

ENVIRONMENTAL MONITORING OF REACTIVE NITROGEN WITH SPECIAL REFERENCE TO USING PLANT BIOINDICATORS

J. Franzaring, A. Fangmeier

University of Hohenheim, Institute for Landscape and Plant Ecology, Stuttgart, Germany

Nationwide chemo-physical measurements of ammonia are being performed online in the Netherlands alone, while regional passive sampler networks have been set up recently in the UK, Switzerland and Germany. Despite their use in identifying regional background concentrations of ammonia, concentration and deposition measurements as well as dispersion models do not fully explain for the so-called ammonia gap. Complementing such approaches, the determination of empirical critical loads and various effects-based bioindication systems have been set up in the UN-ECE region to address the impact of nitrogen deposition loads in forests and semi-natural vegetation. These approaches are paralleled by regional and local studies, which demand eutrophication indicators to be applied in decision-making and EIA studies. The presentation will focus on various bioindicators to study the impact of reduced nitrogen. Ecological indicator values for nitrogen (Ellenberg values) are well suited for the study of long-term eutrophication impacts and may be linked directly to nature conservation issues and NATURA2000 reporting. Other plant ecological approaches relate to the study of foliar nitrogen contents in different plant species and may serve to identify critical plant nitrogen levels. Passive biomonitoring using mosses and conifer needles may be used for the integrated assessment of mid-term effects of regional and national nitrogen deposition loads, while source-oriented active biomonitoring may be used in local impact assessment of short-term effects. In conclusion, effects-based approaches may serve to better understand the dynamics and fate of nitrogen deposition and may offer ways to environmental policy evaluation and planning.