

Interactive comment on “Anthropogenic and natural methane fluxes in Switzerland synthesized within a spatially-explicit inventory” by R. V. Hiller et al.

Anonymous Referee #2

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Hiller et al. present a spatially explicit inventory of methane emissions for Switzerland with a critical analysis of uncertainty. The inventory is comprehensive and insightful, and will certainly guide the science for some time to come. I find the analysis to be one of the most rigorous to date and feel that most improvements can be made in communicating uncertainty to the reader and using such a discussion to further highlight critical needs for future research.

My largest scientific questions arise from potential scale-dependencies of the results. A recent manuscript by Zhao and Liu (<http://onlinelibrary.wiley.com/doi/10.1111/gcb.12496/abstract>), admittedly from a slightly different topic although likewise related to carbon dynamics, highlights some

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important scaling issues. Is 500 x 500 m enough to capture methane emissions? I'm working with colleagues on an interesting permafrost collapse system where anything coarser than 20 x 20 m simply will not do for understanding methane flux. There are surface features with 2 orders of magnitude more methane emissions than anything else on the landscape, and the characteristic dimensions of these things is on the order of tens of meters, not hundreds. That being said, it is exceedingly difficult to upscale methane dynamics of natural ecosystems using typical remote sensing platforms like Landsat. A critical discussion of scale dependencies, potentially as a subsection under section 3.3, would emphasize important avenues of future research without distracting from the rigor of the analysis as presented. Figure 4 does present some important insights into scaling issues, as do the maps with the EDGAR comparisons, although embedded within the scaling uncertainties are multiple important differences in accounting methodology.

The information in the top of 15187, that about 90% of methane fluxes are being investigated here, should be highlighted elsewhere like the abstract to make the reader aware of potential biases in the product.

The introduction is two pages long, the methods about 14 pages, and the combined results and discussion section is about 6 pages. This doesn't leave much room for discussion, in a relative sense. But the measurement, modeling and inventory communities want to know something more about how they can improve understanding of methane flux at the national scale. What sorts of recommendations will be the most fruitful for building realistic national inventories, and what information did you wish that you had when creating this product?

(please note minor usage issues like page 15204 'cattle is moved')

Interactive comment on Biogeosciences Discuss., 10, 15181, 2013.