



BEAR CREEK WATERSHED

Fact Sheet 61 HABs Human Exposure and Risks (EPA)

October 9, 2018

The Bear Creek Watershed Association protects and restores water and environmental quality within the Bear Creek Watershed from the effects of land use.

2018 Membership

Clear Creek County
Jefferson County
City of Lakewood
Town of Morrison
Aspen Park Metropolitan District
Conifer Sanitation Association
Conifer Metropolitan District
Denver Water Department
Evergreen Metropolitan District
Forrest Hills Metropolitan District
Genesee Sanitation & Water District
Geneva Glen
Jefferson County School District
Kittredge Water & Sanitation District
Tiny Town Foundation, Inc.
West Jefferson County Metro District

- Other major routes of human exposure are through ingestion of cyanotoxin-contaminated drinking water, inhalation while showering, dietary intake via consumption of cyanotoxins in contaminated foods and algal dietary supplements, and exposure from water used in medical treatments (e.g., medical dialysis).
- Wind-driven currents may cause buoyant cyanobacterial blooms to amass on shorelines. Exposure to these accumulations of cyanobacteria cells present a greater risk to human and animal health.

How are humans exposed to cyanobacteria and cyanotoxins?

Common exposures to cyanobacteria and their toxins can occur from various recreational activities:

- Oral (drinking) - accidental or deliberate oral intake (ingestion) of contaminated water;
- Skin (dermal) - direct contact of exposed parts of the body to water containing cyanobacteria cells. Also, cyanobacteria cells can accumulate in bathing suits; ruptured cell can expose skin or cuts to potential toxins, and;
- Inhalation of water spray (aspiration) - water containing cyanobacteria cells & their potential toxins can get into the lungs.

Human Risks

Adverse health outcomes from exposure to large amounts of cyanotoxins may range from a mild skin rash to serious illness. Acute illnesses caused by exposure to cyanotoxins have been reported worldwide and after short-term exposures, microcystin and cylindrospermopsin could cause liver and kidney damage.

- Microcystin-LR (e.g., Microcystis, Anabaena) - Abdominal pain, Headache, Sore throat, Vomiting and nausea, Dry cough, Diarrhea, Blistering around the mouth, and Pneumonia.
- Cylindrospermopsin (e.g., Aphanizomenon flos-aquae) - Fever, Headache, Vomiting, Bloody diarrhea.
- Anatoxin-a group (e.g., Microcystis, Oscillatoria) - Tingling, burning, numbness, drowsiness, incoherent speech, salivation, respiratory paralysis (animals).

How do you treat people exposed to high levels of cyanotoxins?

In the event that you do come into contact with water that is known to be contaminated with cyanotoxins, the Centers for Disease Control (CDC) recommends that you rinse off with clean, fresh water as soon as possible. Seek medical treatment right away if you think you or someone you know might have been exposed to cyanobacterial toxins, especially when any of the symptoms mentioned above are recognized or evident.

How do cyanobacteria affect aquatic ecosystems?

High biomass blooms, whether of toxic or nontoxic species, can lead to very low oxygen levels in the water column (hypoxia), resulting in higher mortality rates in local fish, shellfish, invertebrate, and plant populations. The blooms may also affect benthic flora and fauna due to decreased light penetration. Toxic blooms from some cyanobacteria genera may lead to inhibition of other phytoplankton and suppression of zooplankton grazing, leading to reduced growth and reproductive rates and changes in community structure and composition.

What other impacts do cyanobacteria have on their environment?

In addition to the production of toxins, cyanobacteria have often been associated in drinking water with taste and odor problems. Dying and lysing (rupture) cells release their contents (toxins) into the water and are subject to rapid putrefaction of the material. Blooms produce a variety of odor and taste compounds, such as geosmin and 2-methylisoborneol (MIB), which are not toxic but are a nuisance to the public.