

Interactive comment on “Uncertainties in modeling CH₄ emissions from northern wetlands in glacial climates: effect of hydrological model and CH₄ model structure” by C. Berrittella and J. van Huissteden

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In their manuscript, Berrittella and van Huissteden address an uncertainty in glacial CH₄ emissions from northern wetlands by comparing two modelling approaches on large-regional scale. Since there is no direct data to compare with the model results for the glacial conditions, the authors do their best by testing the model against the present-day data. An interesting outcome of their study is that glacial wetland expansion on the exposed seafloor may have compensated for a decrease of wetland area due to continental ice cover. The paper is well structured and easy to read, but some

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formulations are written in too generic form and units are often missing or mismatched. This should be improved in accordance with the comments listed below.

Specific comments

Abstract: “Methane (CH₄) fluxes from northern wetlands may have influenced atmospheric CH₄ concentrations at climate warming phases during the 800 000 years and at present global warming.” This is a very weak statement. There are no doubts that CH₄ fluxes from northern wetlands have influenced atmospheric CH₄ concentration in the past and that they are important at present and in the future, disregard of the warming or cooling phases. The authors surely had a more specific point in mind.

Page 825, section 2.2.3: BIOME is a biogeography model, while the BIOME3 model includes carbon cycle. The authors should be more precise about the model names.

Table 1: What are the units? “Corresponding values are reported in Fig. 1.” Reference to the Fig.1 is wrong. Should it be the Figure 9?

Fig. 2: “The upper map displays simulated fluxes of peatland for each climate model gridcel (ST3ADHOC climate). “ Should it be “fluxes of methane”? “The lower map shows the model results after overlay with the wetland distribution map.” What exactly is shown on the lower map – CH₄ fluxes or wetland fraction?

Page 832, l, 1-2: “Results for the same climate (Fig. 8) differ at least about 1 GTon ..” The units are wrong.

Fig. 10: again, what are the units here?

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