A hit on the upper Miss. [Supplement, Vol. 4, No. 5] [September-October 1980]

Upper Mississippi River Basin Commission
[Madison, Wisconsin]: [Wisconsin Department of Natural Resources], [September-October 1980]

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A supplement to *Wisconsin Natural Resources*

UMRBC A hit on the Upper Miss

Upper Mississippi River Basin Commission

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Editorial assistant

Introduction

Not so many years ago, water projects were the exclusive province of the US Congress, and nobody questioned that much. Every year 15, 20 or more harbor, dam, reservoir and other water projects were lumped into one big "pork barrel" water appropriations bill, and passed en masse. Many of the projects were economically and environmentally justified, but some were not.

Now things have changed. In 1978, President Carter named a celebrated "hit list" of 18 water projects he thought should not be funded. Half were finally scrapped — including some already underway — mostly on economic grounds. The pork barrel had sprung a leak. This change signaled new importance for the Upper Mississippi River Basin Commission (UMRBC). Wisconsin has been one of the beneficiaries.

In October, 1978, Lock and Dam 26 legislation became law. It gave the US Army Corps of Engineers money to rebuild one aging Mississippi River lock and dam at Alton, Illinois. Originally, the Corps wanted to build two locks there, both deep enough to handle barges with 12 feet of displacement, instead of the traditional nine feet. Many environmentalists and resource managers initially opposed that move. Nobody knew what environmental havoc going so deep (18 feet) and adding a second lock might bring to the river. As it turned out, the final legislation let only one nine foot lock go through, but it also breathed new life into water management for the whole region. The law required a study before any work could begin on the second lock. And next, it turned chaos into order by requiring a master plan for navigation. UMRBC was given a one-shot task of drawing up a plan that would thereafter manage all water activity in the basin. The UMRBC got the job because they were already doing similar planning work on the river. They also had the structure to bring together all the states and federal agencies that would have to work on the master plan.

When finished, the navigation master plan will incorporate studies conducted by the Commission, the Great River Environmental Action Team (GREAT), the Corps of Engineers, and other state, federal, and local agencies. It will spell out the river's navigational "carrying capacity" to help plan for future barge traffic. And it will determine the benefits of transportation as well as its cost to fish and wildlife, wilderness, water quality, recreation, and the environment.

After the master plan is completed, it will undergo a year of public hearings in each state and be revised to reflect public comments. Then, if Congress approves, it will become law. Thereafter, no state or federal agency will be able to do anything on the river that violates the plan, or change it without another Act of Congress.

Before the master plan assumes final form, two-thirds of the Commission have to agree to its recommendations regarding the best course of action for addressing the river's ills. But that's not all the UMRBC does, nor is it even the most important thing. Once, before the Basin Commission was formed, confusion reigned. One state seldom knew what other states or the federal government were doing to each other's water.

"Now we have a mechanism whereby we can all sit down together and discuss projects and programs that concern all of us and decide who will do what," says Rahim Oghalai, Wisconsin's liaison with the Basin Commission.

Soon to be completed, says Oghalai, is the Commission's Water Resources Management Plan. This will be the key element in the UMRBC's work, the guideline for deciding which projects get a high priority and which get a low one. It's just a rough draft now, but once all members iron out the wrinkles it will become the backbone for future water-related work in the basin. It will plan for effective land and water management as far as 20 years into the future.

Like the master plan, the Water Resources Management Plan will be submitted to the Water Resources Council for approval. Thereafter, states and federal agencies will request federal funding in the basin to rectify ills identified by this plan. It is flexible—the Basin Commission will update it every two years as new problems arise or old ones are remedied. But it's not so pliable that anybody will be able to get funds for any project that violates the plan without a darn good reason why.

It's a giant job, but results will be worth it. In the future, water projects will be decided not by what's in the pork barrel, but by what's best for the big river and its tributaries.

MEMBERSHIP:
Upper Mississippi River Basin Commission

States:
Illinois
Iowa
Minnesota
Missouri
North Dakota
Wisconsin

Federal agencies:
Army Corps of Engineers
Emergency Management Agency
Environmental Protection Agency

Departments of:
Agriculture
Commerce
Energy
Health and Human Services
Housing & Urban Development
Interior
Transportation

This supplement was prepared under the auspices of the Upper Mississippi River Basin Commission in cooperation with Rahim Oghalai, DNR Supervisor for Interstate Planning and Jeffrey P. Featherstone, UMRBC Program Manager.

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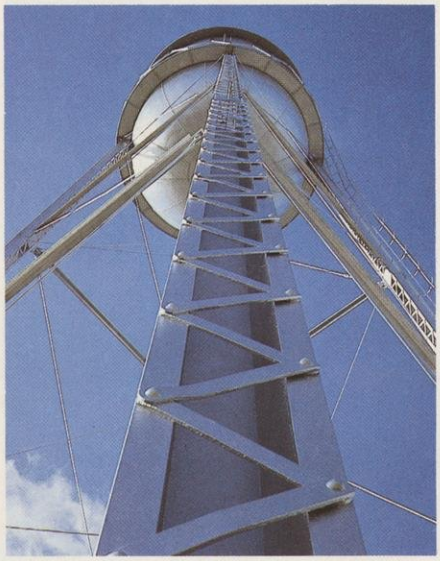
Cover:
Artist John Runion's watercolor of the bridge at Highway 54 south of Fountain captures subtle shades, moods and activities on the river. The barge moving under a span and the flight of ducks wheeling above the bluffs are typical. About 182-million tons of cargo are shipped on the basin's rivers every year and from three to five million ducks migrate down the flyway through Wisconsin each fall. Painting by John Runions, Box 55, Alma, WI 54610.

Water supply



The water tower at Taylor. About 60% of Wisconsin's residents are supplied by wells. The other 40% drink surface water. It's usually pumped to towers like this one before it flows to the faucet at home. Except in a few local situations, water supply is generally not a problem in the Upper Mississippi River Basin. DNR Water Supply Section photo.

Water, and lots of it, is essential. We just can't do without it. Important not only for homes and businesses, it's also crucial to industry and agriculture. Its purity and amount are a vital concern of UMRBC. Deep wells supply most of Wisconsin's water and fortunately the state has plenty of good, clean groundwater in most places. Most, but not all.

In Marathon and Wood counties, many wells yield less than 25 gallons per minute. In heavily populated southeastern Wisconsin and northern Illinois, municipal wells from Milwaukee to Chicago often pump so fast the water table can't replenish itself. What's called a cone of depression, a deep dent in the water table, develops at each well and sometimes leaves other nearby, shallower wells dry. The same thing can happen when farmers drill irrigation wells to water crops. Streams, ponds, and marshlands are also threatened by cones of depression.

Although it's only been done on an experimental basis in Wisconsin so far, it may someday be necessary to "recharge" the water table under these wells with surface water.

Quality, as well as quantity, of groundwater is important. In some places, particularly in the Wisconsin River Valley's Central Sand region, private wells are beginning to show traces of contamination from agricultural chemicals. Investigators from the Wisconsin Department of Agriculture, Trade and Consumer Protection first looked into the problem because of similarities between the irrigated sandy soils of central Wisconsin and soils of Suffolk county, New York. There, traces of aldicarb, a potent pesticide used on potatoes, were discovered in groundwater. Wisconsin officials found no aldicarb, but they did find small amounts of two other less toxic herbicides, dinoseb and metribuzin, in two wells near Plover. UMRBC recommends continued, careful monitoring, to be sure no harm is done.

In other areas where shallow soils overlie impermeable bedrock, bacteria, nitrates and chlorides from septic systems can seep into wells. UW researcher George Gibson has spot-checked residential wells in lakeside communities throughout the state during the last two years. He found 40% of them to be what he called "suspect"—higher in bacteria, nitrates, or chlorides than normal. Gibson blames the contamination on wells, septic systems and houses all installed too close together in sandy soils. UMRBC urges people who suspect their wells might be faulty to contact a county sanitarian or the State Laboratories of Hygiene in Madison.

Conserving water to meet supply problems is an important gospel of the Upper Mississippi River Basin Commission. (UMRBC). Efficient water use can delay the need for expensive new wells and sewage plants, reduce water-heating bills, decrease competition for water during droughts, and stabilize stream levels and groundwater. The federal government now requires a water conservation program before it will give federal cost-sharing related to water supply.

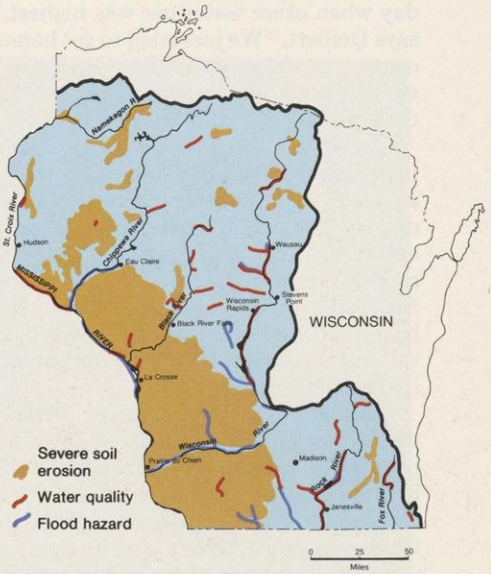
In Wisconsin, many people look to the city of Madison as a model in this effort.

Until 1974, a growing population and soaring demand was forcing the Madison Water Utility to sink a new deep municipal well almost every two years at a cost of between $500,000 and $1-million each. But the peak demand wasn't year-round, it came mostly in summer.

"We found we were drilling new wells to run two or three thousand lawn sprinklers at the same time on just a few hot days for just a few hours," says the utility's Larry Deibert. "That amounted to some three million gallons of water for two or three hours, roughly the total daily capacity of one well that then sat idle the majority of the year."

The solution, in retrospect, seems simple.

KEY PROBLEM AREAS IN WISCONSIN



Map by Barbara Young, UMRBC cartographer.

RATING THE PROBLEMS

1st	Erosion & Sedimentation
2nd	Nonpoint Source Pollution
3rd	Loss of Fish & Wildlife Habitat
4th	Point Source Pollution Recreation Deficiencies Urban Flood Damages
5th	Rural Flood Damages
6th	Navigation/Water Use Conflicts
7th	Rural Water Supply
8th	Urban Water Supply Groundwater Contamination
9th	Insufficient Instream Flows Dam Hazards
10th	Energy/Water Use Conflicts

"Historically, people turned their sprinklers on at five or six o'clock when they got home from work, at a time of day when other water use was highest," says Deibert. "We just tried to get homeowners to delay sprinkling until after eight o'clock. Then there'd still be high demand, but not quite so high."

The utility ran ads on radio, TV, and in newspapers and even neighborhood association newsletters. They erected displays at schools, shopping centers, and the YMCA. They put billboards on rooftops and placards on city buses. According to Deibert, the program has been an unqualified success. The city will put a new well on line in 1981 or '82, its first since 1974.

"And it's all been voluntary," Deibert says. "We haven't tried to convince people not to water their grass, just to do it more sensibly, or not at all on a few certain, terrifically hot days. If there are those who must have a green lawn, we want them to know there's a right and a wrong way to go about it. A new well costs $80,000 a year over the well's lifetime. Whenever we don't have to build one—we obviously don't have to spend that $80,000."

This sewage plant at La Crosse was upgraded to secondary treatment status in 1972. It handles about 12-million gallons per day but has a capacity of 20-million. Eighty-five per cent of all contaminants must be removed before effluent can be discharged. The Black and La Crosse Rivers come into the Mississippi at the top of the photo. Most water in the basin is getting progressively cleaner as more plants like this come on line. However, the attack on nonpoint pollution has only just begun. Photo by Dave Weitz

Clean water

Some towns and cities in Wisconsin may soon be forced to switch from deep wells to surface water to meet rising demand. The City of Green Bay has already made the change. In most places in the state, surface waters are pure enough to allow that without extensive water treatment. A few years ago, that statement might not have been true, but as clean water laws have done their work, the quality of Wisconsin's lakes and streams has gotten better and better. And it will continue to.

That's not to say there aren't trouble spots. Although billions of federal, state and private dollars have been spent to upgrade municipal and industrial wastewater treatment plants, the job is not yet finished. Particularly worrisome to UMRBC are areas downstream from cities—for example, below Madison and Janesville in the Rock River Basin, below Wausau, Rhinelander and Wisconsin Rapids on the Wisconsin River, or down from Minneapolis-St. Paul on the Mississippi, and Chippewa Falls or Eau Claire on the Chippewa. The UMRBC estimates it may still take more than $500 million to upgrade Wisconsin's municipal sewage plants in the basin. And that figure doesn't include the remaining cost to Wisconsin paper mills, foundries, cheese factories, and other industry.

Water pollution of this sort is called "point-source" pollution—where contaminants can be traced to a specific place, or point. More pervasive and much harder to deal with, UMRBC finds is what's called "non-point" pollution. Urban storm runoff, fertilizers and pesticides, barnyard animal waste, products of natural decomposition, sediment, dissolved road salt—virtually every possible natural or man-made water contaminant that can't be traced to a specific source is non-point pollution.

As point-source gradually comes under control, researchers like Bob Pitt have begun to turn more attention to non-point pollution. Pitt is an independent environmental engineer who specializes in urban runoff problems. He says after a spring thaw or a summer thunderstorm the water that runs down city streets and parking lots can contain some pretty nasty stuff.

"During the first parts of a storm,"says Pitt, "Urban runoff can be as rich in bacteria as raw human sewage. It's different bacteria, but in roughly the same amounts. The runoff can contain more heavy metals than sewage—lead, zinc, mercury, selenium—plus road salt, pesticides, herbicides, and a small but consistent amount of carcinogenic compounds."

Pitt is currently working in Madison and Milwaukee with DNR researcher Roger Bannerman. Their findings will not only help those cities do what they can to clean up urban runoff, but will become part of a Congressional report on setting national policy to deal with the problem.

Erosion & sediment

Probably the biggest non-point pollution problem in Wisconsin is farmland erosion. Wisconsin is lucky to be a dairy state, says UW-Madison soil scientist Francis Hole. Dairy farming requires large acreages of hay and pasture lands that don't erode much. Other states aren't so lucky. Where Wisconsin farmers lose an average of a bushel of soil for every bushel of grain they grow, Iowa farmers sacrifice twice that.

"We're mining the soil," Hole claims. "Maximizing each year's production at the expense of our most valuable renewable resource, the soil."

In large part, the blame can be laid to world agricultural markets and the demand for American farm products. This has induced farmers to plant every possible acre, including marginal and highly erodable cropland. Even though prices have now stabilzed, most of the marginal land remains in production.

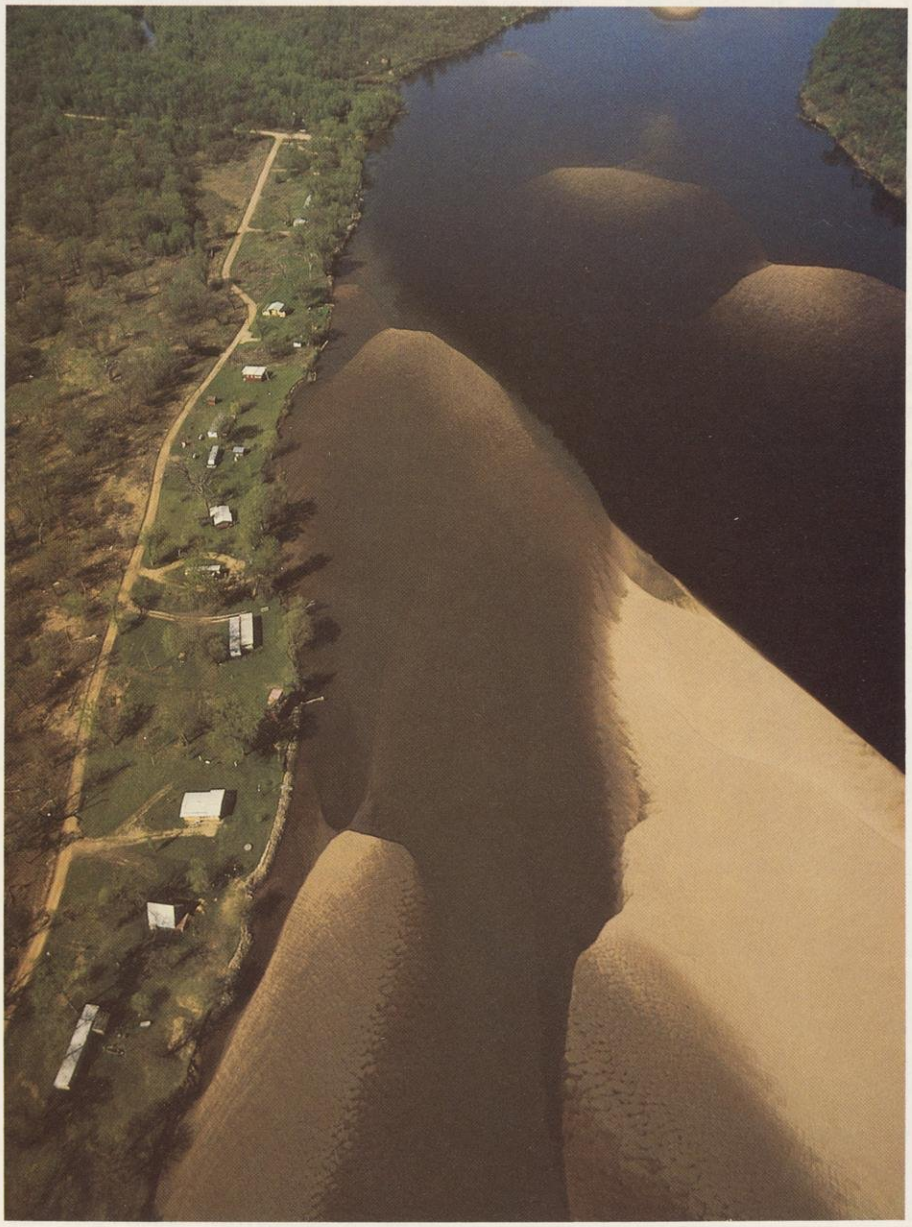
And farming itself has changed. Petro-chemical fertilizers and pesticides have lured farmers away from age-old, time-tested soil conservation practices. Where once many rotated crops—for example, corn for one year, then nitrogen-replacing alfalfa for three—they now buy the nitrogen in tanks from a local supplier. Terraces have been abandoned to accommodate newer, larger farm machinery. Windbreaks planted in the '20's and '30's have been cut down to make room for rotating irrigation rigs.

UMRBC is also working to stop erosion on Wisconsin's steep bluffs along the Mississippi and some of its tributaries—the Chippewa, Trempealeau, Grant, and Platte Rivers. Pasturing cattle there causes less erosion than cropping, but livestock do damage to groundcover.

"On some of those steep bluff ridges, forested areas really should be fenced to keep livestock out," says James Harrison of the Minnesota-Wisconsin Boundary Area Commission. "Forest land doesn't revegetate very easily and when a good old Midwestern gully-washer hits, it can strip the root systems of those trees. Eventually, the trees go down and then the bluff starts to come down."

The key to stopping erosion is easy: keep the soil where it is. It's the practice that's difficult. Should a farmer treat eroded soil with expensive chemical fertilizers or maintain the rich topsoil in the first place? Some erosion-stopping practices like fencing, chisel plowing, and low- or no-till planting are relatively cheap. Others, like installing terraces, are expensive. In some places, where slopes are steep, hillsides shouldn't be plowed, or even pastured at all. But right now, these practices don't pay out. Short-term economic gains outweigh long-term conservation. To put an end to erosion, we've got to make conservation pay. UMRBC has recommended that Congress consider dollar soil conservation incentives in future farm legislation.

The sun catches highlights of sediment in the Wisconsin River at the mouth of Blue Mounds Creek north of Arena. Deposits like these, eroded from Wisconsin's rich farm soil average 6½ tons per acre per year throughout the basin. How to stop them is a major preoccupation of UMRBC. UMRBC Photo



Navigation

Erosion not only steals priceless topsoil, it also chokes streams, and fills in lakes, rivers, and backwaters. When sediment settles in navigation channels, the US Army Corps of Engineers gets busy and dredges it back out.

The Mississippi River and the lower parts of some tributaries are vital links in a state, national and international transportation network. Midwestern corn and wheat move down river while products like coal, oil, and road salt move up. Wisconsin has active ports at La Crosse, Prairie du Chien, Cassville, Alma, and Genoa that will undoubtedly become even more important as oil prices rise and other forms of shipping grow more costly.

And therein lies the rub. Barge traffic is important and so is keeping the Mississippi's navigation channel open. But the Mississippi and its tributaries are not just a network of barge canals. They're also a vast wildlife refuge, a tremendously productive fishing ground, and a priceless recreational and aesthetic resource! What's good for barge traffic may not be good for fish, wildlife, and scenic beauty.

One example is the problem of dredge spoil. The channel in the Mississippi River is 12 feet deep to accommodate barges with a nine foot displacement. To keep it navigable the Corps uses hydraulic dredges to remove silt and sediment. This stirs up the bottom mud, makes the water murkier, and may even re-suspend PCBs and other toxic contaminants that have safely settled out. Compounding these problems is the move to build a second lock at Alton, Illinois. Economic and environmental effects are unknown. The UMRBC is currently grappling with these issues and its Master Plan is expected to resolve them. Much of the information needed will be included in the lock and dam 26 report mentioned earlier.

Sometimes, when spoil is deposited too near the channel, it can wash right back into the river during the next high-water and then have to be dredged out all over again somewhere downriver. Spoil placed on one side of the river can also increase floods on the other side. (Wisconsin law prohibits putting spoil into any navigable waterway.)

In the past, the Corps dumped dredge spoil wherever it was handy—on islands, or in backwaters and marshes. That often hurt wildlife habitat and the beauty of the river. When Wisconsin and other states objected, the Corps got together with the Upper Mississippi River Basin Commission to work out compromises. Thus GREAT, the Great River Environmental Action Team, was born back in 1974.

GREAT learned that dredge spoil could be used for landfill, roads, and levees and, in fact that there was more demand for the material than supply. GREAT also determined that in many places the Corps could dredge less and still keep the main channel open. It pushed to solve erosion problems on tributary streams which would lessen the need to dredge. It also found that sediment traps and wing dams in the main channel make the need to dredge less frequent.

But GREAT couldn't solve all disputes between the Corps and states bordering the river. Wisconsin thinks the Corps should obey two Wisconsin laws: The Clean Water Act and the Resource Conservation and Recovery Act. The Clean Water Act sets guidelines for exactly how clean water must be when it flows back into the river from sewage plants, industries, power plants and the like. This law applies specifically to the silt and nutrient-laden water that flows back into the river during the Corps' hydraulic dredging. But the Corps thinks DNR's standards for cleanliness are too stringent and too expensive. The other law, Wisconsin's Resource Conservation and Recovery Act defines dredge spoil as solid waste. Reason is that Wisconsin wants something to say about where spoil is put when the stuff is full of PCB's, mercury, ammonia or some other contaminant. The Corps doesn't want dredge spoil defined as solid waste. That dispute is now in court.

Barge fleeting is another river problem. Last year, Prairie Sand and Gravel, a Prairie du Chien barge shipper, began to anticipate expanding traffic. To increase the number of barges it handles, the company needed someplace to put them before unloading, after loading, and before shipping again. The barge business has big growth potential. Maybe five or ten times more barges than there are now could soon be moving in and out of Prairie du Chien. This would mean a terrific economic boost for the town, but nobody really knows what it might do to the river.

And there's a special reason for worry. Prairie Sand and Gravel uses what's called the East Channel to get barges to and from the main river. The east channel, as it turns out, is one of only four remaining places where the Higgins-eye pearly mussel, an endangered species of clam, is known to live and breed. DNR researchers believe propwash from greatly expanded barge traffic could smother the Higgins-eye clam beds with silt. They also fear that shallow parts of the east channel would have to be dredged, which would also kill the clams.

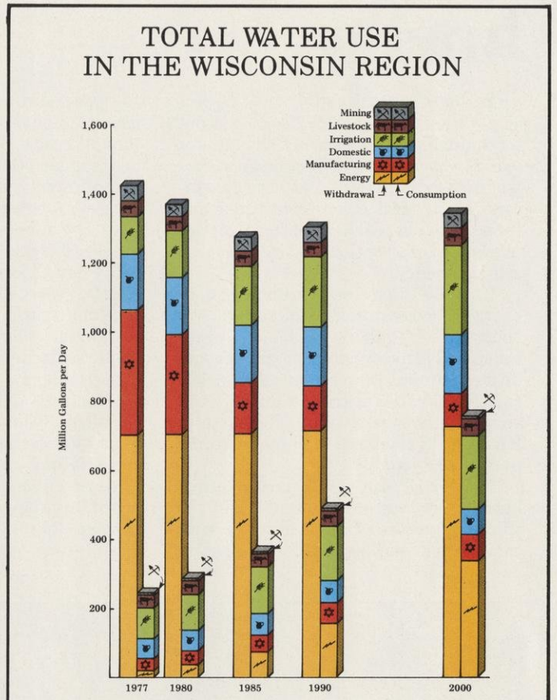
Hopefully, UMRBC's Master Plan will resolve most of these key issues.

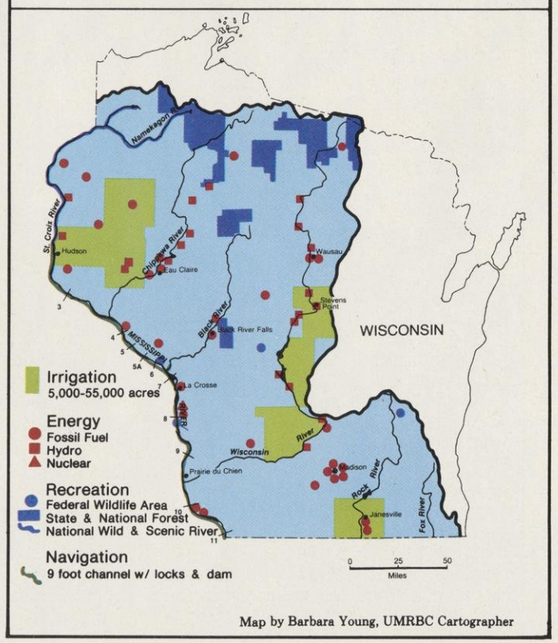
The act

The Water Resources Planning Act was passed in 1965, giving birth to the Water Resources Council (WRC) which oversees national water projects and policy. In 1972, Wisconsin enlisted the support of Minnesota, Iowa, Illinois, and Missouri and formed the Upper Mississippi River Basin Commission (UMRBC) with the approval of the council.

The UMRBC is one of six such basin commissions in the country. Each has responsibility for all or part of a great river, and the tributaries that flow into it. There's a potential for about another half-dozen or so, but not all states in all watersheds have elected to form them.

The Wisconsin-Dubuque bridge dead ahead. Towboats and barges move about 67-million tons of cargo per year up and down the Mississippi between Minneapolis and the Missouri River. Wisconsin has river ports at La Crosse, Prairie du Chien, Cassville, Alma and Genoa. There are problems with location of a fleeting area for the barges. Photo courtesy of the Minnesota-Wisconsin Boundary Area Commission.





Energy

Perhaps surprisingly, the largest single use of water in Wisconsin is not for humans, animals or crops, but for energy. About 75% of Wisconsin's electric power comes from coal-fired generators. The federal government is pushing for more use of coal to meet future power needs and our national goal of energy self-sufficiency.

UMRBC, therefore, is immersed in energy considerations. There are the thousands of gallons of cooling water taken daily from Wisconsin streams and flushed through power plants. There is a reviving hydro-electric industry. And significantly, there is the Mississippi River itself, the barge lifeline for transport of coal and oil.

More coal use could put a heavy burden on Wisconsin's waters. If the sulphur and nitrogen in coal smoke isn't removed, it combines with precipitation to form acid rain. Ash particles can cause emphysema, cancer, and other lung diseases. The technology to get rid of these air pollutants isn't particularly complicated, but it is expensive, and creates a whole new problem: What to do with the tons of fly ash and scrubber sludge that coal burning plants turn out every day? These must be disposed of in landfills in such a way that they don't leach into surface or groundwater. What was an air pollution problem becomes a solid waste and potential water pollution problem.

Nuclear power poses different problems. The Wisconsin Public Service Commission has imposed a de facto moratorium on new nuclear plants because of concern over their economic feasibility, long-term safety and waste-disposal questions. Demand for power hasn't been growing as fast as many energy experts once predicted, making the need for new nuclear plants doubtful. Wisconsin has done a remarkable job of conserving energy, using 20% less per capita than the national average despite the pre-recession expanded economy, income and employment.

Conservation goes a long way, but UMRBC is also hopeful that many power needs can be met with small-scale, alternative energy projects. In Wisconsin, solar power, biomass, and alcohol aren't just a dream, practical only in the far-distant future. They're something we're doing right now, today.

There are probably more than a thousand solar homes already built in Wisconsin, according to the Division of State Energy, and that doesn't even include passive solar installations. The state boasts a dozen small-scale, on-farm alcohol stills, and the number is

How the basin commission works

Let's say the Wisconsin county where you live has a flood problem, and you want something done about it. In the old days, you complained to your senator or representative who sponsored a flood control dam or something else and probably got it lickety-split, whether it was the best solution or not. But things don't work that way anymore.

These days your county gets in touch with Rahim Oghalai, DNR water resources planner and Wisconsin's liaison with the Upper Mississippi River Basin Commission. He takes the problem before the Commission. Will a dam be built? Maybe, maybe not.

The Department of Agriculture is represented on the Commission and it might see a way to reduce flooding by preventing rapid runoff from farmers' fields. Or the Corps of Engineers might decide it would be cheaper to move people out of the flood plain. And the Fish and Wildlife Service could object because a dam destroys too much animal habitat. So after discussion and study, the states and federal agencies on the Basin Commission come up with the best possible way to solve your county's flood problem.

Whatever is needed though, costs money and somebody has to do the work. Every year the Commission sends a report to its parent agency, the federal Water Resources Council, and this year the solution to your county flood problem will be included. That solution will get a high or low priority, based on a Water Resources Management plan the Commission is working on. If the best way to control flooding turns out to be a dam, *and* if the county and the state both want it, *and* if the Corps of Engineers or the Soil Conservation Service wants to build it, *and* if nobody else objects, then a dam it is and the project gets a high priority. But if any participant objects, the dam gets a lower priority or maybe none at all.

When the Water Resources Council passes the report on---to Congress, to the Office of Management and Budget, and to the President, a high priority means a pretty good chance that the project will be funded in the annual budget. A low priority means a poor chance for funding.

But the process isn't foolproof. If your county is convinced a dam is the only way to go, even if nobody else agrees, the dam is still a possibility if you can bring enough pressure to bear on the local congressman.

And it works the other way around, too. The Office of Management and Budget can decide not to fund a high-priority project. If that happens, the state's Basin Commission member will probably contact legislators and can sometimes get action.

"The Water Resources Council and the Basin Commission could be more effective if funding were based 100% on priorities," says Oghalai, "But we've come a long way since the Water Resources Council was formed in 1965. In those days, we never knew what anybody else was up to. Now the Corps of Engineers, the Soil Conservation Service, and other federal agencies come to us. They ask us what we'd like them to do, or they tell us what they plan and ask if it's OK before they request funding. If the Basin Commission did no more than that, it would be a lot."

Generation of hydroelectric power from plants like this one at St. Croix Falls is reviving in Wisconsin as fossil fuel prices rise. Water consumption from hydroelectric generation is negligible, but coal, oil and nuclear plants actually consume about 268-million gallons of water per day basin-wide. The consumption figure for Wisconsin is 5-million gallons per day from a total withdrawal of 300-million. Corps of Engineers Photo

"growing rapidly." There are already four commercial-sized stills here and, in the next year or so, two more will boost the state's alcohol production to 12 million gallons a year. A power plant in Ashland has converted a boiler to handle sawdust and sawmill scraps mixed with coal, saving its customers an average of $9 on their monthly electric bills. A new $5-million school in Park Falls—30 classrooms and an indoor swimming pool—is heated entirely with scraps from the local sawmill. School officials estimate it costs $7,000 a year to heat with wood, compared to a potential $80,000 for oil. Residents on Washington Island in Lake Michigan are looking to wind power. Researchers there think windmills can provide electricity cheaper than conventional techniques.

Meantime, hydroelectric is enjoying a revival and UMRBC is encouraging it. Peter Burno, for example, is a man who knows producing electricity doesn't have to be a mammoth undertaking left only to giant utilities. A retired power engineer, Burno has rebuilt and modernized two small dams on the Yahara River at Dunkirk and Stebbinsville in southern Wisconsin. Another near Stoughton will be operating soon, and that dam alone will save a quarter-million gallons of oil, enough to supply the complete power needs of 60 homes for one year.

Burno is optimistic, yet realistic, about the future of small dams.

"No matter how long my lifespan, I'll never see the money I've put into these dams again, I'll never see a payback," Burno says, "but I'm leaving a legacy to my heirs that will keep generating income for years into the future. This is something that's got to come, I'm betting my own and my family's future on it."

Burno says the biggest impediments to refurbishing small hydroelectric dams are not technical, but economic and legal. He believes wholeheartedly in the future of small dams, but not as much as other energy experts. Some predict that small dams nationwide could provide as much power as all the nuclear power plants now being built or planned in this country. That's not realistic, Burno says.

"I could generate five megawatts of power at the McFarland dam on the south end of Lake Waubesa (near Madison), but to do that I'd have to raise the water level forty feet, and that would flood most of the town," he says, and then adds puckishly, "but I haven't altogether given up the idea."

Flooding

Just about every year a main problem faced by the UMRBC is not lack of water or the quality of it, but just too much all at once. Snowmelt and spring rain can sometimes mean disaster to people who live along Wisconsin's rivers. Floods threaten lives and damage homes, farms, business, industry, and roads.

In the past, the government response was levees or a dam. But dams and levees don't really stop floods, they just keep the floodwaters someplace manageable. And dams don't always do their job.

"Do they ever fail? Hell, yes, they do!" says Dick Knitter of the DNR's dam safety program.

Floods in 1934 took out dams at Colfax, Menominee and Hudson. A 1941 flood washed out the dam at Hayward. In 1970, a flood on Hemlock Creek took out the Buck's Lake Dam, the Murphy Dam, and the Bolger Dam, says Knitter.

"They go like dominoes once they start," Knitter says. "That 1970 flood on the Hemlock just about took the Mikana Dam, too. If that one had gone the town of Rice Lake would have gone, too."

This spring, gates on a dam on the Menominee River gave way all at once, Knitter says, and the water above the dam dropped fifteen feet almost immediately. Two fishermen in a canoe directly above were sucked through the outlet.

"They just about drowned," Knitter says. "I don't know why they didn't."

"I rap on wood when I say this—there's been no loss of life due to dam failure in Wisconsin as far as I know," says Knitter. "But I look for it to happen, the way some people get careless with their lives and build below dams."

A dam on a creek near Muskego started to wash out in March of 1963. "It took over 10,000 sand bags and more than 300 volunteers to close that break," Knitter says. "And in the very area where that dam failed and where six or eight feet of water was flowing, there are now three new homes built. How does that grab ya?"

"We have the potential for loss of life in Wisconsin," Knitter says. "It just hasn't happened."

This "tremendous potential" for tragedy is the reason Wisconsin has a dam safety inspection program. If a dam is found to be unsafe, Knitter says, "we have the owner open the gates and leave them open," draining down the reservoir behind the dam.

Relocation of buildings to high ground may someday make pictures like this obsolete. Meanwhile, annual damage on flood-prone Wisconsin streams still ranges from about $170 per mile on the St. Croix and Black Rivers to more than $80,000 on portions of the Mississippi, Wisconsin and Trempealeau Rivers. Yearly losses basin-wide are projected to rise from $421-million to $702-million by the year 2000. Major reason is urban encroachment onto floodplains.
Photo courtesy of the Minnesota-Wisconsin Boundary Area Commission

In the past when floods wiped out someone's home, farm, or business, federal flood relief programs helped them rebuild, usually in the same spot. The next high water to come along often wiped them out again. The result was an expensive, recurring cycle of disaster and relief, that is only now beginning to be approached differently.

One place trying a different approach is Soldiers Grove in southwestern Wisconsin. Floods coursed through downtown Soldiers Grove in 1935, '51, '65 and '78. As part of the LaFarge Dam project downstream, the Corps of Engineers offered to help out by building levees to protect the town. But the village's share of the project would have cost $220,000. Maintenance on the levee would have run another $10,800 a year, at a time when total annual tax revenues for the town totalled only $12,000.

Clearly, there had to be a better way, and the residents of Soldiers Grove found it. They decided it made more economic sense to simply move out of harm's way—up to higher ground out of the floodplain.

Research showed they could get help. They applied for and received a grant from the US Department of Housing and Urban Development (HUD) and began rebuilding on a hill above the old downtown.

Eventually 50 homes and 44 businesses, many solar-heated, will sit high, dry, and safe on a hilltop above the floodplain.

Another such project is underway at Prairie du Chien where the Corps of Engineers is helping the city relocate 130 buildings and floodproof another 175 in the city's flood-prone Fourth Ward.

Federal laws now limit building in floodplains. The National Flood Insurance Program provides low-cost insurance to towns and cities that agree to regulate floodplain development. The Wisconsin Floodplain Management Program also requires communities and counties to develop zoning ordinances that limit construction in floodplains.

But these "non-structural" solutions often suffer from lack of money and have trouble finding a government agency to give them a hand. If we really want to put an end to flood damage, local, state and federal agencies must work together to find new ways to solve this age-old problem. The Upper Mississippi River Basin Commission has the broad membership it takes to get consensus on new approaches. Its planning process will include them.

Recreation, fish & wildlife

Few states can boast Wisconsin's blend of scenery, history, and geology. We may not have the West's Rocky Mountains, but we've got the Baraboo Range. We haven't got Big Sur, but we've got the rocky, rugged Lake Superior coastline. And, so what, if the Pilgrims landed at Plymouth Rock in Massachusetts? French voyageur Jean Nicolet landed at Red Banks, near the toe of Green Bay, in July 1634, wearing a Chinese damask robe and firing his twin pistols. He was seeking to expand fur trade with the Winnebago Indians and hoping he'd found the fabled northwest route to the Orient. Nicolet only made it a short way up the Fox River, but almost 40 years later Father Marquette traced Nicolet's route and kept going—down the Fox, across to the Wisconsin and on to the Mississippi. From that day, and even long before, right up to creation of the Upper Mississippi River Basin Commission in 1972, mankind has worried about this vital piece of water.

From the hills and valleys of southern Wisconsin to the forests, lakes, and streams of the north, Wisconsin has a combination that's hard to beat anywhere. People come to enjoy our bounty year-'round. Tourism is a $5 billion business employing about a quarter of the state's workforce in some capacity or other. Many of the things that bring people to Wisconsin have something to do with water. More than 400,000 motor and sailboats use Wisconsin's lakes and rivers. There are an estimated 225,000 canoes in the state, 130,000 duck hunters, more than 1 1/4-million anglers and over 2 1/2-million swimmers. No matter how you stack it, that's a lot of people using Wisconsin's waters, most of which flow into the Upper Mississippi River.

In some places the summertime crush of tourists and the proliferation of summer homes brings the very real danger of loving Wisconsin to death. Nowhere is this more apparent than on the St. Croix River along the Minnesota-Wisconsin border. A total of 227 miles of the St. Croix and its tributary the Namekagon were one of eight river systems first protected under the 1968 Wild and Scenic Rivers Act. The Northern States Power Company had held the land undeveloped for 50 years and then donated some of it and agreed to leave other parcels pristine. But the river runs through 15 incorporated communities, has a major coal-fired power plant on its bank, gets extremely heavy use from residents on both sides, and yet remains in good shape. The kind of planning UMRBC does, helps keep it that way.

"People seem really willing to come to the St. Croix, despite heavy pressure on it," says Jim Harrison, executive director of the Minnesota-Wisconsin Boundary Area Commission. "Part of it is prestige. Some people say 'Hey, I was to the St. Croix today,' almost as if they were saying, 'Hey, I'm a nice person, I'm a good guy.'"

"The name has a very positive ring to it. Any development within 10 miles has 'Croix' in its name somewhere—Croix Downs, Croix Woods, always Croix something. It might not even be within commuting distance. Corporations keep big boats on the St. Croix and they park out there to wine and dine people on these big yachts."

How does this kind of use jibe with a river that's called wild and scenic?

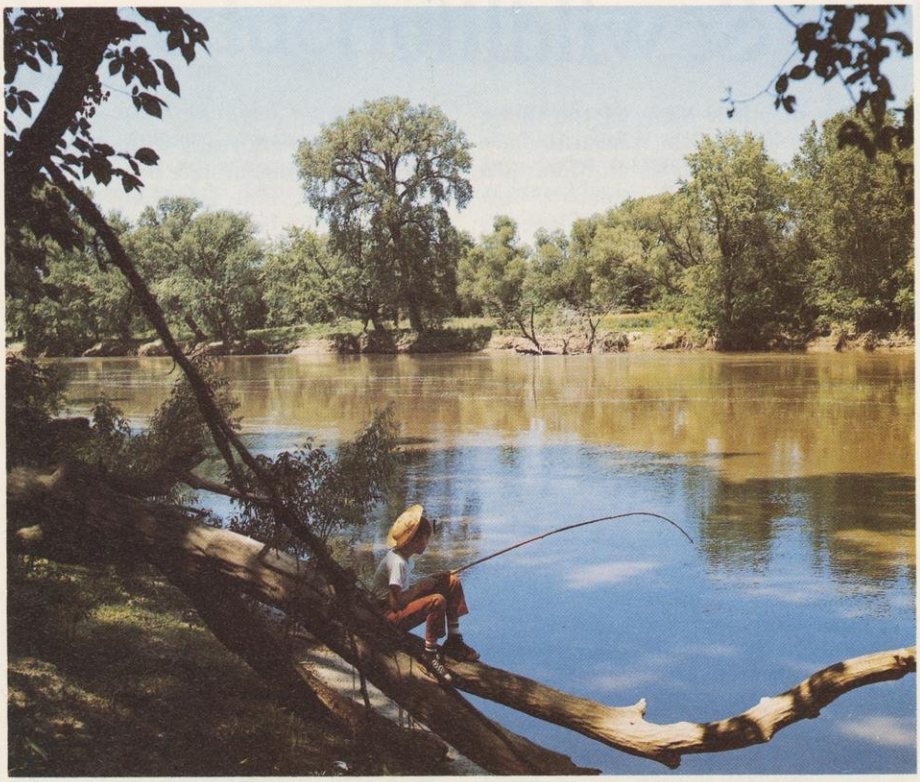
The St. Croix may have been included in the wild river system *because* of its unique combination of scenic beauty and heavy use, not despite it, says Harrison. "It's the last remaining unspoiled metropolitan river in the country, and for that reason alone deserves to be protected. It's an example that we can, as a society, take care of some of these rough-cut stones lying around."

Another "rough-cut stone" well on its way to being included in the national wild and scenic river system is the lower Wisconsin River, from Ferry Bluff below Sauk City to the Mississippi River at Wyalusing.

The Pine, Pike and Popple Rivers are three state-designated and protected wild rivers. The Flambeau and Brule Rivers are not designated wild rivers, but are protected because they run through state forests. The Wolf River, was originally designated a national wild river, but never included in the system. It is protected by state land along its banks and by its long run through the Menominee Indian Reservation.

Wisconsin has many other beautiful streams not specifically protected by law or circumstance. For them, DNR helps landowners and local governments preserve aesthetic qualities through local zoning initiatives. So far, efforts have concentrated on the Black River in West Central Wisconsin where counties and landowners teamed up to thwart bad development and other destructive

Paddlewheelers have symbolized the excitement of the river for more than 100 years. Decorated like a "floating wedding cake," the Delta Queen still sets the shoreline astir as it wheels "Down River at Alma" in this watercolor by Artist John Runions, Box 55, Alma, WI 54610.



Wisconsin waters are fished by 800,000 licensed residents, 400,000 non-residents and countless small fry. They catch 115-million fish per year. Wisconsin's commercial fishermen on the Mississippi harvest 5-million pounds annually. Corps of Engineers Photo

change. Local action to protect other streams is expected soon.

Closely associated with state rivers and perhaps even more vulnerable, are Wisconsin's wetlands. Call them marshes, swamps, sloughs, or bogs, by whatever name, they provide habitat for wildlife and spawning grounds for fish. UMRBC recommends their protection. Wetlands reduce floods and filter out nutrients that choke lakes and streams with weeds and algae. But more than half of Wisconsin's original 4-1/2-million acres have already been drained, dredged, or filled. An average of 20,000 acres of the state's wetlands disappears every year.

Wisconsin's Legislature has attempted to pass a wetlands protection bill in every session since 1971. Each time, environmentalists and wildlife interests supported the bills while many agriculture and development interests opposed them. Last session, when legislators made concessions to farmers and builders, environmental groups balked and withdrew *their* support.

Earlier this year, DNR moved to protect wetlands along navigable waterways under authority originally granted by the 1966 Shoreland Zoning Act. When the new code takes effect anyone who wants to bulldoze, dredge, plow, or make other specified alterations in a marsh will first need a zoning change from their local shoreland-wetland zoning district.

In such a situation it's tempting to see those who want to preserve wetlands as "good guys," and those who want to use them as "bad guys." Few issues are that simple, and marshland preservation is no exception.

"Way back before there were locks and dams on the Mississippi," Harrison says, "the river was much smaller because we didn't flood so much bottomland. We've gotten a lot of gains over that older time. The 'natural' river didn't have all these wonderful marshes, backwaters and bays. You can argue about whether dams are good or bad."

While Harrison's Minnesota-Wisconsin Boundary Area Commission is not a member of the Mississippi River Basin Commission, the two groups are concerned with many of the same issues from different perspectives. Harrison calls himself a "dispassionate observer" of the Basin Commission and its activities. Where the Basin Commission shines, he says, is when conflicts arise over equally valid uses of water.

"UMRBC tries to mediate these kinds of disputes," he says, "tries to balance off all these basic inherent benefits from rivers. The Mississippi is one of the most important transportation routes, one of the best fisheries, and one of three major waterfowl flyways on the North American continent. You can't have it all ways, all the time, in all places."

When any Commission member plans any activity in the Mississippi Basin, other states and agencies in the Commission must approve, Harrison says.

"The Basin Commission is only as effective as it's partner members are willing to let it be. If, say, a majority of federal agencies want to veto a plan to benefit fishing, because it might interfere with duck management, it can be done. But it'll stymie the Commission because, by law, it operates by consensus.

"Of course, Congress set it up that way on purpose, to force the members of the Commission to work things out among themselves. In other words, nobody can get anything done, get any plans sent to the Water Resources Council in Washington, and then on to Congress for funding, unless everybody agrees. They have a bounden duty to work out their differences; it's in the law and it's their underlying philosophy."