
ENVIRONMENTAL Fact Sheet



29 Hazen Drive, Concord, New Hampshire 03301 • (603) 271-3503 • www.des.nh.gov

WD-BB-14

2019

Bacteria in Surface Waters

What are Coliform Bacteria?

Coliform bacteria are a large assemblage of various species of bacteria that are linked together because of the ease of culturing as a single group. They include both fecal and non-fecal coliform bacterial sources. Fecal coliforms are bacteria that are found naturally in the intestines of warm-blooded animals. Fecal coliforms are sometimes pathogenic, as many are disease-causing species, though non-pathogenic species may be present too. The presence of fecal coliform bacteria may indicate contamination of the waterbody by human and/or animal fecal material.

What is *Escherichia coli*?

Escherichia coli, commonly called *E. coli*, is one of the most common species of fecal coliform bacteria. It is a normal component of the large intestines in humans and other warm-blooded animals, and it's found in human sewage in high numbers. *E. coli* is used as an indicator organism for fecal contamination because it is easily cultured. If sewage is present in water, pathogenic or disease-causing organisms may also be present.

What are Enterococci?

Enterococci are another type of fecal bacteria which are a subgroup of the fecal streptococcus group. Enterococci have the ability to survive in saltwater and therefore are the chosen indicator organism for coastal beaches and shellfish harvesting areas.

Why do we measure bacteria?

Typhoid and cholera epidemics in the mid-19th century led to the discovery that certain gastro-intestinal diseases of humans are transmitted via water. The disease-causing organisms leave the infected individual via the feces, which can become discharged into surface waters. These water-borne diseases include typhoid, cholera, enteric fevers, and bacterial dysentery. It is not feasible, however, to test waters for each possible type of disease-causing bacterium. Fecal indicator bacteria (e.g., *E. coli* and Enterococci) are used to indicate, on a statistical basis, the likelihood of contracting a disease by consuming or recreating in such waters.

What level of *E. coli* is acceptable?

The acceptable level of *E. coli* is determined by risk analysis based on statistics to protect human health. Drinking water should have no *E. coli* after treatment. *E. coli* levels at designated swimming beaches should not exceed 88 per 100 milliliter (mL) in any one sample, or exceed a three-sample geometric mean average over a 60-day period of 47/100 mL. Recreational waters that are not designated beaches should not have more than 406 *E. coli*/100 mL in any one sample, or more than 126/100 mL in a 60-day, three-sample geometric mean average. Occasional higher numbers are not unusual, particularly after storm events and where urban or agricultural runoff occurs. These levels are generally not considered unsafe unless investigation indicates the source to be sewage.

What level of Enterococci is acceptable?

Enterococci levels at designated saltwater, coastal beaches should not exceed 104 per 100 milliliter (mL) in any one sample, or exceed a three-sample geometric mean average over a 60-day period of 35/100 mL. Generally, the water quality at New Hampshire's coastal beaches is very good; however, there are occasions when the Enterococci levels go above the acceptable limit.

Can I drink my lake water?

Because *E. coli* are present in all warm-blooded animals, including ducks, geese, beaver and seagulls, it is highly unlikely that any lake will have zero *E. coli* without treatment. Even with no *E. coli*, lake water is still not safe to be used directly as a source of drinking water. Without adequate treatment there can be no guarantee concerning the safety of the water.

Does *E. coli* cause swimmer's itch or swimmer's ear infections?

No. Swimmer's itch is caused by contact with a parasite whose life cycle depends on the presence of snails and waterfowl (often ducks); it is not associated with fecal bacteria. There are a number of illnesses, particularly related to the eyes, ears, nose and throat, which may use water as the medium of transmission but in which the disease-causing organism does not necessarily pass through the feces of the infected individual. Refer to the fact sheet on swimmer's itch, [WD-BB-2](#).

Sources of Fecal Bacteria to Surface Waters:

Possible sources of fecal contamination include wastewater treatment plants, failing septic systems, domestic and wild animal waste, and stormwater runoff. For additional information on how to reduce the impact of stormwater runoff, please refer to the following NHDES fact sheets:

- Low Impact Development and Stormwater Management (WD-WMB-17)
<http://des.nh.gov/organization/commissioner/pip/factsheets/wmb/documents/wmb-17.pdf>
- Lake Protection Tips Some Do's and Don'ts for Maintaining Healthy Lakes (WD-BB-9)
<http://des.nh.gov/organization/commissioner/pip/factsheets/bb/documents/bb-9.pdf>
- Care and Maintenance of Your Septic System (WD-SSB-2)
<http://des.nh.gov/organization/commissioner/pip/factsheets/ssb/documents/ssb-2.pdf>