Geophysical Research Abstracts, Vol. 9, 11683, 2007
SRef-ID: 1607-7962/gra/EGU2007-A-11683

An overview of the Danish Ammonia Modelling System (DAMOS) and standard model calculation used for regulation of ammonia from agriculture in Denmark

C. Geels, L. M. Frohn, P. Løfstrøm, O. Hertel, C. Ambelas Skjøth, S. Gyldenkærne, K. M. Hansen, J. H. Christensen, J. Brandt, T. Ellermann and Lars Moseholm.

National Environmental Research Institute, P.O. Box 399, Frederiksborgvej 358, 4000 Roskilde, Aarhus University, Denmark

Atmospheric deposition of nitrogen to natural surfaces has for decades been a problem in Northern Europe. This deposition exceeds the critical load of nutrients for many European ecosystems. One of the main reasons of these exceedances is high ammonia emission from intense agricultural production. In Denmark the nitrogen deposition in background areas is estimated to be in the range 13 to 16 kg N/ha/year. However, near livestock farms with intense production the deposition is much higher due to the local emissions.

In order to assess the atmospheric deposition of nitrogen related to local, regional and international emissions the National Environmental Research Institute (NERI) has through the years developed the Danish Ammonia Modelling System (DAMOS). DAMOS is a coupling between the long-range transport model DEHM and the local-scale model OML-DEP and both models have now been updated to include an advanced dry deposition module based on the module applied in the EMEP model. Regional scale emissions are obtained from EMEP. For Denmark high resolution emissions down to farm and field level are obtained from a detailed ammonia emission model developed at NERI.

In Denmark livestock farms are regulated with respect to the environmental impact in relation to ammonia emission. The regulations are performed according to national legislation regarding protection of the environment. The local-scale model OML-DEP within DAMOS has in 2006 been used to develop a simple tool for these regulations. Sensitivity analyses have been used to determine which local parameters that is most

important for the deposition of ammonia and a nomogram method has been developed. This method is based on standard model calculations presented in simple curves of deposition as function of distance from the source.

The poster will give an overview of DAMOS as well as a description of the standard model calculations that form the basis of the regulation tool.