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GHG-MANAGE: Managing and Reporting of Greenhouse Gas Emissions and Carbon Sequestration in Different Landscape Mosaics

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We present a new consortium under the European FACCE ERA-GAS programme, focusing on GHG-exchange at the (role of) the heterogeneous landscape scale and agricultural management decisions. Different landscape mosaics contribute an as yet poorly quantified contribution to greenhouse gas (GHG) emissions and carbon sequestration, as well as having an uncertain direct warming effect through variations in their surface properties. This limits our ability to implement mitigation measures at the farm scale. In this project we aim to assess the GHG characteristics and surface-related warming effects of the most relevant European landscape types and examine the optimum configuration of different land uses and management interventions, including afforestation-related GHG offsetting, to minimise or reduce GHG emissions. We will provide information that can be utilised for on-farm reporting tools, such as an economic tool and the Cool Farm Tool (CFT). We will also use this information to both refine and increase the utility of these approaches, particularly in relation to CH 4 and N2O exchange and for organic soils. Important compensation mechanisms will be quantified and their impact on regional to national scale GHG emissions and soil carbon stocks assessed. Finally, appropriate methodologies to report and verify the effects of landscape scale GHG emission compensation mechanisms, both top-down and bottom-up, will be developed and assessed.
These methodologies include low-flying aeroplane sensing of land-atmosphere exchange fluxes, that can be statistically dis-aggregated into averages and components (NEE, GPP, Re for CO_2) for each land use type. Bottom-up (leaf to field/stand) scaling methods will also be explored, and simplified methods using concentration variance or budget methods will be revisited. Preliminary results will be demonstrated in this poster.