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Mr Robbie Butler MLA
Chair, Committee for Agriculture, Environment and Rural Affairs
Parliament Buildings
Stormont
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By email only

Dear Mr Butler

At our recent appearance before the Committee, members mentioned an Oxford University study in the context of discussions about the relative importance of agricultural and wastewater sources of nutrient pollution. At the time, we were not aware of the specific study and undertook to review the paper and report back to you.

We understand the study referred to by members was:

Albini D, Lester L, Sanders P, Hughes J & Jackson MC (2023) The combined effects of treated sewage discharge and land use on rivers. *Global Change Biology* **29**, 6415-6422.¹

It was the subject of a press release from the University on 22 September 2023, with the headline "New study finds that sewage release is worse for rivers than agriculture".² It is therefore understandable that Committee members took the significance of this headline at face value in their questions to us.

We have now reviewed this paper in detail. We believe the press release headline is misleading and over-reaches the study findings. While this small-scale study has its merits, it does not provide evidence specifically to inform the relative importance of agricultural and wastewater sources of nutrient pollution. The main challenge is that while there are specific findings relating to the effects of each of wastewater and agriculture, the findings do not enable informative comparison between the two, and are not generalisable in the way suggested by the press release.

Our view is that the study adds little to the current discussion in Northern Ireland.

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¹ The study is available to download at <https://doi.org/10.1111/gcb.16934>. Accessed 9/6/2025.

² [New study finds that sewage release is worse for rivers than agriculture | University of Oxford](#). Accessed 9/6/2025.

This was a small-scale study. It entailed comparison of several water quality measures, including nutrient concentrations, immediately above and below the outlets of four wastewater treatment plants (WWTP) on rivers in England, on three occasions in August, October and November 2021. The analysis (a) compares variation in these measures of water quality above and below WWTP outlets, among the three sampling occasions, and (b) tests relationships between these measures and variation in the surrounding patterns of land-use, characterised as proportions of agricultural and urban land-use.

The study finds that several measures of water quality are worse below the WWTP outlets than above, with this effect being more pronounced on some sampling occasions than others. It also finds that the more sensitive river invertebrates, but not other pollution measures, are affected by variation among these four sites in the proportion of the surrounding land used in agriculture.

These are robust findings for a small study, and, while not novel, they are consistent with larger-scale, longer-term studies. The results do support the authors' statements that "sewage discharge has a significant impact on water quality...regardless of the surrounding land use".

However, the study does not and could not, with its design and scale, evaluate the relative importance of agricultural and wastewater sources of nutrient pollution. This would entail a much larger study, with a design that adequately sampled across a range of conditions of nutrient flow from farms, as well as from WWTPs.

We do not suggest any intention to mislead on the part of the authors. Indeed, they are explicit in the study abstract that "We need both improvements to wastewater treatment processes and reductions in agricultural pollution to reduce threats to vulnerable freshwater communities." However, it is the press release headline that "sewage release is worse for rivers than agriculture", which is simplistic and misleading.

In our evidence to the Committee, we highlighted the importance of sources of nutrient pollution from both the agri-food industry and from wastewater. We advised that both are important sources and both must be managed effectively to improve the environment and meet legal obligations. Nothing in this study affects this advice.

It may also be of interest to the Committee that we submitted advice to the Minister on the Nutrients Action Programme consultation, and have published this advice, here: [OEP gives advice to DAERA Minister on Nutrients Action Programme Regulations consultation | Office for Environmental Protection](#)

We remain ready to provide further assistance to the Committee on this or other matters.

Yours sincerely



Professor Robbie McDonald

Chief Scientist, Office for Environmental Protection