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Isotopic constraints on the source and transformation of nitrate in groundwater systems

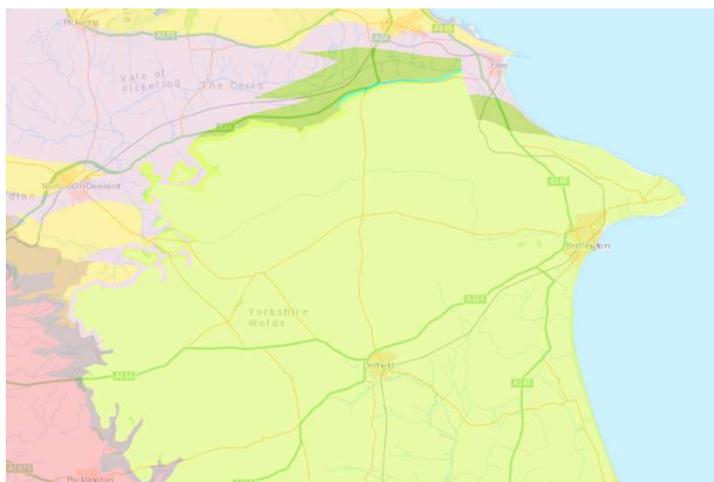
Dr Josephine McSherry

(Affinity Water / University of Leeds)

12th October 2021 | Zoom Video Conference | 6:30pm start

Synopsis:

Nitrate is a limiting nutrient and an important additive for agriculture. It is also an environmental risk to surface water and of concern to the water industry. This study sampled and explored transformation processes in the nitrogen cycle uniting hydrogeochemistry and soil science between catchments in the Yorkshire Wolds and Hampshire. Dual stable isotope analysis and major ion concentrations were used to identify nitrate sources and compared to identify to what extent nitrate sources and processes were similar between geologies, aquifer lithology and flow mechanism.



In many locations in the UK groundwater nitrate concentrations are high or increasing; on the Northern Chalk catchments studied nitrate often exceeded the legal drinking water limit of 11.3 mg/L nitrate-N, with major ion concentrations suggesting anthropogenic pollution occurred. Dual stable isotope analysis provided clear evidence of manure/slurry nitrate and indications of inorganic fertilisers. The data also provided strong evidence for denitrification on the RTG, and widespread seasonality that was more distinct for samples from observational boreholes than pumped boreholes.

About the Speaker:

An ecologist by nature, Dr Josephine McSherry undertook a PhD in geochemistry and hydro-geology at the University of Leeds investigating the origin and fate of nitrate pollution in the Yorkshire ground water. A period of living in South Africa ignited an enthusiasm for birds and the outdoors, so on weekends Josephine can often be found in the Yorkshire countryside with binoculars in hand. In a previous life she was an analytical chemist for a winery and a lock keeper on the River Thames.

Forthcoming Talks:

DATE	TITLE	SPEAKER	VENUE
09 th November 2021 6:30pm	Past climates to constrain future climate projections	Dr Kirsty Edgar (University of Birmingham)	Zoom – Virtual Meeting
14 th December 2021 6:30pm	Finalists from the early careers award	Various speakers	Zoom – Virtual Meeting
11 th January 2021 6:30pm	Subsurface engineering and water resources of Greater London	Dr Jonathan Paul (University of London)	Zoom – Virtual Meeting

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