Biogeosciences
Discussions

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Interactive comment on "WETCHIMP-WSL: intercomparison of wetland methane emissions models over West Siberia" *by* T. J. Bohn et al.

Anonymous Referee #2

Received and published: 21 March 2015

This manuscript presents the results of a multi-model intercomparison of methane emissions from the West Siberia Lowlands. The West Siberia Lowlands are a good choice for this study – big and important, some good data (but not enough to know the answer), and important climate gradients, particularly non-permafrost to permafrost. The intercomparison includes inverse and forward models of varying complexity and emphasis, and thus represents a diversity of approaches. Overall, it represents the state-of-the-art in regional/global methane modeling, and should be of interest to readers of Biogeosciences.

The paper is very clearly written and the tables and figures are also clear (a few comments on the figures below). I recommend minor revisions before final publication.

GENERAL COMMENT

The concluding recommendations are not unexpected, but it is useful to have them spelled out and backed up by the analysis of multiple models of multiple types. It would be interesting to read any conclusions/recommendations you reached at this stage about model representation(s) of biogeochemistry?

SPECIFIC COMMENTS p. 1915, l5-7. Why aggregated from 25-km to 0.5°? There is probably a good reason, which you should provide.

p. 1926, l5-7. Comparing soil moisture content between mineral and peat soils – what do you mean by 'content'? by mass or volume, or by degree of saturation? This needs a more careful explanation.

p. 1931, l3-4: this is true for UW-VIC (GEIMS) in the north only.

p. 1934, l1-3. This isn't clear, and as I try to interpret it, it doesn't seem like a general conclusion in keeping with points above.

p. 1934, l4-21. Would an interactive N cycle also be a longer-term influence? Did the N-cycle (stocks and/or fluxes) change substantially over the ∼10 year simulations for those models that included it?

p. 1934, l22-28. This paragraph may be more specific to a limited set of models than should be included in the paper.

p.1935, l5. 'larger' or 'large'?

p. 1937, l17-19. Well, really, from a climate change point of view, CH4 is well-mixed in the atmosphere and has a c.10-year lifetime, so to first order (which is where we are with this collection of models) long-term mean emissions is probably good enough. Not satisfactory, and not a goal, certainly, but not necessarily any worse than the other results at this point. Until we have more confidence in the models, this is probably still as good as any of them.

Refs missing – at least Walter et al. 2006; Pace et al. 2004 (I didn't do a thorough

check, but you should).

Table 2. A footnote should define I, M, M+, and T.

Fig. 5. Interesting figure! I suggest moving I, T, M and gray symbols to upper right (above legend (and adding that to figure 12 upper right), and then either reduce area in upper left to 800 (all match), or reduce all areas to use more of the graph.

Fig. 5 & 8 & 12 (in particular). Increase font size in legends (there is space in upper right). As many model names are similar, it is difficult to tell them apart when the font is small.

Fig 12. Explain 'Tair-dominated' and 'Finund-dominated' and associated lines at 0.7 in caption, for the benefit of most of your 'readers'.