

Home

Online Library HESS

- Recent Final Revised Papers
- Volumes and Issues**
- Special Issues
- Library Search
- Title and Author Search

Online Library HESSD

Alerts & RSS Feeds

General Information

Submission

Review

Production

Subscription

Comment on a Paper



- Volumes and Issues
- Contents of Issue 4
- Special Issue

Hydrol. Earth Syst. Sci., 8, 651-662, 2004

www.hydrol-earth-syst-sci.net/8/651/2004/

© Author(s) 2004. This work is licensed under a Creative Commons License.

Regional variations in diffuse nitrogen losses from agriculture in the Nordic and Baltic regions

N. Vagstad¹, P. Stålnacke², H.-E. Andersen³, J. Deelstra¹, V. Jansons⁴, K. Kyllmar⁵, E. Loigu⁶, S. Rekolainen⁷, and R. Tumas⁸

¹Jordforsk - Norwegian Centre for Soil and Environmental Research, Frederik A Dahlsv 20, N-1432 Aas, Norway

²NIVA - Norwegian Institute for Water Research, P.O. Box 173, Kjelsaas, N-0411 Oslo, Norway

³National Environmental Research Institute, Vejlsovej 25, Dk-8600 Silkeborg, Denmark

⁴Latvia University of Agriculture, Dep of Environmental Engineering and Management, 19 Akademijas street, LV-3001 Jelgava, Latvia

⁵Swedish University of Agricultural Sciences, Department of Soil Sciences, P.O. Box 7072, SE-75007 Uppsala, Sweden

⁶Tallinn University of Technology, Ehitajate tee 5, EE-0026 Tallinn, Estonia

⁷Finnish Environment Institute, P.O. Box 140, FIN-00251 Helsinki, Finland

⁸Lithuania University of Agriculture, Water Management Department, 4324 Kaunas-Akademija, Lithuania

E-mail for corresponding author: nils.vagstad@jordforsk.no

Abstract. This paper describes nitrogen losses from, and the characteristics of, 35 selected catchments (12 to 2000 ha) in the Nordic and Baltic countries. Average annual losses of N in 1994–1997 ranged from 5 to 75 kg ha⁻¹, generally highest and characterised by significant within-country and interannual variations, in Norway and the lowest losses were observed in the Baltic countries. An important finding of the study is that the average nutrient losses varied greatly among the studied catchments. The main explanations for this variability were water runoff, fertiliser use (especially the amount of manure), soil type and erosion (including stream bank erosion). However, there were several exceptions, and it was difficult to find general relationships between the individual factors. For example, there was poor correlation between nitrogen losses and surpluses. Therefore, the results suggest that the observed variability in N losses cannot have been due solely to differences in farm management practices, although the studied catchments do include a wide range of nutrient application levels, animal densities and other relevant elements. There is considerable spatial variation in the physical properties (soil, climate, hydrology, and topography) and the agricultural management of the basins, and the interaction between and relative effects of these factors has an important impact on erosion and nutrient losses. In particular, hydrological processes may have a marked effect on N losses measured in the catchment stream water. The results indicate that significant differences in hydrological pathways (e.g. the relationship between fast- and slow-flow processes) lead to major regional differences in N inputs to surface waters and therefore also in the response to changes in field management practices. Agricultural practices such as crop rotation systems, nutrient inputs and soil conservation measures obviously play a

Search HESS

Library Search

Author Search

News

- New Service Charges
- Financial Support for Authors
- ISI Impact Factor: 2.270

Recent Papers

01 | HESS, 06 Mar 2009: Uncertainty analysis of hydrological ensemble forecasts in a distributed model utilising short-range rainfall prediction

02 | HESSD, 06 Mar 2009: EAGLE 2006 – multi-purpose, multi-angle and multi-sensor in-situ, airborne and space borne campaigns over grassland and forest

03 | HESSD, 06 Mar 2009: Evaluation of a probabilistic hydrometeorological forecast system

significant role in the site-specific effects, although they cannot explain the large regional differences observed in this study. The interactions between agricultural practices and basic catchment characteristics, including hydrological processes, determine the final losses of nitrogen to surface waters, hence it is necessary to understand these interactions to manage diffuse losses of agricultural nutrients efficiently.

Keywords: agriculture, catchments, diffuse sources, nitrogen, losses, Baltic, Nordic

■ [Final Revised Paper](#) (PDF, 770 KB)

Citation: Vagstad, N., Stålnacke, P., Andersen, H.-E., Deelstra, J., Jansons, V., Kyllmar, K., Loigu, E., Rekolainen, S., and Tumas, R.: Regional variations in diffuse nitrogen losses from agriculture in the Nordic and Baltic regions, *Hydrol. Earth Syst. Sci.*, 8, 651-662, 2004. ■ [Bibtex](#) ■ [EndNote](#) ■ [Reference Manager](#)