More Rain, More Risk of Contaminated Drinking Water

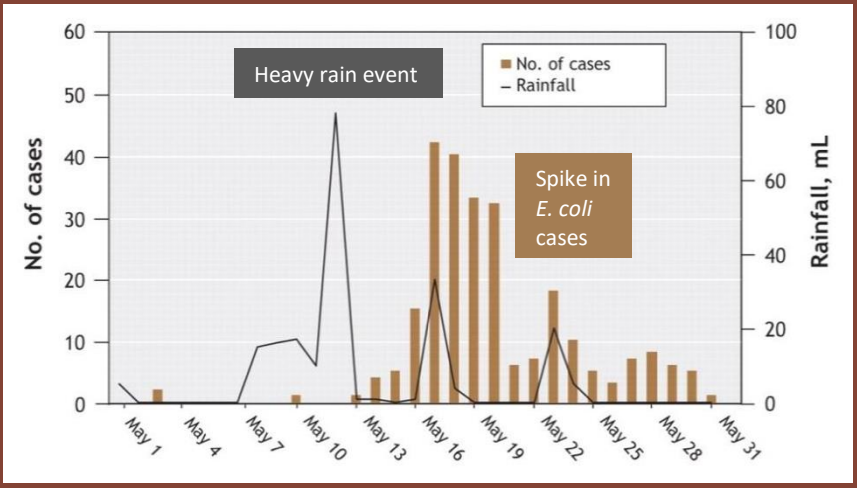
Rain can wash contaminants into drinking water sources. More rain, especially heavy rains, are expected with climate change increasing the risk of contamination.

How do floods or heavy rain events impact drinking water?

Flood waters and heavy rain events can carry contaminants into drinking water supplies like lakes, streams and ground water, causing waterborne illness. These illnesses are caused by pathogens (microbes like bacteria, viruses), bio-toxins (toxins produced by living things like algae) and toxic contaminants. The majority of waterborne diseases are gastrointestinal (diarrheal diseases), however they can also impact the kidneys, the lungs, the brain, and metabolic processes.

In 2000, Walkerton, Ontario had a large rain event (about 130 ml over 5 days ending with a day of heavy rain on May 12th where 80 mL fell in 24 hours) and a few days after the community had a massive surge of people with *E. coli* bacteria infection. It is thought that *Escherichia coli* bacteria from cattle manure fertilizer spread on a farmer's field was washed into the municipal water supply where other oversights left the water inadequately treated.

CASE STUDY: WALKERTON, ON
Heavy rainfall and *Escherichia coli*



This graph depicts both the rainfall (black line) and number of *E. coli* cases (brown bars) in Walkerton, ON, in May 2000.

A large rain event (about 80mL) hit the area just days before an outbreak of *E. coli* cases. This 3-4 day lag time between the rain and the spike of cases is consistent with the incubation period of E. coli.

Heavy rain and associated flooding and runoff can quickly transport pathogens into water supplies. Graph from Greer et al., 2008*.

How are drinking water sources impacted by climate change?

With climate change, large rain events (50mm to 150mm of rain in one day) are expected to happen more often. This could present more chances for contaminants to enter drinking water sources. Climate change is also expected to bring higher temperatures which will increase water temperatures which can also increase the risk of algal blooms and certain waterborne pathogens.

*Greer, A., Ng, V. & Fisman, D. Climate change and infectious diseases in North America: the road ahead. *Can. Med. Assoc. J.* **178,** (2008)

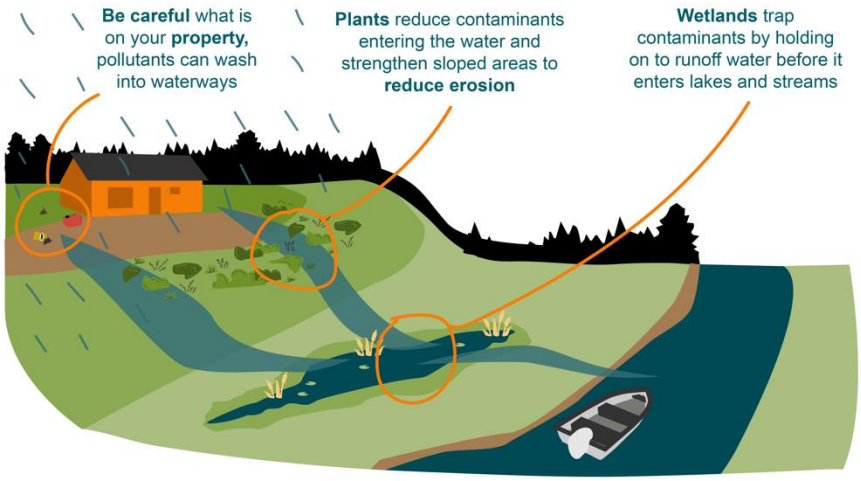
How can we prepare?

Advocate for safe drinking water

Clean, safe drinking water is already an issue for many First Nations communities. Communities should continue to push for safe drinking water and effective training for water treatment staff. In communities that do have drinkable tap water, make sure effective monitoring programs are in place and that the water continues to be safe to drink. During times that water is not safe to drink, communities should have an alerting system to notify members and provide alternative sources of water (bottled water, boiled water, different water sources, etc.).

Manage stormwater runoff

When stormwater flows over the landscape, it can pick up debris, chemicals, bacteria, and other pollutants that can then end up in lakes and rivers that provide drinking water. Keep drinking water sources safe by managing stormwater runoff with a good drainage plan. This can include ditches and culverts to direct water flow, green spaces to soak up rainwater, and holding areas (like ponds or wetlands) for excess water.



Sourcewater protection

A watershed is the area of land that drains into a waterway like a stream or lake. Your house may not be on the shore of a lake but the water that runs off your yard eventually makes it to the nearby lake. Limiting pollutants on the landscape can help keep water systems healthy. This can include steps like:

- Locate sewage lagoons and garbage dumps far and downstream of drinking water sources
- Keep plants and trees near the shore to prevent erosion and trap contaminants before they reach the water
- Avoid using chemicals (like pesticides) or fertilizers
- Be careful not to spill gas or oil when pouring into tanks
- Don’t use or reduce the use of road salt
- Reduce the area with hard surfaces and lawns, instead leave wetlands or plant a rain garden
- Maintain septic and waste systems
- Pick up garbage and dog poop especially near the water

Best-practices for home wells

Drinking water wells can be at risk of contamination during flooding events. If your home well has flooded, or you find your well water has changed in colour, taste, or smell, the water should be tested before you drink it. Your well and plumbing systems may also need to be disinfected.

Heavy rain events are predicted to happen more often because of climate change will put drinking water at risk. Protect the source of your drinking water and monitor its quality.

Resources

https://conservationontario.ca/conservation-authorities/source-water-protection/
https://www.gov.mb.ca/asset_library/en/spring_outlook/wellwater_safety_factsheet.pdf

UP NORTH ON CLIMATE
Climate Change Impact and Adaptation Study for the North of Ontario