

CONTENTS

Volume 159 Issue 11 2011

SPECIAL ISSUE: Assessment of Nitrogen Fluxes to Air and Water from Site Scale to Continental Scale

Introduction

3143 Assessment of nitrogen fluxes to air and water from site scale to continental scale: An overview

W. de Vries, P. Cellier, J.W. Erisman, M.A. Sutton

Special Issue Papers

3149 Effect of topography on nitrous oxide emissions from winter wheat fields in Central France

J. Gu, B. Nicoullaud, P. Rochette, D.J. Pennock, C. Hénault, P. Cellier, G. Richard

Spatial variations in N₂O fluxes were in part the result of variations in soil water content.

3156 Sensitivity analysis for models of greenhouse gas emissions at farm level. Case study of N₂O emissions simulated by the CERES-EGC model

J.-L. Drouet, N. Capian, J.-L. Fiorelli, V. Blanfort, M. Capitaine, S. Duret, B. Gabrielle, R. Martin, R. Lardy, P. Cellier, J.-F. Soussana

Three methods of sensitivity analysis were compared to analyse their efficiency in assessing the sensitivity of a complex soil-crop model to its input factors.

3162 NitroScape: A model to integrate nitrogen transfers and transformations in rural landscapes

S. Duret, J.L. Drouet, P. Durand, N.J. Hutchings, M.R. Theobald, J. Salmon-Monviola, U. Dragosits, O. Maury, M.A. Sutton, P. Cellier

A model integrating terrestrial, hydrological and atmospheric processes of Nr transfer and transformation at the landscape scale has been developed to simulate the effect of spatial interactions between landscape elements on Nr fate.

3171 Integrated analysis of the effects of agricultural management on nitrogen fluxes at landscape scale

J. Kros, K.F.A. Frumau, A. Hensen, W. de Vries

Effects of agricultural management on N losses to air and water are evaluated at landscape scale combining a model assessment and measurements.

3183 Effects of farm heterogeneity and methods for upscaling on modelled nitrogen losses in agricultural landscapes

T. Dalgaard, N. Hutchings, U. Dragosits, J.E. Olesen, C. Kjeldsen, J.L. Drouet, P. Cellier

This study illustrates the importance of including non-linear effects of farm and landscape heterogeneity on the modeling and upscaling of farm nitrogen losses and greenhouse gas emissions in agricultural landscapes.

3193 Developments in greenhouse gas emissions and net energy use in Danish agriculture – How to achieve substantial CO₂ reductions?

T. Dalgaard, J.E. Olesen, S.O. Petersen, B.M. Petersen, U. Jørgensen, T. Kristensen, N.J. Hutchings, S. Gyldenkerne, J.E. Hermansen

Scenario studies of greenhouse gas mitigation measures illustrate the possible realization of CO₂ reductions for Danish agriculture by 2050, sustaining current food production.

3204 Quantification of nitrate leaching from German forest ecosystems by use of a process oriented biogeochemical model

R. Kiese, C. Heinzler, C. Werner, S. Wochele, R. Grote, K. Butterbach-Bahl

The Forest-DNDC model is tested on observations at nearly 80 sites and then used to quantify nitrate leaching from German forest ecosystems.

3215 Differentiation of nitrous oxide emission factors for agricultural soils

J.P. Lesschen, G.L. Velthof, W. de Vries, J. Kros

Emission factors for nitrous oxide from agricultural soils are derived as a function of N input sources and environmental conditions on the basis of empirical information.

ENVIRONMENTAL POLLUTION

CONTENTS—Continued from outside back cover

3223 Developing spatially stratified N₂O emission factors for Europe

A. Leip, M. Busto, W. Winiwarter

Model simulations suggest that stratified country-specific N₂O emission factors are useful to better describe the soil emission behaviour of the European Union countries.

3233 Assessing the impact of Cross Compliance measures on nitrogen fluxes from European farmlands with DNDC-EUROPE

M. Follador, A. Leip, L. Orlandini

Model simulations suggested that Cross Compliance measures can help reducing the environmental impact of corn cultivation.

3243 Farm, land, and soil nitrogen budgets for agriculture in Europe calculated with CAPRI

A. Leip, W. Britz, F. Weiss, W. de Vries

Consistent calculations of farm, land and soil N-budgets for agriculture in Europe are presented and discussed at the national level and for EU27.

3254 Comparison of land nitrogen budgets for European agriculture by various modeling approaches

W. de Vries, A. Leip, G.J. Reinds, J. Kros, J.P. Lesschen, A.F. Bouwman

Nitrogen budgets of agro-ecosystems in the EU 27 countries are assessed for the year 2000 by four models with different complexity and data requirements.