

Protection from Foodborne or Water-Related Illnesses

- Do not walk, swim, or drive through flood waters.
- ◆ Stay off bridges over fast moving water
- ◆ Do not use flood water to wash dishes, brush teeth or wash/prepare food , used bottle water or boil water to make it safe.
- ◆ Remove bacteria from drinking water by using modern water filtration equipment without the need for chemicals or power or boil water to make it safe. Boiling water will kill most types of disease causing organisms.
- ◆ Do not eat any food that may have come into contact with flood water.
- ◆ Discard any food and beverage that is not in a waterproof container if there is any chance that it has come into contact with flood water.



Harmful algal blooms within the tribal service area

- ◆ Healthy water recreational activities behaviors can prevent recreational water illnesses such as:
 - do not swim in water with algal blooms
 - shower before getting in water
 - don't swallow the water
 - shower after getting out water
 - don't go in the water if sick
 - always diaper small children

Kaw Nation EPA

Preserve, Protect, and Improve

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Climate Change and Human Health

Adverse Health Effects of Extreme Precipitation



Kaw Nation EPA Office
With Support From
National Indian Health Board

Climate Change and Extreme Precipitation

One extreme event that could significantly impact human health in Oklahoma is flooding, which related to extreme precipitation and severe thunderstorm. Flooding is a key driver of pathogen introduction, food contamination, and foodborne disease. Flooding can introduce toxins to developing crops.

Runoff from more frequent and intense extreme precipitation events will contribute to contamination of drinking water sources with pathogens and algal toxins and place additional stresses on the capacity of drinking water treatment facilities and distribution systems.



Shigella is a species of enteric bacteria



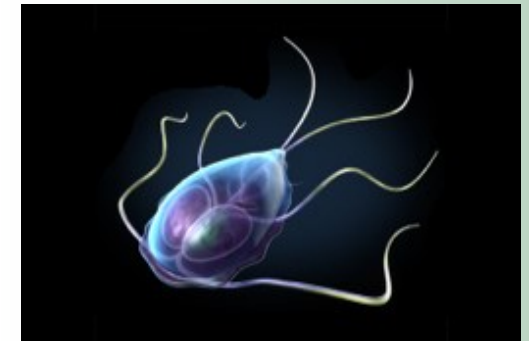
Flooding increases pathogens in food

Adverse Health Effects

Flooding conditions may be related to a number of serious health possibilities:

- ◆ Increase in foodborne illnesses due to increase incidences and levels of pathogens in food production, harvesting, and processing environments, particularly from flooding and other weather extremes.
- ◆ Increase in foodborne illnesses due to groundwater and surface water used for irrigation, harvesting, and washing being contaminated with runoff or flood waters that carry partially or untreated sewage, manure, or other wastes containing foodborne contaminants.
- ◆ Increase in water-related illnesses Salmonella and enterohemorrhagic Escherichia coli.

- ◆ Increasing bacterial pathogens causing eye, ear, and wound infections or irritations, or diarrheal illness.
- ◆ Increase in norovirus infection is the most common diarrheal illness and is often referred to as the “24-hour stomach flu.”
- ◆ Increase exposure to Giardia, cryptosporidium, and Shigella by drinking contaminated water.
- ◆ Increase harmful algal blooms will increase preexisting respiratory illnesses, especially asthma.
- ◆ Increase in harmful algal blooms which are dangerous to human health but can also cause fish kill and produce conditions that are dangerous to aquatic life.
- ◆ Increase mosquito-borne diseases: such as West Nile virus and Zika virus.



Giardia parasite in contaminated water