Does atmospheric nitrogen contribute significantly to the nutrient budget in a South Wales sand dune?

Laurence M.M. Jones[1], S.Y. Tang[2] and B. Reynolds[1]

[1]*Centre for Ecology and Hydrology (Bangor), Deiniol Road, Bangor, Gwynedd, LL57 2UP*

[2]*Centre for Ecology and Hydrology (Edinburgh), Bush Estate, Penicuik, Midlothian EH26 0QB*

Merthyr Mawr is a large dunes system in South Wales. This study was funded by Countryside Council for Wales to ascertain whether atmospheric N deposition, and polluted groundwater, contributed significantly to the nutrient budget at the site.

Gaseous NOx and NH_3 were measured by diffusion tubes and ALPHA samplers respectively over a 12-month period. Rain chemistry was collected monthly and groundwater and surface water samples were collected monthly for nutrient chemistry analysis. Soil and vegetation N pools were assessed in winter and summer.

The results suggest that ammonia levels are moderate to low at the site, with the greatest contribution coming from grazing land to the east of the site, and from localised areas of sea buckthorn (*Hippophae rhamnoides*) clearance on-site. Nitrate pollution in some groundwater sources was considerable, affecting certain areas subject to regular winter flooding. However, neither effects of atmospheric nitrogen nor of groundwater contamination were detectable within the typical dune habitats across the site.