

# 2003 LAKE SUPERIOR PILOT BEACH MONITORING and NOTIFICATION PROGRAM and RELATED LAKE SUPERIOR PROGRAMS



Minnesota Pollution Control Agency

May 2004

Minnesota Lake Superior Beach Monitoring and Notification Program  
525 South Lake Avenue, Suite 400 ♦ Duluth, MN 55802  
800-657-3864

# Introduction

Although Minnesota is rich in lakes and streams, it is easy to pick out the most spectacular water body in or adjacent to Minnesota: Lake Superior. In 2003 a little tarnish, or bacteria in this case, blemished the image of the glorious Great Lake.

The bacteria were discovered by the Minnesota Pollution Control Agency (MPCA), in partnership with the three counties along Lake Superior's North Shore, which began a beach monitoring and notification program.

High counts of indicator bacteria found in a handful of Lake Superior beach water quality samples surprised both MPCA staff and the public. Most people thought that the lake is too clear and cold to support bacteria, and even if some fecal contamination reached the lake, it would be diluted to safe levels. It was obvious almost from the beginning that this is not true.

**To best understand the monitoring program's scale and context, we offer three facts about the lake called Gitchi Gummi by indigenous people:**

## **SHEER SIZE**

- The surface of this magnificent lake is the largest freshwater body in the world. It is third largest by volume.
- On average, a droplet of water entering the lake at Duluth will take 191 years to reach Sault Ste. Marie where Lake Superior empties into Lake Huron.
- The lake is a stunning 1,332 feet deep at its deepest point, averaging 483 feet deep.
- It covers 31,700 square miles (about the same size as Maine) and drains 49,300 square miles of adjacent land (about the same size as North Carolina).
- The shoreline and islands that rim the lake stretch 2,726 miles.

## **VULNERABILITY**

Despite its immense size, Lake Superior is surprisingly vulnerable. Lake Superior's year-round cold temperatures (averaging 40 degrees Fahrenheit) and small amount of

entering nutrients result in a simple and fragile food chain. Because Lake Superior is nourished by forests and watered by streams, changes on the land become changes in the lake. We find algae blooms in Lake Superior bays, decreasing clarity in the lake's western arm, contaminated sediment in the Duluth-Superior harbor (one of the lake's 43 Areas of Concern) and toxic contaminants building up in the food chain.

## **CURRENT CONDITION**

Unlike other water resources such as the Mississippi and Minnesota Rivers and the lower Great Lakes, most of Lake Superior has never suffered the extreme degradation that once characterized these waters. Slowly, carefully, and with considerable effort and expense, those waters are

being reclaimed. The challenge with Lake Superior is to keep it as clean as it is now and to clean up problems that have been found.

The MPCA, other government agencies, and non-profit organizations are tackling the restoration and protection of Lake Superior through a variety of approaches. One of the most recent is the Lake Superior Beach Monitoring and Notification Program (Beach Program).



*Like all good programs, the Minnesota Lake Superior Beach Monitoring and Notification Program (Beach Program) does not work in a vacuum. The Beach Program is one of many local partnering, monitoring, and action programs currently working to protect and restore Lake Superior. The following report summarizes some of those programs that have partnered with the MPCA Beach Program and how they work together to keep Lake Superior great.*



# Table of Contents

<i>Introduction</i> .....	1
<i>Lake Superior Beach Monitoring and Notification Program</i> .....	3
Swimming Beach Monitoring in Minnesota .....	3
Beach Program Guidance Team Members.....	6
<i>Planning Efforts in Lake Superior Basin</i> .....	7
Lake Superior Basin Plan .....	7
Coastal Nonpoint Pollution Program .....	8
Lake Superior Lakewide Management Plan (LaMP).....	9
<i>North Shore Wastewater Projects and Related Development Issues</i> .....	10
North Shore Development .....	10
North Shore Wastewater Management Projects .....	11
<i>Monitoring Efforts</i> .....	12
DuluthStreams.org .....	12
An Assessment of Representative Lake Superior Basin Tributaries 2002 .....	13
WLSSD Water Quality Monitoring Program .....	14
<i>Education and Outreach</i> .....	15
Nonpoint Education for Municipal Officials (NEMO).....	15
Regional Stormwater Protection Team (RSPT) .....	16
<i>What's Ahead for 2004</i> .....	17
Planned Activities for 2004 Beach Monitoring Season.....	17
Minnesota Beach Monitoring Website	
Beach Advisory E-mail Alert Service	
Site Specific Follow-Up	
Implementation Stage of Lake Superior Basin Plan	
Snow Melt Monitoring	
RSPT Adult Education Campaign	
Minnesota Water Standards Revision	
Ongoing Basin Tributary Assessment	
New Beaches Added to Monitoring Schedule	
High-Use Weekend Sampling	
Event Follow-up Sampling	
<i>What You Can Do</i> .....	19
When at the Beach .....	19
When at your Home .....	19
When on your Boat .....	19
<i>Acknowledgements</i> .....	19

# Lake Superior Beach Monitoring and Notification Program

*It's no accident Minnesota promotes itself as 'the land of 10,000 lakes.' Aesthetically, recreationally and economically rewarding, its pristine water resources generate multiple billions of dollars from rat-race escapees and baby boomers seeking second homes along a quiet lakeshore, outdoor enthusiasts fishing for lake trout and walleye, tourists who've never seen a "saltie" or an ore carrier sailing the greatest of lakes, Lake Superior, and a host of industries requiring fresh--and clean--water for paper milling, mining and manufacturing processes.*

## Swimming Beach Monitoring in Minnesota

Currently, Minnesota does not require beach water testing. As a result, water sampling and announcements of unsafe swimming conditions are inconsistently issued. In 2000, the federal Beach Environmental Assessment and Coastal Health (BEACH) Act, an amendment to the Clean Water Act, called on Minnesota to monitor water quality at public beaches and improve public communication of health risks at coastal beaches on Lake Superior.

The key emphasis of the BEACH Act is to significantly reduce exposure and risk of water-borne disease for users of recreational waters. Minnesota's program, administered by the Minnesota Pollution Control Agency (MPCA), supports these objectives by monitoring the coastal recreational waters on Lake Superior, revising state water quality standards for pathogens or pathogenic indicators, and supporting and participating in national efforts to improve scientific methods and research designed to improve recreational water quality.

Lake Superior is Minnesota's only coastal recreation waterway, and 2003 was the first year monitoring for fecal indicator bacteria occurred along most of the northern shores of Lake Superior. The program is a cooperative effort with Minnesota Department of Health (MDH); St. Louis, Cook, and Lake County Health and Environmental Departments; and other private and public organizations along Minnesota's Lake Superior shore.

The program's goal is to assure safe and healthy aquatic recreation by informing the swimming public about the risk of contracting waterborne diseases from exposure to contaminated waters. The program collects samples from 35 Lake Superior beach locations, stretching from Boy Scout Landing in West Duluth to Paradise Beach Northeast of Grand Marais, May thru October and analyzes those samples for waterborne indicator bacteria.

Lake Superior recreators and basin residents are encouraged to help protect our ground and surface waters by properly disposing of pet waste and garbage, keeping diapered children out of the water (or dressing them in rubber pants), using natural lawn and garden fertilizers, maintaining septic systems, emptying marine and recreational boating waste into proper receptacles, and conserving water.

Additional Beach Program partners include Cook, Lake, and St. Louis Counties; City of Duluth; Western Lake Superior Sanitary District (WLSSD); University of Minnesota Duluth (UMD) Biology Department, Outdoor Recreation Program, Minnesota Sea Grant, and Natural Resources Research Institute (NRRI); Duluth Boat Club; Park Point Community Club; Clean Water Action; and the State of Minnesota's Coastal Zone Program.

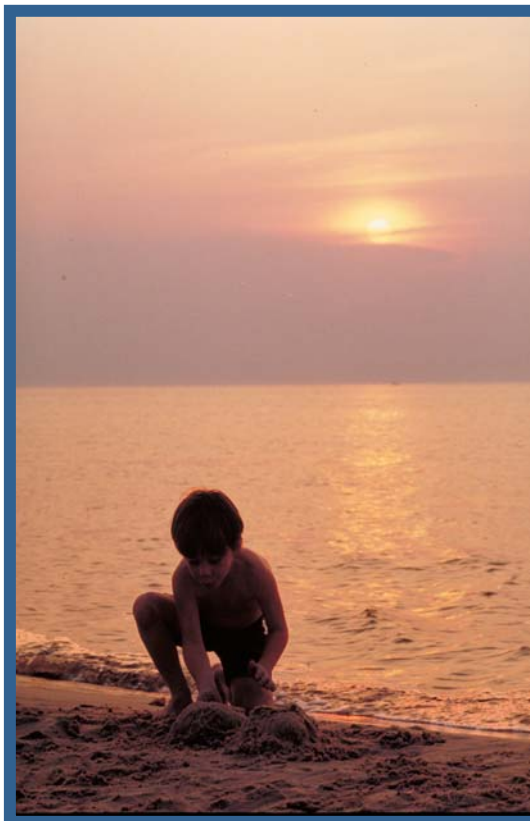
## Swimming Beach Water Quality Standards

Minnesota and U.S. Environmental Protection Agency (EPA) recommendations for posting advisory signs at swimming beach areas are based upon the *E. coli* or fecal coliform bacteria content of water samples collected.

Evaluation of water sample results is based on the EPA recommendations for acceptable *E. coli* levels, and Minnesota fecal coliform standards as specified in Minnesota Rule 7050.0222.

The federal acceptable water sample standard for *E. coli* is:

1. The geometric mean based on not less than five samples within a 30-day period shall not exceed 126 *E. coli* colonies per 100 ml of water; and
2. Content shall not exceed 235 *E. coli* colonies per 100 ml of water in a single sample.



# Lake Superior Beach Monitoring and Notification Program

The state acceptable water sample standard for fecal coliform is:

1. The geometric mean based on not less than five samples within a 30-day period shall not exceed 200 fecal coliform colonies per 100 ml of water; and
2. Content shall not exceed 400 fecal coliform colonies per 100 ml of water in more than ten percent of all samples taken during any 30-day period.

## Advisory Signs

Beach advisory signs are posted when sample analysis results indicate bacteria levels above the established standard, signifying the possible presence of disease-causing organisms.

These advisories are recommendations to the public to avoid water contact at the beach until further analyses reveal safe conditions.

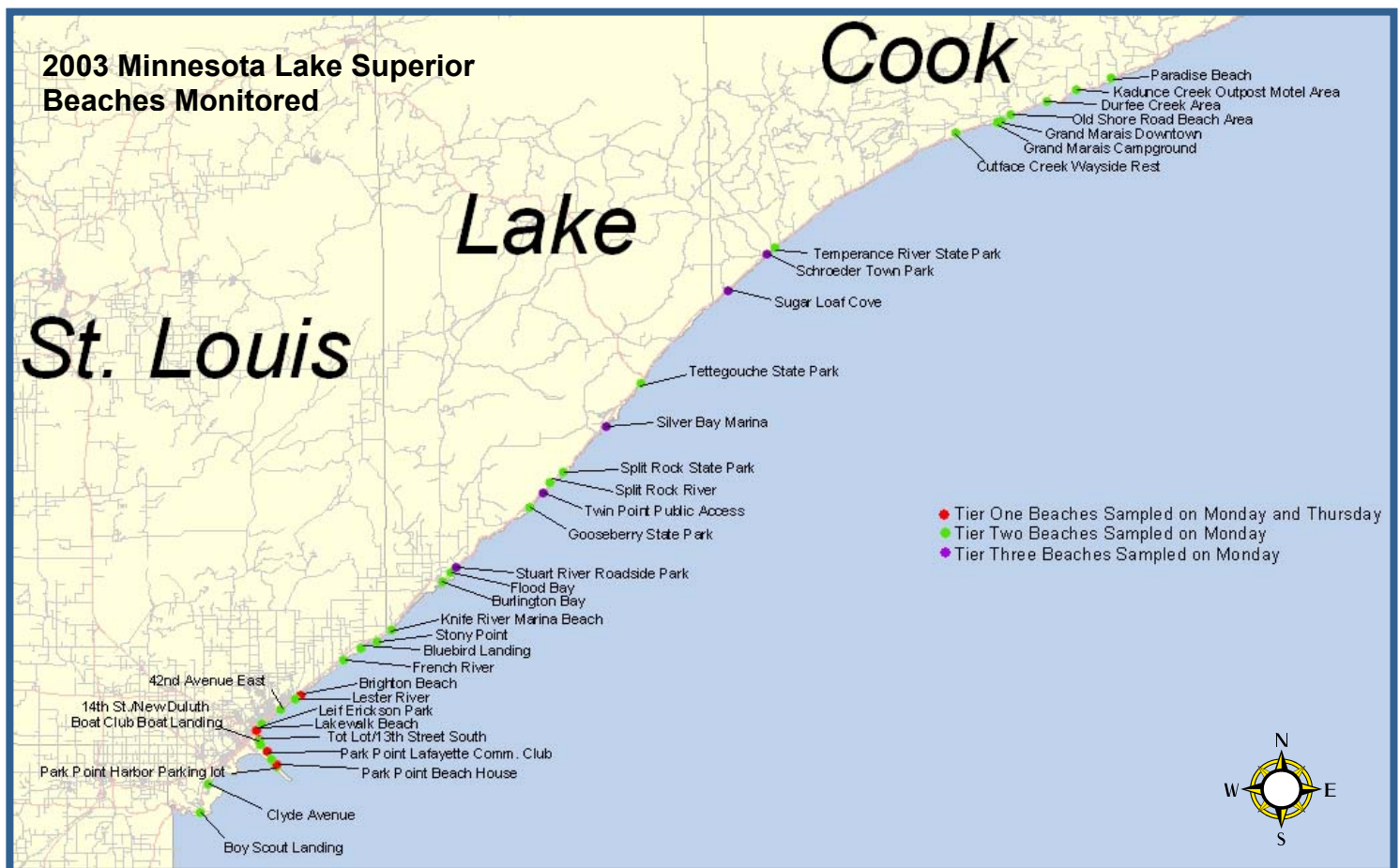
Advisory signs are removed when sample analysis results return to below the established standard, and the 5-sample geometric mean levels are acceptable.



## 2003 Monitoring Season

The 2003 pilot monitoring season was an eye-opening experience for all involved and the residents of the Lake Superior watershed. Staff were surprised at the number of “water contact not recommended” advisories they posted at public swimming beaches and boat-access points due to elevated *E. coli* and fecal coliform levels. Weekly testing at 35 locations resulted in 19 advisories at 10 sites. Most advisories were posted for one or two days, however the longest posting at Duluth’s New Duluth Boat Club / 14th Street Beach on the harbor-side of Park Point spanned 39 days. Fortunately for Lake Superior swimmers and recreators, 96.4 percent of the 1,678 samples collected during the 2003 beach monitoring season were within acceptable bacteria levels.

Laboratory tests only measure bacteria counts, not determine sources. Grant restrictions prevent the MPCA from testing samples for DNA markers or track likely sources. Fortunately, other organizations have picked up where the Beach Program leaves off. Several legislative and grant proposals have been submitted by Beach Program partners to work towards identifying fecal contamination sources at some sites via DNA fingerprinting and other cutting-edge identification methods.





# Lake Superior Beach Monitoring and Notification Program

Obvious contaminants such as geese, rabbit, and dog droppings, and dirty diapers likely caused some of the high bacteria levels. Other possible contributors include sewer system breakages and overflows, outdated individual septic systems, low-flow conditions in rivers, and warm, dark undisturbed water in the St. Louis River harbor.

## What are *E. coli* and Fecal Coliforms?

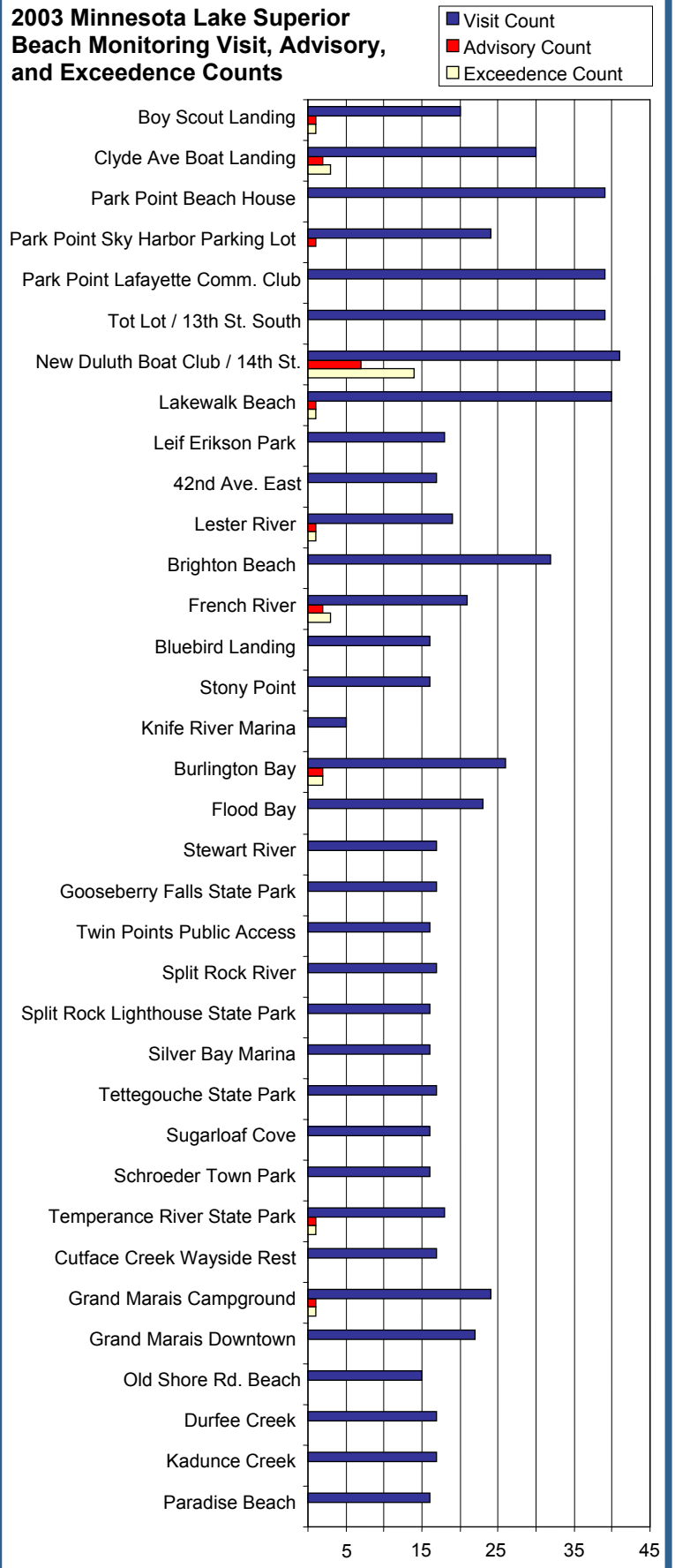
The vast majority of bacteria in streams and lakes are 'good' bacteria. They do not cause diseases and are necessary for healthy ecosystems to function properly.

In almost all cases of water-borne illnesses the disease causing organisms, technically called pathogens or pathogenic organisms, come from untreated human waste or feces. The most common illness associated with swimming in and ingesting contaminated water is gastroenteritis which can cause nausea, vomiting, abdominal cramps, fever, headache, and diarrhea. Other illnesses associated with swimming in such waters include eye, ear, nose, and throat infections.

Direct testing for pathogens is expensive and impractical, as pathogens are rarely found because they usually occur sporadically and mostly at low levels. Instead, public health agencies look for the presence of "indicator" species, so called because their presence indicates that fecal contamination may have occurred. The two most commonly used indicators for recreational waters are fecal coliforms and *E. coli* (short for *Escherichia coli*). These are bacteria that live in the lower intestines of warm-blooded animals, including wildlife, farm animals, pets, and humans, and are excreted in their feces. In fact, the bacteria may constitute a significant fraction of fecal waste. *E. coli* and fecal coliform are not usually pathogenic, but their presence can indicate sewage contamination, perhaps accompanied by disease-causing pathogens.

According to MDH, during the 2003 beach monitoring season there were no reported water contact related health problems. That does not mean there were no illnesses. People reporting similar symptoms are often assumed to have food-borne illnesses and are investigated accordingly. MDH requests people who experience illness following water contact to report their condition to the county health department. County staff are required to report such illnesses to MDH for further investigation. Timely reports may also prevent others from becoming ill from the same contaminated site.

**2003 Minnesota Lake Superior Beach Monitoring Visit, Advisory, and Exceedence Counts**



# *Lake Superior Beach Monitoring and Notification Program*

## **Beach Monitoring in Other Coastal States**

BEACH Act Grants are awarded to eligible coastal and Great Lakes states, territories, and tribes to develop and implement beach monitoring and notification programs. Information about other states' beach programs can be obtained through the EPA's Beaches web site at <http://www.epa.gov/beaches/>.

## **For More Information**

Heidi Bauman, MPCA

Direct: 218-723-4953

Toll-Free: 800-657-3864

E-mail: [Heidi.Bauman@pca.state.mn.us](mailto:Heidi.Bauman@pca.state.mn.us)

<http://www.pca.state.mn.us/water/beaches/>



## **Beach Program Guidance Team Members**

---

Minnesota Pollution Control Agency (MPCA), Lake Superior Beach Monitoring and Notification Program	
Program Coordinator.....	Heidi Bauman
Information Technology.....	Melissa Rauner
Cook County Planning Department.....	Karen Evens
Lake County Health Department.....	Michelle Larson
St. Louis County Health Department.....	Roger Bard
Minnesota Department of Health (MDH),	
Environmental Health.....	Randy Ellingboe
Northeast District Epidemiologist.....	Amy Westbrook
Minnesota Department of Natural Resources (DNR),	
Lake Superior Coastal Program.....	Tricia Ryan
Western Lake Superior Sanitary District (WLSSD),	
Manager Environmental Services.....	Joe Stepun
Information Officer.....	Karen Anderson
City of Duluth	
Stormwater Utility.....	Marion Lonsdale
Parks and Recreation.....	Julene Boe
Information Office.....	Jeff Papas
University of Minnesota Duluth (UMD),	
Department of Biology.....	Randy Hicks
Recreational Sports and Outdoor Programs.....	Greg Eliason
Natural Resources Research Institute (NRRI).....	Rich Axler
Minnesota Sea Grant.....	Jesse Schomberg
Park Point Community Club.....	Kinnan Stauber
Duluth Boat Club.....	Keith Stauber
City of Minneapolis.....	Laura Huseby
Clean Water Action.....	Rosie Loeffler-Kemp
Minnesota Pollution Control Agency (MPCA),	
Community and Area-Wide Program Supervisor.....	Pat Carey
Lake Superior Basin Program.....	Brian Fredrickson
Water Quality Monitoring.....	Jesse Anderson
Lake Superior Basin Initiative Coordinator.....	Chris Butler
Information Officer.....	Anne Moore

# *Planning Efforts in Lake Superior Basin*

*The Beach Program brought together researchers, scientists, politicians, information officers, concerned citizens, and the recreating community to take a look at the bacteria issue and how it affects human health in those that use Lake Superior for recreating. There are many programs, in various stages of development or implementation that are working to protect or improve Lake Superior. At the MPCA, staff are working on the Lake Superior Basin Plan to pull together water and land resource management agencies to work together on basin issues. The Minnesota Department of Natural Resources Coastal Non-Point Program is targeting nonpoint issues on the North Shore. The recently organized Regional Stormwater Protection Team will start their education program this spring. There are many other groups, programs and projects and these are but a few which are Beach Program partners.*

## **Lake Superior Basin Plan**

MPCA's Lake Superior Basin Plan is an effort to combine the resources of numerous agencies at the local, state, tribal and federal levels to more effectively address water quality issues. It is one of ten major watershed-based studies in Minnesota; none are intended as replacements for local initiatives or plans that already exist, but rather extensions of these policies. The plan also consists of recommendations for the protection of threatened waters and restoration strategies for impaired waters.

Although MPCA is facilitating and participating as a partner in the process, the basin plan will be created by the participants and will not be a MPCA plan. Basin plan implementation and success depends upon partnerships among resource managers, landowners, industry, agriculture, local, state, federal, and tribal

governments, advocacy groups, academia, etc. Thus, all parties must participate in the development of the basin plan so they are supportive and comfortable with the implementation process.

### **Lake Superior Basin Plan Report**

The final product of the Lake Superior Basin planning process is the Lake Superior Basin Plan, also known as the Water Quality Plan, and will document water management activities for the Lake Superior Basin for a five year period.

The Basin Plan was built from local plans and is intended to enhance implementation of locally-identified goals, objectives and strategies. Additionally, the Basin Plan can be used for obtaining resources. Local units of government can use the plan to obtain technical assistance and grants; state and federal agencies may use the Plan in

allocating staffing and financial resources to the Lake Superior Basin.

### **Getting Involved**

The residents in the Lake Superior Basin will serve as the court of the public opinion for the plan's development and implementation. Therefore, the views and perspectives of average citizens are extremely important to the process.

Residents will be asked to submit their ideas, comments, and concerns about plan development at various stages. Comments submitted verbally or in writing will become part of the public record. These comments, along with the responses of the Programmatic Work Group (PWG), will be disseminated widely throughout the process.

This public distribution of comments and responses should make it apparent if important comments or good ideas are not given adequate consideration. Residents may submit their comments online through the "Lake Superior Listening Log form" (<http://www.pca.state.mn.us/water/basins/superior/lbsbasin/listeninglog.html>), or by mailing them to MPCA, Attention: Lake Superior Basin Planning, 525 South Lake Avenue, Suite 400, Duluth, MN 55802.



### **For More Information**

Brian Fredrickson, MPCA

Direct: 218-723-4663

Toll-Free: 800-657-3864

E-mail: [Brian.Fredrickson@pca.state.mn.us](mailto:Brian.Fredrickson@pca.state.mn.us)

<http://www.pca.state.mn.us/water/basins/superior/lbsbasin>



## *Planning Efforts in Lake Superior Basin*

### **Coastal Nonpoint Pollution Program**

Under the umbrella of the Lake Superior Basin Planning process, Minnesota's Lake Superior Coastal Nonpoint Pollution Control Program is designed to reduce nonpoint pollution in the Lake Superior Basin. The Coastal Nonpoint Program is being co-facilitated by both the MPCA and Minnesota Department of Natural Resources (DNR). Numerous partners are involved in this effort, including state, federal, tribal and local governments, agencies, and citizens

#### **Program Benefits**

The Coastal Program and Coastal Nonpoint Program provide opportunities for securing federal funding and technical assistance in order to protect and enhance local natural resources and support community goals. Program development also encourages cooperation and improves efficiency among partners managing natural resource programs. As a result we can better prevent erosion and stop polluted runoff from reaching the many high quality waters of Minnesota's Lake Superior Basin.

#### **Background Information**

Minnesota became part of the national Coastal Management Program after receiving federal approval in July 1999. Upon acceptance to the national coastal program, the State of Minnesota had 30 months to develop a nonpoint pollution control program that is equivalent to the federal guidance for addressing nonpoint issues in the Lake Superior basin or watershed.

Final approval of the Coastal Nonpoint Program will come when the National Oceanic and Atmospheric Administration (NOAA) and EPA determine that Minnesota's program is the equivalent of the federal nonpoint pollution management measures.



#### **For More Information**

Brian Fredrickson, MPCA

Direct: 218-723-4663




Toll-Free: 800-657-3864

E-mail: [Brian.Fredrickson@pca.state.mn.us](mailto:Brian.Fredrickson@pca.state.mn.us)

<http://www.pca.state.mn.us/water/basins/superior/coastalnp.html>



### **Fascinating Facts... Beach Sweep**

-  During the 2003 International Coastal Cleanup along the Minnesota Lake Superior coast, 334 volunteers of all ages collected 1,467 pounds of debris, filling 127 garbage bags along 15.25 miles of Duluth and North Shore beaches.
-  Also as part of the 2003 International Coastal Cleanup, 12 volunteer divers collected 90 pounds of debris from the Lakewalk and Lester River Mouth areas, filling 8 garbage bags.
-  During the 2002 International Coastal Cleanup, 5,241 cigarette butts, 2,372 food or beverage related wrappers, 53 apparel pieces, 50 toys, 33 tarps, 7 diapers, 1 tire, and much more were removed from Lake Superior Beaches in Duluth.

## *Planning Efforts in Lake Superior Basin*

### **Lake Superior Lakewide Management Plan (LaMP)**

Toxic chemicals in Lake Superior's fish, water, sediment and air are the main concern of the Zero Discharge

Demonstration, which is part of the Lake Superior Lakewide Management Plan (LaMP). Using advice from a binational citizen's group, governments from both sides of Lake Superior have established a reduction schedule for nine persistent bioaccumulative toxic chemicals, called the "nasty nine." These chemicals include mercury, PCBs, dioxin and other by-product chemicals, and some banned pesticides.

#### **Minnesota LaMP Initiatives**

One current Minnesota LaMP effort is a rural electric cooperatives project that involves identifying transformers likely to contain PCBs and contracting with cooperatives to remove the suspect transformers.

Other recent projects include contracting with two counties to remove abandoned white goods from dump sites in the Lake Superior Basin; seven small contracts for municipal mercury reduction projects; a project to distribute amalgam separators to dentists in the Lake Superior Basin;

a thermostat swap project; and production and distribution of mercury and PCB use tree posters and cards distributed to U.S. Forest Service and U.S. Park Service campgrounds that encourage campers to avoid burning trash.



#### **LaMP 2004 Report**

A summary of recent toxics reduction activities carried out in Minnesota, Wisconsin, Michigan and Ontario can be found in Chapter 4a of the LaMP 2004 Report. Additionally, the report covers other LaMP aspects, including sustainability and habitat.

CDs are available from the MPCA and the report is also on the internet at

[www.epa.gov/glnpo/lakesuperior/2004](http://www.epa.gov/glnpo/lakesuperior/2004)

#### **For More Information**

Carri Lohse-Hanson, MPCA

Direct: 651-296-9134

Toll-Free: 800-657-3864

E-mail: [Carri.Lohse-Hanson@pca.state.mn.us](mailto:Carri.Lohse-Hanson@pca.state.mn.us)

[www.epa.gov/glnpo/lakesuperior/2004](http://www.epa.gov/glnpo/lakesuperior/2004)



### **Lake Superior Creation... Fire and Ice**

One billion years ago, molten basalt erupted from the Mid-Continent Rift. This rift extended from near Detroit, Michigan, north through what is now Lake Superior, to Minnesota, and then south to Kansas. Lava flowed from the rift for 22 million years, resulting in a layer of basalt as much as ten miles thick. Billions of tons of molten rock, moving from underground to the surface, caused the surface to gradually sink as the earth's crust pulled apart, forming the broad, shallow Superior basin.

Had the rift continued to evolve, the North American continent would have split in two, and Duluth might now be on the shore of an ocean instead of a lake. But the deep forces that fueled the rifting stopped, leaving behind the basalt-covered North Shore. The basin continued to sink, accumulating eroded sand and mud. Ancient rivers deposited the sand that became the Apostle Islands and Bayfield Peninsula in Wisconsin. Shallow seas flooded the southeastern part of the basin and deposited the sandstone found today in Pictured Rocks National Lakeshore in Michigan. The area became stable about 500 million years ago. Starting two million years ago, a series of glacial ice advances and retreats began to sculpt the basin into its present shape.

Ten thousand years ago, the last ice mass began a slow retreat from western Lake Superior while the eastern drainage outlet was still blocked by ice. Impounded water caught between the ice front and the southwestern highlands formed Glacial Lake Duluth. The wave-cut cliffs and terraces that line Duluth's Skyline Drive about 600 feet above the present lake level are the remains of one of the highest former shorelines of Glacial Lake Duluth.

Water flowed out of this large glacial lake through Wisconsin's Brule River Valley into the St. Croix River, and then to the Mississippi River. Another route took it past Carlton, Minnesota, and into the Kettle River. As the ice retreated, Lake Superior's present outlet was established through the St. Marys River, and the water level fell.

# North Shore Wastewater Projects and Related Development Issues

*In the good old days, going “up north” meant a little fishing, a lot of silence, and no one else in sight. Now, the view is cluttered with new developments, signage, cleared forest-land, and crushing traffic. The changing face of Minnesota’s lakeshore isn’t necessarily bad, but it is happening rapidly. Whether fast-paced land consumption on and near lakes is regarded as unsightly sprawl or economic growth, it has far-reaching effects. Communities that want to safeguard the vibrant lake country must plan wisely to preserve the social, historical, economic and environmental heritage of our lakes – now, before we lose what we love.*

## North Shore Development

Minnesota is now the fastest-growing state in the Midwest, adding more than 400,000 people in the last decade. Growth rates are highest in the Twin Cities Metro area, Cook County, and along a corridor from Olmsted County in the southeast to Lake of the Woods in the northwest. The three counties lining the North Shore of Lake Superior average a 6.6 percent annual growth rate. With rapid growth comes conflicting perceptions about the nature and severity of development pressure. Developers say their projects will attract jobs, people and opportunities; the resulting impact to the local environment may not be as easily measured as the increased tax base.

The real costs of growth aren’t always obvious as it’s often difficult to see past the promise of new homes, jobs and tourist dollars.

According to 1000 Friends of Minnesota, a smart-growth coalition, for every housing unit built a community spends another \$18,374 in services and supporting infrastructure (roads, storm and sanitary sewers, water supply and erosion control). In addition, multiply each new resident by the average person’s annual water use (16,425 gallons), solid waste generated (over one ton), vehicle emissions (10,727 pounds per car), and the potential environmental impacts become overwhelming. Unknown are rapid development’s costs on wildlife habitat and natural resources, which no amount of money can fully restore after they’ve been damaged or lost.

### State and Regional Smart Growth Goals

The state’s goals, outlined in the Minnesota Statutes on Sustainable Development, describe the challenge; maintain or enhance economic opportunity and community well-being while protecting and restoring the natural environment upon which people and communities depend.

Also, communities must meet the needs of the present without compromising the ability of future generations to meet their own needs.

Promoting regional cooperation has become a cornerstone of MPCA’s efforts to encourage a healthy discussion on growth. Methods include:

- Stimulating regional planning by linking state spending for local infrastructure to regional cooperation;
- Encouraging the protection of lake, stream and ground-water quality by providing data to communities drafting comprehensive plans;
- Encouraging use of ordinances for local management of stormwater, wetlands, buffer zones and septic systems; and
- Involving citizens and stakeholders in decision-making.



### Conclusion

Given the significant appeal of the North Shore’s natural environment, it is no wonder that more people are making it their home or home away from home. The influx can be significant: it is possible for the number of people inhabiting one piece of property to literally double over a relatively short period

of time. Between 1990 and 1995, 50 new lodging establishments were built along the North Shore; many other complementary construction projects have followed since: wastewater plant upgrades and expansions, a new Gooseberry State Park Visitors Center, Highway 61 improvements, and “cabins” that rival urban mansions. As development occurs, the question is not “When?” but “How?” It is up to the residents, planners and visionaries to craft a solution that will balance environmental protection with other competing interests. The ultimate plan must protect the abundance of natural resources that brought us here in the first place.

### For More Information

Tom Estabrooks, MPCA

Direct: 218-725-7763

Toll-Free: 800-657-3864

E-mail: [Tom.Estabrooks@pca.state.mn.us](mailto:Tom.Estabrooks@pca.state.mn.us)

[http://www.pca.state.mn.us/publications/](http://www.pca.state.mn.us/publications/wq-b2-03.pdf)

[wq-b2-03.pdf](http://www.pca.state.mn.us/publications/wq-b2-03.pdf)



# *North Shore Wastewater Projects and Related Development Issues*

## **North Shore Wastewater Management Projects**

### **Duluth/North Shore Sanitary District (D/NSSD) Sewer Extension Project**

The Duluth/North Shore Sanitary District (D/NSSD) has begun construction of a wastewater collection system to extend sewer service along the Lake Superior shoreline. The sewer will service the area between the city of Duluth, the Lake Superior shoreline, U.S. Highway 61 expressway and the St. Louis County border. Additionally, a storage tank was constructed to temporarily store wastewater during high-flow periods and minimize by-pass opportunities. The wastewater from this area will be treated at the Western Lake Superior Sanitary District (WLSSD) wastewater treatment facility.

### **D/NSSD Project Progress and Planned 2004 Activities**

- Construction of mainline piping and infrastructure is near completion. Restoration activities and finishing touches should be completed in upcoming months.
- Construction of the 300,000 gallon storage basin was completed in early 2003.
- Telecommunication systems are presently being hooked up and will be operational prior to adding wastewater flow.
- Installation of lateral lines, grinder pump installation and connection to the residential gravity drains started in 2003 and is entering the second year of construction.
- Its anticipated wastewater service will be in place for approximately one-half of the system connections by the end of the 2004 construction season.
- At this time, there are approximately 200 grinder pumps and associated lateral lines installed. The remaining activities for these installations are the connection to gravity building drains and start of wastewater flow in the system. It's anticipated the first home to be connected to the system will be mid-May 2004. The contractor has expressed a goal of connecting approximately 15-20 homes per week.

### **Knife River/Larsmont Sanitary District (KR/LSD) Wastewater Project Proposal**

The Knife River/Larsmont Sanitary District (KR/LSD) consists of the communities of Knife River and Larsmont. Both are located along the North Shore of Lake Superior,

nestled in Lake County between the U.S. Highway 61 expressway and the Lake Superior shoreline.

Knife River completed a collection system and wastewater treatment plant in 1984. That plant is still operational and performing at acceptable levels. The Larsmont neighborhood is currently serviced by individual onsite sewage treatment systems.

Currently, the KR/LSD board is reviewing two wastewater management proposals:

- 1) Construct new pipeline and collector system for Larsmont; connect the existing Knife River collection system and new Larsmont system to the D/NSSD which is currently under development (wastewater ultimately treated at WLSSD); remove the Knife River wastewater treatment facility from service; and develop a storage tank to minimize by-pass risks, or
- 2) Upgrade the existing Knife River wastewater treatment plant and existing onsite systems in the Larsmont neighborhood.

The KR/LSD board will vote in late June on the proposals.

### **Environmental Review**

MPCA staff prepared an Environmental Assessment

Worksheet (EAW) for the D/NSSD and Knife River sewer extensions. The public comment period for the EAW began on August 20, 2001 and ended October 3, 2001. Thirteen comment letters and e-mails were submitted.

The MPCA found that the environmental effects of the project that can reasonably be expected to occur could be anticipated and controlled. In January 22, 2002, the MPCA Citizens Board approved the EAW as submitted, and determined an Environmental Impact Statement study was not needed.



### **For More Information**

John Thomas, MPCA

Direct: 218-723-4298

Toll-Free: 800-657-3864

E-mail: [John.Thomas@pca.state.mn.us](mailto:John.Thomas@pca.state.mn.us)

## Monitoring Efforts

*The beauty and unique setting of Lake Superior's North Shore have made the region a popular recreation destination. It is likely that the number of recreationists drawn to the North Shore will continue to increase over the years to come. A substantial part of their recreational experience is due to the quality of the environment.*

*Unfortunately, the same natural features that draw recreationists to the North Shore can make it more susceptible to degradation from the increased attention. For example, cool and cold water fisheries (such as trout) have low tolerances for increased temperatures and the quantities of sediment and nutrients that can originate from typical urban settings.*

### DuluthStreams.org

Duluth has one of the highest densities of stream corridors of any of the more than 150 metro areas established by EPA's Environmental Monitoring for Public Access and Community Tracking (EMPACT) programs. Streams form the fabric of the aesthetic appeal and character of Duluth, but are also the core of the city's stormwater runoff system with 250 miles of storm sewer, 93 miles of creek, and over 138 miles of roadway ditches. Urbanization and rural development are placing increased pressure on Duluth's streams, and in particular, on its 12 designated trout streams. Fish and amphibians, and the invertebrates that sustain them are being impacted by increased temperature, excess turbidity and suspended sediment, road salts, organic matter, and nutrients. Further, these streams discharge directly into ultraoligotrophic Lake Superior, the focus of the International Joint Commission Zero Discharge Demonstration Project, or indirectly via the St. Louis River-Duluth Superior Harbor, already a Great Lakes Area of Concern.

In 1998, Duluth established a stormwater utility to address the quality and quantity of surface water moving through the city and is now developing a Surface Water Management Plan. Despite a strong attachment to Duluth's streams, there has already been resistance from citizens to the increased charges needed to pay for the Plan, the monitoring, and the necessary infrastructure improvements.

This project forms a partnership between the City of Duluth, University of Minnesota research, education and outreach professionals at the Natural Resources Research Institute (NRRI) and Minnesota Sea Grant with demonstrated expertise in EMPACT's goals, the MPCA, the WLSSD, and the Great Lakes Aquarium. The primary goal is to enhance public understanding of aquatic ecosystems, the influence of land uses in their watersheds, and the importance of these systems to both economic and environmental sustainability.

The project, DuluthStreams.org, has these goals:

1. Install in-stream sensors and integrate real-time sensor data with historical and current monitoring data for four

representative watersheds in the Duluth metropolitan area;

2. Gather historical water quality and biological data from agency and academic research programs for all 42 Duluth urban streams, incorporating the results of ongoing city operations, agency and academic studies;
3. Combine these data with appropriate watershed-based land use and cultural data into a GIS-linked database;
4. Develop advanced interactive data visualization tools to animate and simplify the presentation and interpretation of complex, real-time stream data;
5. Place data into an internet, kiosk, and programmatic framework that provides not only public access to data, but also the educational materials required for data interpretation;
6. Develop curricula to accompany the data for area schools and colleges;
7. Implement mechanisms for incorporating public input into the decision-making process.



### Results

The website **DuluthStreams.org** is the project's focus. Some sections are still under construction, but the site now offers water quality, biological and GIS data, and a variety of formal and community educational material. Near real-time intensive data collection began in Summer 2002 at three urban streams and the St. Louis River and has continued to present except for periods when the streams are frozen. The project and its partnership has grown to provide data for other streams, information from nearby communities in the region, St. Louis *RiverWatch* volunteer monitoring program materials, and it will provide a common source of information for the newly created Regional Stormwater Protection Team (RSPT).

#### For More Information

Richard Axler, UMD - NRRI

Direct: 218-720-4316 / 4279

E-mail: [raxler@nrri.umn.edu](mailto:raxler@nrri.umn.edu)

<http://duluthstreams.org>



## Monitoring Efforts

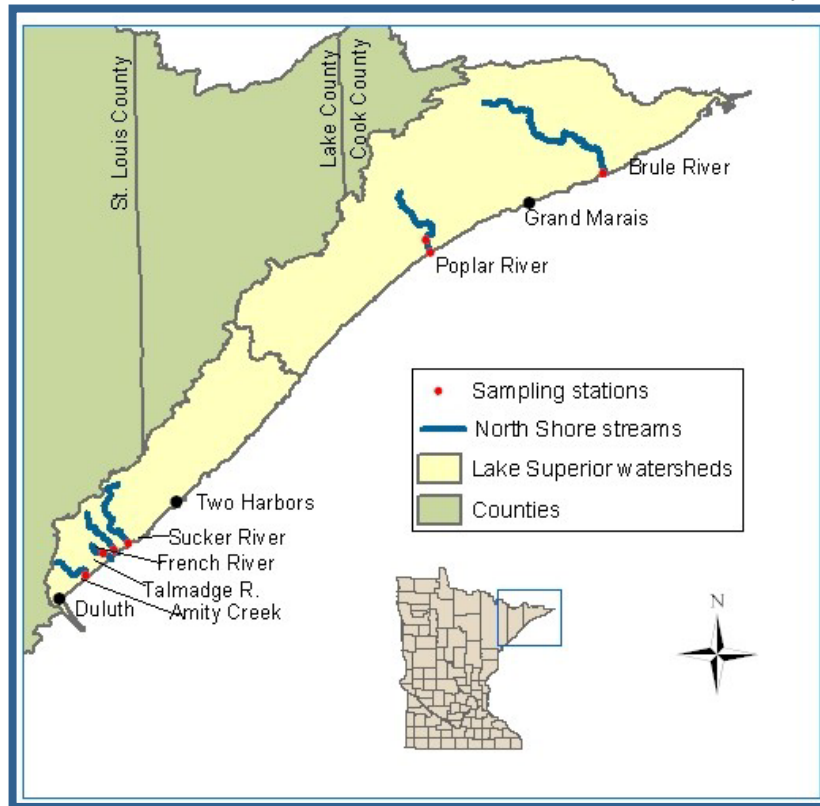
### An Assessment of Representative Lake Superior Basin Tributaries 2002

#### Assessment Overview

Water quality and streamflow were monitored on six North Shore streams (Amity, Talmadge, French, Sucker, Poplar, and Brule Rivers) in 2002.

The purpose of this North Shore Streams Assessment project is to begin long-term water quality and streamflow monitoring of representative North Shore streams to:

- Assess current water quality conditions using state-of-the-art monitoring techniques;
- Provide baseline information for detection of water quality trends over time; and
- Assist in the development of stream protection and remediation management options for public, private, and commercial interests.



- Loads of total phosphorus and total suspended solids increased by factors of about two-fold and six-fold, respectively, between two monitoring sites bracketing a developed area on the Poplar River.
- Total mercury levels in the Poplar River exceeded the state standard, and mercury and suspended solid levels

were strongly correlated.

- Historical data from the 1970s suggests that water quality has declined, except in the Brule River, a watershed that has maintained relatively pristine.

#### Recommendations

Given these findings, it is recommended that long-term monitoring of a representative number of North Shore streams continue in order to track water quality trends and to help provide accurate and up to date information for local decision makers.

#### Conclusions

- Flow weighted mean concentrations of water chemistry parameters typically associated with non-point source pollution (total phosphorus and total suspended solids), were greatest in the southern portion of the Shore, and decreased farther up the Shore. This is likely due to a combination of natural watershed variation (size, soils, storage, slopes) and land use changes, such as increased urbanization.

#### For More Information

Jesse Anderson, MPCA

Direct: 218-529-6218

Toll-Free: 800-657-3864

E-mail: [Jesse.Anderson@pca.state.mn.us](mailto:Jesse.Anderson@pca.state.mn.us)

<http://www.pca.state.mn.us/publications/reports/lis-tributarystreamassessment-2002.pdf>



### Fascinating Facts... Duluth Lakewalk

- ♠ The City of Duluth annually dispenses 80,000 Mutt Mitts® along city walkways in an attempt to encourage pet owners to remove their pets' droppings.
- ♠ During annual spring clean up, City of Duluth employees remove three one-ton truckloads of pet feces from the Duluth Lakewalk.



## Monitoring Efforts

### WLSSD Water Quality Monitoring Program

While the MPCA's Beach Program monitors Lake Superior beaches, the Western Lake Superior Sanitary District (WLSSD) monitors a 20-mile portion of the St. Louis River during the same time period. The sampling area starts at the Highway 33 Bridge in Cloquet, and ends at the Oliver Bridge that connects Oliver, Wisconsin, to Gary-New Duluth, Minnesota.

Twelve sites are sampled weekly and analyzed for fecal coliform bacteria. This stretch of the St. Louis River is an important recreational area of particular interest to kayakers and whitewater rafters. It also includes several popular fishing spots. The results of the bacteria monitoring are sent to the MPCA, which posts the data on its Beach Program Web site (<http://www.pca.state.mn.us/water/beaches/>).

As part of the WLSSD Spill Response Plan, in addition to weekly monitoring, the same sites will be sampled whenever a spill occurs above or within the sampling area, and three days after the spill.

The WLSSD also performs sampling and testing for fecal coliform bacteria in several Duluth-area streams following significant rain events, and during low-flow conditions.

Through monitoring and sampling, the WLSSD learns whether its pollution prevention measures are having the desired effects.

In addition to bacteria monitoring in the St. Louis River and area streams, the WLSSD also conducts the following monitoring activities:

- The WLSSD samples and analyzes what enters and leaves the plant, giving day-to-day information on how the plant is performing.
- Industrial pre-treatment sampling helps in working with industries by periodically assessing what they discharge in their wastewater.
- Bacteria samples taken five times a week from effluent and from the St. Louis River, just downstream from our effluent discharge pipe, inform plant operators about how the plant is performing and whether permitted standards are met.



Clear Answers for Clean Water<sup>SM</sup>

#### For More Information

Joe Stepun, WLSSD  
Direct: 218-740-4806

E-mail: [Joe.Stepun@wlssd.duluth.mn.us](mailto:Joe.Stepun@wlssd.duluth.mn.us)  
<http://www.wlssd.duluth.mn.us/waterquality/wq1.shtml>



### Fascinating Facts... Lake Superior

- ✚ The first French explorers approaching the great inland sea via the Ottawa River and Lake Huron referred to their discovery as le lac superieur. Properly translated, the expression means "Upper Lake," that is, the lake above Lake Huron. Kitchi-gummi, a Chippewa Indian translation, signifies Great-water or Great-lake. A Jesuit name, Lac Tracy, was never officially adopted.
- ✚ Lake Superior is the cleanest, clearest, and coldest of the Great Lakes. Low concentrations of nutrients, suspended sediments, and organic material create an underwater visibility averaging 27 feet (8 meters).
- ✚ Lake Superior contains three quadrillion (3,000,000,000,000,000) gallons of water. That's ten percent of the world's fresh water and over half of the water in the Great Lakes.
- ✚ Lake Superior contains enough water to submerge all of North and South America under one foot of water.

### **Nonpoint Education for Municipal Officials (NEMO)**

Nonpoint Education for Municipal Officials (NEMO) is a national program that has been developing for almost a decade. Its collaborators from the University of Connecticut Sea Grant and Cooperative Extension System are devoted to educating city planners and decision makers about the way land use influences water quality. NEMO relies on a dynamic presentation of data through remote sensing and GIS technology to illuminate potential surface and ground water quality hazards as broader areas of a watershed become developed.

#### **How the Program Developed**

In the Land of 10,000 Lakes, the importance of high quality water resources is well appreciated by residents. Interest in the NEMO Program from the upper Midwest came early and from several different sources. In the western Lake Superior Basin, the Minnesota Sea Grant Program in Duluth and the University of Wisconsin Superior Cooperative Extension Program were focusing on the bi-state Minnesota/Wisconsin Lake Superior Watershed. The rapidly urbanizing Twin Cities region formed the other area of interest in NEMO. A consortium of partners headed by the Minnesota Erosion Control Association and the Minnesota Department of Natural Resources coordinated the Twin Cities' effort. Staff from the National NEMO Hub office held scoping sessions in Duluth and the Twin Cities in 1999 and 2000 to help organize both efforts. These two programs have since joined together and are now coordinating their outreach efforts under the Northland NEMO moniker.

#### **How and Where NEMO Works**

The Lake Superior Basin Program began with the bi-state Minnesota/Wisconsin Lake Superior watershed, and has begun to spread its efforts to surrounding areas. This portion of the Northland NEMO is particularly interested in working with small underdeveloped communities, and is working with a variety of partners to provide both educational and technical assistance to these under-served municipalities. Initial and continuing support comes from NOAA Sea Grant's Coastal Community Development Program and the Wisconsin Department of Natural Resources.

The Twin Cities portion of the Northland NEMO Program is made up of more than a dozen partners who help deliver the message in various regions of Minnesota and western Wisconsin. Through this network of statewide partnerships, the program can quickly address the needs and land use issues specific to individual communities. These partnerships bring together regional, state and private natural resource agencies and organizations to deliver a coherent and consistent message to the decision-makers and citizens of Minnesota and Wisconsin. The partners also support Northland's efforts, either financially or through in-kind donations of time and resources. Funding for this two year-old program has come from: the Metropolitan Council, a regional planning agency to the Minneapolis/St. Paul area; the McKnight Foundation, a philanthropic arm of the 3M Corporation; the Minnesota Department of Natural Resources, and; the Clean Water Act Section 319 Nonpoint Source Program.

#### **Accomplishments**

Northland NEMO has been developing and presenting programs for communities along the North Shore of Lake Superior, both in the Duluth Minnesota area and in northern Wisconsin

communities such as Bayfield and Ashland. Focusing on the Linking Land Use to Water Quality Program, they have developed current and future impervious surface maps of the communities to drive the message home. Northland NEMO partners participated in a recent Network Hub training session on the Impervious Surface Analysis Tool (ISAT), to help bring customized and accurate assessment of impervious surface and its impacts to their communities. They are also exploring new topical areas by working closely with the timber industry to determine the effects of timber and forest management practices on water quality, as well as working with their Twin Cities colleagues to develop a Lakes NEMO workshop.

#### **For More Information**

Jesse Schomberg, Minnesota Sea Grant

Direct: 218-726-6182

E-mail: [jschombe@d.umn.edu](mailto:jschombe@d.umn.edu)

<http://www.seagrants.umn.edu/water/nemo.html>



### Regional Stormwater Protection Team (RSPT)

In 2002, City of Duluth crews removed 573 gallons of garbage from area creeks and streams, including a microwave oven, a construction dumpster, and a bicycle frame. Crews also removed three one ton dump truck loads of dog droppings from the Lakewalk alone. Several beaches were closed last summer due to high bacteria levels. In a long-term effort to promote positive community and individual activities to protect the waters of the region, 17 governments and groups combined in 2003 to form the Regional Stormwater Protection Team (RSPT). Their mission: ***to protect and enhance the region's shared water resources through stormwater pollution prevention by providing coordinated educational programs and technical assistance.***

The RSPT consists of the cities of Duluth, Hermantown, Proctor, and Superior; University of Wisconsin Superior (UWS); University of Minnesota Duluth (UMD) and its Minnesota Sea Grant Program and Natural Resources Research Institute; St. Louis County; South St. Louis County Soil and Water Conservation District; the Minnesota Department of Transportation; the Western Lake Superior Sanitary District; MPCA; the Fond du Lac Reservation; Midway, Rice Lake, and Duluth Townships; Minnesota Department of Natural Resources (DNR); and Wisconsin Department of Natural Resources.

The RSPT conducted a logo design contest open to students from UWS and UMD Graphics Design programs. The logo will be used in television ads, brochures, and exhibits and will be shown extensively in Northeastern Minnesota and Northwestern Wisconsin. The winning concept, designed by UMD student Eric Lichtenberg, was unveiled at a news conference in February 2004 at UMD.

"We hope that our new logo will help identify our group as a leader in stormwater management and will help our cause," said Marion Lonsdale, City of Duluth stormwater project coordinator. "We hope homeowners will associate this logo with caring for their watersheds. The different colors on the logo represent problem areas of the environment soil, streams, and lakes that we're trying to work on with this education campaign."

UMD is one of the many organizations involved with the RSPT, and is required to lessen its impact on surrounding

waterways. UMD facility managers plan to add a rain garden filled with native plants to collect and filter water from one of its largest parking lots before it runs into nearby streams. Slowing down the water and allowing it to filter naturally through soil is an important part of the solution. Natural buffer areas between hard surfaces protect ponds and nearby Oregon and Tischer Creeks. New construction projects, like the James I. Swenson Science Building, are making stormwater concerns an integral part of the project design. "Being a great University on a Great Lake means we have a tremendous responsibility to the nearby waterways that feed into Lake Superior, and we take that responsibility seriously," said

UMD Chancellor Kathryn Martin. "We'll find ways to soften our impact on the environment in every phase of development, and we hope the rest of the Duluth community will also."

Public education and outreach is a key part of any stormwater pollution prevention plan. The Internet is an effective way to provide stormwater information. The RSPT will be using the new DuluthStreams.org web site as a resource for information for residents living in Duluth's watersheds. The site was developed by UMD's Natural

Resources Research Institute, Minnesota Sea Grant, and the City of Duluth as part of a regional effort to provide water pollution information to the public. Look for regional messages on protecting our waters "Watershed Moments." The RSPT reminds residents that **"it all comes down to the water."**

The RSPT educational campaign is supported by a grant from the DNR-Waters and Minnesota's Lake Superior Coastal Program through the Coastal Zone Management Act, which is administered through the NOAA's Office of Ocean and Coastal Resource Management.



#### For More Information

RSPT Hotline: 218-529-3281

Marion Lonsdale, Duluth Stormwater Utility

Direct: 218-730-4130

E-mail: [mlonsdale@ci.duluth.mn.us](mailto:mlonsdale@ci.duluth.mn.us)

<http://www.duluthstreams.org/stormwater/rspt.html>



# *What's Ahead for 2004*

## **Planned Activities for 2004 Beach Monitoring Season (May – October 2004)**

---

### **Minnesota Beach Monitoring Website**

A new web site dedicated to beach monitoring in Minnesota is expected to go live late this monitoring season. The new site's proposed URL is <http://MinnesotaBeaches.org> and will contain current beach status, beach photos and accommodations, an e-mail alert service sign-up, links to other Great Lakes Beach Monitoring Programs, water-borne diseases information, and much more.

### **Beach Advisory E-mail Alert Service**

Individuals interested in receiving e-mail notifications when beach advisories are posted can send an e-mail to [beaches@pca.state.mn.us](mailto:beaches@pca.state.mn.us). Alert service participants will be notified promptly when their favorite beach(es) receive an advisory and when that advisory is removed.

### **Site Specific Follow-Up**

After an advisory posting, the most common question is 'from where is the bacteria coming?' The City of Duluth and the WLSSD started researching high bacteria sources in 2003, and will continue their study at New Duluth Boat Club/14th Street on Park Point. If other problem sites arise, were possible, staff will work with local authorities to identify fecal contamination sources.

Additionally, research projects have been proposed by University of Minnesota Duluth Department of Biology and University of Minnesota Twin Cities Department of Soil, Water, and Climate. If these projects are approved and receive funding, work would begin in 2005 towards identifying fecal bacteria sources in the Duluth Harbor and along the North Shore of Lake Superior.

### **Implementation Stage of Lake Superior Basin Plan**

The Lake Superior Basin Plan is diving into the implementation stage of the program this summer. MPCA staff will begin collaborating with local partners to work on protection and improvement projects.

### **Snow Melt Monitoring**

MPCA Beach Program staff will sample its beach locations adjacent to river and stream mouths during the spring run-off. This is the first such monitoring along Minnesota's Lake Superior shores, and staff are looking to learn if fecal indicator bacteria is contained in melted snow carried to Lake Superior by raging rivers and streams.

### **RSPT Adult Education Campaign**

The first project for the Regional Stormwater Protection Team (RSPT) is to create an advertising campaign reminding the public that personal pollution matters. The campaign, which will feature a new logo, radio and

television ads, should be in full swing by mid-summer. The campaign's goal is to remind residents that they live, work and play in watersheds, and whatever they do on land impacts some waterway.



### **Minnesota Water Standards Revision**

The MPCA is currently in the midst of a triennial review of state water quality rules. Proposed changes include the replacement of our current fecal coliform

standards with an *E. coli* criterion consistent with the 1986 EPA criterion and the November 2003 (draft) EPA bacterial implementation guidance. The target date for the completion of these amendments is July 2005.

Public meetings are scheduled around Minnesota in late-spring to notify the public of the pending changes and allow for public comments. The public comment period ends June 30, 2004. Send comments to David Maschwitz with the MPCA, at (651) 296-7255 or via e-mail at [David.Maschwitz@pca.state.mn.us](mailto:David.Maschwitz@pca.state.mn.us).

### **Ongoing Basin Tributary Assessment**

MPCA water quality monitoring staff will continue monitoring North Shore streams, looking at the affects of development on the quality of these sensitive streams.

## What's Ahead for 2004

### New Beaches Added to Monitoring Schedule

Two new monitoring locations were added for the 2004 beach monitoring season. Those beaches are Southworth Marsh and 20<sup>th</sup> Street / Hearing Island Canal, both located on the harbor-side of Park Point in Duluth.

Beach Program staff are always on the look-out for publicly owned, Lake Superior beaches to include in the monitoring schedule.

### High-Use Weekend Sampling

Are large numbers of recreators causing an increase of unhealthy bacteria at beaches? This is a difficult question to answer as beach water quality samples are collected by Beach Program staff on Monday and Thursday mornings, when beach populations are generally low. Beach Program staff will take samples during a high-use weekend at popular beaches on Park Point this summer in an attempt to determine if large crowds and warmer afternoon temperatures impact bacteria numbers at a beach.

### Event Follow-Up Sampling

A majority of advisories in 2003 were posted following significant rain events, which occasionally triggered sewer overflows and breakages. Heavy rain in the drainage basin washes debris from beaches, roadways, fields, parking lots, and lawns into Lake Superior. In addition, rain, wind, and current stirs up any settled fecal matter which may be in beach sediments. As a precautionary measure, starting in 2004, Beach Program staff will monitor adjacent beaches following significant rain events, and sewer overflows and breakages.



### For More Information

Heidi Bauman, MPCA

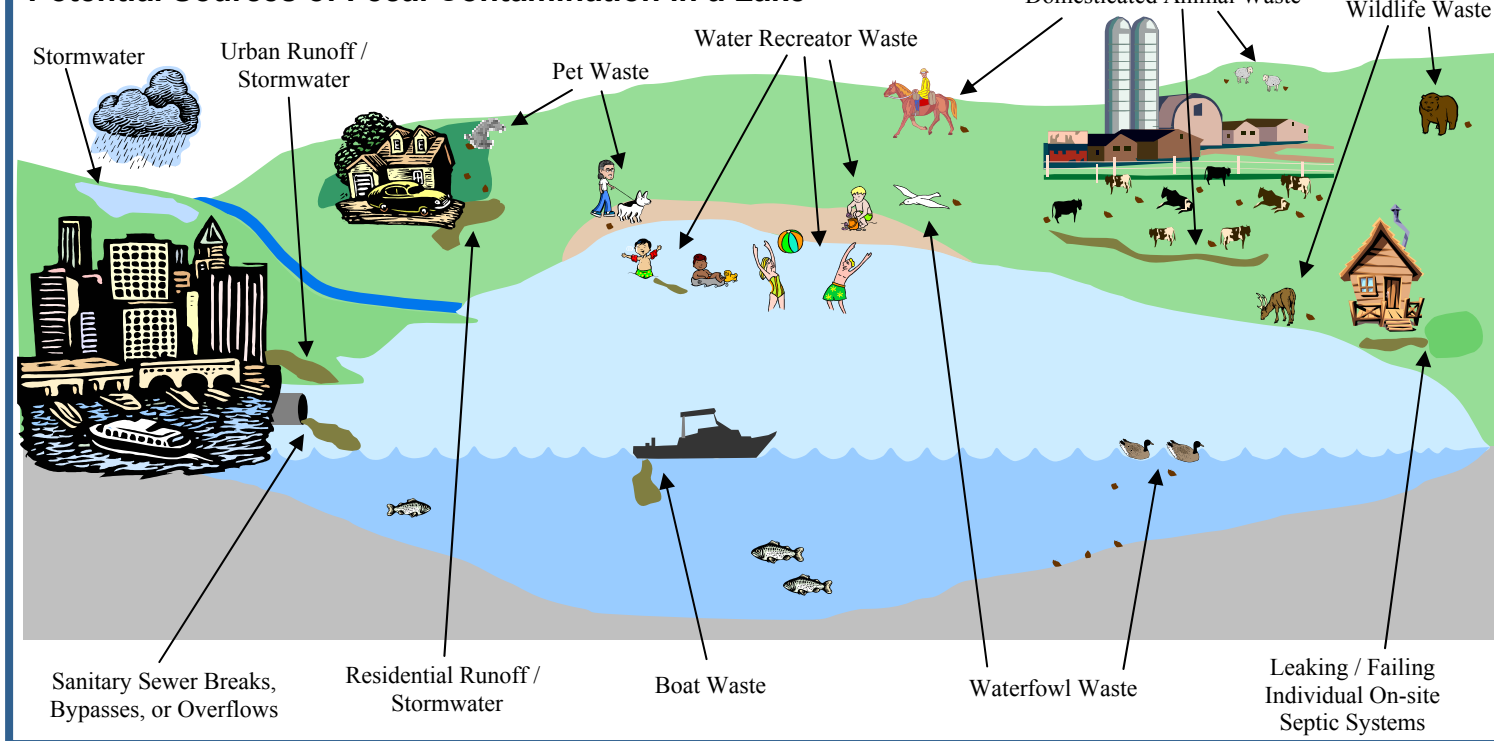
Direct: 218-723-4953

Toll-Free: 800-657-3864

E-mail: [Heidi.Bauman@pca.state.mn.us](mailto:Heidi.Bauman@pca.state.mn.us)

<http://www.pca.state.mn.us/water/beaches/>

### Potential Sources of Fecal Contamination in a Lake



# What You Can Do...

## When at the Beach

- Do not allow diaper-age children or children who are not toilet-trained into public swimming areas without tight-fitting rubber or plastic pants that will contain fecal matter.
- Change diapers frequently, always away from the water's edge, and in a restroom, if possible.
- Dispose of diapers properly. Place them in trash receptacles or seal them in a plastic bag to carry out with you.
- Do not encourage water fowl by feeding ducks, geese, seagulls, or other birds.



- Take your children for frequent bathroom breaks.
- Dispose of animal waste properly. When exercising your pet, collect and properly dispose of its waste. This helps to reduce the amount of animal waste that may be washed into the beach area from stormwater runoff.
- Trash may attract wild fowl and other animals. Carry out all trash or dispose of it securely in trash receptacles.
- Don't swim if you have diarrhea or feel like you may vomit.

## When at your Home

- Conserve water. Excess water use at home means more water that has to be processed by sewage treatment plants. This can lead to sewer overflows and raw sewage discharges into beach areas.
- Use natural substances to fertilize lawns and gardens. For example, use compost made from natural products instead of chemical fertilizer. Minimize the use of pesticides and herbicides whenever possible.
- Maintain private septic systems. Keep your septic tank or aeration system in good working order. Have it pumped and serviced in accordance with the manufacturer's recommendations. This will help prevent leaking and inadvertent discharge of treated or untreated sewage into the storm sewer – and ultimately into the beach area.

## When on your Boat

- Properly dispose of boating wastes.
- Empty sewage holding tanks and portable toilet waste in proper onshore sanitary facilities.
- Regularly service boat engines to minimize discharged gasoline and motor oil.

## Acknowledgements

This report was prepared by the Minnesota Pollution Control Agency Northeast Regional Office, with the assistance of various other agencies and organizations. *We would like to thank the Beach Program Guidance Team for the efforts in completing this document.*

**Cook County Planning Department  
Lake County Health Department  
St. Louis County Health Department  
Minnesota Department of Health  
Minnesota Department of Natural Resources  
Western Lake Superior Sanitary District  
City of Duluth  
UMD Department of Biology**

**UMD Recreational Sports and Outdoor Programs  
Natural Resources Research Institute  
Minnesota Sea Grant  
Park Point Community Club  
Duluth Boat Club  
City of Minneapolis  
Clean Water Action  
U.S. Environmental Protection Agency**