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Review of atmospheric ammonia data in the context of developing technologies, changing climate, and future policy evidence needs

Christine Braban, Sim Tang, Bill Bealey, Elin Roberts, Amy Stephens, Megan Galloway, Sarah Greenwood, Mark Sutton, Eiko Nemitz, and David Leaver

Centre for Ecology and Hydrology, NERC, Penicuik, United Kingdom (chri2@ceh.ac.uk)

Ambient ammonia measurements have been undertaken both in the atmosphere to understand sources, concentrations at background and vulnerable ecosystems and for long term monitoring of concentrations. As a pollutant which is projected to increase concentration in the coming decades with significant policy challenges to implementing mitigation strategies it is useful to assess what has been measured, where and why. In this study a review of the literature, has shown that ammonia measurements are frequently not publically reported and in general not reposited in the open data centres, available for research. The specific sectors where measurements have been undertaken are: agricultural point source assessments, agricultural surface exchange measurements, sensitive ecosystem monitoring, landscape/regional studies and governmental long term monitoring. Less frequently ammonia is measured as part of an intensive atmospheric chemistry field campaign. Technology is developing which means a shift from chemical denuder methods to spectroscopic techniques may be possible, however chemical denuding techniques with off-line laboratory analysis will likely be an economical approach for some time to come. This paper reviews existing datasets from the different sectors of research and integrates them for a global picture to allow both a long term understanding and facilitate comparison with future measurements.