

Background on: Minnesota's Beach Monitoring and Notification Program

General Public 5-06, March 2005

Introduction

The purpose of the Minnesota's Lake Superior Beach Monitoring and Notification Program is to reduce unnecessary exposure and minimize health risks related to water-borne bacteria-related disease for the lake's recreational waters users. To accomplish this goal, staff regularly monitor 39 of Lake Superior's most popular public swimming beaches and boat access sites, provide easily-accessible monitoring results, and participate in national efforts to improve scientific research methods related to recreational water quality.

Communicating regularly-scheduled beach water monitoring data (for *E.coli* and fecal coliform bacteria) has at least three benefits: local residents and tourists may make better-informed decisions about where they may safely swim, boat or otherwise engage in water-based activities; local units of government associated with wastewater treatment may be better able to learn about and / or locate sewer line breaks; and, researchers may supplement their bacterial-source identification efforts.

Unintended, water-borne bacterial exposure can have human health consequences. Because symptoms mimic food-borne illnesses, people suspecting either should report their condition to the local county health department for further investigation. Timely reports may also prevent others from becoming ill from the same contaminated site.



Minnesota's monitoring and notification program was created following passage of the federal 2000 Beach Environmental Assessment and Coastal Health (BEACH) Act, which is also an amendment to the Clean Water Act.

The Minnesota Pollution Control Agency (MPCA) has program authority. Its staff created the 2003 Lake Superior Pilot Beach Monitoring and Notification Program, began collecting water samples at 34 public swimming beaches and access points between Duluth and the Canadian border, and initiated public communication about related health risks through a variety of outreach activities.

The program has since expanded in size and scope. Partners now include the Minnesota Department of Health, St. Louis, Cook and Lake County Health and Environmental Departments, the Western Lake Superior Sanitary District, the University of Minnesota-Duluth and other private and public organizations along the lake's North Shore.

Contents:

Monitoring Minnesota's swimming beaches.....	2
Surprising statistics	2
Determining when to post advisory signs	2
Communicating advisories to the public.....	3
Timelines and costs	3
Comparisons with other states	3
Lake Superior stewardship opportunities	4
Protecting the public at non-monitored sites.....	4
More information	4



Monitoring Minnesota's swimming beaches

Currently, Minnesota does not require beach water testing. As a result, county health departments determine where and when to monitor public swimming beach water quality. Announcements related to unsafe swimming beach water conditions are issued inconsistently at best.

The BEACH Act literally changed the beach water monitoring landscape in Minnesota. Program staff established the first consistent monitoring program for fecal bacteria along Lake Superior's coastal recreational waters. It also began reviewing state water quality standards for pathogens or pathogenic indicators for subsequent revision and agreed to support and participate in national efforts to improve scientific research designed to improve recreational water quality.

It should be noted that the act does not allow program support, funding or staff time dedicated to determining likely bacterial source(s) or testing samples for DNA markers. Other organizations, including some of the beach program's partners, have applied for grants to work toward identifying fecal contamination sources via DNA fingerprinting and other cutting-edge identification techniques.

Surprising statistics

The 2003 sampling season was an eye-opening experience for staff and long-time Lake Superior residents and enthusiasts. The lake's average temperature of 40° F. (4° C.) was assumed to be inhospitable to warm-temperature-loving bacteria. And its sheer size (three quadrillion gallons of water) was thought to overwhelm relatively minute bacteria concentrations, should any survive the cold environment.

Despite the odds, weekly beach water quality monitoring resulted in 19 "water contact not recommended" sign postings at 10 of the 35 testing sites. (The 35th site was added during the pilot season.)

Most advisories were posted for only one or two days; the longest spanned 39 days at Duluth's New Duluth Boat Club / 14th Street Beach (located on the harbor side of Park Point).

Fortunately for the beach-going public, 96.4 percent of the 1,678 samples collected the program's first year were within acceptable bacteria levels and allowed unimpeded enjoyment of the Lake Superior's beaches and water.

During the program's second monitoring season, which had expanded to 38 testing sites, 26 advisory signs were posted for 113 days at 17 of those sites. Duluth's 20th Street / Harding Island Canal site was posted for all of the season's 113 advisory days.

Determining when to post advisory signs

Minnesota and the U.S. Environmental Protection Agency (USEPA) recommendations for posting advisory signs at swimming or public access areas are based on the *E. coli* or fecal coliform bacteria content in collected water samples.

"Acceptable" and "unacceptable" *E. coli* levels and fecal coliform bacteria levels are specified in Minnesota's Rule 7050.0222.

The *E. coli* standard is:

1. The geometric mean based on not fewer than five samples within a 30-day period that shall not exceed 126 colonies per 100 milliliters (ml) of water; and,
2. Content shall not exceed 235 colonies per 100 ml of water in a single sample.

The fecal coliform standard is:

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



When sample analysis results indicate bacteria levels above either of the established standards and signify the possible presence of disease-causing organisms, advisory signs are posted at the affected beach or access point.

Advisory signs are considered recommendations to the public to avoid water contact until further analyses indicate a return to safe conditions. Signs are removed when bacteria levels fall below the established standard and the five-sample geometric mean levels are also acceptable. Per state standards, only county health departments can “close” a beach to public use.

Communicating advisories to the public

In addition to posting advisory signage at affected locations, program staff also communicate “no water contact recommended” messages in other ways:

1. News releases are issued and distributed throughout the local and regional areas. Often, statewide media will pick up the story and broadcast it to a wider audience. Copies of the news releases are also e-mailed to interested others including local and regional tourism offices, lodging establishments, outdoor education programs and people living adjacent to popular swimming beaches and boat access locations.
2. People with Internet service may sign up for a free e-mail alert service that will advise them when signs are posted and removed from affected areas. Individuals may sign up for this service by emailing beaches@pca.state.mn.us.
3. The program maintains a Web site, www.mnbeaches.org, dedicated to providing the most current status, photos and nearby accommodations, plus links to the alert service, other Great Lakes beach monitoring programs, water-borne disease information, and much more.
4. Program results also are posted on external Web sites managed by the U.S. EPA and Earth911.
5. During regular office hours, people may call the program at (800) 657-3864 or call a hotline at (218) 725-7724 for recorded information about currently-posted beaches and access points.

Timelines and costs

Soon after Congress passed the BEACH Act in 2000, Minnesota’s Lake Superior Basin staff worked with USEPA to secure a \$58,694 grant to develop a comprehensive beach monitoring program. In May 2002, the state was awarded an additional \$204,630 to further develop the program.

The program’s costs during 2003 were \$203,300; during 2004, the costs were \$204,490.

Not all states are eligible for BEACH Act grants. Only those states, territories and tribes with ocean or Great Lakes coastlines can apply for funding to develop and implement beach monitoring and notification programs.

Other jurisdictions may participate in the U.S. EPA’s more recent effort, the 2004 Clean Beaches strategy and Clean Beaches Plan. This plan helps state, tribal, and local beach managers strengthen existing programs which reduce the risks of infection to people using recreational waters. The plan’s tools also allow for local and regional differences in pollution sources and climate.

Despite their differences, BEACH Act grantees and Clean Beaches Plan participants share two goals: to promote recreational water quality programs nationwide and create scientific improvements that support timely recreational water monitoring and reporting.

Comparing Minnesota with other states

Today, many U.S. beaches are either not monitored well or not monitored at all, so Americans continue to face risks of illness from swimming and other water-activities in coastal areas, lakes, and rivers containing disease-causing microbes. Of those with testing programs, more than 2,500 U.S. beaches posted advisories or closed the beach for at least one day during 1996 due to contaminated water. Between 1981 and 1994, half of the Great Lakes states’ 581 beaches were closed due to pollution or bacterial contamination.



The most often cited reason for beach postings or closings was insufficient wastewater treatment system capacity to manage heavy rains combined with stormwater and sewer system overflows. The Lake Superior Beach Monitoring and Notification Program currently cites this as one of several possible factors for excessive bacterial counts.

Other possible sources include large concentrations of seagulls and waterfowl observed in the immediate area, pet wastes, dirty diapers, boat septage and stormy weather and wave action churning up sediments and re-suspending buried bacteria.

Lake Superior stewardship opportunities

Lake Superior's water enthusiasts and basin residents are encouraged to help protect the "greatest of lakes" by:

- properly disposing of pet wastes 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 wastes into proper receptacles; and
- conserving water.

Protecting the public at non-monitored sites

For people considering swimming or recreating at beaches that are not monitored, the Lake Superior Beaches program staff offer the following advice:

- Avoid swimming after a heavy rain.
- Look for storm drains along the beach — don't swim near them.
- Look for trash and such other signs of obvious pollution, such as oil slicks, in the water. These kinds of pollutants may indicate the presence of land-based, disease-causing microorganisms that may also have been washed into the water.

- When in doubt, don't take chances. If there is any reason to suspect the beach water is contaminated, contact local health or environmental protection officials. It is important for them to know about possible beach water contamination so they can protect people from exposure.

Resources for more information

The MPCA and other organizations' Web sites contain more detailed information about beach water and public access point locations, monitoring data, the science behind water monitoring and related disease-causing bacteria, other Minnesota sites with monitoring programs, as well as links to related sites.

For more details on the agency's program, visit www.mnbeaches.org

For a current map of all monitored sites along Lake Superior: www.mnbeaches.org/beaches/lksuperior/index.html

For more information about the U.S. EPA's beach program: www.epa.gov/waterscience/beaches/

The Minn. Department of Health maintains a Web site for beaches at www.health.state.mn.us/divs/eh/beaches as does the Centers for Disease Control and Prevention at www.cdc.gov/healthyswimming/

To take advantage of the MPCA's 24-hour recorded hotline for up-to-date beach advisory postings, call (218) 725-7724. The agency's toll-free number, with staff available during normal working hours, is (800) 657-3864.