

Foam: An Introduction

Robin Pike

Observations of foam (spume) on mountain streams and near lakeshores can be alarming and may immediately raise suspicions of pollution. But while frothy water in some cases may indicate pollution, it usually results from natural processes.



Dave Scott

exposed to prevailing winds, in eddies, in areas of slow moving water, in pools, and behind rocks.

Depending on chemical composition, foam can be white to yellow. Foam caused by pollution (i.e., soap or detergent) is usually white. Foam can also be stained brown from humic acids (another plant breakdown product) that may be especially noticeable in tea-coloured waters or boggy areas with large accumulations of organic material (R. Nordin, pers. comm., 2003).

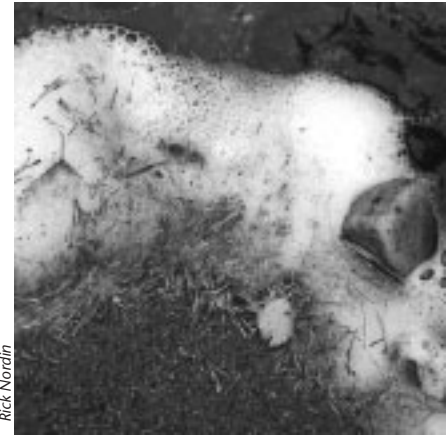


Rick Nordin

Is Foam Harmful?

Natural foam is usually harmless as approximately 1% of the foam is surfactant while the remaining 99% is water and air (IDEM 2002). However, excess foam sometimes indicates imbalances in an aquatic system (e.g., excess phosphorous) and may indicate a need for further assessment.

Foam caused by pollutants, as well as the pollutants themselves, can be directly harmful to aquatic life for various reasons not detailed here. Foam is usually undesirable in drinking water because surfactants



Rick Nordin

How and Why Does Water Foam?

Water bodies containing large amounts of organic material can form spume when surfactants (e.g., non-soluble fatty acids) are released during decomposition. A surfactant, or surface-active agent, is a compound that lowers the surface tension of a liquid and makes the water surface foam more easily. Examples of surfactants include soaps, non-soluble fatty acids, and synthetic detergents. Wind, waves, and flowing water agitate the surfactant at the water surface resulting in the entrainment of air bubbles. Foam then builds and stabilizes on the water surface as air bubbles, water, surfactant, and small pieces of organic debris and/or other materials form the foam's matrix. Foam will often accumulate along lake margins

Natural Versus Pollution-Caused Foam: What's the Difference?

Distinguishing between natural and pollutant-caused spume can be difficult. Smell may provide a clue as to the source—natural foam often smells earthy or fishy whereas foam derived from pollutants may have a perfumy or soapy odour. Foam that is persistent and cannot be easily brushed apart is likely caused by pollution. Natural spume, in contrast, is usually short lived, breaking down quickly after agitation from wind or wave action ceases.

Some watershed managers use the simple "shake test." In a medium-sized container (0.5–1 litre), shake a sample of spumous water. Natural foam will dissipate upon agitation whereas foam from detergents will generally increase.

may impart an unpleasant taste and cause frothing. Regardless of whether foam is present, any untreated surface water should be appropriately tested and disinfected before consumption to ensure safe drinking water. ~

Reference

Indiana Department of Environmental Management (IDEM). 2002. Foam. Fact sheet. Available from: www.in.gov/idem/water/assessbr/surveys/025surfacefoam.pdf

For further information, contact:

Robin Pike
Watershed Management
Extension Specialist
FORREX
c/o B.C. Ministry of Forests
722 Johnson Street
Victoria, BC V8W 9C2
Phone: (250) 387-5887
E-mail: Robin.Pike@forrex.org