

Water quality and bacteria frequently asked questions

The most frequently asked questions about bacteria in Minnesota waters.

Countless bacteria can be found in land and water, and in humans and animals. Most bacteria are beneficial, serving as food for larger organisms, and playing critical roles in natural processes such as organic matter decomposition and food digestion. However, about 10% are harmful and, if ingested by humans, can cause sickness or even death.



Where do bacteria in Minnesota waters come from?

Bacteria in Minnesota lakes and streams mainly come from sources such as failing septic systems, wastewater treatment plant releases, livestock, and urban stormwater. Waste from pets and wildlife is another, lesser source of bacteria. In addition to bacteria, human and animal waste may contain pathogens such as viruses and protozoa that could be harmful to humans and other animals.

What other factors affect the presence of bacteria in lakes and streams?

The behavior of bacteria and pathogens in the environment is complex. Levels of bacteria and pathogens in a body of water depend not only on their source, but also weather, current, and water temperature. As these factors fluctuate, the level of bacteria and pathogens in the water may increase or decrease. Some bacteria can survive and grow in the environment while many pathogens tend to die off with time.

What types of bacteria does the Minnesota Pollution Control Agency test for?

Testing for specific disease-producing bacteria or other pathogens (viruses, protozoa, etc.) is difficult, expensive, and time-consuming. The Minnesota Pollution Control Agency (MPCA) tests for fecal coliform and *E. coli* bacteria, which are commonly found in fecal waste and are easy to measure; they are often used as “indicator organisms” to denote the potential presence of fecal waste. Using indicator bacteria to assess the presence of pathogens is not a perfect process though it is the best available at this time. Lakes and streams in Minnesota meet water quality standards if they have a monthly geometric mean less than 126 colony-forming units of *E. coli* per 100 milliliters of water, between April and October.



What does the standard for bacteria tell us about the water?

Most lakes and streams in Minnesota meet water quality standards for bacteria. MPCA uses the *E. coli* water quality standard to identify water bodies that may be contaminated with fecal waste. Higher levels of *E. coli* in the water may or may not be accompanied by higher levels of pathogens and an increased risk of harm; varying survival rates of bacteria make it impossible to definitively state when pathogens are present. Take precautions to avoid illness when wading, swimming, or boating in any body of water.

What are the symptoms of illnesses contracted from water recreation?

People swimming or playing in lakes or streams may inadvertently ingest water. If the water is contaminated with pathogens, people may experience such symptoms as diarrhea and nausea, jaundice, headaches, and fatigue. Not all people are affected to the same degree; young children and the elderly are generally more vulnerable to pathogens.

The actual number of people sickened by pathogens in surface water is not clear. Most gastrointestinal illness of the types associated with surface water pathogens go unreported. Documented outbreaks typically are associated with swimming beaches where a number of people become ill.

How do I know if a lake or stream is safe for swimming?

Minnesota does not have a list of “safe” bodies of water for recreation. Sometimes a local (city or county) health department will close a swimming beach due to bacterial contamination. Conditions can change over time, and state water-testing efforts are not frequent enough to stay on top of the changes, particularly in streams and rivers. If you have questions about a specific beach, check with the proper beach authority for their current information and recommendations. See the [Minnesota Department of Health Recreational Water Illnesses webpage](#) for more information on how to reduce your risk to waterborne illnesses.

What is being done in my lake? Has it been tested?

- Check with your city or county environmental services to see if your local lake is tested on a regular basis. Two examples of local testing programs:
- [Minnesota Lake Superior Beach Monitoring Program](#)
- [Hennepin County public swimming beaches](#)

How do I avoid getting sick from pathogens in the water?

Use common sense to reduce your risk of pathogen exposure. Pathogens are more likely present if stream levels are high or the water is muddy. Consider delaying your water recreational activity until conditions improve. Don't go into the water with open cuts or sores or if you feel ill. Don't ingest water. If you do come in contact with the water, take care to wash your hands or shower afterwards. Think about how your activities may expose you to pathogens and take steps to reduce your risk. Individuals must decide for themselves when they are comfortable using Minnesota's lakes and streams.

If you or a companion experiences symptoms such as diarrhea and nausea, jaundice, headaches, and fatigue after being in the water, seek proper medical attention.

How do you get rid of pathogens in the water?

Some bacteria and pathogens will always be present in surface waters. While most of the bacteria and pathogens from fecal waste in the water will die off over time, some may survive. Pathogens from fecal waste generally die off in the environment much faster than bacteria. While there isn't a way to rid water bodies of all pathogens, actions can be taken to decrease the amount of fecal waste getting into lakes and streams.

How can we reduce the occurrence of bacteria contamination?

Reducing bacteria pollution in Minnesota will require the efforts of many individuals and groups. The best ways to reduce bacteria in surface waters include:

- Controlling runoff on feedlot properties and where manure is spread on farmland
- Repairing or replacing failing septic systems
- Improving wastewater treatment processes at some facilities
- Controlling erosion with practices such as conservation tillage and riparian buffers
- Rotational livestock grazing, which reduces both sedimentation and fecal coliform concentrations
- Urban stormwater management – runoff detention, infiltration, and street sweeping

Who is working on removing sources of bacteria contamination?

Many government entities and groups across Minnesota are working to better understand sources of bacteria in water and mitigate them. Some examples include:

- Pollutant reduction studies that lead to limits on bacteria discharged by wastewater treatment facilities to lakes and streams
- Feedlot runoff controls and other conservation practices installed by farmers because of permit requirements or a statewide water quality certification program
- County and state programs to bring failing sewer systems into compliance