

Reflections from a U.S. Land Owner and Nonpoint Source Pollution Control Implementer in the U.S. Great Lakes basin

Presented for the *Great Lakes Nonpoint Source Pollution from Land Use Workshop*

November 8-9, 2004
Courtyard Marriott Hotel
Ann Arbor, Michigan

By Gary Overmier
Project Manager
Great Lakes Basin Program for Soil Erosion and Sediment Control
Great Lakes Commission

My History – Growing up in the 1950s and 1960s

I grew up on the banks of the Maumee River in the 1950s and 1960s. My friends and I spent a lot of our childhood playing in and around the river and it was not uncommon to see raw sewage floating downstream to Lake Erie. The Maumee was and still is known as the Muddy Maumee. Then as now the river is a chocolate brown color most of the time.

In 1967 I was a high school student. Somewhere, maybe in a newspaper, I read an article that Lake Erie was dead or at least dying. I had seen for myself the piles of stinking dead fish on the beaches when on camping visits to the Lake Erie shore. It was a memory that stuck with me. Why were these fish dying? What was happening both to the physical environment that would cause this? And what, if anything, was being done to stop it? In my junior year, I was required to write a research term paper, I chose for my topic: “Is Lake Erie Dead?” I still have the 3 X 5 note cards that I used to carefully write down bits of information and their sources. A few years later I started college with an eye toward becoming a conservationist.

State of the Resource – 1950s and 1960s

You can always tell how a society values their rivers and lakes by whether it's the front door facing the water or whether it's the back door. During this period of time on the Great Lakes, it was the back door, the door out of which we threw our trash.

Dead fish, green mats of algae, raw sewage, malodorous coastlines, pouring chemicals, flowing sediment and flotsam and jetsam in every port and harbor – a crisis.

The combination of the increased use of synthetic fertilizers and the existing sources of nutrient-rich organic pollutants, such as untreated human wastes, and phosphate detergents caused an acceleration of algal growth in the Great Lakes. In the 1950s, Lake Erie showed the first evidence of lake-wide eutrophic imbalance with massive algal blooms and the depletion of oxygen. Scientists start raising concerns. The public started becoming more aware and involved and so did I.

My History – the 1970s

After graduating from college and a doing stint in the U.S. Army as an armor officer knocking down trees and churning up the landscape, I spent most of my time at the USDA- Soil Conservation Service (SCS) (now Natural Resources Conservation Service (NRCS)) training and working on drainage and flood control projects. Little, if any, of my work at that time dealt directly with nonpoint pollution. I also went back to graduate school to work on a masters in agricultural economics. I was one of the first at the Ohio State University to study to be a natural resource economist versus a production agriculture economist. I had a hard time finding an academic adviser. The few professors that were working on nonproduction issues at the time were researching such things as using crop residue for energy production. During this period of the 1970s, the Great Lakes were still receiving large quantities of nonpoint pollution.

State of the Resource – the 1970s

While federal water legislation dates back to the nineteenth century, when Congress enacted the River and Harbor Act of 1886, Federal involvement in water quality issues goes back to 1948, when Congress began to provide minimal funding for states to build wastewater treatment facilities. It was not until the Water Pollution Control Act was passed in 1972, however, that the federal government took charge of regulating the quality of the nation's water supplies.

A concerned and more informed citizenry launched the environmental movement in the late 1960s, as a result of this movement, several pieces of legislation were enacted and number of programs began in the early 1970s. The National Environmental Protection Act (NEPA) and the U.S. Federal Water Pollution Control Act ("Clean Water Act") were signed into law by then President Nixon. In July of 1970, the White House and Congress worked together to establish the USEPA in response to the growing public demand for cleaner water, air and land. Prior to the establishment of the EPA, the federal government was not structured to make a coordinated attack on the pollutants that harm human health and degrade the environment. The EPA was assigned the daunting task of repairing the damage already done to the natural environment and to establish new criteria to guide the country in making a cleaner environment a reality.

In the early 1970s it was said that Lake Erie was dead. While not exactly accurate, that was a logical conclusion for people to make. The Cuyahoga River, which flows into Lake Erie near Cleveland, had caught fire because of oil on its surface. Lake Erie itself was smothering in algae and its fish population was diminishing. While this Great Lake may not have been dead, it was in grave condition.

Partially in response to these problems, the governments of Canada and the United States signed the Great Lakes Water Quality Agreement in 1972. According to then Canadian Prime Minister, Pierre Trudeau, the Agreement marked "our recognition of the fragility of our planet and the delicacy of the biosphere on which all life is dependent. The Agreement deals with the most vital of all issues - the process of life itself. ...it promises to restore to a wholesome condition an immense area which, through greed and indifference, has been permitted to deteriorate disgracefully."

Under the Agreement, the two countries agreed to work together to restore health to the world's largest freshwater ecosystem. Scientists and managers created methods to study and resolve pollution problems.

At the time of the signing of the agreement, a large study was begun that looked at the source of pollution not coming from the outfall of pipes but rather from the landscape. The governments of the United States and Canada issued a reference letter to the IJC requesting that a study of nonpoint sources of pollution from land uses be conducted. This seminal study called PLUARG (Pollution from Land Use Activities Reference Group) involved dozens of researchers and managers from both countries and the numerous reports prepared under this reference became the standard regarding our knowledge of nonpoint sources of pollution in the Great Lakes region. With this study, the connection between what happens on the landscape and the quality of the rivers and lakes became established in the public's mind.

Also billions of dollars were spent to build waste water treatment plants in the 1970s but little funding was spent to reduce nonpoint sources from the landscape. Two watersheds that I became familiar with, one in Indiana (Black Creek) and one in Ohio (Honey Creek) were chosen as pilot projects to study whether the installation of soil erosion reduction practices would reduce phosphorus. At the time, it was thought that most of the phosphorus entering the rivers and lakes and causing eutrophication was attached to eroded clay/loam particles. However, it was found that some fields had been fertilized to such an extent that there was soluble phosphorus in the runoff.

My History – the 1980s

I started farming using no-till conservation practices in 1982. Some of the highest rates of no-till adoption in the world occur in the Maumee River Basin. From 1984 through 1990, I was the SCS representative for a special USEPA phosphorus reduction project grant obtained by the Defiance County Ohio Soil and Water Conservation District (SWCD). I, along with the SWCD staff, introduced many farmers in Defiance County to conservation and no-till farming. The SWCD rented equipment, purchased with USEPA grant money, to farmers at a nominal cost to test the approach. No-till planters and drills were delivered to the farmers, and assistance was provided to help them hook up the equipment and monitor and adjust the planter based upon the soils, the crop to be planted and the planting conditions. A little hand-holding was needed as the farmers learned a new system. Farming took place seven days a week, but we tried to not move equipment around on the weekends if possible. Yields were monitored and compared to a check plot. We also monitored a small watershed (Lost Creek) for changes in water quality as the result of implementation of conservation tillage and other conservation practices. Ridge tillage (a modified tillage method where 12 inch high ridges are built every 2.5 feet across the field and the crop is planted on top of the ridge leaving crop residue between the rows) in high clay content soils did not work too well and was not adopted by many farmers. The ridge dried out too quickly and reduced soybeans yields.

I, among others, inadvertently caused the development of the Tillage Transect. Each year the NRCS district conservationist (me) and county extension agent and others were asked to estimate the number of acres of conservation tillage in their county. There was a tendency to overestimate the number of acres being used because this group worked very closely with farmers using conservation tillage and this skewed their view of how many acres were actually planted with this method. When I moved into my position in Defiance, I was the third district conservationist in four years. When I first calculated the conservation tillage acreage, I only estimated what was being planted with the project's planters plus the acreage of farmers that used their own specialized planters. Also, the definitions of what constituted conservation tillage changed over time, so my estimates were lower than the previous estimates.

The USEPA reviewed the data for the Water Quality grant in Defiance and found that the more money they put into trying to increase conservation tillage, the less conservation tillage there was. That shook things up. We knew it was not true. So a standardized statistical analysis was need for all counties to take out most of the human bias and the tillage transect method was developed. Still used, in a modified form, today.

It was the most productive and enjoyable portion of my career.

State of the Resource – the 1980s

After the release of the findings of the PLUARG studies the late 1970s and 1980s produced several significant new and reauthorized laws and agreements including amendments to the Clean Water Act in 1977 and 1987, revisions to the Great Lakes Water Quality Agreement in 1978 and 1987 and the passage of the first Farm Bill in 1985. With new nonpoint source and conservation provisions in these acts and agreements, the actual on-the-ground efforts to reduce nonpoint source pollution began in earnest. Mandates to reduce erosion both nationally and regionally, prompted initiatives such as the “T by 2000” campaign in Indiana with similar efforts beginning in other Great Lakes states. In the early 1980s there were almost no acres of notill cropland in the entire Great Lakes basin. Notill farming was declared as the way to reduce erosion and resultant sedimentation on cropland in the Lake Erie basin. However, notill farming was declared unworkable in large portions of Great Lakes area by some universities.

Efforts were also begun to reduce phosphorus flowing into Lake Erie prompted by a renewed commitment of the governments of both the U.S. and Canada due to the revisions to the Great Lakes Water Quality Agreement.

Under the 1987 amendments to the Clean Water Act, Congress instructed U.S. EPA to establish the Section 319 Nonpoint Source Management Program, because it recognized the need for greater federal leadership to help focus state and local nonpoint source efforts. Under section 319, states, territories, and Indian tribes were eligible to receive grant money to support a wide variety of activities, including technical assistance, financial assistance, education, training, technology transfer, demonstration projects, and monitoring to assess the success of specific nonpoint source implementation projects. USEPA Region 5 also began a pilot program to formulate a plan to increase the amount of year around cover by using notill tillage farming in the Maumee River basin.

In Ohio, in order to meet the phosphorus reduction targets established by the federal governments under the Great Lakes Water Quality Agreement, each county in the Lake Erie basin was assigned a specific phosphorus reduction goal based on their share of the load reduction identified by the agreement and using the information obtained in the Lake Erie Wastewater Management Study and the Black and Honey Creek pilot projects. The number of cropland acres in each county and the erosion rates were used to assign the goals. It was estimated, on average, for each ton of soil saved based on the Universal Soil Loss Equation that there would be a corresponding one pound reduction in Phosphorus loadings.

During this decade, farm equipment manufacturers continued to develop better and better machines to control erosion. Pressure was applied to developers to install erosion control measures. Municipalities began to address stormwater and combined sewer overflows problems. Walleye populations in Lake Erie began to increase dramatically, overtaking perch fishing in popularity and producing a robust charter fishing business in all three of Lake Erie’s major sub-basins.

My History- the 1990s

I was assigned to two newly established positions in the 1990s. The first was as the water quality specialist for NRCS in Ohio. I had statewide responsibilities to work with watershed groups to encourage planning and implementation of nonpoint source activities. I also became involved with the Toledo Harbor Management Project. In the mid-1990s as a part of that program, I became the Maumee River Basin Coordinator, implementing a program to reduce sediment being delivered to the Port of Toledo. The position was funded by a two-year grant from the U.S. Army Corps of Engineers. The grant was not renewed, the position was eliminated and I opted for an early retirement rather than be transferred to another position within NRCS at an unknown location and with unknown duties.

State of the Resource – the 1990s

Watershed groups began forming all over the Great Lakes basin gaining local support to assist in the reduction of nonpoint pollution. The USDA introduced the Hydrologic Unit Area (HUA) watershed concept, where NRCS and Cooperative Extension assigned permanent full-time staff to implement and inform landusers about the damage sediment was causing and how they could reduce it on their own land. Indian Lake and Darby Creek watersheds in Ohio were examples of these comprehensive watershed management efforts. Separate funding was given to each HUA allowing for a concentrated effort in each watershed. This model was one of the most effective efforts undertaken by USDA. The program was dissolved during the reorganization of the USDA in the mid-1990s.

Several important pieces of legislation were amended or passed in the early 1990s that influenced the way agencies approached nonpoint source pollution control and habitat.

The Great Lakes Critical Programs Act was passed in 1990, amending parts of the Clean Water Act by putting into place requirements for USEPA's Great Lakes National Program Office to implement Great Lakes programs such as the Great Lakes Water Quality Agreement. In passing this Act, the Congress issued its finding that "the Great Lakes are a valuable national resource, continuously serving the people of the United States and other nations as an important source of food, fresh water, recreation, beauty and enjoyment."

The Critical Programs Act directs the government of the United States to seek to attain the goals embodied in the Great Lakes Water Quality Agreement of 1972 (as amended in 1978 and 1987) and any other Great Lakes agreements and amendments, with particular emphasis on goals related to the reduction of toxic pollutants. The act directed the USEPA to be the lead agency to meet the goals of the Great Lakes Water Quality Agreement, working cooperatively with other federal agencies, states and local authorities.

The Great Lakes Water Quality Initiative (GLI) was begun in 1989 with the states working with USEPA to develop uniform pollution limits to protect the lakes and implement the Clean Water Act (CWA). The goal of the GLI was to set limits on a coordinated basis that would prevent further buildup of toxic pollutants in fish and wildlife.

The Great Lakes Fish and Wildlife Restoration Act was passed in 1990 establishing goals for the U.S. Fish and Wildlife Service (USFWS) programs in the Great Lakes and requiring the USFWS to undertake a number of on the ground activities specifically related to protecting the fishery

resources. The law specifically recognized the importance of the successful partnerships in the Great Lakes region and provided a process for achieving on-the-ground restoration activities to benefit fish, wildlife and plants in the Great Lakes.

Disposal of dredging material in the Great Lakes (both open lake dumping and disposal in confined disposal facilities (CDFs)) started to become a contentious issue between the U.S. Army Corps of Engineers (COE) and the states in the 1990s. Specifically the Toledo Harbor dredging becomes problematic. The State of Ohio had to approve the 401 permits in order for the U.S. Army Corps of Engineers to open-lake dump the dredge material. The State of Ohio was not going to approve the 401 permit because dumping the material violated the state's water quality standards. The Corps' position was that if they could not open-lake dump they could not dredge the harbor because it was not cost effective to do anything else with the material. U.S. Rep. Marcy Kaptur (D- 9th district Ohio) asked the Corps to form a local committee to develop a strategy to reduce open lake dumping and prevent a legal battle between the federal government and the State of Ohio over sediment standards. Many alternatives to open lake dumping were discussed and rejected. One of the alternatives accepted was reducing the amount of sediment that reached the harbor in the first place. This would be accomplished by reducing soil erosion occurring on land in the upstream watershed. Several others involved creating more space in the existing CDFs. One was to use the material as a base to mix with organic material from the waste water treatment plant to make a soil amendment. Another was to consolidate the material in the CDF by evaporating water trapped in the CDF.

In 1991, the Great Lakes Commission began the Great Lakes Basin Program for Soil Erosion and Sediment Control with funding provided by USEPA Region, and the State of Michigan launched the Saginaw Bay Erosion and Sediment Control Program under the Great Lakes Basin Program for Soil Erosion and Sediment Control. In 1994, funding for the Great Lakes Basin Program shifted from USEPA to USDA-NRCS.

Congress amended the Coastal Zone Management Act in 1990 which included nonpoint source pollution provisions (under Section 6217). This section required coastal states - including the Great Lakes states, farmers and other developers - to control nonpoint source pollution such as nutrients and sediments from farmlands.

My History - the 2000s

I begin work as the assistant director of the University of Toledo College of Law's Legal Institute for the Great Lakes and taught a couple of college environmental courses. I also served as the editor of the institute's newsletter and wrote numerous articles, including one on the need to regulate sediment as the most efficient means of controlling the largest pollutant, by volume, to the Great Lakes. I joined the staff of the Great Lakes Commission in 2002 as project manager of the Great Lakes Basin Program for Soil Erosion and Sediment Control.

State of the Resource - the 2000s

The nonpoint source pollution control effort is continuing with more emphasis being placed on the controlling pollutants and implementing programs at the state and local levels. Earlier efforts have solved the easiest problems and solutions are now becoming harder and more expensive. Urban issues such as stormwater management, combined sewer overflows (CSOs) and erosion from construction sites are now the issues of the day. Phase II stormwater regulations have kicked in. Limits have been lowered on the number of acres that can be disturbed without having erosion

control. The number of cities exempt from requiring erosion control practices on development sites was also lowered.

Another version of the Farm Bill was passed in 2002 with new and modified conservation programs are being established. The Great Lakes Basin Program for Soil Erosion and Sediment control received authorization under this bill. Buffer strip programs are receiving large amounts of money and interest in buffer installation is all the rage across the basin.

Epilogue

After spending most of a 35-year career working to restore Lake Erie (and the rest of the Great Lakes) I've seen substantial progress. But then again, some things just stay the same. Here are some quotes from an IJC report now almost 100 years old.

IJC – Final Report on Pollution of Boundary Waters Reference -1918

“Speaking generally, water supplies taken from streams and lakes which receive the drainage of agricultural and grazing lands, rural communities, and unsewered towns are unsafe “ ***Note: Aren't we still dealing with this problem?***

“Neither time nor funds were available for field surveys, except in some minor instances “ ***Note: There still isn't any time or money to do comprehensive field surveys.***

“At International Falls and at Fort Frances objection was also made to the discharge of wastes from the pulp mills ... The pollution was chiefly due to chemical waste resulting from the manufacture of pulp. This form of pollution is ... injurious to fish life and the fishing industry.” ***Note: How long did it take to correct this problem?***

“With the exception of sawmill and pulp-mill wastes no reference has been made to industrial and chemical wastes as a source of pollution. Unquestionably in the future, unless preventive measures are taken, pollution from all these wastes will have a very injurious effect, and the commission has not been unmindful of this fact in preparing the recommendations herein-after made.” ***Note: Unfortunately we didn't follow this advice soon enough.***

“The idea is deeply rooted in the minds of many that running water always purifies itself. This belief was put forward by some as a reason why no action should be taken in respect to these rivers. Undoubtedly water does purify itself if it receives no accretions of contamination and runs in its course a sufficient length of time.” ***Note: Is this one of the first statements of the need for a holistic effort to solve ecosystem degradation?***

“.... these communities took advantage of the diluting powers of the rivers, and resorted to the simple and inexpensive expedient of discharging into (the rivers and lakes) their (pollution) in its raw condition. The custom of doing so (is) ... universal. The selfishness of vested interests, familiarity with evil

conditions, which has begotten an indifference to both the doing and the suffering of wrong, an ill-directed spirit of economy averse to the assumption of financial burdens to remedy what was only regarded as an existing or potential evil to other communities, and the disinclination to change ingrained in humanity, have resulted in a situation along the (border) which is generally chaotic, everywhere perilous, and in some cases disgraceful.” ***Note: This is one of the most lyrical and forceful statements summing up the environmental issue that I have ever read.***

“Pollution by water ballast constitutes a more difficult problem. There has not yet come to the notice of the commission any feasible means of purifying the rather large quantities of water which vessels while in the polluted areas of inner harbors frequently take on board for purposes of ballast, and which they afterwards discharge upon approaching their ports of destination, often while passing water intakes. It will probably be sufficient for the present, at least to control this practice by suitable regulations In the event of the failure of such control by regulations, more expensive and time-consuming methods of treatment will have to be developed and prescribed.”

Note: This issue is still with us but in a different form?

“Through-out the whole length of the boundary waters where sewage is discharged from the sewerage works of cities and towns the pollution is most concentrated in the shore waters on the side of the boundary on which it originates. These shore waters, besides being in places unsightly, malodorous, and absolutely unfit for domestic purposes, are a source of serious danger to summer residents, bathers, and, others who frequent the localities. So foul are they in many places that municipal ordinances have been passed prohibiting bathing in them.”

Note: Heard about any beach closings lately?

It looks like there is still a career or two left to finish what I started.