



UNIVERSITY OF GOTHENBURG

AVAILABLE POSITION

26th of February 2010 Ref nr E 334 802/10

University of Gothenburg, Faculty of Science announces:

Post Graduate Student in Natural Science Specialising Geography at the Department of Earth Sciences

Post Graduate Student wanted for taking part in the project "Practicable tool for to estimate nitrous oxide from biomass-cropping in agriculture and forestry" funded by Swedish Energy Agency.

The Greenhouse gas nitrous oxide (N₂O) is about 300 times stronger than carbon dioxide and long lived in the atmosphere. Nitrous oxide can be emitted from the soil when producing biomass, irrespective aimed for food or biofuels. The project goal is to generate satisfactory and fairly simple emission functions, for to be used in nitrous oxide emission estimations. Methods to use are measurement data and models like the CoupModel. Focus are on the modeling of biological processes in the borderline to soil-water-air to generate emission equations, to be used as a tool for estimating nitrous oxide from different land use primarily in Sweden. Society has a need for better knowledge on nitrous oxide emission as a base for decisions on actions to mitigate emission and also for Life Cycle Assessments or more comprehensive analysis. We are seeking a Post Graduate Student with keen interest in physical geography, biology and climate with knowledge in model work.

Post graduate studies to be initiated shortly or during 2010. Fulltime studies will be paid by education grant for PhD students the first two years and the following two years by PhD employment.

Main supervisor; Åsa Kasimir Klemedtsson Department of Earth Sciences, University of Gothenburg, tel +46 31 786 1960, e-mail asa.kasimir@gvc.gu.se, and assistant supervisor professor Per-Erik Jansson KTH Stockholm.

Application: Together with a letter of intent following annexes are asked for; copies of certificates, CV, one (1) copy of examination paper, and recommendation letter (maximun 2). Electronically sent applications will not be considered.

Application address:

University of Gothenburg
Eugenia Andersson
Department of Earth Sciences
Box 460
S-405 30 Göteborg

Mark the application with reference number: **E 334 802/10** and "Nitrous oxide"

The application must be received **no later than 1th of April 2010**

Trade-Union: SACO Martin Björkman, tel +46 31 786 3608, SEKO Lennart Olsson, tel +46 31 786 1173, OFR-S Astrid Igerud, tel +46 31 786 1167.

DEAN

Short project description.

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The greenhouse gas nitrous oxide (N₂O) is around 300 times stronger than carbon dioxide and long lived in the atmosphere where it is decomposed along with stratospheric ozone. Most nitrous oxide is produced in the soil by micro organisms when nitrogen is in excess compared to plant needs. Biomass production needs available nitrogen irrespective if it will be used for food or biofuels. The connection between biomass production and nitrogen has implication on nitrous oxide emission, but implies also existence of possibilities to mitigate the emission. The Swedish government has set limits for greenhouse gas emissions, a reduction of 40% for 2020 compared to 1990. Additionally the European parliament has decided on a sustainable biofuel production with 35 % savings of greenhouse gases compared with fossil fuel use, and these savings have to increase 2017 to be at least 50 %. Since nitrous oxide emission from agricultural land is large, ways to assess the emission from different cropping practices are of need. A problem is that the only simple method is the IPCC method (Tier1), where nitrous oxide from arable land is estimated upon one factor only, nitrogen addition; in fertilizer, manure or crop residues. The purpose for the Tier1 method is to give all nations a method possible to use in estimations of national emissions, for reporting to the UNFCCC (United Nations Convention on Climate Change). Although the method can not be used for estimation of emission from single fields or to give recommendations on how to get lower emissions. This is why better equations are of need, both for agricultural and forest land, possible to use for Sweden and other countries as well. As tool for to formulate equations, specific for regions and crops we suggest to use the recently improved CoupModel (Coupled heat and mass transfer model for soil-plant-atmosphere systems) since the emission is controlled by many and interacting variables. One important variable is nitrogen availability in the soil which is influenced by nitrogen addition, soil mineralization and nitrification, variables influenced by factors like climate and drainage. The field of research is wide and knowledge have to be collected from different diciplines. This project intends to find proxi-variables on a moderately detailed level to construct multi variable equations, possible to use for estimation of nitrous oxide emission in economic analysis, LCA or as input to userfriendly or research models. The work has importance for different levels in the society, where research needs good detailed and accepted tools and authorities are in need to know how to get lower emissions. For this the commonly used IPCC method for to estimate nitrous oxide emission due to land use is too coarse and do not lead forward finding mitigation options, which makes this project important. The Swedish energy Agency supports the project and tight connections to authorities and enterprize organisations exists.