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## Modelling the recovery of surface water chemistry and the ecological implications in the British uplands

R. C. Helliwell<sup>1</sup>, A. Jenkins<sup>2</sup>, R. C. Ferrier<sup>1</sup>, and B. J. Cosby<sup>3</sup>

<sup>1</sup>Macaulay Institute, Craigiebuckler, Aberdeen, AB15 8QH, UK

<sup>2</sup>Centre for Ecology and Hydrology, Wallingford, Oxon, OX10 8BB, UK

<sup>3</sup>Department of Environmental Sciences, University of Virginia, Charlottesville, VA 22901, USA

Email for corresponding author: r.helliwell@macaulay.ac.uk

Abstract.

Abstract: The MAGIC (Model of Acidification of Groundwaters in Catchments) model has been calibrated to three acid sensitive regions in the UK: Galloway, the South Pennines and Wales. These calibrations use the best available data for surface water, soil and deposition, from several UK data bases and regional sampling programmes. The model is capable of reproducing observed base cation and acid anion concentrations as reflected by a close match between observed and simulated acid neutralising capacity (ANC). Predictions to 2016 under currently agreed emission reductions, the Gothenburg Protocol, show that ANC greater than zero will be achieved at 100%, 86% and 100% of sites in Galloway, the Pennines and Wales, respectively. This indicates the potential for biological recovery and a return to 'good status' although chemical conditions remain some way from simulated pre-acidification conditions. In the longer term, beyond 2036 (20 years after compliance with the Gothenburg protocol), the model indicates that increased N leakage to surface waters may cause deterioration in the chemical status.

Keywords: recovery, acidification, modelling, upland UK, ecology

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