

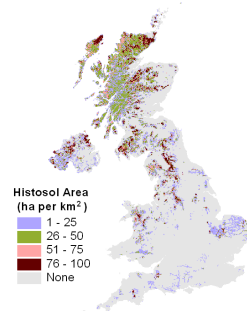
The Greenhouse Gas Platform is a 5-year research programme funded primarily by Defra, with additional support from the Devolved Administrations of Scotland, Wales and Northern Ireland to generate new country-specific measured and modelled Emission Factors for methane (CH<sub>4</sub>) and nitrous oxide (N<sub>2</sub>O) from agriculture. The main objective of the research is the development of an improved Agricultural Greenhouse Gas Inventory, that uses appropriate country and practice-specific emission factors and that will reflect the adoption of mitigation practices by the agricultural industry, enabling forecasting and monitoring of performance against the wider UK target emissions reductions set by the UK Climate Change Act 2008. This newsletter provides an update and more information on the work that has been carried out within the Platform projects over the last six months:

**Data Synthesis, Modelling and Management Project:**

A second knowledge exchange workshop was held in Birmingham that presented results from the Methane and Nitrous Oxide measurement projects and invited the audience to test a range of methods for communicating uncertainty in inventory calculations of the share of emissions between sectors and changes in emissions over time. The meeting was attended by over 60 representatives from industry, Government, research organisations and NGOs. A large number of posters were presented covering topics ranging from the effect of diet type on methane emissions to the efficacy of nitrification inhibitors. Presentations and posters from the workshop are available on the Platform website.



The AC0114 team continue to develop the agricultural activity datasets that will underpin the emission calculations in an improved inventory. The team have developed a new reference map of the extent of cultivated organic soils in the United Kingdom that will be used to calculate nitrous oxide emissions resulting from their drainage or tillage, and will also be used to support the LULUCF inventory. A further literature review has been completed on the potential mitigation of emissions from stored manures, along with a synthesis of manure management practice surveys in the UK from the early 1990s to the present day. The links between manure production and livestock productivity have also been improved through the derivation of new statistical models predicting manure nitrogen excretion from the metabolisable energy requirements of cattle and the dietary protein content.



**Nitrous Oxide InveN<sub>2</sub>Ory project:**

Measurement of direct and indirect N<sub>2</sub>O emissions have continued at a range of sites across the UK, following applications of fertiliser nitrogen, livestock manures and dung and urine, with and without a nitrification inhibitor. Twenty of the planned 35 experiments have now been completed, and data are being analysed. A laboratory based study to determine the factors which control the efficacy of the nitrification inhibitor, DCD, has just been completed – with evidence that soil type, perhaps clay content and organic matter content, are influencing factors.



An automatic chamber (pictured left) has been deployed at most field experiments, to measure N<sub>2</sub>O fluxes with greater frequency, up to six times per day, compared to the once per day measurements from the five static chambers on the same plots. Auto-chambers are not without their challenges, e.g. battery power, but when operating they offer the opportunity to run semi-continuously for

several weeks at a time. Data are being collated to compare fluxes calculated using the more frequent sampling by the auto-chamber with the less frequent static chamber deployment protocol.

**Methane ResearCH<sub>4</sub> project:**

Scientists attending the Greenhouse Gas and Animal Agriculture Conference in Dublin joined a preliminary workshop at AFBI Hillsborough in Northern Ireland to learn about the tools being within the Platform to monitor GHG emissions more accurately. The workshop also covered details of a forthcoming publication on the SF<sub>6</sub> tracer technique guidelines. The manual is due to be published before the end of the 2013. A guided tour of the facilities was also carried out, which covered the calorimetry chambers, gas analysis chambers, anaerobic digester and the renewable energy centre at AFBI. A practical session also allowed scientists to get some hands-on experience with the tools involved in applying the SF<sub>6</sub> technique.

A team of young researchers from the school of biosciences at the University of Nottingham also appeared on Blue Peter on Thursday 5<sup>th</sup> September to explain how much methane is produced by dairy cows. The team was taking part in the BBC Energy Day hosted by Radio 5 Live outside the BBC studios in Salford. Matt Bell, Liz Homer and Ruth Wilcox spent the day demonstrating how they measure methane in breath of cows while the cows are eating. The live demonstration featured two Ayrshire cows that were extremely popular with the public. As well as Blue Peter, the work was featured by local radio and television news programmes.



**Links to the Global Research Community:**

The UK GHG Platform was well represented at GRA meetings in the margins of the Greenhouse Gases and Animal Agriculture conference in Dublin (June, 2013). Platform scientists attended meetings of the Animal Selection, Genetics & Genomics Network, the Feed & Nutrition Network, the Manure Management Network and the Rumen Microbial Genomics Network. The UK was also represented at a scoping workshop for a Grasslands Network. To support the Manure Management Network, Dave Chadwick, Brian Chambers and John Williams have produced a draft "Directory of GHG Mitigation Methods for Manure Management". Platform scientists are also supporting Defra and the AHVLA who are leading the GRA activity to establish a Network on Animal Health and GHG Emissions Intensity. The UK is funding a national project to examine the practicality of using Earth Observation to provide agricultural activity data supporting inventory building and will draw upon international experiences via a stock-take sent to GRA members.

The Global Research Alliance Modelling Platform (GRAMP) project has also developed its website which was launched at the recent GRA Croplands Research Group meeting in Florida. GRAMP aims to link researchers with appropriate datasets, models and training material. Several members of the Nitrous Oxide Project team have contributed to the internationally authored "Best practice guide to using chambers to measure nitrous oxide emissions



from soils" which can be downloaded at <http://www.globalresearchalliance.org/research/livestock/activities/nitrous-oxide-chamber-methodology-guidelines/>. Further information on UK GRA activities is provided in the 'UK Agri-Science & Innovation' newsletter available at <http://www.ghgplatform.org.uk/UKGRAActivities.aspx>.