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Biogeosciences Discussions

Interactive comment on "Wetland restoration and methanogenesis: the activity of microbial populations and competition for substrates at different temperatures" *by* V. Jerman et al.

Anonymous Referee #3

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This manuscript describes the influence of temperature on competition for electron donors between iron reducers and methanogens in microcosms constructed from Ljubljana marsh soil. The primary objective of the study is not particularly interesting; it is expected that iron reducers would outcompete methanogens for electron donors, assuming sufficient Fe(III) is available. The affects of temperature on the competition are interesting, although temperature does not change the outcome of the competition. The study is tight, however, with a significant amount of supporting data that strongly support the author's conclusions. The coupling of kinetics of organic matter decomposition with the production and accumulation of products (CH_4 and CO_2) and reactants (H_2 and acetate) are strong points of the manuscript, as is the linking of acetate and

methane date with mcrA genotypes.

I have a few suggestions and questions.

Some wording is awkward. For example:

1. p. 2358 line 23: Change to "For centuries, most European wetlands. . . "
2. p. 2359, line 8: Change to "Fermentation products such as acetate and H_2 are substrates for . . . "
3. p. 2360, line 2 (Fey and Conrad, 2000) Remove the comma after Fey.
4. p. 2360, line 11: "This will result in anoxic conditions. . . "

General comments:

1. In the Introduction, briefly introduce the importance of two component models and their use in analyzing processes.
2. Throughout the manuscript, replace "decomposition" with "mineralization." Decomposition can refer to a variety of processes and products, whereas only mineralization was measured in this study.
3. Ammonium was measured and data displayed in Fig. 2, but very little information was given on why it was measured and for potential implications for its changes in concentration. Some deeper comment would be appreciated.
4. Interestingly, the *mcrA* primers designed by Luton and used in this study are biased against *Methanosarcina* and towards the *Methanomicrobiales* and *Methanobacteriales.* The authors may want to mention this bias; it might serve to support their data.

Interactive comment on Biogeosciences Discuss., 6, 2357, 2009.