

9. Grand Calumet River

Background

The primary study area for this watershed was the Grand Calumet River/Indiana Harbor Canal Area of Concern. This area is located in northern Lake County, Indiana. It includes the Grand Calumet River, the Indiana Harbor Canal, Lake County portions of nearshore Lake Michigan, and Indiana portions of Wolf Lake. The Grand Calumet River watershed is difficult to define due to extensive historical ditching, filling, and sewerage. The approximate size of the systems drainage basin is 67 square miles. The surveying efforts for the project focused on the Area of Concern. The larger watershed that encompasses Grand Calumet River includes the Grand Calumet and Little Calumet Rivers as well as the entire Indiana shoreline on Lake Michigan. Other tributaries in this larger watershed include the Galien River, Salt Creek and Deep River. This watershed is referred to as the Little Calumet-Galien watershed, and we will distinguish between references to the Grand Calumet River and the Little Calumet-Galien watershed. While local surveys focused only on the AOC, this report also evaluates monitoring projects found in the larger watershed.

Status of Watershed Management Efforts in the Study Area

Watershed Management efforts in the AOC have arisen out of the RAP process. Sub-watershed management plans have been created for the Wolf Lake Area and for the Grand Calumet Lagoons. Additionally several best management practices for reducing nonpoint source pollution have been installed at several locations throughout the system. Projects to build BMPs, explore greenway development, educate the public, inform private land owners and encourage watershed coordination have been sponsored throughout the AOC. Participants have included the Hammond Parks Department, the Hammond Department of Environmental Management, the Gary Parks Department, the City of East Chicago, the Natural Resource and Conservation Service, the Grand Cal Task Force, and the Indiana Toll Road Authority.

The RAP has provided a framework for cooperation and watershed management in this politically and naturally complex region. Unfortunately, implementation of watershed management principles remains fragmented across the jurisdictions of the cities and sanitary districts of Gary, Hammond, and East Chicago. Because of the highly industrial and urban nature of the watershed, regulatory permitting and remediation programs tend to receive more focus by the RAP than watershed planning and management activities.

Pollutants of Concern

Aquatic Monitoring

Monitoring coverage for LaMP pollutants reported into the STORET system is shown in Figure 31. These maps indicate that stations exist for two (mercury and PCBs) of seven critical pollutants, six out of ten pollutants of concern, and none of the listed emerging pollutants. Monitoring for all pollutants is heavy along the Lake Michigan shore and at the outfalls to the lake, but the coverage is quite sparse upstream. Three of the four major streams in the watershed (Deep River, Galien River, and Salt Creek) have almost a complete lack of monitoring activity, except at their outfalls. The stations monitoring for LaMP pollutants are maintained by MDEQ, IDEM, Illinois Environmental Protection Agency (IEPA), U.S. EPA (3 programs), the U. S. Army Corps of Engineers (COE), USGS-WRD, Purdue University, or the Chicago Metropolitan Sanitary District.

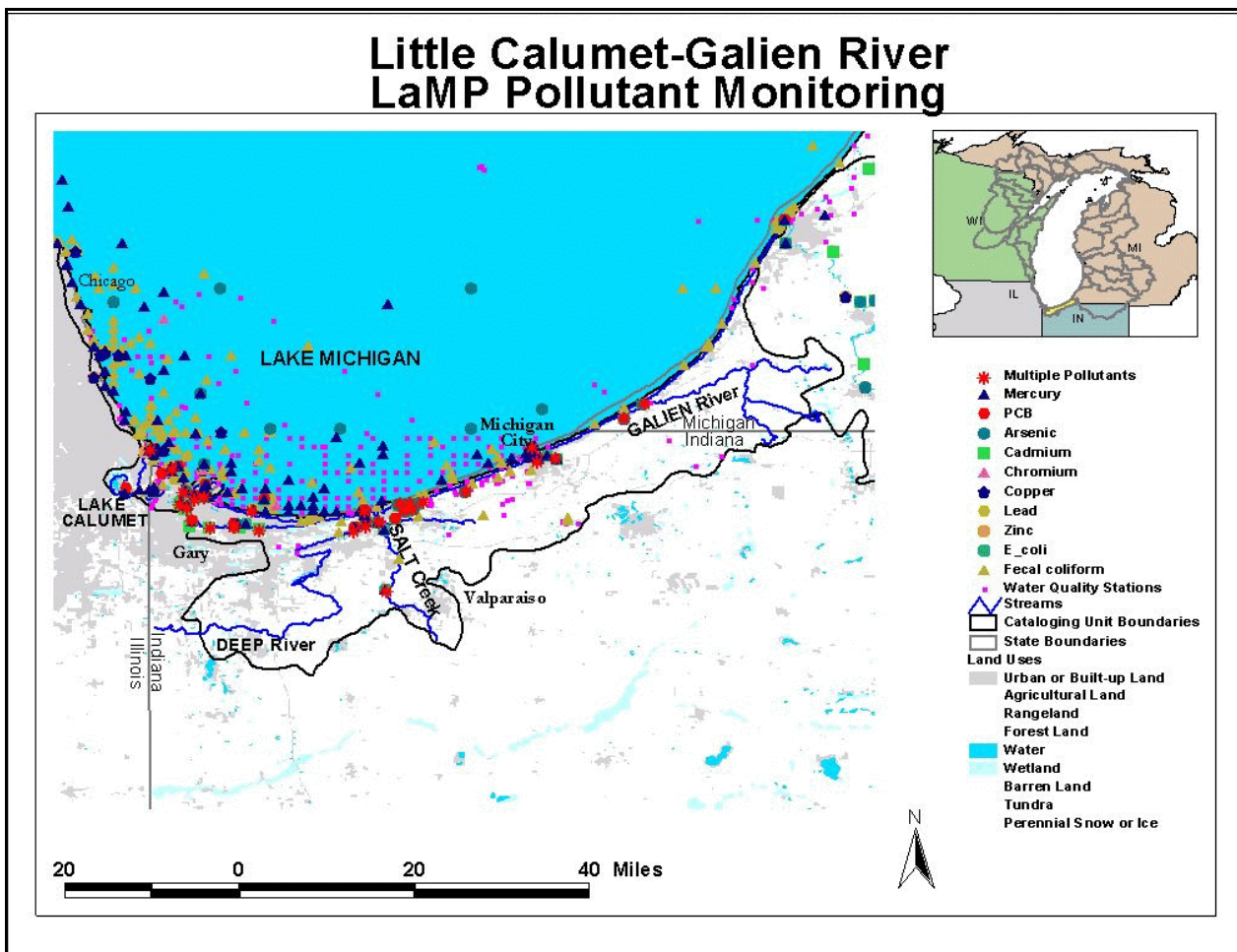


Figure 31. The Little Calumet-Galien watershed with ambient water quality and bacteria monitoring stations from U.S. EPA's STORET system displayed by indicators measured.

In addition, surveys indicate that the Office of Water within IDEM monitors for all LaMP pollutants with the exceptions of dioxins/furans, and atrazine. This monitoring includes over 100 stations within Lake Michigan watersheds within Indiana.

Pollutant Release Monitoring

An examination of Permit Compliance System and Toxic Release Inventory reporting locations in the Little Calumet-Galien watershed indicates a large number of potential pollution sources throughout the watershed (see Figure 32). This includes nearly 100 potential point sources in the Lake Calumet-Gary region alone. Other clusters of point sources can be found along Salt Creek, and around Michigan City, Indiana.

Nutrients and Bacteria

There are nearly 250 water quality monitoring stations within the Little Calumet-Galien watershed listed in the STORET system. A vast majority of these stations (shown in Figure 31) monitor for some form of nitrogen and phosphorus, the chief nutrients impacting water quality. Thus, where monitoring stations exist, they are likely tracking nitrogen and phosphorus. The majority of the stations in the watershed are located along the Lake Michigan shoreline. Very few stations exist inland from the lake shore.

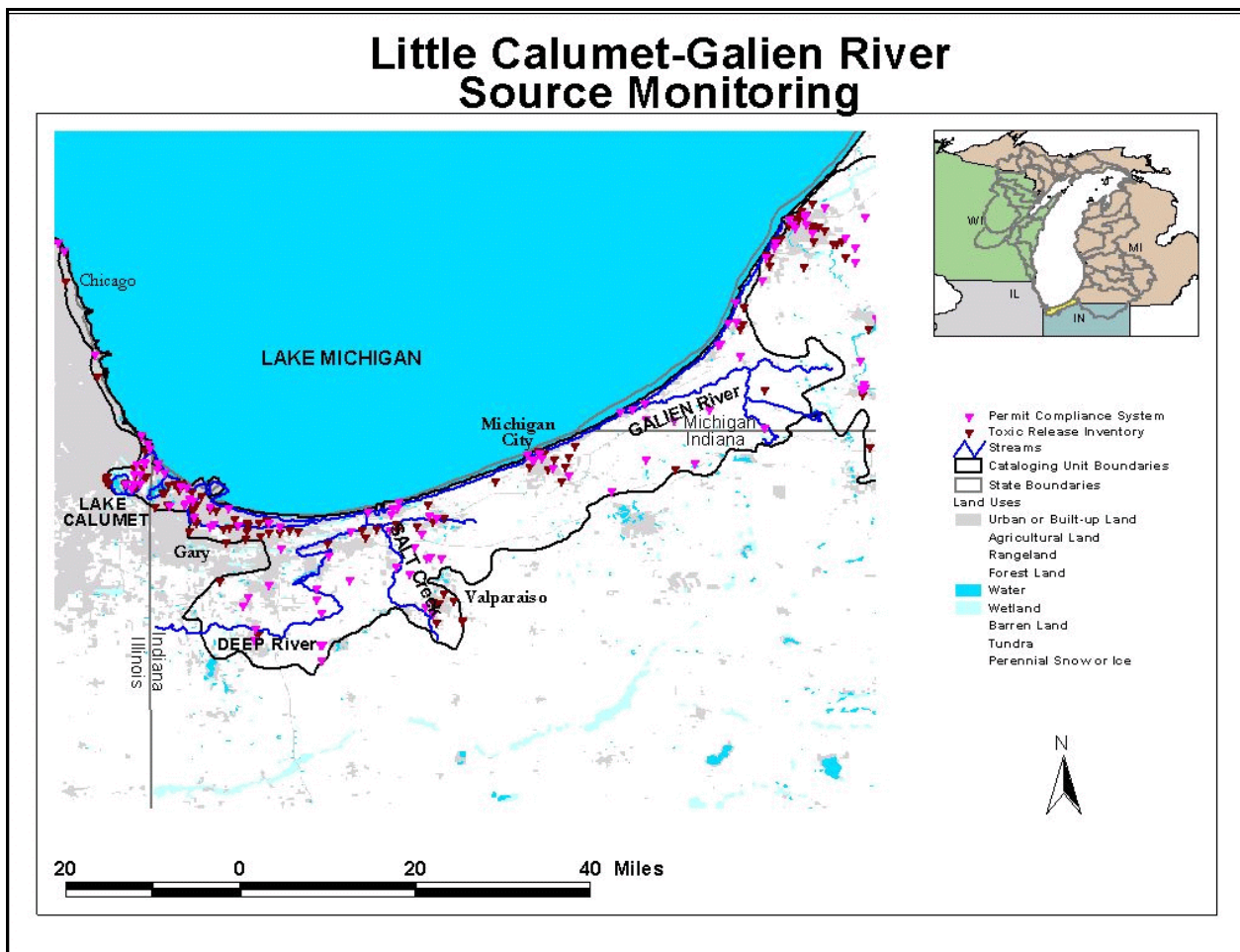


Figure 32. Little Calumet-Galien watershed with pollutant sources from the Permit Compliance System and Toxic Release Inventory databases indicated.

Seventeen stations report to monitor for *E. coli* in the watershed – most clustered in Gary, Michigan City, and at the lower reaches of the Deep River and Salt Creek. All 17 stations are maintained by IDEM. IDEM also reports that they monitor *E. coli* at 80 sites in Lake Michigan watersheds in general. Monitoring for fecal coliform is significantly more extensive. Greater than 100 stations can be found throughout the watershed. As with other monitoring coverage in the watershed, monitoring of fecal coliform levels is clustered along the Lake Michigan shore and at outfalls to the lake. No stations exist in upstream reaches of either the Deep River or Galien River. Organizations monitoring for fecal coliform in the watersheds include MDEQ, IDEM, IEPA, USGS-WRD, U.S. EPA, COE, and Chicago MSD.

Meteorological and Flow Monitoring

USGS maintains 15 gage stations in the watershed to measure flow rates and various other physical characteristics of streams (see Figure 33). Gage stations are located on all major rivers and streams in the watershed.

Little Calumet-Galien River Sediment, Air & Flow Monitoring

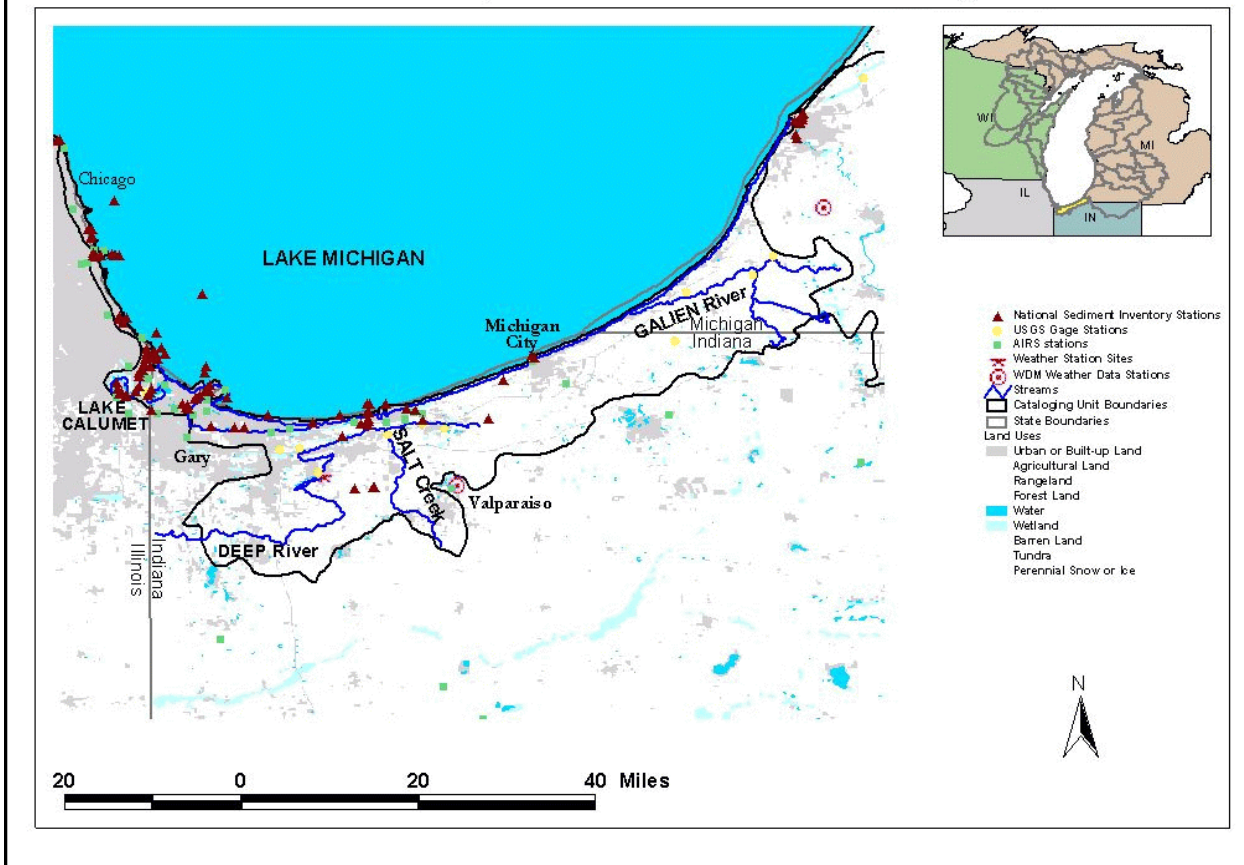


Figure 33. Little Calumet-Galien watershed with National Sediment Inventory stations, USGS gage stations, U.S. EPA's Aerometric Information Retrieval System (AIRS) stations, and NOAA weather stations indicated.

IDEM also reported that they monitor numerous physical properties in streams throughout Indiana's Lake Michigan watersheds. Properties measured include temperature, pH, alkalinity, conductivity, dissolved oxygen, chemical and biological oxygen demand, suspended solids, hardness, and turbidity.

One NOAA weather station is located in the Little Calumet-Galien watershed, and two others are just outside its boundaries. The station inside the watershed is located in Hobart, while the stations outside the watershed are located in Valparaiso and Berrien Springs. These stations measure continuous precipitation data, as well as other meteorological data.

Sediments

There are 84 National Sediment Inventory sites within the Little Calumet-Galien watershed (see Figure 33). Most of these sites are located in Lake Calumet, along the Grand Calumet River, and in and around Gary. These sites are administered by the IDEM, IEPA, USGS-WRD, COE, and U.S. EPA. All but eight of the sites monitor sediment chemistry to assess human health and aquatic life impacts. A total of 12 sites monitor benthic organism tissue, discussed below.

Fish Contaminants, Fish Health, and Aquatic Nuisance Species

As discussed earlier, we have been unable to find specific locational information (such as sampling locations) for programs monitoring fish populations or their health. There are statewide programs in existence, but these are discussed in the overall findings discussion. The National Sediment Inventory lists 12 stations that monitor fish tissue for bottom contamination. These are located throughout several areas of the watershed, and are administered by IDEM and U.S. EPA. IDEM specifically indicates that they monitor fish tissue at numerous undefined locations. At the same time IDEM monitors species, trophic composition, feeding and reproductive guilds, and fish condition and health.

A search of the Fish and Wildlife Advisory database on all major Little Calumet-Galien waterbodies revealed fish consumption advisories for three locations in the watershed. Advisories had been issued for the Grand Calumet River, Galien River, and Salt Creek. The advisories were state issued, covered all fish species and related to PCB, mercury, and chlordane levels.

No programs we discovered claimed to be monitoring for aquatic nuisance species specifically within the Little Calumet-Galien watershed. Refer to the overall discussion of Lake Michigan monitoring for a discussion about programs that cover multiple tributary watersheds.

Benthos Monitoring

No specific locational information was discovered for state or national programs monitoring benthic organisms. However, IDEM reports that they collect macroinvertebrate data (including community composition, and structural and functional integrity) in numerous locations throughout Indiana's Lake Michigan watersheds. Other organizations may be monitoring benthic organisms generally in the watershed, among others. These are discussed in the overall discussion of Lake Michigan monitoring.

Air Monitoring

Figure 33 illustrates the locations of the 65 air monitoring stations in or within five miles of the watershed, according to the U.S. EPA's AIRS database. A majority of the stations are clustered in the Lake Calumet-Gary region. The stations monitor for seven of eight indicators in the database, including low-level ozone, particulate matter, nitrogen dioxide, carbon monoxide, sulfur dioxide, and lead.

Wildlife Monitoring

According to our surveys, one group conducts wildlife monitoring of some form in the watershed. The Save the Dunes Conservation Fund monitors a variety of indicators of birds species health in the Miller Woods section of the Indiana Dunes National Lakeshore, near Gary. There are other organizations monitoring wildlife species in the Little Calumet-Galien watershed and others. These are discussed in the overall discussion of Lake Michigan monitoring.

Land Use

A substantial portion of the watershed exists as developed or urbanized land. This includes the major industrial city of Gary as well as Michigan City, and a portion of South Chicago. Much of the rest of the watershed is managed as agricultural land. There are relatively few sections of wetland area in the

watershed, though there are some around Lake Calumet. These wetlands are surrounded by highly developed land. These wetlands appear to be heavily monitored.

Local Assessment

Monitoring results generated by the various programs of the IDEM, OWM Assessment Branch, have been used in developing the RAP. In particular, the monitoring information has helped the RAP to identify sediment remediation as a high priority for the AOC. Monitoring results have also been used by IDEM to develop the 303(d) list and to begin the TMDL process. The Grand Calumet TMDL has been given a high priority and early scheduling largely as a result of the RAP. Other monitoring efforts are the results of recommendations of the RAP. The formation of the E. coli Task Force and continuation of its monitoring efforts is partly driven by the AOC's beach closure beneficial use impairment. In addition to the monitoring results reported in this survey, IDEM believes that additional information collection is occurring by other RAP partners that did not get reported in the surveys. The Nature Conservancy and Shirley Heinze Fund have many acres of properties that they preserve and maintain. These organizations collect information on their properties to inform their management decisions. The Indiana DNR has recently completed a study updating the Indiana Natural Heritage Database for the region. However, this type of data is often collected in short term or intermittent fashion. This may be why surveys on monitoring programs were not completed. However, this information is shared and utilized in the RAP process through the participation of experts from these organizations.

In the Grand Calumet AOC, there appears to be significantly more information available regarding some beneficial use impairments than others. For example, while IDEM has been collecting fish tissue data for years, some impairments were listed based short term historical studies or anecdotal evidence. Many of these have no current regular monitoring program in place. This could make monitoring progress and delisting difficult. This project found no evidence of monitoring programs in place which would regularly detect changes in BUI 5: Bird or Animal Deformities or Reproductive Problems, BUI 8: Eutrophication, BUI 11: Degradation of Aesthetics, BUI 12: Added Costs to Agriculture and Industry, or BUI 13: Degradation of Phytoplankton and Zooplankton Populations.

In general federal and state monitoring programs have been the primary information sources for the RAP. For the most part, this information has been made available for the RAP. Availability difficulties sometimes arise when data is being collected related to specific enforcement cases. Legal processes can delay public access to this information. Quality assurance procedures set up by agencies to ensure the validity of data can also delay its dissemination to the end users.

Other information sharing problems are geographic, much historical data is kept in Indianapolis in paper files. This makes it difficult for the Northwest Indiana public to access this information. Much of this information has been shared with EPA and is in the STORET database, however this system has not been easily accessible to the public in the past. Conversion of STORET to an internet based system should improve access to this data.

Due to the high levels of contamination in the sediment of the Grand Calumet River, volunteer monitoring efforts in the AOC have been virtually non-existent. However, IDEM is aware that several school programs have participated in volunteer monitoring in other Lake Michigan tributaries in Indiana. However, tracking down the contact persons for these programs has proven difficult. The Hoosier River Watch Program, housed at the Indiana DNR is in the process of developing a web site which will enable better coordination and sharing of data by participants in volunteer monitoring programs. This will also help the data be more accessible for watershed planning efforts in the region.

In general, further development of the internet as a tool for data dissemination has tremendous potential to improve utilization of data which is currently collected by federal and state agencies. GIS tools also present great opportunities to make data more understandable and useable for watershed planning and management. However, legal concerns, quality assurance procedures, staff and budget constraints may result in delays in posting results of current monitoring efforts. Costs to convert existing monitoring records into internet accessible databases may be prohibitive, and are unlikely to be high priorities for public agencies under strict fiscal constraints.

Local agencies, private organizations, non-profits, and the general public participating in monitoring projects have even greater obstacles to overcome. Many of these organizations are ill equipped for online data sharing and access. The E. coli Task Force developed a Volunteer Monitoring Network which collects and analyzes watershed samples for e. coli on a weekly basis during the summer months. Participants in this network are local health departments, sanitary districts, POTWs, industries, and state and federal parks. Many of these organizations were not equipped with modern computers or internet access when the project started. Some of these agencies have since upgraded their capabilities, but some continue to fax hand written data sheets to IDEM or EPA staff. The Task Force is in the process of applying for an EMPACT grant to obtain computers and internet access to those agencies. At the same time, EPA is working to establish an internet database. This will enable Network members to share data. Eventually it will also provide the public with access to recent bacteria sampling results in their area. If the internet is to be the mechanism governments use to share information with each other and the public, then greater investment must be made to ensure that all partners have equipment and training to access this new technology.

A terrific opportunity for better coordination of informational resources exists in state and federal agency management of data received from outside partners and the regulated community. In Indiana, IDEM is making great strides to try and make its monitoring data more available. However, little is currently being done to make data submitted by the regulated communities usable. For example, through the TMDL process we have learned that NPDES regulated dischargers have submitted vast quantities of data to IDEM through monthly reports, daily monitoring records, permit renewal applications, and special projects. Once received at IDEM, this data is reviewed for permit compliance, and monthly data is entered into the Permit Compliance System Database. However, other data is simply filed and eventually stored on microfiche. This maybe the case in other states as well. Working on the TMDL, we have found it is often easier to ask the permittees for electronic copies of this data again than to try and extract it from our own filerooms. The daily monitoring records of industrial and municipal dischargers could provide valuable clues to the sources of loadings measured and modeled in the Lake Michigan Mass Balance. This information will be critical to future efforts to reduce pollutant loadings to Lake Michigan. Agencies have it, but it is not in a usable format at the current time.

Conclusions

This project has not collected as much information about ongoing monitoring programs in the area of concern as was initially hoped. One obvious cause of this problem was an initial misinterpretation on the part of IDEM as the goals of the project. However, other important lessons were also learned.

Future efforts might do well to focus on the distinctions between ongoing monitoring programs and short term data collection projects. Large quantities of information may be gathered by academic researchers, consultants, and others during short term projects. Much of this information may not be captured by a survey about monitoring. Also, a better ability to adapt the survey into the jargon of different fields may have resulted in more responses. Monitoring tends to be a term associated with more closely with chemical sampling than other areas of data collection.

Finally, there is a critical distinction that could be made between two types of problems related to monitoring. The focus of this project has been on discovering what monitoring is occurring with an eye to future coordination of these efforts. Many of the problems identified through research on this project seemed to revolve around data sharing. These two issues are separate, but intertwined. Improving data sharing capabilities may be first key step in moving toward better coordinated monitoring.