments at Superior have dropped off because of the recession, grains, and especially sunflower seeds are on the increase. A new multi-million dollar grain elevator will be built at Superior to help handle the traffic. Superior is a key port in GLBC transportation studies which will show the relationship of railroads and highways to the Great Lakes system. Photo courtesy of the Superior Harbor Commission

THE LAW

The Federal Water Resources Planning Act of 1965 established a U.S. Water Resources Council to oversee the national interest in water resources. The law allowed formation of regional river basin commissions, and provided funds for states to develop comprehensive water and related land resource plans. Under it, Wisconsin receives grants for water resource planning and for participating in both the Great Lakes Basin Commission (GLBC) and the Upper Mississippi River Basin Commission. President Lyndon Johnson established the GLBC by executive order in 1967 at the request of the Governors of Indiana, Michigan, Minnesota, Ohio, and Wisconsin. The Governors of Illinois, New York, and Pennsylvania concurred in the request. Authority of the Commission is limited to The Great Lakes Basin within the U.S. from Lake Superior to the point where the St. Lawrence River ceases to be the international boundary. Wisconsin, through DNR representatives , contributes to commission studies and plans and uses them in its own resource management programs.