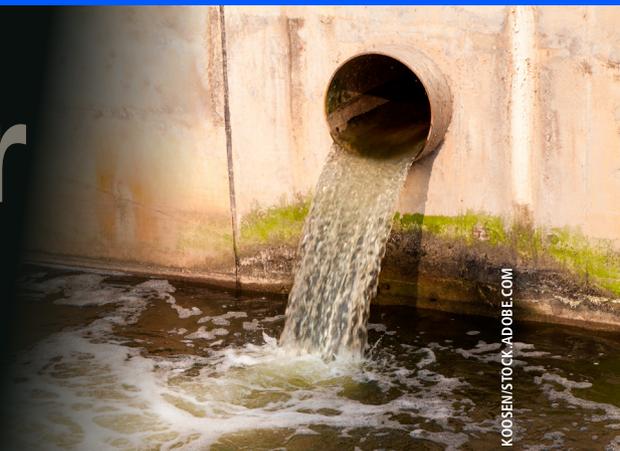


Britain's water quality crisis



Sewage discharges into Britain's rivers and seas have angered the public and organisations representing river- and sea-users. **Cameron Dunn** looks at design flaws in the UK's sewerage systems

Surfers Against Sewage reports 301,091 sewage discharges in England in 2022. The popularity of cold-water swimming and other water sports has increased the number of people directly affected by water quality issues.

Basic design flaw

In the 1860s Joseph Bazalgette (chief engineer to London's Metropolitan Board of Works) built London's sewer system in response to the 'Great Stink' of 1858 (the Thames was a vast, open sewer at that time) and the 1849 cholera epidemic.

Bazalgette's system, still in use today, became a model for other urban sewerage systems.

But there is a basic design flaw (see Figure 1). Bazalgette's sewers were combined sewers where foul water from toilets enters the same drains and sewers as rainwater. During heavy rain, combined sewers become overwhelmed by storm-drain water. Sewage treatment plants cannot cope with this volume of discharge. This leads to combined sewer overflow (CSO) events, where a mixture of rainwater and sewage is discharged into rivers or the sea.

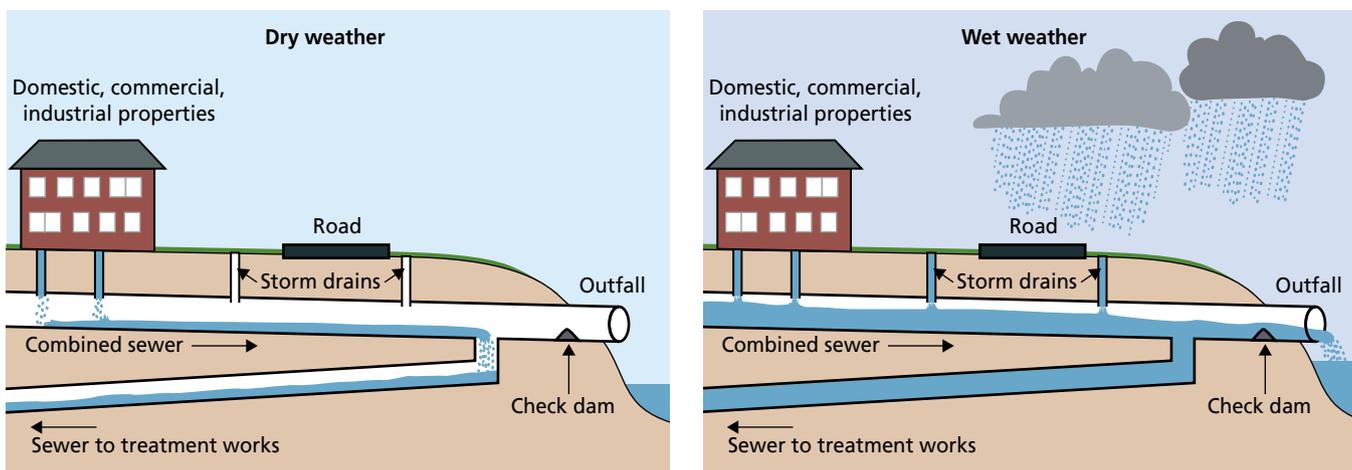
Urban development built since the 1960s usually has separate sewage and rainwater systems. But most of the UK system is combined.

The impacts

CSO events have a range of impacts on people and the environment:

- Excess nutrients (nitrogen and phosphorous) from

Figure 1 Combined sewers in dry and wet conditions



sewage cause eutrophication and algal blooms, harming river and marine ecosystems.

- Serious illnesses can result when water-users ingest or encounter sewage-contaminated water.
- Sewage-contaminated river water can smell and look ugly.

Finding the data

Part of the anger felt by the public and water-users relates to the difficulty of getting accurate data on sewage pollution. Sewage discharges are not illegal in most cases, but water companies need to inform the regulator Ofwat when they occur. However:

- Until recently data on discharges was hard to get hold of, with water companies accused of being less than transparent.
- Water companies have been accused of under-reporting CSO events.
- Some storm overflow outlets are not monitored at all.
- In some cases, the location of outlets is not known.
- Monitoring only records how long the CSO event was, not the volume of water discharged.

While it may not have been possible to solve the CSO problem completely over the last 30 years, investment could have been made into ensuring the scale of the problem was known.

Is privatisation to blame?

Some argue the England and Wales privatised water companies are to blame for the huge number of CSOs. But is this valid? Water was once a nationalised industry owned by the government. It was privatised in 1989 as shares in 10 regional water authorities were sold to private investors.

Private water companies seek to make a profit. Some of this profit is paid to shareholders in the form of dividends. Up to 2022 water companies had paid out £65.9 billion in dividends. Should dividends have been invested in better water treatment systems?

However, CSOs occur in Northern Ireland and Scotland where water companies were never privatised, and in Wales where Welsh Water is run on a not-for-profit basis. Even if all privatised water

company profits had been reinvested in improving sewers it is unlikely the problem would have been solved — in 2022 the government estimated it would cost £350–600 billion to rebuild the entire system as a separated one. Greater long-term investment since 1989 would have reduced the CSO problem.

The future

Climate change may make the CSO problem worse. If the UK gets more very heavy rainfall events and more frequent storms, combined sewers could be overwhelmed more often. The CSO problem has no 'quick fix'. Options include:

- Creating extra storage capacity, such as retention basins or tanks to store contaminated flood water so water can be gradually treated.
- Making data on CSOs more easily available, so that water-users can avoid dangerous conditions.

It is highly unlikely the CSO problem will ever go away entirely due to the huge economic cost involved.

Questions

- 1 If water companies had been government owned since 1989, would the CSO problem in 2023 have been better or worse?
- 2 Should the aim be to reduce CSO events to zero, or is some level of CSO discharge events acceptable?

Further research

The Rivers Trust sewage discharge map:
www.tinyurl.com/yn8abt4j

Cost estimates from the UK government, 2022:
www.tinyurl.com/y5j5hxmh

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