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Changes in direct N2O emission from agricultural soils in Poland during 1960 – 2009

Jedrzej Nyckowiak (1), Jacek Lesny (1), Lutz Merbold (2), Janusz Olejnik (1,3)

(1) Meteorology Department, Poznan University of Life Sciences, Piatkowska 94, 60-649 Poznan, Poland, (2) Department of Environmental Systems Science, Institute for Agricultural Sciences, ETH Zurich, 8092 Zurich, Switzerland, (3) Department of Matter and Energy Fluxes, Global Change Research Center, AS CR, v.v.i. Brno, Czech Republic

Nitrate fertilizing is among one of the major sources of direct nitrous oxide (N2O) emission from agricultural soils. An approximate area of 38 % of the surface of Poland was covered by agriculture. In this paper we determine the changes in direct N2O emissions from agricultural soils in Poland during 1960-2009 using an IPCC approach. Therefore we included data on land exploitation for 13 selected subareas of Poland during the given time period. Seven out of the thirteen subareas are located in the Western part (area A), and six of them in South-Eastern part of Poland (area B). Both areas could be clearly distinguished by the contribution of farms covering around 20 ha (or more) to both areas (A and B). While 10.6 % of Area A were covered by such farm sizes only 0.9 % were covered in Area B. Both regions varied additionally by the amount of fertilizers applied annually, crops yields and the structure of crops.
Direct emission from agricultural soils in the period of 1960 – 2009 were 1.66 $\pm$ 0.09 kg N2O – N ha-1 a-1 for Area A, 1.39 $\pm$ 0.07 kg N2O – N ha-1 a-1 for area B, and 1.46 $\pm$ 0.07 kg N2O – N ha-1 a-1 for the whole country. This is much lower than emissions estimated for example in France or Germany. It is caused mainly by lower consumption of nitrogen fertilizers and lower yields in Poland in comparison with yields in France and Germany