

Foam in rivers and still waters

What are the causes and what should you do?

At certain times of year we get a lot of calls about foam in rivers and still waters. This can be a natural event with no adverse environmental implications; alternatively this can be a sign of pollution. This information sheet explains how to tell the difference and when and how the Environment Agency should be informed.



What causes foam on rivers, lakes and streams?

Foam is a natural phenomenon that occurs on many lakes and streams. Foam is produced when molecules such as fatty acids act as 'surfactants' interfering with the surface tension of water and allowing air and water to mix more easily. These molecules often float on the surface of the water as a thin film. Turbulence from waves, currents and wind cause the surfactant molecules to trap small bubbles that make up the foam.

Natural foam

Naturally produced surfactants, usually a fatty acid, are released from decaying organic material, but are also released in small amounts by living organisms. When dissolved in water, organic compounds are referred to as Dissolved Organic Carbon (DOC). The brown water that drains bogs and wetlands is also high in DOC

due to the high productivity and slow breakdown of plant material in these ecosystems.

Un-natural foam

However, not all foam is natural. Certain man-made products, including detergents, can cause foam.

In addition, human activities that cause an increase in algae or aquatic plant growth such as the introduction of fertilisers can cause plant and algae blooms and an increase in foam production.

What are 'surfactants'?

Molecules that act in a way which interferes with the surface tension of water. There are many natural and synthetic surfactant molecules.

Is foam harmful?

Large amounts of foam can accumulate in certain areas of the river, especially downwind and within eddies, or just downstream of turbulent water, for instance below weirs. This foam is usually harmless; in fact only about 1 % of the foam is made up of the foaming agent which is usually a naturally occurring fatty acid. Most of the foam is simply air and water.

However, foam caused by synthetic products such as detergents, may be a sign of pollution that is harmful to fish and other aquatic life. In addition excess foam can be due to artificial nutrient enrichment of the water causing a nuisance algal bloom. The foam is not toxic, but the removal of oxygen during decay of an algal bloom can cause fish kills.

How can I tell what kind of foam it is?

Although it's difficult to know for sure, foam from various sources can have different characteristics. Most foam in rivers is natural; foam caused by excessive nutrient input may be accompanied by other environmental impacts such as dead fish.



Natural foam

- May start off as white, but often becomes light tan or brown in colour as it collects sediment and organic matter.
- Natural, earthy, fishy or fresh cut grass smell.
- Occurs at many locations and accumulates in eddies and sheltered areas.
- The foam can persist for some time gradually diminishing in size.
- Found where water is agitated by high wind, turbulent water or waves.
- Often seen on windy days or following rain storms that encourage the transport of natural organic compounds.



Man made foam

- Appears white in colour.
- Foam will smell fragrant, perfumed or soapy.
- Usually occurs over small area, localised near source of discharge.
- Generally will accumulate near the source of the synthetic surfactants and should not occur over large distances.
- Modern detergents are biodegradable. Foam will dissipate quickly once the source of synthetic surfactant is removed.
- Generally not related to natural events such as rainfall, high flows, or windy conditions

When and where am I most likely to see natural foam?

In productive, or naturally nutrient-rich, lakes and turbid, tannin-rich rivers. However, clear nutrient-poor rivers can also have natural foam forming in the right conditions.

After rain, on a windy day, or in an area of water turbulence such as below weirs and in tidal areas.

In autumn when trees drop their leaves, when aquatic plants and algae begin to die and decompose.

As water temperatures rise and decay processes accelerate; this results in the release of organic compounds.

During soil erosion events such as high flows that result in input of nutrients from surrounding land.

What if I suspect foam is the result of pollution?

It is important that if you suspect a pollution event you inform the Environment Agency as soon as possible.

Please use the Incident Hotline, and provide as many details as possible.

**In an emergency or to report an incident call
0800 80 70 60 (24 hours)**

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