

# Effects of dry and wet N deposition on vegetation and biogeochemistry of an ombrotrophic bog

Elleke van Zetten<sup>1</sup>, Irene de Lange<sup>1</sup>, Lucy J Sheppard<sup>2</sup>, Ian D Leith<sup>2</sup>, Alan Crossley<sup>2</sup>, Leon van den Berg<sup>1,3</sup>, Jan Roelofs<sup>1</sup>

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<sup>1</sup>*Radboud University Nijmegen (Netherlands)*

<sup>2</sup>*Centre for Ecology and Hydrology (Edinburgh), Bush Estate, Penicuik EH26 0QB*

<sup>3</sup>*Environment Department University of York, Heslington York*  
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It has repeatedly been shown that increased nitrogen (N) deposition results in dramatic shifts in vegetation composition. The sources of N-deposition vary from agriculture (mainly NH<sub>3</sub> and NH<sub>4</sub>) to industry and traffic (mainly NO<sub>x</sub>).

Effects of these different N forms on the vegetation and biogeochemistry of an ombrotrophic peat bog, Whim Moss (~15km southwest of Edinburgh), have been investigated since April 2002, by employing an automate N manipulation system. This field experiment, uniquely, offers the possibility to investigate the effects of the different N forms at the same site and at application rates and deposition scenarios simulating natural variation in rainfall. Within the manipulation system there are two N manipulations: **Dry**, where gaseous NH<sub>3</sub> is released over a 60 m transect at concentrations that simulate a 100,000 bird poultry unit (0.4-200 µg m<sup>-3</sup>), and **Wet**, as soluble nitrate or ammonium, covering the full range of UK wet N-deposition (8 – 64 kg N ha<sup>-1</sup>yr<sup>-1</sup>).

The effects of dry N deposition on the vegetation and biogeochemistry at different distances from the NH<sub>3</sub> source have been analysed. In the wet N deposition experiment, 5 treatments were followed, ranging from 8-64 kg N ha<sup>-1</sup>yr<sup>-1</sup> and differing in N form as either oxidised or reduced N.

Samples of soil water were obtained using mini-rhizon samplers and were tested for pH, NH<sub>4</sub>, NO<sub>3</sub>, P and base cations. Young (1 year old) shoots of *Calluna vulgaris* L. (Hull), *Erica tetralix* L. and *Sphagnum capillifolium* Ehrh. (Hedw.) were harvested and tested for chlorophyll concentrations, aminoacids and P and base cation concentrations in acid digests.

The preliminary results show differences between treatment N forms and N doses and along the NH<sub>3</sub> gradient. In this presentation we will focus on the plant responses to the changes in the biochemistry.