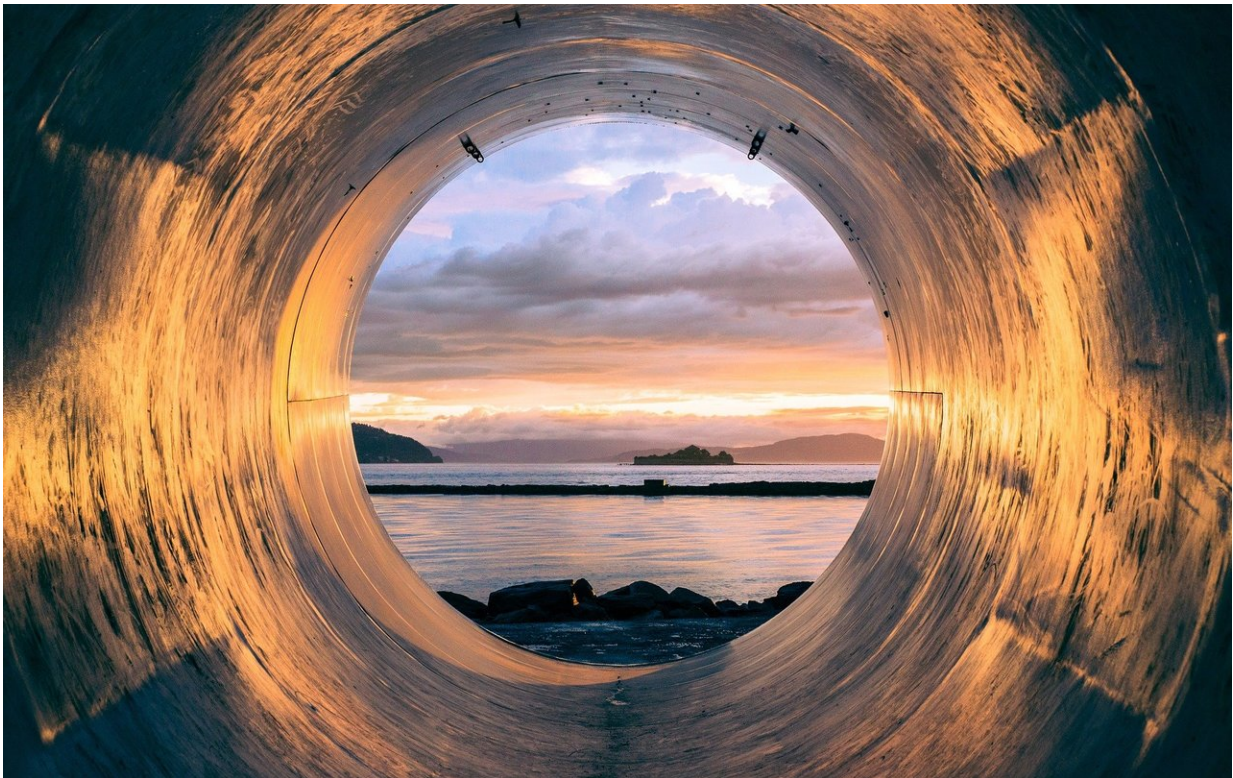


River pollution is causing harmful outbreaks of sewage fungus in the UK

March 4 2024, by Dania Albini



Credit: CC0 Public Domain

The pollution of the UK's waterways and coastlines with sewage is throwing its ecosystems out of balance. One well documented example is the spread of microscopic bacteria that can multiply rapidly into algal blooms, causing extensive dead zones once oxygen in the water has been

used up.

But there's another pollution problem that has been largely overlooked, until now. Dangerous outbreaks of [sewage fungus](#) are becoming a big problem for the UK's rivers, ponds and lakes.

While working at the University of Oxford with associate professor Michelle Jackson, my aquatic ecology colleagues and I studied how to detect sewage [fungus](#) in polluted rivers. We also investigated how changes in a river's chemical and physical characteristics might be related with the spread of sewage fungus, for example, the high concentration of nitrates [from fertilizers](#) coming from farmland.

Healthy rivers are crucial for ecosystems, drinking water, biodiversity and our well-being. But [sewage pollution](#), and the sewage fungus within it, threaten all of this, endangering aquatic life, [human health](#) and our economy.

Frequent [sewage fungus outbreaks](#) indicate how badly polluted our environment is. Our rivers are in trouble and governments, water companies and regulators need to act fast to protect them before it is too late.

Sewage fungus isn't actually a fungus. It's a mix of microscopic bacteria, viruses and organisms that can form visible masses in water. Despite their fungus-like appearance, these masses of threads are made up of tiny single rod-shaped cells.

These bacteria multiply quickly in [nutrient-rich environments](#), such as [rivers contaminated](#) with [sewage effluent](#). More than 100 types of sewage fungus have been identified, with two known as *Sphaerotilus natans* and *Beggiatoa alba* commonly found in [most English rivers](#).

Sewage fungus predominantly lives in polluted waters with high levels of nutrients. That's typically in areas with poor water quality or inadequate sewage treatment.

That includes ponds and reservoirs near urban areas with high levels of sewage run-off or polluted rivers and streams where untreated or treated sewage is [discharged regularly](#). Sewage fungus also grows naturally in wastewater treatment plants due to the high concentrations of organic material present.

Sewage fungus, although not always visible to the naked eye, is likely to be present in rivers that receive sewage discharge. Most common methods used to detect it rely on visual inspection of the river, so it is hard to identify early or smaller growth, and we don't have accurate figures on how widespread the problem is.

However, more hi-tech approaches such as machine learning combined with microscopy can detect and quantify sewage fungus filaments, even before they [become visible](#). We have applied one such technique, using a machine called [FlowCam](#) which made it possible to quickly identify and count fungus filaments.

Dangerous for wildlife and humans

High levels of sewage fungus indicate [poor water quality](#). Sewage fungus can harm freshwater environments by reducing oxygen levels in the water, affecting aquatic life, reducing the numbers of sensitive organisms and disrupting the natural balance of rivers.

Fish and shellfish can become stressed due to low oxygen levels, making them more prone to disease and ultimately leading to [their death](#).

High levels of sewage fungus can also have negative effects on human

health. If contaminated water is used for swimming or fishing this can lead to human sickness, because some of the microorganisms can include [human parasites](#)

Sewage fungus effects can interact with other types of human pollution, including agricultural and [urban runoff](#). The full impact of these interactions is not yet well understood.

But it is important to consider all sources of pollution, from sewage to agricultural run-off, when estimating the effect sewage fungus might have on ecosystems. By doing so, water companies and [environmental groups](#) can work towards more effective management and protection of rivers and freshwater resources.

What to do about it

By using more advanced detection methods, regulatory bodies and water companies can monitor rivers more efficiently. More timely action could help limit the source of pollution and prevent future outbreaks of sewage fungus, protecting both freshwater ecosystems and human health.

On a local level, people can report pollution incidents, including sewage fungus outbreak, to the respective authorities: [Environment Agency](#) in England, [Natural Resources Wales](#), the [Scottish Environment Protection Agency](#) or the [Department of Agriculture, Environment and Rural Affairs for Northern Ireland](#).

Before calling those authorities, it is useful to collect details about the date, time and precise location of the [sewage](#) fungus. Passing this information on to the authorities will hopefully encourage more comprehensive monitoring in the future.

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