



Sensitivity of global methane emissions to wetland area estimates

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Model estimates of global methane emissions from wetlands are subject to a number of uncertainties. Among these, uncertainty in the area of methane emitting wetlands plays an important role, as important as uncertainty in model parameters related to the generation of methane within wetlands.

For estimating wetland CH₄ emissions, we use a version of the dynamic global vegetation model LPJ, which we have extended by modules determining dynamic wetland extent, based on a TOPMODEL approach, wetland biogeochemistry, and methane transport through the soil column. For the present assessment, we drive the model with observed climate data, as well as different estimates of wetland area. These are derived from maps, from remote sensing data, or modelled internally, with some estimates distinguishing between permanent and non-permanent wetlands.

We analyse the experiments performed and present results for global emissions, as well as emissions in special regions. We also investigate interannual and seasonal variability and relate emission patterns to atmospheric concentrations.

We compare results with other estimates of CH₄ emissions and apply various measures to evaluate the quality of our results.