

Researchers contribute to new USDA report and tools to measure, manage greenhouse gas emissions

5 August 2014, by Jeff Dodge

The U.S. Department of Agriculture today released a report that, for the first time, provides uniform scientific methods for quantifying the changes in greenhouse gas (GHG) emissions and carbon storage from various land management and conservation activities.

Colorado State University faculty members served as authors and external science advisors on the new [report](#), and a CSU team is leading the implementation of a new online tool that provides customized GHG reports and management plans in accordance with the new guidelines.

The report, *Quantifying Greenhouse Gas Fluxes in Agriculture and Forestry: Methods for Entity-Scale Inventory*, will help the USDA evaluate [greenhouse gas](#) mitigation programs and develop new tools to help farmers, ranchers and forest landowners participate in emerging carbon markets.

"This report provides science-based methods for quantifying [greenhouse gas emissions](#) and [carbon storage](#) on local farms, ranches and forests, allowing managers of these entities to calculate reductions in greenhouse [gas emissions](#) while building carbon storage and improving production efficiency on their lands," said Stephen Ogle, associate professor in CSU's Department of Ecosystem Science and Sustainability and senior scientist at the Natural Resource Ecology Laboratory (NREL).

Ogle was the lead author of the cropland/grassland working group and the wetlands working group, two of the four groups convened by the USDA for the methods development, which also included forestry and livestock.

To help make the new GHG guidelines more accessible and applicable, an interdisciplinary

research team led by CSU soil and crop sciences professor Keith Paustian is implementing the new web-based tool, COMET-Farm (cometfarm.nrel.colostate.edu) in conjunction with the report. The site will allow users to select their land use (including cropland, grassland, livestock and agroforestry), enter information about their management practices, and then generate a report on their current baseline emissions and how emissions could be reduced with GHG management practices.

"Quantifying greenhouse gas emissions from land use is particularly difficult, because there are so many interacting processes and factors that affect emissions," said Paustian, who is also a senior scientist with NREL. "COMET-Farm is unique in that it allows non-experts to use very advanced methods, databases and models for greenhouse gas inventory, via a fully spatial, user-friendly interface. We think it will be a very powerful tool to aid land managers and others working to reduce greenhouse gas emissions from land-use activities."

Paustian also served as an external science advisor on the USDA report, along with Shawn Archibeque, associate professor of animal sciences at CSU. CSU researchers Mark Easter and Ernie Marx also contributed to the report. The lead software engineer on COMET-Farm, CSU computer science alumnus Kevin Brown, is the lead software engineer on COMET-Farm, and his team includes several CSU undergraduate students in computer science, engineering and agriculture.

The USDA report is the work of 38 experts in GHG estimation in the cropland, grazing land, livestock and forest management sectors across academia, the USDA and other agencies of the federal government. The report was reviewed by an

additional 29 scientists, other federal experts, and the public. While developing the report, reviewers considered scientific rigor, transparency, completeness, accuracy, and cost effectiveness, as well as consistency and comparability with other federal GHG inventory efforts.

More information: The report can be downloaded at www.usda.gov/oce/climate_change/estimation.htm.

Provided by Colorado State University

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