

Toxic chemicals hindering the recovery of Britain's rivers

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Welsh rivers in urban locations still have damaged food chains and fewer species of invertebrates in comparison to rural rivers

Toxic chemicals from past decades could be hindering the recovery of Britain's [urban rivers](#), concludes a recent study by scientists from Cardiff University, the University of Exeter, and the Centre for Ecology and Hydrology.

During the 1970s, over 70 percent of the rivers in the South Wales valleys were classified as grossly polluted, by a combination of poor sewage treatment, colliery waste and industrial discharge. Since then, industry has declined, deep mining has ceased and sewage treatment has improved to the point that clean water species such as salmon and otters have returned to rivers such as the Taff.

However, Welsh rivers in urban locations still have damaged food chains and fewer species of invertebrates in comparison to more rural rivers. According to the researchers, these effects might be explained by the higher concentrations of former industrial pollutants such as PCBs (Polychlorinated Biphenyls) and flame-retardant chemicals (PBDEs) that persist in these rivers despite being phased out.

Dr. Fred Windsor, a doctoral student at Cardiff University, explained: "Despite major success in controlling sewage pollution in South Wales' rivers over the last three decades, something appears to be holding back biological recovery. Our investigations show that persistent contaminants might be responsible as they still occur widely in invertebrates, particularly in urban river environments."

Professor Charles Tyler, from the University of Exeter's School of Biosciences, added: "These apparent effects of what we call 'legacy' pollutants—PCBs, flame retardants, [organochlorine pesticides](#) and other complex organic chemicals that have now been largely discontinued from production and use—are yet another reminder that we continue to live with problems caused by [toxic chemicals](#) from past decades. These chemicals still occur widely in rivers, lakes and seas in Britain and

beyond, and still affect a wide range of animals."

Professor Steve Ormerod of Cardiff University's School of Biosciences and Water Research Institute concluded: "Urban river ecosystems in Britain have been on an improving trajectory since at least 1990, but there is still a way to go before we can say that they've wholly recovered from well over a century of industrial and urban degradation.

"The ecological pressures on our rivers are multiple, ranging from combined sewer overflows to engineering modifications, and this research adds a new dimension to understanding why they're not yet at their best.

"The slow degradation of some pollutants means that we may have to wait a long time before these chemicals disappear. Perhaps one of the lessons is that we should avoid ecosystem damage in the first place rather than try to solve problems after they occur."

The paper "Persistent contaminants as potential constraints on the recovery of urban river food webs from gross pollution' is published in the International journal *Water Research*.

More information: Fredric M. Windsor et al. Persistent contaminants as potential constraints on the recovery of urban river food webs from gross pollution, *Water Research* (2019). [DOI: 10.1016/j.watres.2019.114858](https://doi.org/10.1016/j.watres.2019.114858)

Provided by Cardiff University

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