



Modelling CH₄ emissions from Northern wetlands: importance of vegetation in past and present climates

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Methane fluxes derived from wetlands strongly depend on vegetation cover. Vegetation influences methane emissions, by transferring labile organic carbon into anoxic soils and transferring methane from soil to atmosphere. In large scale models these processes are often not taken in account. This leads to an oversimplified view of the system and may result in over- or underestimation of the wetland fluxes.

Methane emissions from continental Europe in different glacial climates and the present climate have been simulated by coupling the Peatland-VU model (based on the Walter-Heimann model) to climate model simulations. We tested different vegetation and hydrological parameter sets. The results show a very wide range of wetland methane emissions and indeed the output proves to be particularly sensitive to vegetation parameters. Vegetation parameters are important since past (glacial) northern wetland vegetations may have differed considerably from the present-day *Sphagnum*-rich tundra vegetations. We also experimented with different approaches of hydrological modelling by adding a simple hydrological model.

Emissions during Glacial climates are also highly sensitive to assumptions on the extent of ice cover and exposed sea floors. Low relief exposed sea floor areas may have compensated for decreasing emissions due to continental ice cover.

Modelled CH₄ fluxes on a continental scale are in particular sensitive to assumptions on vegetation. This sensitivity has to be accounted for in assessing past (glacial) methane sources.