

[The effect of weirs on nutrient concentrations \(Cisowska & Hutchins 2016\)](#) [1]

The removal of a weir in 1999 from the River Nidd in Yorkshire, UK, was assessed in terms of its impact on in-stream nitrate removal along a 15.8 km long stretch of river. Models of channel hydraulics and denitrification quantified the impact on an annual basis, using, as inputs, river flow, water temperature, water quality data and cross-section geometry collected both before and after the weir was removed.

To remove the confounding influences of year-specific conditions, two counterfactual simulations were set up whereby the pre-removal configuration was driven by data from the post-removal period (and vice versa). Results revealed the removal of the weir to have reduced the annual fraction of the upstream nitrate load being retained along the stretch by 2.6% (i.e. 812 kg) and 1.8% (382 kg) for the years 1997 and 2000 respectively. Differences resulting from the presence or absence of the weir were most marked during low flow summer conditions.

Highlights

A model of channel hydraulics and denitrification was set up for 15.8 km of river.

Model performance pre- and post-removal of a weir was assessed.

Fluxes of denitrification were estimated based on two years of daily simulations.

It is estimated that 1.8–2.6% less nitrate is being retained annually since removal.

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Cisowska, I., & Hutchins, M. G. (2016). The effect of weirs on nutrient concentrations. *Science of The Total Environment*, 542, 997-1003. Online 4 november 2015.

Link to DOI:

<http://dx.doi.org/10.1016/j.scitotenv.2015.10.064> [2]

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